



Town of Johnstown

TOWN COUNCIL REGULAR MEETING

450 S. Parish, Johnstown, CO

Wednesday, September 08, 2021 at 7:00 PM

MISSION STATEMENT: Enhancing the quality of life of our residents, businesses, and visitors through community focused leadership.

AGENDA

CALL TO ORDER

Pledge of Allegiance

ROLL CALL

SPECIAL PRESENTATIONS

1. Business of the Month - Presented by Sarah Crosthwaite, Economic Development Manager
- [2.](#) Christmas Tree in Town

AGENDA APPROVAL

PUBLIC COMMENT

Members of the audience are invited to speak at the Council meeting. Public Comment is reserved for citizen comments on items not contained on the printed agenda. Citizen comments are limited to three (3) minutes per speaker. When several people wish to speak on the same position on a given item, they are requested to select a spokesperson to state that position.

TOWN MANAGER REPORT

- [3.](#) Town Manager's Report

CONSENT AGENDA

The Consent Agenda is a group of routine matters to be acted on with a single motion and vote. Council or staff may request an item be removed from the Consent Agenda and placed on the Regular Agenda for discussion.

- [4.](#) Minutes - August 16, 2021
- [5.](#) Second Reading - Ordinance No. 2021-206 Approving the North Ridge P.U.D. Outline Development Plan
- [6.](#) Adopting Resolution 2021-27, A Resolution Authorizing a Mail Ballot Election for the Town of Johnstown's Regular Municipal Election Scheduled for April 5, 2022
- [7.](#) Amendment to Non-Potable Irrigation Agreement
- [8.](#) LED Streetlight Conversion Project for Supplemental Environmental Project

TOWN ATTORNEY REPORT

PUBLIC HEARING

- [9.](#) Resolution 2021-28 - Resolution Approving the Service Plan for Ledge Rock Center Commercial Metropolitan District

- [10.](#) Resolution 2021-29 - Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 1
- [11.](#) Resolution 2021-30 - Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 2

NEW BUSINESS

- [12.](#) Award design services for Water Treatment Plant
- [13.](#) Dam Repair Contract for Johnstown Reservoir

COUNCIL REPORTS AND COMMENTS

MAYOR'S COMMENTS

EXECUTIVE SESSION

- 14. For the purpose of determining positions relative to matters that may be subject to negotiations, developing strategy for negotiations, and/or instructing negotiators, under C.R.S. Section 24-6-402(4)(a). Regarding Economic Development.
- 15. For the purpose of determining positions relative to matters that may be subject to negotiations, developing strategy for negotiations, and/or instructing negotiators, under C.R.S. Section 24-6-402(4)(a). Regarding Economic Development.

INFORMATIONAL ITEMS

ADJOURN

AMERICANS WITH DISABILITIES ACT NOTICE

In accordance with the Americans with Disabilities Act, persons who need accommodation in order to attend or participate in this meeting should contact Town Hall at (970) 587-4664 within 48 hours prior to the meeting in order to request such assistance.

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Your Guide to Adirondack Pine
GIANT TREES

Trees, lights, ornaments & toppers

LUSH THICK LAVISH PLUSH OPULENT
GRAND LUXURIOUS DENSE SPLENDID
BOUNTIFUL DELUXE GORGEOUS POSH

Item #2.



Quality of product and service

Appreciate the Difference when working with Downtown Decorations, Inc. With over 60 years combined experience in the commercial holiday industry, we have sold thousands of commercial trees and will guide you through the process with ease. As a full-service company, we have the ability to meet with you and walk you through your project. Our sales representatives will work closely with you every step of the way to ensure the success of your program. From the initial call to the completion of installation, we are here for you.



Fun Stuff

Realistic Foliage

Our trees are not the standard panel cone trees, but are made to look like the real thing with individual life-like branches that fluff out instead of laying flat. Each branch has dimension and depth to mimic the natural shape and angle of real pine branches. This depth of the foliage allows the lights and ornaments to be tucked within the branches and not dangle on top. Our pine foliage has 2 shades of color to add realistic live tree color and dimension.



Tree's can "Grow"

Our stackable ring construction allows customers to increase the height of their tree in 2' increments up to 110' with no issue.



Technical Stuff

Our products will exceed your expectations every time. We are committed to having the highest quality products in the industry.

All Parts Are...

- UV Protected
- UL Listed
- Flame Retardant

5 Season Heavy Weather Warranty

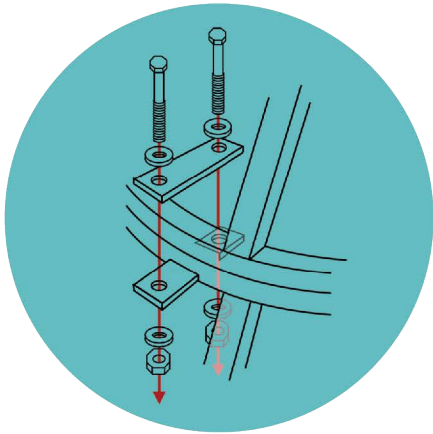


Construction & Materials

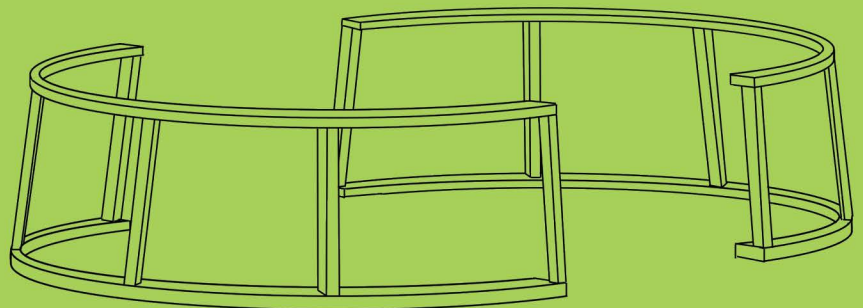
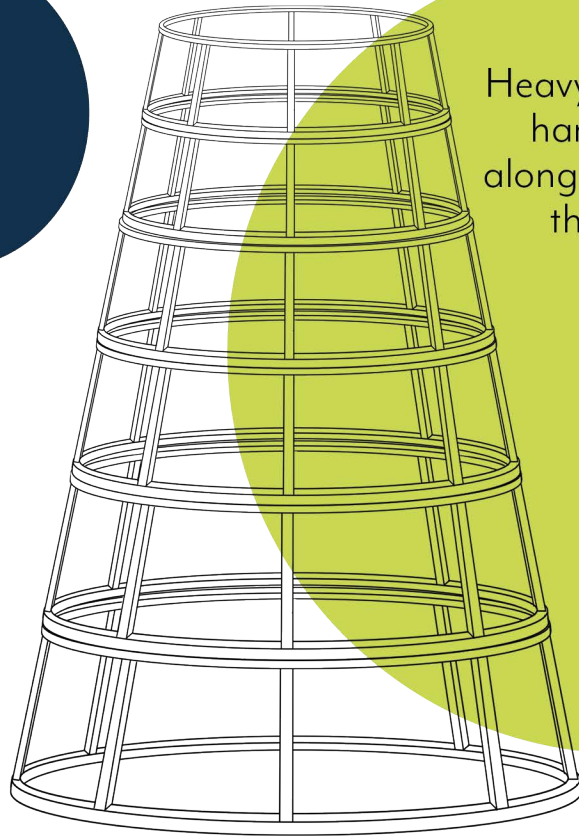
Item #2.

Heavy gauge powder coated steel frame comes in 2' high sections. Frames are concentric and nest together for easy storage.

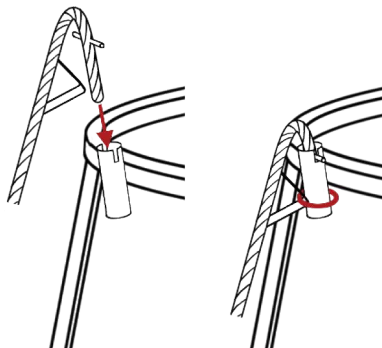
Heavy duty wiring harness runs along the inside of the frame.



Welded brackets and interchange bolts for easy assembly



Branches are easily slid into pre-drilled slots throughout the frame without need of additional hardware.





Installation

Item #2.

Ease of Installation

Easier than trying to put together a Ikea Hassablagaticfrufferdtifiter bookshelf by yourself on a Sunday when you'd rather be doing something else.

Frame



Our 2' ring construction allows for all parts of any size tree to fit through a standard double door or into an elevator.

Once on site the tree can be completely assembled with hand tools. Even a lift is not required, as the tree frame forms it's own climbable scaffolding for install (but we will admit that a lift can be pretty helpful for trees over 30').

Branches



All branches are interchangeable on the frame so there is no complicated labeling system.

Ornaments are attached to branches on the ground, prior to frame attachment. We not only provide a designed ornament pattern but create an printable PDF ornamenting guide, with lots of pictures, created specifically for each unique pattern.

Tree Lighting



Lighting your space

Our in stock trees feature 5mm Warm or Cool White LED mini lights that give you the warm fuzzy feelings.

Features

- High quality commercial LED sets = 50,000-hour rating and unbreakable.
- LED does not burn out like and incandescent. If one light goes out, the rest all stay lit.
- LED lighting option reduces energy consumption and energy costs by 85%

Ornaments

Item #2.



Add some color

Customize your ornament pattern to match your unique space.

Features

- UV resistant and Shatterproof Commercial ornaments
- Easy ornamenting guide provided
- Ornaments ship separately to save labor and avoid breakage in transit
- Custom Ornament patterns available. See your rep for details.



Ornament Patterns



Festive Reds & Golds



Modern Holiday Charm



Classic North Pole

Tree Toppers

Item #2.



Make a statement

A sundae's just ice cream without the cherry and a tree isn't a Christmas tree without the star.

Features

- Designed to fit our Adirondack Pine Trees but can fit any tree including live trees
- Made for indoor or outdoor use
- All feature LED UL listed lighting in warm or cool white
- Be sure to consider a tree topper when selecting your tree height

Tree Toppers



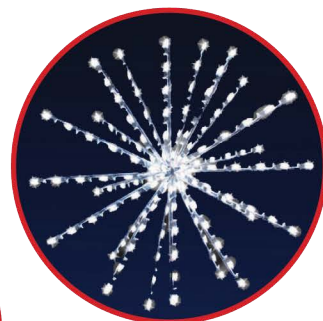
3' 3D Moravian Star
Super White LED Tree Topper



4' Internally Lit Mexican
Star Tree Topper



3', 4' & 5' Nativity Star
Tree Topper



3' & 5' 3D Snow burst
Tree Topper

CONTACT US

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East Syracuse, NY 13057

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Johnstown Jingle

Sunday, December 5, 2021

2-5pm with Tree Lighting at 5:30pm

- The JDDA is wanting to start an Annual Tree Lighting Celebration for the Community following the Johnstown Jingle.
- We have two different Styles of trees to choose from and different prices.
- We have checked in with the Public Works Director and the town is able to install and store this tree in the off season.
- The following is the 1st option from Temple Display.



TEMPLE
display, ltd.

Item #2.



Our LED Panel Trees are Proudly Made right here in the U.S.- they are easy to install & store and are available in a variety of sizes and your choice of LED light colors. Our Panel Trees can be increased in height in 4 ft. increments as budget permits. The lights are all wired on here, so there is no putting on or taking off lights every year. And, for storage - the panels nest right inside one another. They are not only beautiful but they are built to last!



TEMPLE
display, ltd.

Item #2.





TEMPLE
display, ltd.

Item #2.



← *Row 1*

Row 2 →



Please Note: Install Pic is for a 34'
Panel Tree



TEMPLE
display, ltd.

Item #2.



Please Note: Install Pic is for a 34'
Panel Tree



TEMPLE
display, ltd.

Item #2.

*Please Note:
Install Pic is
For a 34'
Panel Tree*





TEMPLE
display, ltd.

Item #2.



Cone



Panels

Please Note: Install Pic is for a 34'
Panel Tree



TEMPLE
display, ltd.

Item #2.



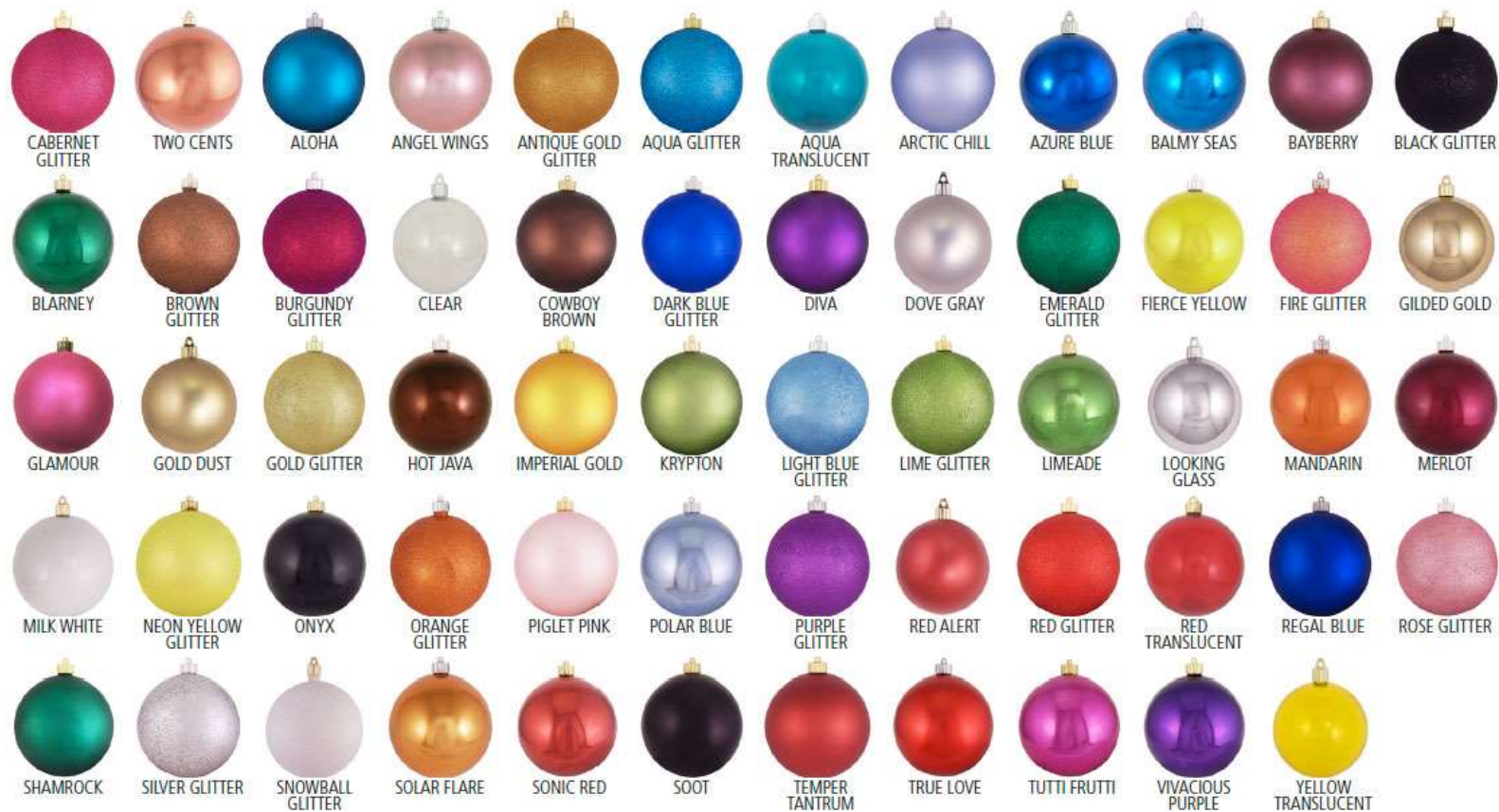
Please Note: *Install Pic is for a 34'*
Panel Tree



TEMPLE
display, ltd.

Item #2.

Optional Ornament Packages Available





Warranty

Temple Display, Ltd. warrants to the original buyer that all decorations manufactured by them will be free from defects and material workmanship under normal conditions of use and service, including damage caused by winds of up to 60 mph. This protection is extended as follows:

- 6 seasons - steel frames, 1/4" Cold Rolled Steel – Powdercoated*
- 6 seasons - garland*
- 6 seasons - electrical components (including wire, sockets, and plugs)*
- 3 seasons – LED light bulbs*

This warranty is non-prorated.



Temple Display Pricing

18' LED Panel Tree

\$11,884

- 10' Base (\$10,446)
- 680 C-7 Led Lamps (Can choose any color, warm or cool)
- 3' Flat Star w/ 37 C-7 LED Lamps (\$386.00)
- Shatterproof Ornaments (\$1,052.00) - any color arrangement
 - 84 6" ornaments (\$446.00)
 - 54 8" ornaments (\$576.00)
- 10% discount on tree and star if ordered by 9/9/21 bringing the total price to \$10,800.80
- These trees can grow by 4' increments - \$5,948 (Minus a discount which can be upwards of 33% if purchased in Jan or Feb.)



Temple Display Pricing

22' LED Panel Tree

\$18,360.00

- 12' Base (\$16,394.00)
- 995 C-7 Led Lamps (Can choose any color, warm or cool)
- 3' Flat Star w/ 37 C-7 LED Lamps (\$386.00)
- Shatterproof Ornaments (\$1,580.00) - any color arrangement
 - 132 6" ornaments (\$748.00)
 - 78 8" ornaments (\$832.00)
- 10% discount on tree and star if ordered by 9/9/21 bringing the total price to \$16,682.00
- These trees can grow by 4' increments - \$7,144 (Minus a discount which can be upwards of 33% if purchased in Jan or Feb.)

Downtown Decorations Pricing

20' Adirondack Mountain Pine Tree

\$18,360.00

- \$13,591 - This tree is individual branches
- 6500 LED 5mm Warm White Lights
- 3' Glitter Star Tree Topper LED Lights (\$425)
- Shatterproof Ornament Package (\$3,302)
- This tree can grow in size by 2' increments
 - 22' increase price is \$3,882
 - 24' increase price is \$4,468

Realistic Foliage

Our trees are not the standard panel cone trees, but are made to look like the real thing with individual life-like branches that fluff out instead of laying flat. Each branch has dimension and depth to mimic the natural shape and angle of real pine branches. This depth of the foliage allows the lights and ornaments to be tucked within the branches and not dangle on top. Our pine foliage has 2 shades of color to add realistic live tree color and dimension.





Features

- *High quality commercial LED sets = 50,000-hour rating and unbreakable.*
- *LED does not burn out like and incandescent. If one light goes out, the rest all stay lit.*
- *LED lighting option reduces energy consumption and energy costs by 85%*

More information for Downtown Decorations Christmas Trees is in a separate PDF

We are wanting to ask if there is room in the budget for this year to purchase a Christmas Tree for downtown.

If there is not, we would like to ask if this could be included for next years budget.

Both companies have said if we order by September 10th we will have the tree in plenty of time to set it up just after Thanksgiving.

One addition investment we may want to consider is some way to protect the tree when it is in storage. This will primarily be dependent on where the tree gets stored and what the environment is like. Neither company had a great answer for me when I asked this question.



Town of Johnstown

MEMORANDUM

TO: Honorable Mayor and Town Council Members

FROM: Matt LeCerf, Town Manager

DATE: September 8, 2021

CC: Town Staff
Local Media

SUBJECT: Town Manager's Report

Upcoming Town Council Meetings & Work Sessions – If there are topics that the Council would like staff to schedule for discussion, please let me know. The following topics are recommended for Council discussion (all meetings will be held in the Town Council Chambers unless otherwise indicated):

- 09/20/2021 – Regular Town Council Meeting
- 09/27/2021 – FY 2022 Budget Work Session 6:00 p.m.
- 10/04/2021 – **Cancelled** Regular Town Council Meeting
- 10/11/2021 – FY 2022 Budget Work Session (if necessary) 6:00 p.m.
- 10/20/2021 – Regular Town Council Meeting

Administration, Finance, Planning, & Human Resources

- *Leadership Change* – Our Public Works Director has resigned from the organization. Ellen Hilbig will assume the responsibilities of this position as the Interim Public Works Director.
- *LFRA Fire Chief Interview* – The Town Manager participated in the LFRA Chief interviews last month. Four (4) candidates were interviewed and in the end, LFRA selected Tim Sendelbach.
- *Impact Fee Study* - The impact fee study is currently underway. This will be a 'light' update to evaluate the fees based on our capital needs, personal property, growth and

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other factors to determine the 5-year outlook for the impact fee rates. It will not include substantial narrative that provides the rudimentary information regarding impact fees.

- *Planning & Zoning Commission* – The PZC is now a full commission, and will be meeting in September on the 15th & 29th at 7 PM at Town Hall. Agendas and packets are posted to the website at least 5 days prior to the meetings.
- *Hiring* – A new Code Enforcement Officer and Public Works Maintenance Worker I have accepted offers and are scheduled to start later this month. We are still hiring for Public Works, Water, and Police administration.
- *Retirement Plan* – We are in the process of implementing a new retirement plan provider for Town employees. The new provider will provide increased services and cost participants 60% less in fees compared to the previous vendor.
- *Compensation Survey* – The Town is nearing completed of a compensation survey. This will help us hire and retain excellent talent by benchmarking our compensation against market rates.
- *Johnstown Cash Program* – As of August 30, 2021, \$51,460 has been redeemed in certificates with 49 businesses participating in the program. The program will run until December 31, 2021 and certificates will no longer be valid after that date.
- *August Biz Walk* – August's Biz Walk included the Economic Development Manager who visited with LYS Salon and Hays Market. Biz Walks are scheduled monthly by the Economic Development Department.
- *DOLA: Keep Main Street Open Grant* – The Town of Johnstown submitted a completed grant application to DOLA for the Keep Main Street Open Grant on August 23, 2021. The Town expects a response regarding it's grant award status between end of September through early October. Should the Town be awarded grant funds, the funds will be used to complete numerous façade and energy efficient projects in the Downtown corridor.

Police Department

Training

- *FBI- LEEDA Supervisor Leadership Institute* – Sergeant Timme attended the first part of the FBI-LEEDA trilogy. He learned about different leaderships styles, and leadership traits. The training also focused on building credibility as a leader and building organizational credibility.
- *Driving Training* – All sworn members of the department completed their mandated annual driving training. The driving training was held at the new Northern Colorado Law Enforcement Training Center.
- *Conducted Energy Device Training (CED)* – All sworn members who carry a CED were recertified and learned about legal updates, and medical updates. They were also required to show proficiency in the use of their CED.

- *Search and Seizure* – Officer Wild took a Search and Seizure in Fort Collins. Officer Wild learned about legal developments since the United States V. Jones decision along with legal developments with curtilage, force, and exceptions to the warrant.

Community Policing, Outreach & Miscellaneous Items:

- *Hunger Heroes* – The Johnstown Police Department, Front Range Fire Rescue, and community volunteers are helping deliver food to kids in need. Volunteers work with the Weld County Food Bank to provide needed food to over 100 students in the RE-5J school district.
- *School Zone Enforcement* – The police department narrowed its enforcement/education efforts to school zones and crosswalks with schools being back in session.

Public Works Department

Streets, Stormwater, Fleet & Parks

- *Pavement Maintenance Program* – Town Staff have been assisting with the preparation of the Pavement Maintenance Program (PMP) and has been crack sealing ahead of the HA5 application. We hired A-1 Chip Seal to assist with the crack seal. HA5 started on August 30 and will be completed in Thompson Crossing and Thompson River Ranch. Completion of the project is expected by mid to end-September.
- *Crosswalks* – Placement of thermo plastic has been completed around Town for crosswalks and stop bars.
- *Grading* – Grading of County Roads 20C, 42, 44, and 46 were completed, measuring approximately 8 miles.
- *Parks* – Parks are greening up after an increase in the watering schedule. Staff has been focusing on Pioneer Ridge Park and has raised/adjusted sprinkler heads, trimmed the trees back, and treated the grass for grubs and mites. Staff is in the process of purchasing new playground equipment for the Rolling Hills Park and plans to install pour-and-place in 2022. Our goal is to replace all outdated playground equipment and convert our parks to pour-and-place for a safer surface for the children and residents of Johnstown. This will be an ongoing program over the next 7-10 years.
- *County Road 3 Update* – Work on CR 3 has started again. EZ Excavation has started the new water line on the north side of CR3. A new 16" water line will be installed to the south side of the Hillsboro Ditch. Parapet walls have been completed. Once waterline is completed, electrical lines are scheduled to be lowered and final road work will start.

Water Plant & System

- *GAC* – Geosmin levels in the Town Lake and Lone Tree Reservoir are still on the high side. We are happy to report that new GAC System is doing its job and reducing the levels below our expectations.
- *Auger* – A new Auger has been installed at the Lone Tree pump station. An auger allows for better feeding of the powdered activated carbon that is placed in the pipe line prior to treatment at the water plant.

- *Sanitary Survey* – The Town recently went through our three-year sanitary survey at the water plant with the last being done in 2018. We are proud to say that we received no violations and only a few recommendations. I would like to thank Ramey Environmental Service our ORC and Staff for raising the bar. A copy of the report is in the informational section of the Council packet.

Wastewater Plants

- *Low Point* – Low Point Plant has been running very well. Staff recently drained and cleaned the chlorine contact basins.
- *Central Plant* – Central Plant is also doing well. Staff is working on fine tuning the DAF unit for better treatment. Mowing and weed control is being done at the plant as well as the cleaning up of the old building and throwing away years of debris. Browns Hill has been working on the SCADA at Central Plant

Development & Project Updates

- *HWY 60 Waterline* – The Hwy 60 Waterline is about 60% complete. DeFalco Construction completed the installation on the southside of Hwy 60, and has started connecting the waterline from Rocksbury Ridge to the westside of Carlson Farms.
- *Low Point Expansion* – Design for the Low Point Wastewater Treatment Plant expansion is 90% complete. We are starting the value engineering to get our final GMP. The expected date to bring in front of Council is November 1, 2021.
- *South Water Tank* – Ground work will begin mid-September for the South Water Tank. Some delays are expected as we wait for final approval from Colorado Department of Public Health and Environment, hopefully by mid-October. In the meantime, dirt work on the access road and clearing of the site will begin.
- *Distribution Pipeline* – The new distribution pipeline from the Water Treatment Plant to the South Tank and Pioneer Ridge has been put out to bid with the bid opening set for October 1. We expect to bring to Council a recommendation at the second meeting in October.
- *Old Town Storm & Street Project* – The Old Town Storm and Street Project is scheduled to start the second week of September. Notice to proceed has been issued, the contract with DeFalco has been signed, and they have begun ordering materials.



Town of Johnstown

TOWN COUNCIL REGULAR MEETING

450 S. Parish, Johnstown, CO

Monday, August 16, 2021 at 7:00 PM

MINUTES

CALL TO ORDER

Mayor Lebsack called the meeting to order at 7:00 p.m. and led the Pledge of Allegiance.

ROLL CALL

PRESENT

Mayor Gary Lebsack
Councilmember Damien Berg
Councilmember Troy Mellon
Councilmember Chad Young

ABSENT

Councilmember Jesse Molinar
Councilmember Bill Stevens
Councilmember Amy Tallent

Staff Present: Matt LeCerf, Town Manager, Avi Rocklin, Town Attorney, Kim Meyer, Planning Director, Marco Carani, Public Works Director, Mitzi McCoy, Finance Director, Brian Phillips, Chief of Police and Sarah Crosthwaite, Economic Development Coordinator.

AGENDA APPROVAL

Motion made by Councilmember Berg, seconded by Councilmember Mellon to approve the amended agenda with the removal of Design Services for Water Treatment Plant. Motion carried unanimously.

PUBLIC COMMENT

Mr. Jim Hatfield brought forward recommended changes to the Town's website.

CONSENT AGENDA

Motion made by Councilmember Berg, Seconded by Councilmember Young to approve the Consent Agenda. Motion carried with a unanimous vote.

- Minutes August 2, 2021
- July 2021 Financial Statements
- List of Bills - August 2021
- Appointment of Planning and Zoning Commission Members
- Water and Sewer Service Agreement - LFRA Station 10 (4301 Ronald Reagan Blvd.)
- Contract Award - Land Use Code Update

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August 16, 2021

PUBLIC HEARING

1. Ordinance 2021-206 Approving the North Ridge P.U.D. Outline Development Plan – Mayor Lebsack opened the Public Hearing at 7:22 p.m. and heard from staff. Staff is proposing revisions to the original Outline Development Plan that was presented at the July 19, 2021 Council Meeting: 1. Add: a minimum 15-foot Buffer Yard adjacent to existing residential properties in compliance with the Town Landscape Standards with 1 tree and 5 shrubs per 600 SF, 2. Add: Construction of a 6-foot solid fence or wall is required, adjacent to existing larger-lot residential properties, where none may exist at the time of construction, 3. Revise maximum residential density in Planning Area E shall to 8.5 DU/Acre. This would result in a maximum unit count of 200 units on 23.4 acres, 4. Add: Planning Area E shall permit only single family detached homes within 150-feet of the north and east boundaries. Any attached or multi-family housing types shall be placed outside of this use-transition buffer area. The following individuals representing the applicant was present to answer questions: Mark Hunter and Todd Bloom. Mr. Thomas Powell of 5218 Ironwood Court, addressed Council with concerns about preserving the scenic views, possible homes being built in the subdivision that will take away the character of the existing neighborhood, if this development will be included in the existing metro district already established in Thompson River Ranch. Mr. Mike Walker, 5206 Ironwood Court, expressed concerns with the proposed Carriage House product not being compatible with the existing neighborhood and homeowner's desires. Having no further comment's, the public hearing was closed at 8:08 p.m. Motion made by Councilmember Mellon, seconded by Councilmember Young to approve Ordinance 2021-206, Approving the North Ridge P.U.D. Outline Development Plan on First Reading, with the following modifications and direct Town Staff to oversee such modifications to the North Ridge P.U.D. Outline Development Plan prior to recordation, to include revisions 1, 3 and 4 as listed. Motion carried unanimously.

2. Ordinance 2021- 207 Amending Article IV of Chapter 7 of the Municipal Code Concerning Trash Collection – The revisions to the current ordinance would require residents and multi-unit structures at the Town's discretion to subscribe to the single source trash service provided by the Town. Mayor Lebsack opened the public hearing at 8:16 p.m. and heard from staff. After hearing from numerous citizen's opposing Ordinance 2021-207 and having no comments in favor of the ordinance, the public hearing closed at 8:42 p.m. Motion made by Councilmember Berg, seconded by Councilmember Young to deny Ordinance 2021-207. Motion carried unanimously.

NEW BUSINESS

1. Resolution 2021-26: Colorado Main Street Program Grant -This Resolution would establish the Town's support to pursue the Main Street Open for Business Facade Improvements and Energy Efficiency Grant Program through Colorado Main Street Program. Motion made by Councilmember Young, seconded by Councilmember Mellon to adopt Resolution 2021-15, A Resolution Authorizing the Main Street Project in Johnstown. Motion carried unanimously.

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August 16, 2021

2. Award Design Build services for the North 2nd Street Widening at Hillsborough Ditch - This is a request to award the Design Build Contract to Connell Resources, Inc. for the widening of the North Second Street Bridge over the Hillsborough Ditch. The project consists of replacing the existing bridge, asphalt and installation of ADA compatible sidewalks and ramps. Motion made by Councilmember Berg, seconded by Councilmember Young to award the design build contract for the North 2nd Street Widening at Hillsborough Ditch to Connell Resources, Inc. with Galloway & Company, Inc. as their design sub-contractor and authorize the Town Manager to approve additional funds for the project in an amount not to exceed the \$840,633.75 plus a 10% contingency budgeted for the project. Motion carried with a unanimous vote.

EXECUTIVE SESSION

It was moved by made by Councilmember Mellon, seconded by Councilmember Young to convene into Executive Session for the purpose of determining positions relative to matters that may be subject to negotiations, developing strategy for negotiations, and/or instructing negotiators, under C.R.S. Section 24-6-402(4)(a). Regarding Economic Development. Motion carried unanimously. The Regular Meeting was recessed at 9:17 p.m. The mayor reconvened the Regular Meeting at 9:32 p.m. and stated the only item discussed was what was stated in the motion.

ADJOURN

The meeting adjourned at 9:33 p.m.

Mayor

Town Clerk



Town of Johnstown

TOWN COUNCIL AGENDA COMMUNICATIONS

AGENDA DATE:	September 8, 2021
SUBJECT:	Ordinance No. 2021-206 Approving the North Ridge P.U.D. Outline Development Plan
ACTION PROPOSED:	Consider Ordinance No. 2021-206 Approving P.U.D. Outline Development Plan for North Ridge Located in the Southeast Quarter of Section 22, Township 5 North, Range 68 West, County of Larimer, State of Colorado, Consisting of Approximately 60 Acres on Second Reading.
ATTACHMENTS:	1. Ordinance No. 2021-206
PRESENTED BY:	Kim Meyer, Planning & Development Director

AGENDA ITEM DESCRIPTION:

This is a continuation of the Agenda Item opened on July 19, 2021. See Attachment 1 for a full set of prior documents related to this item.

Please be advised that the public hearing conducted on this matter was closed prior to passage of the motion to continue the hearing. If Town Council would like to consider additional evidence, the public hearing should be re-opened by motion duly passed.

If the hearing is re-opened:

This memo addresses additional perspectives on issues brought up in July. During that hearing Council expressed concern with the residential density proposed adjacent to existing larger-lot single family homes in Thompson River Ranch Filings 3 & 4.

In re-evaluating the existing context of this proposed Outline Development Plan (ODP), Staff has provided a brief analysis of the area.

- The Ridge at Johnstown is a larger master-planned mixed-use area (410+ acres), of which North Ridge is a part. The Ridge, focused around the interchange, is intended a more commercially-intense development, overall. There are two existing subdivision filings of The Ridge which include 288 single family lots with more traditional lot sizing. A new “South Ridge” Annexation and ODP was recently submitted to the Town for an additional 80-acres of traditional single-family lots, and a transitional higher-density residential area acting as a buffer between those neighborhoods and the commercial and business areas nearer Freedom Parkway (CR 18) and Frontage Road. Staff estimates approximately 225 acres of the 410 acres are dedicated to residential development.

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- Thompson River Ranch is primarily a residential neighborhood, with areas originally intended for “mixed-use” nearest the Frontage Road, which have since been developed as a church site and the more-dense Filing 9 “Carriage Homes.” As there is concern with compatibility related to the TRR areas adjacent to the North Ridge site, Staff completed a brief comparison table to better clarify the issues:

	Thompson River Ranch		North Ridge ODP
	Filing 3 & 4 – SFD	Filing 9 – Carriage SFD	Planning Area E – SFD, SFA or Multi
Gross Acres	39.5	21.2	23.4
Acres of O.S.	4.0 (10.1%)	7.6 (35.8%)	7.3 (min 30%)
Acres – Net of O.S.	35.5	13.6	16.1
Lots/Units	136	128	234
Gross Density*	3.4	6.0	10.0
Net Density (for comparability)	3.8	9.4	14.5
Lot Size Range	5,500 - 9,000 In-line 8,016 - 16,234 Cul-de-sac	2,785 - 5,310 Carriage 3,740 - 6,256 Alley	TBD with Development Plans

Note that most of the PUD-required open space for Thompson River Ranch Filings 3 & 4 is located in other areas of the master-planned community and the Big Thompson floodplain areas. The lots in this area along the southern boundary in this area have homes set between 48 to 57 feet from that boundary line; homes along the eastern and western boundaries range from approximately 51 to 92 feet from those boundaries, largely dependent on the size of the home.

- North Ridge proposed a residential area that is more-dense than the adjacent subdivisions, with the intent being to create a buffer of residential uses between the higher intensity highway commercial areas and the existing Thompson River Ranch neighborhood.
- Johnstown Municipal Code (JMC) Analysis:
 - Section 16-302(d) provides that residential units in a PUD-MU zone should be consistent with the type of units permitted in the SF-2 and MF-1 zoning districts. While there is no minimum lot size required for the PUD-MU district to encourage more creative designs and provide community amenities, the SF-2 zone provides that the minimum lot area per dwelling unit is 4,500 SF (§16-203) and the MF-1 zone provides that the minimum lot area per dwelling unit is 3,000 SF (§16-223).
 - Section 16-306 encourages clustering of dwelling units, as well as bufferyards to minimize impacts to adjacent properties, the size of which shall be determined through the review process.
 - Section 17-133 indicates the maximum density of dwelling units in a PUD shall be 12 units/acres, or less, if the Planning & Zoning Commission permits such, provided that a density less than 12 units per acre shall be based on the proposed land use plan.

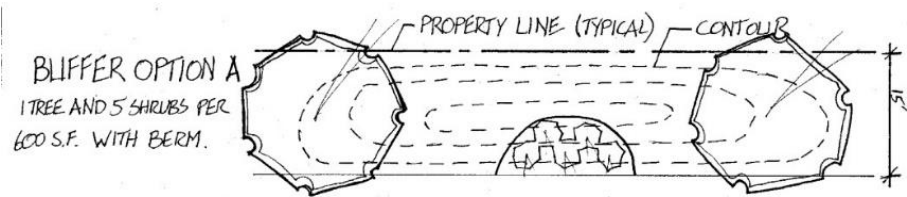
In light of the comments and discussion at the July 19th hearing, and subsequent analysis of the adjacent areas as well as the municipal code and standards, Staff has considered potential revisions to the North Ridge ODP that could further mitigate the impacts of development of the North Ridge area. The intent is to find a balance of compatibility between the existing residential and the proposed buffer of high-density residential.

RECOMMENDED REVISIONS:

Staff proposes revisions to the approval of this ordinance on first reading, that requires a revision to the ODP documents prior to the Second Reading of the Ordinance, that includes the following:

1. ADD: A minimum 15-foot Buffer Yard A is required adjacent to existing residential properties, in compliance with the Town Landscape Standards (Sec. E.2), with 1 tree and 5 shrubs, per 600 SF.

(Note: This is a typical buffer yard between non-residential and residential uses.)



2. ~~ADD: Construction of a 6-foot solid fence or wall is required, adjacent to existing larger lot residential properties (>6000 SF), where none may exist at the time of construction.~~
REMOVED WITH APPROVED MOTION
3. REVISE: Maximum residential density in Planning Area E shall be revised to 8.5 DU/Ac. This would result in a maximum unit count of 200 units on 23.4 Acres.
4. ADD: Planning Area E shall permit only single family detached homes within 150-feet of the north and east boundaries. Any attached or multi-family housing types shall be placed outside of this use-transition buffer area.

These proposed revisions have been presented to the Applicant for their consideration.

LEGAL ADVICE:

Ordinance was prepared by the Town Attorney.

FINANCIAL ADVICE:

NA

RECOMMENDED ACTION:

Approve Ordinance No. 2021-206 Approving the North Ridge P.U.D. Outline Development Plan on Second Reading.

SUGGESTED MOTIONS:

Reviewed and Approved for Presentation,

Town Manager

The Community That Cares

www.TownofJohnstown.com

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141

**TOWN OF JOHNSTOWN, COLORADO
ORDINANCE NO. 2021-206**

**APPROVING P.U.D. OUTLINE DEVELOPMENT PLAN FOR
NORTH RIDGE LOCATED IN THE SOUTHEAST QUARTER OF
SECTION 22, TOWNSHIP 5 NORTH, RANGE 68 WEST, COUNTY
OF LARIMER, STATE OF COLORADO, CONSISTING OF
APPROXIMATELY 60 ACRES.**

WHEREAS, the Town of Johnstown, Colorado (“Town”) is a Colorado home rule municipality, duly organized and existing under the laws of the State of Colorado and the Town’s Home Rule Charter; and

WHEREAS, Ridge II HoldCo, LLC, a Delaware limited liability company, submitted an application to the Town for approval of a P.U.D. Outline Development Plan for a subdivision known as North Ridge, located in the Southeast Quarter of Section 22, Township 5 North, Range 68 West of the 6th Principal Meridian, Town of Johnstown, County of Larimer, State of Colorado, consisting of approximately 60 acres; and

WHEREAS, on June 9, 2021, the Planning and Zoning Commission held a public hearing and recommended approval of the P.U.D. Outline Development Plan for North Ridge; and

WHEREAS, on July 19, 2021, and, as continued, on August 16, 2021, the Town Council held a public hearing concerning approval of the P.U.D. Outline Development Plan for North Ridge; and

WHEREAS, after considering the Planning and Zoning Commission’s recommendation for approval, reviewing the file and conducting such public hearing, Town Council finds that the P.U.D. Outline Development Plan for North Ridge is consistent with, and furthers the goals of, the *Johnstown Area Comprehensive Plan* goals and is compatible with all other applicable Town standards and regulation; and

WHEREAS, based on the foregoing, Town Council desires to approve the P.U.D. Outline Development Plan for North Ridge subject to modifications, if any, provided by Town Council to Town staff during the public hearing.

NOW, THEREFORE, BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF JOHNSTOWN, COLORADO, THAT:

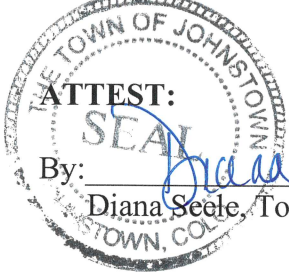
Section 1. P.U.D. Outline Development Plan Approval. The P.U.D. Outline Development Plan for North Ridge, located in the Southeast Quarter of Section 22, Township 5 North, Range 68 West of the 6th Principal Meridian, Town of Johnstown, County of Larimer, State of Colorado, consisting of approximately 60 acres, attached hereto and incorporated herein by reference as Exhibit A, as amended, if at all, is hereby approved subject to the following condition:

1. The P.U.D. Outline Development Plan for North Ridge shall not be recorded until it is in the form finally approved by Town staff based on the direction of Town Council provided to Town staff during the public hearing.

Section 2. Supersede and Replace. The P.U.D. Outline Development Plan for North Ridge adopted herein shall supersede and replace the outline development plan, if any, previously approved with respect to the 402 Exchange Business Park annexation, an annexation approved by the Town on or about December 15, 2005.

Section 3. Effective Date. This Ordinance, after its passage on final reading, shall be numbered, recorded, published and posted as required by the Home Rule Charter of the Town of Johnstown, Colorado ("Charter") and the adoption, posting and publication shall be authenticated by the signature of the Mayor and the Town Clerk and by the Certificate of Publication. This Ordinance shall become effective upon final passage as provided by the Charter. Copies of the entire Ordinance are available at the office of the Town Clerk.

INTRODUCED AND APPROVED on first reading by the Town Council of the Town of Johnstown, Colorado, this 16th day of August, 2021.



ATTEST:

By: _____

Diana Seele, Town Clerk

TOWN OF JOHNSTOWN, COLORADO

By: _____

Gary Lebsack, Mayor

PASSED UPON FINAL APPROVAL AND ADOPTED on second reading by the Town Council of the Town of Johnstown, Colorado, this _____ day of _____, 2021.

TOWN OF JOHNSTOWN, COLORADO

ATTEST:

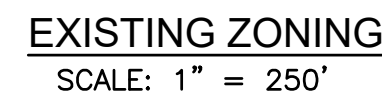
By: _____

Diana Seele, Town Clerk

By: _____

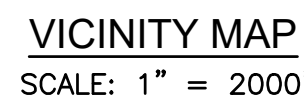
Gary Lebsack, Mayor

LOCATED ON THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 5 NORTH, RANGE 68 WEST OF THE SIXTH
PRINCIPAL MERIDIAN, COUNTY OF LARIMER, AND STATE OF COLORADO



1. ACCESS POINTS SHOWN ON THIS ODP ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED DURING THE PRELIMINARY AND FINAL PLATTING PROCESS BASED ON THE FINAL TRAFFIC IMPACT STUDY.
2. LOCAL AND COLLECTOR STREETS MAY CHANGE LOCATION, SIZE AND CONFIGURATION AT THE TIME OF FINAL PLATTING. LOCAL AND COLLECTOR STREETS WILL CONFORM TO THE TOWN OF JOHNSTOWN STREET STANDARDS.
3. ALL DENSITIES AND UNIT COUNTS ARE PROJECTIONS. FINAL DENSITIES TO BE DETERMINED AT TIME OF PLATTING. DENSITY OF ANY GIVEN PHASE WILL NOT EXCEED VALUES LISTED ON ODP #02. ACTUAL NUMBER OF UNITS WILL BE DETERMINED AT TIME OF RESIDENTIAL PLATTING.
4. AREA OF DEVELOPMENT PARCELS SHOWN ARE APPROXIMATE AND MAY VARY. EXACT LOT SIZES WILL BE DETERMINED WITH EACH PRELIMINARY AND FINAL SUBDIVISION SUBMITTAL.
5. FINAL CONFIGURATION OF PARCELS, OPEN SPACE AREA, AND STREETS MAY VARY FROM THAT SHOWN.
6. WHERE A PROPOSED USE IS NOT LISTED IN THE ODP, IT MAY BE ALLOWED IF DETERMINED BY THE TOWN OF JOHNSTOWN TO BE SIMILAR IN CHARACTER AND OPERATION, AND HAVING THE SAME OR LESSER IMPACT AS USES THAT ARE ALLOWED.
7. ALL DRAINAGE ELEMENTS ARE CONCEPTUAL IN NATURE AND FINAL DETERMINATIONS OF THE DRAINAGE SYSTEM, TO INCLUDE THE PLACEMENT OF DETENTION BASINS AND DRAINAGE CHANNELS, SHALL BE MADE DURING THE PRELIMINARY AND FINAL DRAINAGE REPORTS AND DURING THE PRELIMINARY DEVELOPMENT PLAN PROCESS AS PART OF THE FINAL SUBDIVISION PLATTING.
8. LANDSCAPING, SIGNING, ARCHITECTURE, NON-RESIDENTIAL PARKING, FENCING, AND LIGHTING FOR DEVELOPMENT WITH THIS PUD WILL EITHER FOLLOW THOSE APPLICABLE STANDARDS IN THE TOWN OF JOHNSTOWN MUNICIPAL CODE OR THE DESIGN GUIDELINES SPECIFIC FOR CALIBER PROJECTS.

IT IS ANTICIPATED THAT NORTH RIDGE WILL DEVELOP SOUTH TO NORTH, COMMENCING ON THE 402, LLC PARCEL WITH ANTICIPATED LOT DELIVERIES IN 2021 AND BUILD-OUT BY 2022 OR EARLY 2023. CURRENT CONCEPT PLANS FOR COMMERCIAL, INCLUDE CONVENIENCE STORE WITH GAS, RETAIL SHOPS, OFFICE CONDOMINIUMS, AND A POTENTIAL HOTEL ALONG THE I-25 CORRIDOR. GARAGE CONDOMINIUMS WERE CONSIDERED IN CONCEPT DRAWINGS, BUT HAVE BEEN REJECTED IN FAVOR OF OTHER COMMERCIAL USES TO BE DETERMINED BY MARKET DEMAND. CURRENT CONCEPT PLANS FOR RESIDENTIAL INCLUDE 23.5 ACRES OF SINGLE FAMILY SMALL FOOT-PRINT (1,100 - 1,700 SQ. FT.) HOMES. INTEREST ON THE RESIDENTIAL COMPONENT IS BY A SINGLE DEVELOPER WHO HAS SUCCESSFULLY DEVELOPED OTHER PROJECTS WITHIN THE TOWN.



THE INTENT OF THIS OUTLINE DEVELOPMENT PLAN (ODP) IS TO PROVIDE THE FRAMEWORK FOR THE NORTH RIDGE JOHNSTOWN DEVELOPMENT. NORTH RIDGE JOHNSTOWN IS A CONTINUATION OF THE RIDGE AT JOHNSTOWN DEVELOPMENT, ALL OF WHICH WILL BRING NEEDED INFRASTRUCTURE, SERVICES, AMENITIES, AND TAX REVENUE TO THE TOWN.

THE ANNEXATION OF THE BATH PARCEL WILL COMPLETE NORTH RIDGE AND COMPLEMENT THE RIDGE DEVELOPMENT BRIDGING THE TWO PROJECTS TOGETHER THROUGH INTEGRATED CONCEPT DESIGN AND UNIFORM DEVELOPMENT STANDARDS. THE BATH PARCEL IS CONTIGUOUS TO AN EXISTING ANNEXED PARCEL IN THE TOWN ALLOWING INFRASTRUCTURE TO BE BROUGHT TO NORTH RIDGE FROM EITHER OR BOTH THE SOUTH AND THE NORTH IN COORDINATION WITH DEVELOPED PROJECTS. THE TOWN WILL BENEFIT FROM REVENUES GENERATED BY NEW BUSINESS, AND INCREASED EXPOSURE AND VISIBILITY ALONG I-25. THE COMMUNITY WILL HAVE ADDITIONAL COMMERCIAL RESOURCES NEEDED FOR A GROWING JOHNSTOWN.

RIDGE II HOLDCO, LLC, A COLORADO LIMITED LIABILITY COMPANY, BEING THE OWNER(S) OF THE PROPERTY LOCATED IN THE TOWN OF JOHNSTOWN, COUNTY OF LARIMER, AND STATE OF COLORADO, DO HEREBY SUBMIT THIS OUTLINE DEVELOPMENT PLAN AND AGREE TO PERFORM UNDER THE TERMS NOTED HEREIN.

RIDGE II HOLDCO, LLC
A DELAWARE LIMITED LIABILITY COMPANY

BY: RIDGE II MANAGECO, LLC
A DELAWARE LIMITED LIABILITY COMPANY
ITS: MANAGER

BY: CALIBER SERVICES, LLC
AN ARIZONA LIMITED LIABILITY COMPANY
ITS: MANAGER

BY: CALIBER COMPANIES, LLC
AN ARIZONA LIMITED LIABILITY COMPANY
ITS: MANAGING MEMBER

BY: CALIBERCOS INC.
A DELAWARE CORPORATION
ITS: MANAGER

BY: _____
NAME: JENNIFER SCHRADER
ITS: PRESIDENT

TOWN COUNCIL

THIS OUTLINE DEVELOPMENT PLAN, TO BE KNOWN AS NORTH RIDGE P.U.D. OUTLINE DEVELOPMENT PLAN, IS APPROVED AND ACCEPTED BY THE TOWN OF JOHNSTOWN, BY ORDINANCE NUMBER 2021-206, PASSED AND ADOPTED ON FINAL READING AT THE REGULAR MEETING OF THE TOWN COUNCIL OF THE TOWN OF JOHNSTOWN, HELD ON THE _____ DAY OF _____, _____.

BY: _____
GARY LEBSACK, MAYOR

ATTEST: _____
DIANA SEELE, TOWN CLERK

[illegible]

NORTH RIDGE DEVELOPEMNT
JOHNSTOWN

OUTLINE DEVELOPMENT PLAN COVER

FILE : 87-20-003_ODPCOVER
JUB PROJ. # : 87-20-003
DRAWN BY: ALM
DESIGN BY: ALM
CHECKED BY: ###
 ONE INCH AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY
LAST UPDATED: 9/1/2021

SHEET NUMBER:

ODP-01

LOCATED ON THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 5 NORTH, RANGE 68 WEST OF THE SIXTH
PRINCIPAL MERIDIAN, COUNTY OF LARIMER, AND STATE OF COLORADO

NOTES:

1. ADDITIONAL DESIGN REQUIREMENTS FOR COMMERCIAL DEVELOPMENT PER THE DESIGN GUIDELINES.
2. THE PLANNING DIRECTOR MAY APPROVE ADJUSTMENTS TO COMMERCIAL SETBACKS THAT MAY BE NECESSARY DUE TO PARCEL SIZE, CONFIGURATION, OR OTHER CONSTRAINT.
3. LANDSCAPING, SIGNING, ARCHITECTURE, NON-RESIDENTIAL PARKING, FENCING, AND LIGHTING FOR DEVELOPMENT WITH THIS PUD WILL EITHER FOLLOW THOSE APPLICABLE STANDARDS IN THE TOWN OF JOHNSTOWN MUNICIPAL CODE OR THE DESIGN GUIDELINES FOR CALIBER PROJECTS.

PLANNING AREA ACREAGE AND BOUNDARIES ARE PRELIMINARY AND SUBJECT TO CHANGE WITH DETAILED PLANNING. PLANNING ACREAGE MAY CHANGE UP TO 30% WITHOUT A MAJOR AMENDMENT TO THIS PUD DOCUMENT.

ANTICIPATED RESIDENTIAL DENSITIES ARE SPECIFIED WITHIN EACH PARCEL. THE FINAL DENSITY SHALL BE DETERMINED AT THE TIME OF PLATTING. NO MINIMUM DENSITIES ARE REQUIRED FOR RESIDENTIAL PLANNING AREAS.

LAND USE	ACRES	PERCENTAGE (NEAREST 1%)
COMMERCIAL	36.5	60
RESIDENTIAL	16.4	30
OPEN SPACE	7.1	10
TOTAL	60.0	100

MAXIMUM HEIGHT	A: 130' B & C: 85' D: 50' ALL AREAS UP TO 150' W/ CONDITIONAL USE GRANT
LANDSCAPE REQUIREMENT	20% LANDSCAPING
BUILDING SETBACK FROM HIGHWAY	50'
BUILDING SETBACK FROM ARTERIAL	25'
BUILDING SETBACK FROM FRONTAGE ROAD	20'
PARKING SETBACK FROM ROW	20'

	SINGLE FAMILY DETACHED
MINIMUM LOT SIZE	1,400 SF
MAXIMUM HEIGHT	35'
FRONT SETBACK TO BUILDING	15' MIN.
FRONT SETBACK TO GARAGE	10' MIN.
FRONT SETBACK TO SIDE LOADED GARAGE	10' MIN.
SIDE YARD SETBACK	5' MIN.
REAR YARD SETBACK (FRONT LOADED)	5' MIN.
REAR YARD SETBACK (ALLEY LOADED)	5' MIN.
SIDE (CORNER) SETBACK	15' MIN.
BUILDING SEPARATION	PER FIRE CODE

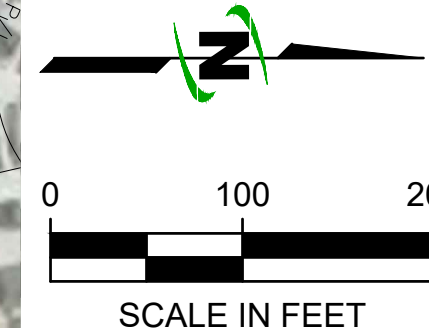
1. ADDITIONAL DESIGN REQUIREMENTS FOR RESIDENTIAL DEVELOPMENT PER THE DESIGN GUIDELINES.
2. PLANNING AREA E SHALL HAVE A MINIMUM 15' BUFFER YARD ADJACENT TO EXISTING RESIDENTIAL PROPERTIES, IN COMPLIANCE WITH THE TOWN LANDSCAPE STANDARDS (SEC. E.2), WITH 1 TREE AND 5 SHRUBS, PER 600 SF.
3. PLANNING AREA E SHALL PERMIT ONLY SINGLE FAMILY DETACHED HOMES WITHIN 150-FEET OF THE NORTH AND EAST BOUNDARIES. ANY ATTACHED OR MULTI-FAMILY HOUSING TYPES SHALL BE PLACED OUTSIDE OF THIS USE-TRANSITION BUFFER AREA.
4. THE PLANNING DIRECTOR MAY MAKE ADJUSTMENTS TO RESIDENTIAL CATEGORIES THAT MAY BE NECESSARY DUE TO PARCEL SIZE, CONFIGURATION, OR OTHER CONSTRAINTS.

1. 30% OF RESIDENTIAL ACREAGE IS REQUIRED TO BE OPEN SPACE.
2. PARK SPACE WILL BE COUNTED TOWARDS OPEN SPACE REQUIREMENTS.
3. OPEN SPACE INCLUDES STREETSCAPES OUTSIDE OF ROW, HARDSCAPES, PLAZAS, FOUNTAIN AREAS, PONDS, AND AREAS SUCH AS SIDEWALKS WITH BENCH SEATING.
4. SIDEWALKS ARE REQUIRED TO BE 10' WIDE AND 6" DEEP REINFORCED CONCRETE ALONG STANDARD ARTERIAL STREET SECTIONS. DETACHED AND MEANDERING SIDEWALKS PROPOSED AS FEASIBLE.

1. 10% OF RESIDENTIAL ACREAGE IS REQUIRED TO BE DESIGNATED AS LAND USE FOR PARKS AND RECREATION.
2. PARKS MAY BE PRIVATELY OR PUBLICLY OWNED, TO BE DETERMINED AT THE TIME OF FINAL PLAT.
3. ALL PARKS, NO MATTER IF OWNERSHIP IS PUBLIC OR PRIVATELY HELD, WILL BE ACCESSIBLE TO THE GENERAL PUBLIC, REGARDLESS OF RESIDENCY STATUS.

THE DESIGN INTENT FOR THE PLANNING AREAS A, B, C, AND D IS TO ALLOW FOR A WIDE RANGE OF COMMERCIAL DEVELOPMENT USES, WHICH COULD INCLUDE VARIOUS OFFICE, RETAIL, PRIVATE GARAGE CONDOMINIUMS, HOTEL DEVELOPMENT OR SIMILAR USES.

THE DESIGN INTENT FOR PLANNING AREA E IS TO ALLOW FOR RESIDENTIAL DEVELOPMENT. RESIDENTIAL DEVELOPMENT COULD INCLUDE SINGLE-FAMILY, MULTI-FAMILY USES SUCH AS CONDOMINIUMS OR APARTMENTS, OR MIXED USE DEVELOPMENT.

[illegible]

NORTH RIDGE OUTLINE DEVELOPMENT PLAN

FILE : 87-20-003 ODP
 JUB PROJ. # : 87-20-003
 DRAWN BY : ALM
 DESIGN BY : ALM
 CHECKED BY : ###
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY
 LAST UPDATED: 8/31/2021
 SHEET NUMBER:
 ODP-02

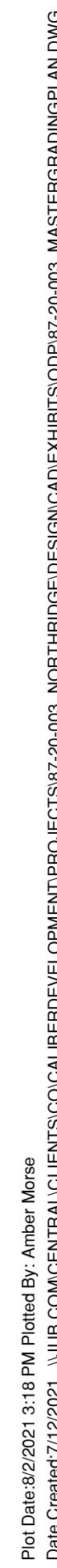
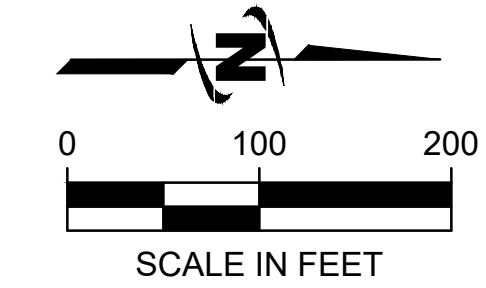
LOCATED ON THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 5 NORTH, RANGE 68 WEST
OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF LARIMER, AND STATE OF COLORADO

	4900	EXISTING MAJOR CONTOUR
	4902	EXISTING MINOR CONTOUR
	SD	EXISTING STORM PIPE
		BASIN BOUNDARY: ONSITE
		BASIN BOUNDARY: OFFSITE
		BASIN BOUNDARY: PROPERTY LINE
		BASIN ID C-MINOR AREA C-MAJOR
		DESIGN POINT
		DIRECT FLOW ARROW
		OVERLAND FLOW ARROW

Basin	Total Area	Composite	Composite	Q2	Q100
	acres	"C2"	"C100"	cfs	cfs
P1-N	9.84	0.64	0.79	13.93	49.36
P-1S	11.77	0.64	0.79	14.93	48.00
P-2S	4.15	0.77	0.87	23.35	75.32
P-2N	7.86	0.77	0.87	14.93	48.00
P-3	12.84	0.76	0.86	23.35	75.32
P-4	23.48	0.64	0.80	31.67	112.01
Total:	69.94				
Combined Basins to Design Point (DP)					
P2	33.62	0.73	0.82	89.50	173.28
P2 is combined basins P1-N, P1-S, P2-N and P2-S.					

PROPOSED PONDS	100-YR RELEASE RATE (cfs)	WOCV (acre-ft)	100-YR VOLUME (acre-ft)	TOTAL VOLUME (acre-ft)	APPROX SURFACE AREA (area)
P1-N	9.84	0.64	0.79	13.93	49.36
P-1S	11.77	0.64	0.79	14.93	48.00
P-2S	4.15	0.77	0.87	23.35	75.32
P-2N	7.86	0.77	0.87	14.93	48.00
P-3	12.84	0.76	0.86	23.35	75.32
P-4	23.48	0.64	0.80	31.67	112.01

TYPE B SOIL TYPE.



FINAL
EXHIBIT

SHEET: 87-20-003 MASTERGRADING PLAN
 PROJECT #: 87-20-003
 DRAWN BY: ALM
 CHECKED BY: ALM
 DESIGNED BY: ###
 SCALE: 1" = 40'
 DATE: 7/12/2021
 SHEET NUMBER:
 ODP-03

LOCATED ON THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 5 NORTH, RANGE 68 WEST
OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF LARIMER, AND STATE OF COLORADO

ESTIMATED WASTEWATER FLOW:

WASTEWATER CALCULATIONS AND ASSUMPTIONS:

RESIDENTIAL AVERAGE DAILY FLOW (ADF) = 220 GPD/SFE*

*INCLUDES ALLOWANCE FOR 1/1

COMERCIAL AVERAGE FLOW = 1,550 GPD/ACRE

COMMERCIAL PEAKING FACTOR

$$\text{RESIDENTIAL PEAKING FACTOR} = 2.6 * Q_A^{-0.16}$$

Q_A = AVERAGE FLOW IN CFS

Q_A = AVERAGE FLOW IN CFS

ESTIMATED WATER DEMAND:

WATER CALCULATIONS AND ASSUMPTIONS:

RESIDENTIAL AVERAGE DAY FLOW (ADF) = 150 GPCD (450 GPD/SFE)

$$= 1,700 \text{ GPD/ACRE}$$

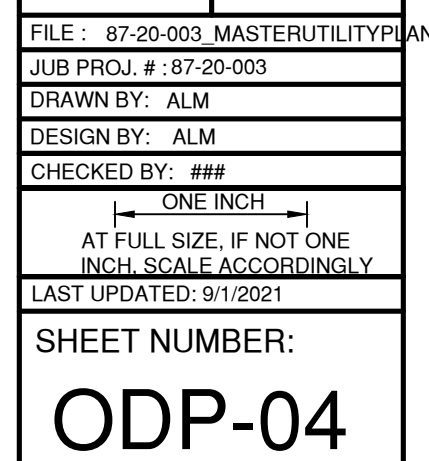
FIRE FLOW AVAILABILITY

MAXIMUM DAY FLOW (MDF) = 2 x ADF

PEAK HOUR FLOW

$$= 1.5 \times \text{MDF}$$

FEAR HOUR FLOW

$$= 1.0 \times \text{MDI}$$




Town of Johnstown

TOWN COUNCIL CONSENT AGENDA COMMUNICATIONS

AGENDA DATE: September 8, 2021

SUBJECT: Adopting Resolution 2021-27, A Resolution Authorizing a Mail Ballot Election for the Town of Johnstown's Regular Municipal Election Scheduled for April 5, 2022

ACTION PROPOSED: Approve Resolution 2021-27

ATTACHMENTS: Resolution 2021-27

PRESENTED BY: Diana Seele, Town Clerk

AGENDA ITEM DESCRIPTION:

The regular municipal election for the Town of Johnstown is scheduled for April 5, 2022. As per C.R.S. 31-10-908 a municipality may determine that an election be conducted by mail. The Town has conducted mail ballot elections for a number of years. Besides authorizing the election as a mail ballot election, Section 31-10-701 states voting machines may be used to record votes at the election. Resolution 2021-27 authorizes the mail ballot election, and the use of the accu-vote electronic system for the April 5, 2022 election

LEGAL ADVICE:

N/A

FINANCIAL ADVICE:

Funds will be budgeted in the 2022 Budget

RECOMMENDED ACTION:

Approve Resolution 2021-27, A Resolution Authorizing a Mail Ballot Election for the Town of Johnstown's Regular Municipal Election Scheduled for April 5, 2022.

Reviewed and Approved for Presentation,

Town Manager

The Community That Cares

www.TownofJohnstown.com

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141

**TOWN OF JOHNSTOWN, COLORADO
RESOLUTION NO. 2021-27**

**A RESOLUTION AUTHORIZING A MAIL BALLOT ELECTION
FOR THE TOWN OF JOHNSTOWN'S REGULAR MUNICIPAL
ELECTION SCHEDULED FOR APRIL 5, 2022.**

WHEREAS, the Town of Johnstown, Colorado is a Colorado home rule municipality, duly organized and existing under the laws of the State of Colorado and the Town's Home Rule Charter; and

WHEREAS, pursuant to the Home Rule Charter, a regular municipal election is to be conducted on April 5, 2022 and

WHEREAS, except as otherwise provided in the Home Rule Charter, the election is be governed by state statutes, including the Colorado Municipal Election Code of 1965, C.R.S. §§ 31-10-101, *et seq.* ("Municipal Election Code"); and

WHEREAS, C.R.S. § 31-10-908 provides that a municipality may determine that an election be conducted by mail ballot; and

WHEREAS, the Town Council of the Town of Johnstown desires to utilize the mail ballot procedure to increase the likelihood that the election will result in higher voter participation; and

WHEREAS, the conduct of a mail ballot election is governed by C.R.S. §§31-10-907-913; and

WHEREAS, the Home Rule Charter further provides that the Town Clerk shall be in charge of all activities and duties relating to the conduct of the election; and

WHEREAS, Town Council finds that it is in the best interest of the Town of Johnstown to conduct its regular municipal election on April 5, 2022 as a mail ballot election, and to adopt the procedures set forth herein.

NOW, THEREFORE BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF JOHNSTOWN, COLORADO, THAT:

Section 1. Town Council hereby determines that the regular election of the Town of Johnstown to be held on April 5, 2022 shall be conducted as a mail ballot election.

Section 2. The Town Clerk is hereby directed to take all action necessary with respect to the conduct of the April 5, 2022 election, following the provisions of the Home Rule Charter and the Municipal Election Code.

Section 3. The Accu-vote electronic system shall be used to record votes at said election.

Section 4. This Resolution shall be effective as of the date hereof.

PASSED, SIGNED, APPROVED, AND ADOPTED this ____ day of _____, 2021.

TOWN OF JOHNSTOWN, COLORADO

ATTEST:

By: _____
Diana Seele, Town Clerk

By: _____
Gary Lebsack, Mayor



Town of Johnstown

TOWN COUNCIL CONSENT AGENDA COMMUNICATIONS

AGENDA DATE: September 8, 2021

SUBJECT: Approve Amendment to Non-Potable Irrigation Agreement

ACTION PROPOSED: Consider Final Approval of an Amendment to Non-Potable Irrigation Water Agreement

ATTACHMENTS: 1. Amendment to Non Potable Irrigation Water Agreement

PRESENTED BY: Avi Rocklin, Town Attorney
Diana Seele, Town Clerk

AGENDA ITEM DESCRIPTION: In 2006, The Town entered into a Non-Potable Irrigation Water Agreement with Thompson Ranch, LLP and the Gerrard Family Limited Partnership. The purpose of the 2006 agreement was to provide a dedication of water to be used through a non-potable irrigation system to be constructed and operated by Thompson Crossing Metropolitan District No. 2, as provided in a separate agreement, for the 2534 Project. The 2006 agreement estimated the future water demand under the non-potable system and the results of a to-be filed change case in Water Court. The non-potable system has now been in operation for years and the change case is completed.

The purpose of the Amendment to Non-Potable Irrigation Water Agreement is to update the 2006 agreement to reflect the results of the previous change case, the current operation and water supplies for the non-potable system. The Amendment also requires the transfer of all of Thompson Ranch, LLP and the Gerrard Family Limited Partnership's interests in the water rights, agreements, and obligations associated with the non-potable system to the 2534 Master Association, who will then be responsible for operation and maintenance of the non-potable system.

The Amendment sets forth the specific water rights and amounts that are associated with the system, including additional water rights to be assigned to the Town, slightly corrects the area where the system is currently operating, recognizes the 2010 Effluent Agreement that allows the system to be used more efficiently and states that the current water supply, including an additional 2.5 cfs of Farmers shares to be dedicated, is sufficient for the current service area. The Town's water engineer has confirmed that finding.

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LEGAL ADVICE:

The Town Attorney and Town Water Attorney reviewed and revised the Amended Agreement.

FINANCIAL ADVICE:

N/A

RECOMMENDED ACTION: Approve Non Potable Irrigation Water Agreement

Reviewed and Approved for Presentation,



Town Manager

AMENDMENT TO NON-POTABLE IRRIGATION WATER AGREEMENT

THIS AMENDMENT TO NON-POTABLE IRRIGATION WATER AGREEMENT (the “Amendment”) is made and entered into this ____ day of _____, 2021, by and among **THOMPSON RANCH, LLLP** and **GERRARD FAMILY LIMITED PARTNERSHIP** (hereinafter collectively referred to as the “Owners”), the **TOWN OF JOHNSTOWN**, a Colorado municipal corporation (hereinafter referred to as “the Town”), **2534 MASTER ASSOCIATION**, a Colorado nonprofit corporation (“the Association”), and Thompson Crossing Metropolitan District No. 2, a Colorado Special District (“District #2”). Owners, the Town, the Association and District #2 are collectively referred to sometimes as “the Parties” or individually as a “Party”).

WHEREAS, Owners and the Town entered into a Non-Potable Irrigation Water Agreement dated August 21, 2006 (“Non-Potable Agreement”), for the irrigation of certain lands located within the Town (“Subject Property”), described in the Non-Potable Agreement as approximately 420 acres located in portions of Sections 14 and 15, Township 5 North, Range 68 West of the 6th P.M., Larimer County, Colorado; and

WHEREAS, the Owners developed a mixed-use community on the Subject Property that is commonly referred to as the 2534 development and that is some or all of the Project described in the Non-Potable Agreement (“2534 Project”); and

WHEREAS, the non-potable irrigation system contemplated under the Non-Potable Agreement currently serves the 2534 Project and two contiguous developments known as 2534 West and Iron Horse (“Non-Potable Irrigation System”); and

WHEREAS, District #2 is the current owner of the Non-Potable Irrigation System and entered into an operating agreement with the Association so that the Association would operate the Non-Potable Irrigation System;

WHEREAS, the Association is the operator of the Non-Potable Irrigation System and is in the process of being assigned certain agreements, rights, and obligations associated with the Non-Potable Irrigation System; and

WHEREAS, after adjudicating a change of water rights in Case No. 07CW14 to serve the Non-Potable Irrigation System and after incurring approximately fifteen years of operating experience, the Parties desire to amend paragraphs 1 – 5, 7, and 8 of the Non-Potable Agreement to reflect current circumstances and current operations of the Non-Potable Irrigation System as described herein; and

WHEREAS, it is in the mutual interest of the Parties to have a viable and well-operated Non-Potable Irrigation System.

NOW THEREFORE, in consideration of the mutual promises hereinafter contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereto agree as follows:

1. **Existing Non-Potable Agreement.** Except as expressly modified herein, the Non-Potable Agreement shall remain in full force and effect. All defined terms in the Non-Potable Agreement apply to this Amendment unless specifically defined otherwise herein.

2. **Non-Potable Water Supply.** The Non-Potable Irrigation System is currently supplied by the following water rights that constitute the “Non-Potable Water Supply”:

- A. **Priority #1.** The Non-Potable Water Supply primarily consists of 3 cfs of the Priority No. 1 Right on the Big Thompson River, originally part of the Big Thompson Ditch with an appropriation date of November 10, 1861 (“Priority #1”), which was changed by decree in Case No. 07CW14 (“07CW14 Decree”) as contemplated in the Non-Potable Agreement. The 3 cfs of Priority No. 1 was dedicated to the Town by special warranty deeds dated October 28, 2009 and June 12, 2012 and are committed to the Non-Potable Irrigation System.
- B. **Farmers’ Shares.** When in priority, 2.50 shares of the Reorganized Farmers Ditch Company (“Farmers’ Shares”) are used within the Non-Potable Irrigation System. These Farmers’ Shares are committed to the Non-Potable Irrigation System and only used to irrigate those lands historically irrigated as described in paragraph 4, below.
- C. **Augmented Junior Rights.** The Non-Potable Irrigation System contains two detention ponds for irrigation as described in the 07CW14 Decree. One pond has a junior water right previously decreed in Case No. 02CW305 and a junior water right is being sought for the other pond in Case No. 20CW3159. An augmentation plan is also being sought for both detention ponds in Case No. 20CW3159 to ensure proper administration if the ponds capture water out-of-priority. These junior water rights and augmentation plan are committed to the Non-Potable Irrigation System.

3. **Non-Potable Irrigation System Lands.** The Non-Potable Agreement contemplated a non-potable service area of approximately 420 acres of Subject Property. Exhibit A to the Non-Potable Agreement did not correctly reflect the Subject Property and that Exhibit A is hereby stricken from the Non-Potable Agreement. The current service area of the Non-Potable Irrigation System includes lands located within the Subject Property, but also includes lands outside but contiguous to the Subject Property in the Iron Horse and 2534 West developments (collectively the “Current Service Area”), as depicted in **Exhibit A** attached hereto. The 07CW14 Decree allows for a service area that includes the Current Service Area, plus additional lands outside both the Current Service Area and Subject Property for future service (“Future Service Lands”). The Non-Potable Agreement is hereby amended to allow irrigation of the combined Current Service Area and the Future Service Lands as those lands are depicted in **Exhibit B** attached hereto, subject to the provisions of this Amended Agreement.

4. **Non-Potable Irrigation Water Rights Dedication (Farmers’ Shares).** The Non-Potable Agreement identified 2.75 shares of the Reorganized Farmers Ditch Company to be dedicated to the Town for use within the Non-Potable Irrigation System and required such shares be changed in water court. Said shares are hereby reduced to 2.5 Farmers’ Shares, with 1.0 share

currently owned by 2534 West, 1.25 shares currently owned by Thompson Ranch LLLP, and 0.25 share owned by the Town after assignment by Thompson Ranch LLLP as part of the non-potable water rights dedication. The Farmers' Shares were removed from Case No. 07CW14 and are no longer required by the Parties to be changed in water court. Instead, the Parties agree that the 2.5 unchanged Farmers' Shares will be used only on the 2534 West property and the Thompson Crossing property, all as shown in **Exhibit B**.

5. Reusable Effluent Agreement. The Owners and the Town increased the efficiency of the Non-Potable Water Supply through a Non-Irrigation Season Reusable Effluent Designation Agreement dated September 8, 2010 ("Effluent Agreement"), which was included as a replacement source for maintaining historical return flows in the 07CW14 Decree. The Owners, Association, and Town entered into the Amendment to Non-Irrigation Season Reusable Effluent Designation Agreement dated November 2, 2020, which was included as a source in 20CW3159 ("Amended Effluent Agreement").

6. Finding of Water Supply Adequacy for Current Service Area. The Non-Potable Agreement was based upon projections and assumptions. Based upon a recent water rights engineering analysis by the Association dated March 17, 2021 ("Engineering"), the Parties agree that the Non-Potable Water Supply is adequate to meet the non-potable water demands on the 2534 Property, 2534 West Property, and Thompson Crossing Property at full buildout, and on the currently served lands at Iron Horse (*See Exhibit A*). This finding of water supply adequacy and the Engineering are based upon the actual water demands for the past 15 years, projected demands for remaining undeveloped area, volumetric limits and other conditions in the 07CW14 decree, the availability of the Effluent Agreement and Amended Effluent Agreement, and the actual design and operations of the Non-Potable Irrigation System. Based upon this water supply adequacy finding and the Engineering, the following additional changes to the Non-Potable Irrigation Agreement are hereby made and approved: (a) the analysis of non-potable irrigation supply and demand is replaced by the Engineering; (b) the additional water rights dedication requirement and the Unmet Irrigation Demand are hereby eliminated; and (c) the right of Owners to obtain transferable non-potable water credits for excess water dedicated to the Non-Potable Irrigation System is hereby eliminated.

7. Non-Potable Water Supply for Future Service Lands and Additional Iron Horse Lands. Before any connection to supply non-potable irrigation water to Future Service Lands or to serve any Iron Horse Property that is not part of the currently served lands at Iron Horse as shown in **Exhibit A**, the Association and Town must both first agree on the water supply adequacy for the Future Service Lands and additional Iron Horse Property service which may require new water supplies or other arrangements with the Town if the Non-Potable Water Supply is not adequate to supply the additional lands. The Association may update the Engineering from time to time to determine the excess Non-Potable Water Supply available for additional irrigation, but subject to Town approval of the updated Engineering.

8. Assignment and Conveyance to Association. The Owners agree that upon execution hereof, and not more than 60 days thereafter, they shall assign to the Association all of the agreements, rights, and obligations associated with the Non-Potable Irrigation System. This will include, but not be limited to, the following:

- A. The Non-Potable Agreement;
- B. The 07CW14 Decree;
- C. The Decree entered in Case No. 02CW305 by the District Court for Water Division No. 1; and
- D. The Effluent Agreement and Amended Effluent Agreement.

The Association agrees to the above-described assignment and agrees to incur all obligations and responsibilities associated with the assigned documents. The Town does hereby approve the above-described assignment from Owners to the Association and upon completion thereof, and upon acceptance by the Association, the Town does hereby relieve Owners of any and all obligations under the Non-Potable Agreement, 07CW14 Decree, and under the Effluent Agreement and Amended Effluent Agreement. Further, and consistent herewith, the Gerrard Family Limited Partnership LLP has by bargain and sale deed dated May 12, 2021 conveyed to the Association at no cost to the Association the water rights for the Gerrard Seepage Ditch No. 1, Gerrard Seepage Ditch No. 2, and the Gerrard Seepage Pond decreed in Case No. 02CW305.

10. Assignment and Commitment of Non-Potable Water Supply. The Owners do hereby agree to assign to the Town the 2.25 of the 2.5 Farmers Shares not yet assigned to the Town in a form acceptable to the Town but at no cost to the Owners. The Town covenants and agrees that the entire 2.5 Farmers Shares and the entire 3.0 cfs of Priority #1 that was changed in the 07CW14 Decree shall be committed to serve the Non-Potable Irrigation System in perpetuity so long as that Non-Potable Irrigation System continues to be operated consistent with this Amendment Agreement.

11. Modifications to Non-Potable Agreement. Paragraphs 2 – 10 above do hereby replace Paragraphs 1 – 5 of the Non-Potable Agreement in their entirety. Paragraph 7 is also replaced, except that the Parties agree no water court transfer fee shall be payable by any Party to the Town for any of the Non-Potable Water Supply.

12. Notices. The Notice provision in paragraph 8 of the Non-Potable Agreement is hereby updated with the following information for the Association:

2534 Master Association

Attn: Justin Morrison
 2534 Master Association
 375 E. Horsetooth Road, Building 3, Suite 100
 Fort Collins, CO 80525
 (970) 221-2323
 justinm@mnpre.com

With Copy to:

Todd Williams
 Williams & Weiss Consulting, LLC
 5255 Ronald Reagan Blvd., #220
 (303) 653-3940

tlwwater@msn.com

Town of Johnstown

Town of Johnstown
c/o Town Clerk
450 S. Parish Ave.
Johnstown, CO 80534

With Copy to:

Avi Rocklin, Esq.
Johnstown Town Attorney
1437 N. Denver Avenue, #330
Loveland, CO 80538

Peter J. Ampe
Hill & Robbins, P.C.
1660 Lincoln St., Suite 2720
Denver, CO 80264

The remainder of paragraph 8 of the Non-Potable Agreement remains unchanged.

13. Counterparts. This Amendment may be executed in several counterparts, and all such executed counterparts shall constitute the same Amendment. The Parties agree that signatures transmitted electronically shall be binding as if they were original signatures.

IN WITNESS WHEREOF, the Parties have executed this Amendment on the day and year first written above.

TOWN OF JOHNSTOWN, a Colorado home rule municipality

By: Gary Lebsack, Mayor

ATTEST:

Diana Seele, Town Clerk

STATE OF COLORADO)

_____) ss.
COUNTY OF _____)

The foregoing Amendment was acknowledged before me this ____ day of _____, 2021, by Gary Lebsack as Mayor of the Town of Johnstown.

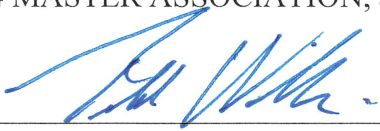
WITNESS my hand and official seal.

My commission expires: _____

(SEAL)

Notary Public

2534 MASTER ASSOCIATION, a Colorado nonprofit corporation



Name: Todd Williams

Title: President of Board of Directors

STATE OF COLORADO)
) ss.
COUNTY OF Weld)

The foregoing Amendment was acknowledged before me this 10th day of August, 2021, by Todd Williams, President of the 2534 Master Association Board of Directors.

WITNESS my hand and official seal.

My commission expires:

4/17/2025


Notary Public


THOMPSON RANCH, LLP

Dale Boehner

Name: Dale Boehner

Title: General Partner

STATE OF COLORADO)

) ss.

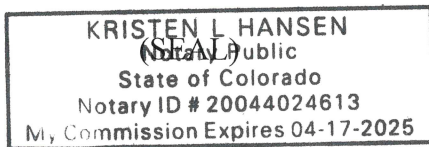
COUNTY OF Weld)

The foregoing Amendment was acknowledged before me this 6th day of August, 2021, by Dale Boehner, General Partner of the Thompson Ranch, LLP

WITNESS my hand and official seal.

My commission expires:

4/17/2025



Kristen L. Hansen
Notary Public

GERRARD FAMILY LIMITED PARTNERSHIP

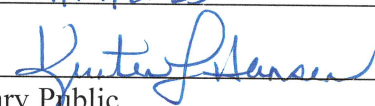

 Name: Nathan Gerrard
 Title: General Partner

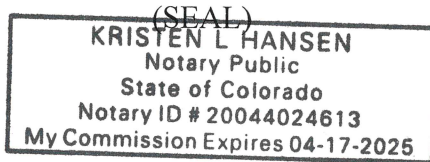
STATE OF COLORADO)
) ss.
 COUNTY OF Weld)

The foregoing Amendment was acknowledged before me this 5th day of August, 2021, by Nathan Gerrard, General Partner of the Gerrard Family Limited Partnership.

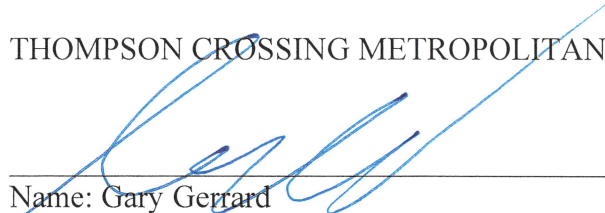
WITNESS my hand and official seal.

My commission expires:

4/17/2025

 Notary Public



THOMPSON CROSSING METROPOLITAN DISTRICT #2



Name: Gary Gerrard

Title: President

STATE OF COLORADO)

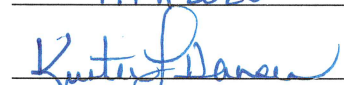
) ss.

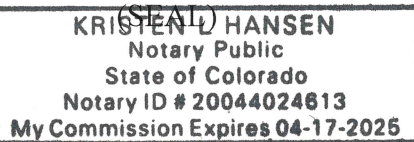
COUNTY OF Weld)

The foregoing Amendment was acknowledged before me this 5th day of August, 2021, by Gary Gerrard, President of the Thompson Crossing Metropolitan District #2.

WITNESS my hand and official seal.

My commission expires:

4/17/2025


Notary Public




Town of Johnstown

TOWN COUNCIL AGENDA COMMUNICATIONS

AGENDA DATE: September 8, 2021

SUBJECT: Town of Johnstown LED Light Conversion Program

ACTION PROPOSED: Consider Confirmation Letter to Xcel Energy for LED Light Conversion Program.

ATTACHMENTS:

1. Confirmation Letter
2. LED Light Conversion Program SEP Agreement
3. Xcel Energy Quote

PRESENTED BY: Matt LeCerf, Town Manager

AGENDA ITEM DESCRIPTION:

Enclosed for your review and consideration is a Confirmation Letter to Xcel Energy to begin work on the Town of Johnstown LED Light Conversion Program. As part of the Compliance Order issued by the Colorado Department of Public Health and Environment, the Town of Johnstown shall perform three Supplemental Environmental Projects (SEP) totaling \$502,523.00.

One of those SEP projects is the LED Light Conversion Project. This project requires the replacement of inefficient streetlights with LED lights resulting in energy demand reduction and reduced CO2 emissions. As an added benefit of installing the LED streetlights, the lighting system will provide better visibility to travelers resulting in increased safety. The LED Light Conversion Program based on the SEPT requires an expenditure of \$151,438.56. We are recommending increasing this cost by approximately \$10,215.60 to \$161,654.16, based on the facts that the Johnstown Housing Authority boiler replacement project came in under the estimate and concerns regarding our final project, a solar project which may have supply chain cost increases or availability challenges. This increase will allow us to better flex the final project into the final SEP total cost of \$502,523.

Staff has received a quote from Xcel Energy for the costs of the LED Conversion and must submit written confirmation we wish to continue this project. Once confirmed, Xcel Energy believes work will begin sometime in Q4 2021 or in early 2022. We have until December 1, 2022 to complete the LED Light Conversion Program SEP.

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P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141

The subdivisions to be completed with this work are as follows:

- Corbet Glenn/Carlson Farms
- The Landings
- Johnstown Center (West of Aragon Park)
- Redstone Hills (between 2nd and 7th Streets)

As we look into future fiscal years, we will continue to allocate funds for replacement of other subdivision streetlights.

LEGAL ADVICE:

Not Applicable.

FINANCIAL ADVICE:

Johnstown shall pay \$502,523.00 in the form of expenditures on Supplemental Environmental Projects to meet the terms of the settlement agreement. The cost of the LED Light Conversion Program is part of the total SEP expenditures approved in FY 2021.

Reviewed and Approved for Presentation,



Town Manager



Town of Johnstown

September 8, 2021

Ms. Christina Carusone
Xcel Energy
Project Coordinator, Outdoor Lighting
1123 West 3rd Avenue Denver, CO 80223

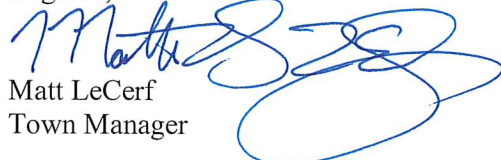
Dear Christina:

This letter serves to confirm the intention of the Town and request that you proceed with the Outdoor Street Lighting improvements program provided by Xcel Energy for the following subdivisions in Johnstown at the prices quoted below.

	Head Type	Quote
Carlson Farms/ Corbet Glenn:		\$ 94,829.68
152 Regular Street Light Poles	Black Traditional	
22 Double Street Light Poles along Carlson Blvd	Globes/ NA	
The Landings:		\$ 16,065.25
25 Regular Street Light Poles	Grey Contemporary	
Neighborhood West of Aragon Park:		\$ 16,065.25
	25 Grey Contemporary	
Redstone Hills (N 2nd- 7th area)		\$ 34,693.98
54 Regular Street Light Poles	Contemporary	
Total Sum for Fixtures we offer as LED		\$ 161,654.16

The Town is excited to begin this project, as it benefits both our community and our environment. If you require additional information or communication with the Town regarding this project, please utilize Danielle Gardner, Executive Assistant who can facilitate any information you may need.

Regards,


Matt LeCerf
Town Manager

Cc: Danielle Gardner, Executive Assistant

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Town of Johnstown

TOWN COUNCIL AGENDA COMMUNICATIONS

AGENDA DATE: September 8, 2021

SUBJECT: **Public Hearing** – Resolution Approving the Service Plan for Ledge Rock Center Commercial Metropolitan District

ACTION PROPOSED: Consider Resolution No. 2021-28

ATTACHMENTS:

1. Proposed Service Plan
2. Executive Summary prepared by David O’Leary, counsel for the Developer
3. Resolution Approving the Service Plan for Ledge Rock Center Commercial Metropolitan District

PRESENTED BY: Town Attorney, Avi Rocklin, and Special Counsel, MaryAnn McGeady

AGENDA ITEM DESCRIPTION:

An application for approval of a Service Plan for the Ledge Rock Center Commercial Metropolitan District (“Service Plan”) was submitted on behalf of Ledge Rock Center, LLC, a Kansas limited liability company (“Developer”), pursuant to the requirements of the Special District Control Act, Title 32, Article 1, Part 2, C.R.S. The Service Plan was submitted in connection with a development known as Ledge Rock Center, generally located east of U.S. Interstate 25 and south of Highway 60/County Road 48 (“Property”). The Ledge Rock Center development is anticipated to include commercial development, multi-family development and single-family residential homes. The service area of the proposed District includes the commercial portion of the Ledge Rock Center development. The Developer is under contract to purchase the Property. The owners of the Property provided consent to the organization of the District, as evidenced in Exhibit C-3 to the Service Plan.

To satisfy the statutory requirements, the Service Plan includes (1) a description of the proposed services, (2) a financial plan as to how the services are to be financed, (3) a preliminary engineering or architectural survey showing how the proposed services are to be provided, (4) a map of the proposed District boundaries, (5) a description of the facilities to be constructed and the standards for construction, (6) a general description of the estimated cost of acquiring land, engineering services, legal services, administrative services, initial proposed indebtedness and estimated proposed maximum interest rates and discounts, and other major expenses related to the organization and initial operation of the district, and (7) a proposed intergovernmental agreement between the District and the Town.

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The service area for the proposed Ledge Rock Center Commercial Metropolitan District (“District”) includes approximately 35.857 acres of land in the initial boundaries and approximately 88.804 acres of inclusion area boundaries, including a parcel of land totaling approximately 50 +/- acres that may be conveyed by the Town to the District or to the Developer at a later date pursuant to the terms of a Development and Reimbursement Agreement, as set forth in the Memorandum of Understanding executed between the Town and the Developer on May 5, 2021 and further described in the proposed Service Plan. In total, the initial boundaries and subsequent inclusion area boundaries consist of approximately 124.661 acres.

The debt is anticipated to be paid from public improvement fee revenue, including, as defined in the Service Plan, a Credit PIF consisting of a portion of the Town’s sales tax and an Add-on PIF. The rates of the Credit PIF and Add-on PIF will be determined in the Development and Reimbursement Agreement. The maximum debt mill levy is 25 mills and the maximum operations and maintenance mill levy is 10 mills. The maximum aggregate mill levy, however, is 25 mills. The mill levies are subject to an assessed valuation adjustment, meaning, primarily, that if the commercial assessment rate is changed (the ratio of assessed valuation to actual valuation), the mill levy may be increased above the cap so that the rate change is revenue neutral to the District.

The maximum term for developer debt is 20 years from the initial imposition of an ad valorem property tax, unless the Town approves a longer term by intergovernmental agreement, and 40 years for all other debt.

The capital plan, attached as Exhibit E to the Service Plan, estimates public improvement project costs of approximately \$152,054,812.00. Given the timing of the submittals, Greg Weeks, the Town’s Engineer, did not have an opportunity to review the capital plan.

The financial plan, attached as Exhibit F to the Service Plan, provides that the District will have the ability to issue debt in the amount of \$144,821,000, which is anticipated to generate approximately \$114,422,092 in net proceeds to the project. The maximum debt authorization under the Service Plan is \$173,785,000.

Importantly, the District is not entitled to issue any debt until an Amended and Restated Service Plan is presented to and approved by the Town Council. The methodology allows the Developer to form the District during the November election but provides the Town Council with an opportunity to review and, if appropriate, modify the terms of the Service Plan once the development plans are better understood.

Pursuant to state law, the Town Council must approve the Service Plan before the District is formed and entitled to operate. The Service Plan must be approved through a public hearing process. Upon approval, the Service Plan, along with a petition for organization of the District, must be submitted to the Weld County District Court, who will then hold a hearing on the petition and order an election regarding the organization of the District. Notice of this public hearing before the Town Council was published in *The Johnstown Breeze* and provided to interested persons by the proponents of the District.

LEGAL ADVICE:

The Town Attorney and the Town’s Special Counsel have reviewed the proposed Service Plan.

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FINANCIAL ADVICE :

The Town's Special Counsel has reviewed the financial plan.

RECOMMENDED ACTION: Approve Resolution No. 2021-28

SUGGESTED MOTIONS:

For Approval: I move to approve Resolution No. 2021-28, a Resolution Approving the Service Plan for Ledge Rock Center Commercial Metropolitan District.

For Approval with Conditions: I move to approve Resolution No. 2021-28, a Resolution Approving the Service Plan for Ledge Rock Center Commercial Metropolitan District, with the following modifications to the proposed Service Plan, _____, and direct the Town Attorney to revise the Service Plan accordingly.

For Denial: I move to deny approval of Resolution No. 2021-28, a Resolution Approving the Service Plan for Ledge Rock Center Commercial Metropolitan District.

Reviewed and Approved for Presentation,



Town Manager

SERVICE PLAN
FOR
LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT
TOWN OF JOHNSTOWN, COLORADO

Prepared
by

SPENCER FANE, LLP
1700 Lincoln Street, Suite 2000
Denver, Colorado 80203

Resubmitted: September 1, 2021

Approved: _____, 2021

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I. INTRODUCTION

A. Intent and Purpose.

The Town intends that this Service Plan grant authority to the District to provide for the planning, design, acquisition, construction, installation and financing of Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The Town and the District acknowledge that the District is an independent unit of local government, separate and distinct from the Town, and, except as may otherwise be provided for by State or local law, this Service Plan or an intergovernmental agreement with the Town, the District's activities are subject to review by the Town only insofar as the activities may deviate in a material manner from the requirements of the Service Plan. The primary purpose of the District will be to finance the construction of these Public Improvements.

The District will also provide ongoing operations and maintenance services as set forth in this Service Plan and pursuant to an Operations and Maintenance Intergovernmental Agreement.

B. Need for the District.

There are currently no other governmental entities, including the Town, located in the immediate vicinity of the District that consider it desirable, feasible or practical to undertake the planning, design, acquisition, construction, installation, and financing of the Public Improvements or the ownership, operation and maintenance by the Town or another entity. Formation of the District is therefore necessary in order for the Public Improvements to be provided in the most economic manner possible.

C. Town's Objective Regarding the District's Service Plan.

The Town's objective in approving the Service Plan is to authorize the District to provide for the planning, design, acquisition, construction, installation, relocation, redevelopment, financing, repair, replacement and operations and maintenance of the Public Improvements from the proceeds of Debt that may be issued by the District and to provide for the ownership, operation or maintenance by the Town or District where appropriate. Debt is expected to be repaid by revenues resulting from a Public Improvement Fee ("CPIF") and an Add-On Public Improvement Fee ("Add-On PIF") pursuant to the terms of a Development and Reimbursement Agreement, as well as other legally available revenues of the District as more particularly described herein. It is also anticipated that a portion of the Debt is expected to be repaid by an ad valorem property tax no higher than the Maximum Debt Mill Levy and other legally available revenues of the District as provided herein. Debt issued within these parameters and, as further described in the Financial Plan, is intended to insulate property owners from excessive tax and financial burdens and result in a timely and reasonable repayment. Generally, the cost of Public Improvements that cannot be funded within these parameters and the financing capacity of the District are not costs to be paid by the District.

The Town intends to authorize the District to have the ability to plan, design, acquire, construct, install and finance the initial Public Improvements necessary to develop the Project and seeks the timely payment of Debt related to those initial Public Improvements so that the financial

burden on End Users is minimized. The District shall not be entitled to issue any Debt until it has received approval of a Service Plan Amendment in the form of an Amended and Restated Service Plan and shall thereafter be required to obtain authorization of the Town, in the form of an intergovernmental agreement, prior to issuing Debt for redevelopment of an existing Public Improvement.

The Town prefers that all property classified as “residential” shall be located solely within the boundaries of a residential district and that all property classified as “commercial” shall be located solely within the boundaries of a commercial district. For purposes of this distinction “commercial property” shall mean all property other than “residential real property” as that term is defined in Article X, Section 3(1)(b) of the Colorado Constitution. The distinction facilitates two goals: (1) to have similarly situated properties governed by common interests, and (2) to apply a lower maximum tax burden on residential owners. The foregoing shall not prohibit residential and commercial Districts from sharing the costs of Public Improvements in compliance with the provisions of this Service Plan and applicable law, provided, however that no PIF Revenue shall be used within residential district(s) and shall be utilized solely within and for the benefit of the commercial district(s).

Unless the District has operational responsibilities for any of the Public Improvements or Covenant Enforcement and Design Review Services, the Town intends that the District dissolves upon payment or defeasance of all Debt incurred or upon a court determination that adequate provision has been made for the payment of all Debt and for continuation of any operations. It is currently anticipated that the District shall have long-term responsibility for maintaining parking areas, common areas, landscaping and snow removal and maintenance of the public improvements owned, operated and maintained by the District.

II. DEFINITIONS

In this Service Plan, the following terms shall have the meanings indicated below, unless the context hereof clearly requires otherwise:

Add-on PIF: means the component of the PIF which will be set at a rate in accordance with the terms and conditions of the Development and Reimbursement Agreement and which will be applied to Taxable Transactions before the calculation of applicable sales taxes.

Add-on PIF Revenues: means the revenues generated from imposition and collection of the Add-on PIF pursuant to the terms of this Service Plan, and other agreements.

Add-on PIF Sale(s): means the following transactions which are subject to the Add-on PIF: (i) any exchange of goods or services for money or other media of exchange initiated, consummated, conducted, transacted or otherwise occurring from or within any portion of the District which are subject to the Sales Tax; (ii) any additional transactions that the Ledge Rock Center PIC, if organized and operating, or includes within the definition of Add-on PIF Sales in the guidelines established by it from time to time, but not including (iii) any transactions that the Ledge Rock Center PIC with the approval of the Town

Council, expressly excludes from the definition of Add-on PIF Sales in the guidelines established by it for the Add-on PIF from time to time.

Add-on PIF Termination Date: means the later of the date that all Debt, other financial obligations, and operations of the District that are payable from Add-on PIF Revenues have been paid or discharged, or the District and the Town agree in writing to terminate the Add-on PIF. As of the date of this Service Plan, it is expected that the Add-on PIF will exist in perpetuity to provide revenue to support improvements and services for the continued vitality of the Service Area and the businesses therein.

Amended and Restated Service Plan: means an amendment to this Service Plan approved by Town Council that may, among other potential matters, authorize the issuance of Debt in compliance with the terms thereof.

Approved Development Plan: means a development plan or other process established by the Town (including but not limited to approval of a preliminary development plan, preliminary or final plat, minor development plat or site plan by the Town Council) for identifying, among other things, Public Improvements necessary for facilitating development of property within the Service Area pursuant to the Town Code.

Assessment Ratio Adjustment: means, if, on or after January 1, 2021, there are changes in the method of calculating assessed valuation or any constitutionally mandated tax credit, cut or abatement, the Maximum Debt Mill Levy and Maximum Operations and Maintenance Mill Levy may be increased or decreased to reflect such changes, such increases and decreases to be determined by the Board in good faith (such determination to be binding and final) so that to the extent possible, the actual tax revenues generated by the applicable mill levy, as adjusted for changes occurring after January 1, 2021, are neither diminished nor enhanced as a result of such changes. For purposes of the foregoing, a change in the ratio of actual valuation to assessed valuation shall be deemed to be a change in the method of calculating assessed valuation.

Board: means the Board of Directors of the District.

Bond, Bonds or Debt: means bonds, notes, contracts, reimbursement agreements or other multiple fiscal year financial obligations issued by the District or other obligations for the payment of which the District has pledged or promised to impose an ad valorem property tax mill levy, Credit PIF, or Add-On PIF Revenue or Development Fee revenues.

Bond Counsel Opinion: means the opinion, to be provided by an attorney licensed in Colorado and published in the then current publication of the Bond Buyer Directory of Municipal Bond Attorneys, providing that the Debt that is the subject of the opinion was issued in accordance with the provisions of the Service Plan.

Capital Plan: means the Capital Plan described in Section V.C. which includes: (a) a list of the Public Improvements which may be developed by the District; (b) an engineer's estimate of the cost of the Public Improvements; and (c) a pro forma capital expenditure plan correlating expenditures with development.

Commercial District: means the District containing solely commercial property within its boundaries. It is anticipated that the Ledge Rock Center Commercial Metropolitan District, and any future inclusion area which has commercial property, will contain the commercial property within the Project.

Commercial Property: means all property other than residential real property as that term is defined in Article X, Section 3(1)(b) of the Colorado Constitution.

Cost Verification Report: means a report provided by an engineer or accountant as required pursuant to Section V.A.30

Covenant Enforcement and Design Review Services: means those covenant enforcement and design review services authorized in the Special District Act.

Credit PIF or CPIF: in accordance with the terms of the Development and Reimbursement Agreement, means the component of the PIF that is set at the rate which, when applied to Taxable Transactions occurring during the Credit PIF Period, will result in an offsetting credit against the Sales Tax obligation, as set forth in the Sales Tax Code Amendment.

Credit PIF Period: means the period during which the Sales Tax Credit is in effect as provided in the Sales Tax Code Amendment and as provided in the Development and Reimbursement Agreement.

Credit PIF Revenues: means that portion of the PIF Revenues derived from imposition of the Credit PIF, which revenues are to be received and utilized by the District pursuant to the terms and conditions of the Development and Reimbursement Agreement with the Town and other agreements.

Credit PIF Sale(s): means any exchange of goods or services for money or other media of exchange initiated, consummated, conducted, transacted or otherwise occurring from or within any portion of the District which are subject to the Sales Tax.

Credit PIF Termination Date: means the date on which the Credit PIF will terminate as provided in the Development and Reimbursement Agreement.

Debt: See Bond, Bonds or Debt.

Developer: means the owner or owners of the property within the Service Area, any affiliates of such owner or owners and their successors and assigns other than End Users. As of the date of this Service Plan, the Developer is Ledge Rock Center, LLC, and may include their heirs, affiliates, successors and assigns designated by the Developer to the Town from time to time.

Developer Debt: means bonds, notes, contracts, reimbursement agreements or other multiple fiscal year financial obligations issued by the District to the Developer within the District for reimbursement of sums advanced or paid for funding of Public Improvements or operation and maintenance expenses. Developer Debt shall be subordinate to other Debt of the District.

Developer Debt Mill Levy Limitation Term: means the Developer Debt Mill Levy Imposition Term set forth in Section VI.D.1.

Development and Reimbursement Agreement: means an agreement, as amended from time to time, between the Town and the District, and the Developer as to those items which the Developer may be a party, that provides, among other matters, the terms and conditions relating to the collection, payment and use of the CPIF and Add-on PIF, including the amount of the CPIF and Add-on PIF and the amount of Debt that may be paid with such revenue, termination of the CPIF, maximum interest rates on Debt issued to the Developer or other landowners, and limitations on other revenue sources.

District: means Ledge Rock Center Commercial Metropolitan District.

End User: means any owner or occupant of any taxable commercial property within the District after such property has been vertically developed. By way of illustration, a commercial property owner or commercial tenant is an End User. The Developer and any business entity that constructs commercial structures is not an End User.

External Financial Advisor: means a consultant that: (1) advises Colorado governmental entities on matters relating to the issuance of securities by Colorado governmental entities, including matters such as the pricing, sales and marketing of such securities and the procuring of bond ratings, credit enhancement and insurance in respect of such securities; (2) shall be an underwriter, investment banker, or individual listed as a public finance advisor in the Bond Buyer's Municipal Market Place; and (3) is not an officer or employee of the District.

External Financial Advisor Certification: means the certification required to be provided pursuant to Section V.A.10. below.

Favorable Opinion of Bond Counsel: means, with respect to the provisions of Sections VI.I. and VI.J., below, as applicable, an unqualified written opinion of Bond Counsel to the effect that compliance with such provisions is not then required to permit the issuance by the District of Tax-exempt Debt, and failure to comply with such provisions will not impair the exemption from gross income for purposes of federal income taxation of interest on any Debt of the District previously issued as federally tax-exempt (or impair such other federal tax advantage in lieu of exemption of interest from gross income as may apply to such Debt). If the Debt to be issued is not intended to be Tax-exempt Debt, then a Favorable Opinion of Bond Counsel is not required.

Fee or Fees: means any fee, rate, toll, penalty, or charge imposed by the District for services, programs or facilities provided or to be provided by the District.

Financial Plan: means the initial proposed Financial Plan described in Section VI, which describes (i) how the Public Improvements are to be financed; (ii) how Debt may be incurred; and (iii) the estimated operating revenue derived from property taxes for the first budget year. Such costs shall not constitute legal limits on the financial powers of the District; provided, however, that the District shall not be permitted to issue Bonds which are not in compliance with the bond registration and issuance requirements of Colorado

law and which are not in compliance with the terms of the Development and Reimbursement Agreement, this Service Plan and any other agreements between the District and the Town.

Inclusion Area Boundaries: means the boundaries of the area described in the Inclusion Area Boundary Map.

Inclusion Area Boundary Map: means the map attached hereto as **Exhibit C-2**, describing the property proposed for inclusion within one, but not any more than one, of the boundaries of the District.

Initial District Boundaries: means the boundaries of the area described in the Initial District Boundary Map.

Initial District Boundary Map: means the map attached hereto as **Exhibit C-1**, describing the initial boundaries of the District.

Intergovernmental Agreement: means the Intergovernmental Agreement required by the Town, a form of which is attached hereto as **Exhibit D** and described in Article IX hereof.

Ledge Rock Center PIC: means a nonprofit Public Improvement Corporation serving Ledge Rock Center that may be organized and operate to impose, collect, and spend or convey to the District the Add-on PIF Revenues or the Credit PIF Revenues pursuant to covenants recorded against property within Ledge Rock Center Commercial District and agreements with the District and/or Town. The Ledge Rock Center PIC may be the Declarant of such covenants or a beneficiary thereof and may perform other services. Nothing in this Service Plan shall be deemed or construed to require the organization or operation of any Ledge Rock Center PIC.

Map Depicting Public Improvements: means the map attached hereto as **Exhibit E**, showing the initial proposed location(s) of the Public Improvements listed in the Capital Plan. The location and specifications of the Public Improvements may change from time to time without a requirement to amend the Map Depicting the Public Improvements or an amendment to the Service Plan.

Maximum Aggregate Mill Levy. means the maximum mill levy the District is permitted to impose for payment of Debt as set forth in Section VI.C.1. below and the maximum mill levy the District is permitted to impose for payment of Operations and Maintenance Expenses, as set forth in Section VI.C.2. below, and is equal to the combination of the Maximum Debt Mill Levy and the Maximum Operations and Maintenance Mill Levy.

Maximum Debt Authorization: means the total Debt the District is permitted to incur as set forth in Section V.A.14. below.

Maximum Debt Mill Levy: means the maximum mill levy the District is permitted to impose upon Taxable Property as set forth in Section VI.C below.

Maximum Debt Mill Levy Imposition Term: means the maximum term for imposition of a mill levy as set forth in Section VI.D. below.

Maximum Operations and Maintenance Mill Levy: means the maximum mill levy the District is permitted to impose for payment of Operation and Maintenance Expenses, as set forth in Section VI.C.2. below.

Operations and Maintenance Intergovernmental Agreement: means an agreement between the Town and the District to be entered into prior to the first issuance of Bonds, and as may be amended from time to time, that defines the duties and obligations of the District to operate, maintain, repair, and replace certain of the Public Improvements, authorizes the District to have access to and perform its duties for the portion of the Public Improvements that are owned by the Town and for which the District is responsible, if any, authorizes the Town to undertake the unfulfilled duties of the District at District expense and provides the Town with access for such undertakings, and confirms the District's authority to raise revenue to pay for such activities with any revenue available to it except CPIF revenue and compels the District to impose a mill levy to reimburse the Town for any costs incurred in the event the Town undertakes the unfulfilled duties of the District.

Operations and Maintenance Mill Levy: means the mill levy the District is permitted to impose for payment of administrative, operations and maintenance expenses as set forth in Section VI.C.2. below.

Public Improvement Fee or PIF: means a fee imposed by property owners on retail sales by covenant. The revenue generated by the PIF is "PIF Revenue."

Privately Placed Debt: means Debt that is issued by the placement of the Debt directly with the Debt purchaser and without the use of an underwriter as a purchaser and reseller of the Debt, and includes, but is not limited to, Developer Debt and bank loans.

Project: means the commercial component of a development to be known as Ledge Rock Center.

Proof of Ownership: means a current title commitment or ownership and encumbrance report showing ownership and all encumbrances on all properties within the Initial District Boundaries, or other documentation acceptable to the Town Attorney.

Public Improvements: means a part or all of the improvements authorized to be planned, designed, acquired, constructed, installed, or developed inside or outside the boundaries of the District and financed as listed on the Capital Plan, attached as **Exhibit E**, and generally described in the Special District Act, or as set forth in an Approved Development Plan or intergovernmental agreement with the Town, to serve the anticipated inhabitants and taxpayers of the Service Area, except as specifically limited in Section V below, and as approved by the Board from time to time.

Publicly Marketed Debt: means Debt that is offered for sale to the public by the District with the use of an underwriter as a purchaser and reseller of the Debt.

Recurring Fee(s): means any recurring fee, rate, toll, penalty or charge imposed by the District for administrative, operations and maintenance costs and for services, programs or facilities provided by the District as limited by the provisions of Section V.A.15. below, but in no event to be used for payment of Debt.

Refunding Bonds or Refunding Debt: means Debt issued for purposes of refunding any Bond or Debt.

Sales Tax: means the sales tax imposed by the Town pursuant to the Town Code.

Sales Tax Code Amendment: means the ordinance, resolution, or other action by the Town Council that authorizes the Credit PIF and provides for its collection, payment, and use consistent with the Development and Reimbursement Agreement. The Sales Tax Code Amendment may be in the form of an Ordinance Amending Article IV of Chapter 4 of the Johnstown Municipal Code Concerning Sales Tax Credits or equal.

Sales Tax Credit: means a credit against the Town's Sales Tax.

Service Area: means the property within the Initial District Boundary Map and, if and when included, also within the Inclusion Area Boundary Map.

Service Plan: means this Service Plan for the District approved by Town Council.

Service Plan Amendment: means an amendment to the Service Plan approved by Town Council in accordance with the applicable state law.

Special District Act: means Section 32-1-101, *et seq.*, of the Colorado Revised Statutes, as amended from time to time.

State: means the State of Colorado.

Taxable Property: means real or personal property within the Service Area subject to ad valorem property taxes imposed by the District.

Taxable Transactions: means sales subject to payment of the Sales Tax.

Tax-exempt Debt: means Debt issued by the District for which the interest paid may be exempt from federal income tax of the recipient.

Total Debt Issuance Limitation: means the amount of Debt authorized by this Service Plan as provided in Section V.A.14.

Town: means the Town of Johnstown, Colorado.

Town Code: means the Town of Johnstown Municipal Code, as may be amended and in effect from time to time.

Town Council: means the governing body of the Town of Johnstown, Colorado.

Transfer Fee: means a fee assessed upon each sale of real property within the District.

III. BOUNDARIES

The area of the District Boundaries includes approximately Thirty-Five and 857/1000 (35.857) acres, in its initial boundaries, with three additional future inclusion area parcels totaling approximately Eighty-Eight and 804/1000 (88.804) acres of future inclusion area property (for a total of approximately 124.661 acres of property) generally located south of Highway 60/County Road 48 and east of Interstate I-25. The proposed service area of the District includes approximately 124.661 acres of commercial development. Legal descriptions of the District Boundaries are attached hereto as **Exhibit A**. A vicinity map is attached hereto as **Exhibit B**. A map of the Initial District Boundaries is attached hereto as **Exhibit C-1**, and a map of which includes the Inclusion Area Boundaries, is attached hereto as **Exhibit C-2**. Proofs of Ownership and consents of the owners to organization of the District for all properties within the initial District Boundaries will be attached hereto as **Exhibit C-3**. The District's boundaries may change from time to time as the District undergoes inclusions and exclusions pursuant to the Special District Act, subject to the limitations set forth in Section V below and as authorized by the Town.

IV. PROPOSED LAND USE / POPULATION PROJECTIONS / ASSESSED VALUATION

The Service Area, upon full build-out, will consist of approximately 124.661 acres of property. The current assessed valuation of the Service Area is assumed to be \$0 for purposes of this Service Plan and, at build-out, is expected to be sufficient to reasonably discharge the Debt under the Financial Plan.

The District Boundaries are estimated to contain approximately 750,000 square feet of commercial retail space at build-out, with over 2.049 acres of parking areas to be utilized in conjunction with a potential park and ride area and up to 7.049 acres of commercial property that may contain one or more hotels and conference center facilities consisting of up to 50,000 square feet.

The Town's approval of this Service Plan does not imply approval of the development of a specific area within the District nor does it imply approval the total site/floor area of commercial or industrial buildings which may be identified in this Service Plan. Those final areas of commercial retail buildings will be based upon Approved Development Plans.

Approval of this Service Plan by the Town in no way releases or relieves the Developer of the Project, or the landowner or any subdivider of any portion of the Project property, or any of their respective successors or assigns, of obligations to construct Public Improvements for the Project or of obligations to provide to the Town such financial guarantees as may be required by the Town to ensure the completion of the Public Improvements, or of any other obligations to the Town under the Town Code or any applicable annexation agreement, subdivision agreement, or other agreements affecting the Project property or development thereof.

V. DESCRIPTION OF PROPOSED POWERS, IMPROVEMENTS AND SERVICES

A. Powers of the District and Service Plan Amendment.

The District shall have the power and authority to provide the Public Improvements and operations and maintenance within and without the boundaries of the District as such power and authority is described in the Special District Act and other applicable statutes, common law and the Constitution, subject to the limitations set forth herein.

1. Operations and Maintenance Limitation. The purpose of the District is to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The District shall only operate and maintain those Public Improvements that are not accepted for ownership, operations and maintenance by the Town or other appropriate entity in a manner consistent with Approved Development Plans, the Operations and Maintenance Intergovernmental Agreement, other rules and regulations of the Town, and the Town Code.

For any Public Improvement that is not conveyed to the Town or other entity as directed by the Town, the District shall administer, operate, maintain, repair, remove, or replace such Public Improvement in compliance with the applicable standards of the Town and the terms of the Operations and Maintenance Intergovernmental Agreement. The District shall not have the authority to issue any Bonds until the District and the Town have entered into the Operations and Maintenance Intergovernmental Agreement. The District shall hold an election to approve a ballot issue or issues required to commit to the financial obligations in the Operations and Maintenance Intergovernmental Agreement. Until such time as such ballot issue is approved, the District shall have no authority to incur Debt or certify a mill levy.

2. Trails and Amenities. The District may own, operate, and maintain trails and related amenities within the District. All parks and trails shall be open to the general public, including Town residents who do not reside in the District, free of charge, unless otherwise specified in an intergovernmental agreement with the Town.

3. Fire Protection, Ambulance and Emergency Services Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain fire protection facilities or services, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town. The authority to plan for, design, acquire, construct, install, relocate, redevelop or finance fire hydrants and related improvements installed as part of the water system shall not be limited by this provision. The District shall not be authorized to provide for ambulance or emergency medical services unless the provision of such service is approved by the Town in an intergovernmental agreement.

4. Television Relay and Translation Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain television relay and translation facilities and services, other than for the installation of conduit as a part of a street construction project, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town.

5. Telecommunication Facilities. The District agrees that no telecommunication facilities owned, operated or otherwise allowed by the District shall affect the ability of the Town to expand its public safety telecommunication facilities or impair the Town's existing telecommunication facilities.

6. Construction Standards Limitation. The District shall ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the Town and of other governmental entities having proper jurisdiction. The District shall obtain the Town's approval of civil engineering plans and applicable permits for construction and installation of Public Improvements prior to performing such work.

7. Zoning and Land Use Requirements; Sales and Use Tax. The District shall be subject to all of the Town's zoning, subdivision, building code and other land use requirements. The District shall not exercise any exemption from Town sales or use tax, whether directly or indirectly.

8. Growth Limitations. The District acknowledges that the Town shall not be limited in implementing Town Council or voter approved growth limitations, even though such actions may reduce or delay development within the District and the realization of District's revenue.

9. Conveyance. The District agrees to convey to the Town, at no expense to the Town and upon written notification from the Town, any real property owned by the District that is necessary, in the Town's sole discretion, for any Town capital improvement projects for transportation, utilities, drainage, streets or trails. The District shall, at no expense to the Town and upon written notification from the Town, transfer to the Town all rights-of-way, fee interests and easements owned by the District that the Town determines are necessary for access to and operation and maintenance of the Public Improvements to be owned, operated and maintained by the Town, consistent with an Approved Development Plan.

10. Privately Placed Debt Limitation. Prior to the issuance of any Privately Placed Debt, including but not limited to any Developer Debt, the District shall obtain the certification of an External Financial Advisor approved by the Town, in the form substantially as follows:

We are [I am] an External Financial Advisor within the meaning of the District's Service Plan.

We [I] certify that (1) the net effective interest rate (calculated as defined in Section 32-1-103(12), C.R.S.) to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District and all Districts pledging revenue to the repayment of the Debt.

The District shall submit written notice to the Town Manager of the name of the proposed External Financial Advisor prior to the engagement of the External Financial Advisor which shall either be approved or objected to by the Town within twenty (20) days of the submittal of such written notice to the Town Manager. If the Town Manager does not object to such selection within the twenty (20) day period, the Town Manager's approval shall be deemed to have been given to the District retaining the External Financial Advisor named in the written notice.

Within ten (10) days subsequent to the issuance of Privately Placed Debt, the District shall provide the Town with copies of the relevant Debt documents, the External Financial Advisor Certification and the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt.

11. Inclusion Limitation. Upon written consent of the property owners, and as provided by the Special District Act, the District may include all property with the Inclusion Area Boundaries, and shall provide written notice to the Town of all such inclusions concurrently therewith. The District shall not include within its boundaries any property outside the Inclusion Area Boundaries without the prior written consent of the Town. The District shall only include within its boundaries property that has been annexed to the Town and no portion of any of the District shall ever consist of property not within the Town's corporate boundaries.

12. Overlap Limitation. The boundaries of the District shall not overlap with any other metropolitan district without the prior written consent of the Town.

13. Debt Limitation. Until the Development and Reimbursement Agreement with the District is approved and executed by the Town and until an Amended and Restated Service Plan is approved by Town Council, the District shall not: (a) issue any Debt; or (b) impose a mill levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds.

14. Maximum Debt Authorization. The District shall not issue Debt in excess of One Hundred Seventy-Three Million, Seven Hundred Eighty-Five Thousand Dollars (\$173,785,000), except that the District shall not issue any Debt absent approval of an Amended and Restated Service Plan by Town Council. Refunded Debt, wherein the initial debt issuance counted toward the Maximum Debt Authorization shall not count against the Maximum Debt Authorization set forth herein.

15. Recurring Fee Limitation. The District may impose and collect Recurring Fees for administrative, operations and maintenance expenses and for services, programs or facilities furnished by the District. Any Recurring Fees for administrative, operations and maintenance expenses not specifically set forth in the Financial Plan, including a subsequent increase in such Recurring Fees, shall be subject to review and approval by the Town. At the discretion of the Town Manager, Town review and, if appropriate, approval shall be provided by the Town Manager in writing or referred by the Town Manager to Town Council. If the Town does not respond to a request for the imposition of the Recurring Fee or an increase in such Recurring Fee within forty-five (45) days of receipt of a written request from the District, the Town shall be deemed to have approved the ability of the District to impose or increase the Recurring Fee as described in the request. Any Recurring Fees imposed or increased for operation and maintenance

expenses without approval as set forth herein shall constitute a material departure from the Service Plan. The revenue from a Recurring Fee shall not be used to pay for Debt.

16. Monies from Other Governmental Sources. The District shall not apply for or accept Conservation Trust Funds, Great Outdoors Colorado Funds or other funds available from or through governmental or non-profit entities for which the Town is eligible to apply, except pursuant to an intergovernmental agreement with the Town. This Section shall not apply to specific ownership taxes which shall be distributed to and a revenue source for the District without any limitation.

17. Consolidation Limitation. The District shall not file a request with any Court to consolidate with another Title 32 district without the prior written consent of the Town.

18. Public Improvement Fee Limitation. The District shall not collect, receive, spend or pledge to any Debt or use to pay for operations and maintenance services, any fee, assessment, tax or charge which is collected by a retailer in the District on the sale of goods or services by such retailer and which is measured by the sales price of such goods or services, except pursuant to an intergovernmental agreement with the Town. The District shall have the authority to receive a Credit PIF applied to Taxable Transactions during the Credit PIF Period only pursuant to the terms of the Development and Reimbursement Agreement. The District shall have the authority to receive an Add-on PIF only pursuant to the terms of the Development and Reimbursement Agreement. The Credit PIF and Add-on PIF may be applied by private covenant authorized only pursuant to the terms of the Development and Reimbursement Agreement.

19. Bankruptcy Limitation. It is expressly intended that all of the limitations contained in this Service Plan, including, but not limited to, those pertaining to the Maximum Debt Mill Levy, Developer Debt Mill Levy Imposition Term, the Maximum Mill Levy Imposition Term, and the Recurring Fees, that have been established under the authority of the Town to approve a Service Plan with conditions pursuant to Section 32-1-204.5, C.R.S.:

(a) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent an amendment to the Service Plan; and

(b) Are, together with all other requirements of Colorado law, included in the “political or governmental powers” reserved to the State under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the “regulatory or electoral approval necessary under applicable nonbankruptcy law” as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

The filing of any bankruptcy petition by the District shall constitute, simultaneously with such filing, a material departure of the express terms of this Service Plan, and thus an express violation of the approval of this Service Plan.

20. Water Rights/Resources Limitation. Water to satisfy the needs of the Project shall be dedicated by the Developer to the Town or, in the discretion of Town Council, paid by cash in-lieu of such dedication. The District shall not acquire, own, manage, adjudicate or develop water rights or resources except pursuant to an intergovernmental agreement with the Town. If the District provides a non-potable irrigation system, which would be owned, operated

and maintained by the District, the District would be permitted to manage the raw water for the District irrigation water system in the manner set forth in a subsequently executed intergovernmental agreement with the Town.

21. Eminent Domain Limitation. Absent the prior written approval of the Town, the District shall not exercise its statutory power of eminent domain or dominant eminent domain for the purpose of condemning property outside of the Service Area. Additional approval from the Town shall not be required prior to the District's exercise of its statutory power of eminent domain or dominant eminent domain with respect to property within the Service Area. In no event shall the District exercise its statutory power of dominant eminent domain to condemn property owned by the Town.

22. Covenant Enforcement and Design Review Services. The District shall have the power, but not the obligation, to provide Covenant Enforcement and Design Review Services within the District in accordance with the Colorado Statutes as they are amended from time to time. The Town shall not bear any responsibility for Covenant Enforcement and Design Review Services within the boundaries of the District. The Town's architectural control, design review and other zoning, land use, development, design and other controls are separate requirements that must be met in addition to any similar controls or services undertaken by the District.

23. Special Improvement District. The District shall not be entitled to create a special improvement district pursuant to Section 32-1-1101.7, C.R.S., unless otherwise provided pursuant to an intergovernmental agreement with the Town.

24. Reimbursement Agreement with Adjacent Landowners. If the District utilizes reimbursement agreements to obtain reimbursements from adjacent landowners for costs of improvements that benefit the third-party landowners, such agreements shall be done in accordance with Town Code. Any and all resulting reimbursements received for such improvement shall be used to re-pay the cost of the Public Improvement that is the subject of the reimbursement agreement or shall be deposited in the District's debt service fund and used for the purpose of retiring Debt. The District shall maintain an accurate accounting of the funds received and disbursed pursuant to reimbursement agreements.

25. Land Purchase Limitation. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and improvements authorized by the Service Plan. Proceeds from the sale of Debt shall not be used to pay the Developer for any real property conveyed by the Town to the Developer or to the District for the Project. Examples of ineligible reimbursements include, but are not limited to: the acquisition of rights of way, easements, land for public drainage, parkland, or open space, unless separate consent is given by resolution of the Town Council.

26. Reimbursement of Public Improvement Related Costs. Prior to the reimbursement to the Developer for costs incurred in the organization of the District, for funds

expended on the District's behalf related to the Public Improvements, for the payment by the District for an invoice related to a Public Improvement cost, or for the acquisition of any part of the Public Improvements, the District shall receive: a) the report of an engineer retained by the District, independent of the Developer and licensed in Colorado verifying that, in such engineer's professional opinion, the reimbursement for the costs of the Public Improvements that are the subject of the reimbursement or acquisition, including the construction costs and the soft costs, but excluding the accounting and legal fees, are, in such engineer's opinion, reasonable and are related to the provision of the Public Improvements or are related to the District's organization; and b) the report of an accountant retained by the District, independent of the Developer and licensed in Colorado verifying that, in such accountant's professional opinion, the reimbursement for the accounting and legal fees that are the subject of the reimbursement or acquisition, are, in such accountants opinion, reasonable and related to the Public Improvements or the District's organization. As set forth in the Development and Reimbursement Agreement, the District shall provide the reports to the Town.

27. Developer Reimbursement of Administration, Operations and Maintenance Related Costs. Prior to the reimbursement to the Developer for costs incurred or for funds expended on behalf of the District related to the administration of the District or the operation and maintenance of the Public Improvements, the District shall receive the report of an accountant retained by the District, who is independent of the Developer and licensed in Colorado, verifying that, in such accountant's professional opinion, the reimbursement of the funds advanced for such administration, operations or maintenance costs, are, in such accountant's opinion, receivable and related to the administration, operations or maintenance of the District or the Public Improvements. As set forth in the Development and Reimbursement Agreement, the District shall provide the reports to the Town.

28. Board Meetings and Website Limitations. Once an End User owns property in the Service Area, the District's Board meeting(s) shall be conducted within the boundaries of the Town of Johnstown or conducted virtually via internet or telephone platform available for free access by the public. The District shall establish and maintain a public website and shall include the name of the Project or a name that allows property owners and tenants of the District to readily locate the District online and shall also include an updated street map for those properties within the Service Area that have constructed streets that are open for public use. In addition, the District shall timely post a copy of all of the following documents on its public website: (a) each call for nominations, required pursuant to Section 1-13.5-501, C.R.S., (b) the transparency notices provided pursuant to 32-1-809, C.R.S, (c) each recorded declaration of covenants if the District provides Covenant Enforcement and Design Review Services, (d) a copy of this Service Plan and all amendments thereto, (e) all approved budgets, audits, meeting minutes, Board orders and resolutions, (f) any Rules and Regulations adopted by the Board, and (g) all meeting agendas and meeting packets.

29. Financial Review. The Town shall be permitted to conduct periodic reviews of the financial powers of the District in the Service Plan in the manner and form provided in Section 32-1-1101.5, C.R.S. As provided in the statute, the Town may conduct the first financial review in the fifth calendar year after the calendar year in which a special district's ballot issue to incur general obligation indebtedness was approved by its electors. After such fifth calendar year and notwithstanding the provisions of the statute, the Town may conduct the financial review at

any time, by providing sixty (60) days written notice to the District, except that the Town may not conduct a financial review within sixty (60) months of the completion of its most recent financial review. The Town's procedures for conducting a financial review under this Paragraph, and the remedies available to the Town as a result of such financial review, shall be identical to those provided for in Section 32-1-1101.5(2), C.R.S. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with such review, and the Town may require a deposit of the estimated costs thereof.

30. Use of Proceeds and Revenues Limitations. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and improvements authorized by the Service Plan. The District shall have ability to use CPIF and Add-on PIF revenues or any other revenues of the District to pay debt service, to pay for capital improvements authorized by this Service Plan, and after termination of the Credit PIF, may use Add-on PIF Revenues in addition to other revenues for operation, maintenance, and administrative costs of the District. Additionally, if the Developer constructs the public infrastructure and conveys it to the District in return for a reimbursement obligation from the District, prior to making such reimbursement for such amounts, the District must receive the report of an independent engineer or accountant licensed in Colorado confirming that in such engineer's or accountant's professional opinion, the amount of the reimbursement is reasonable (a "Cost Verification Report"). The District shall not use CPIF or Add-on PIF revenues to fund acquisitions in interest in land that the Town is contributing to the Project.

31. Transfer Fee Limitation. The District shall not be authorized to collect or spend revenue from a transfer fee on the sale of real property within the District, except pursuant to an intergovernmental agreement with the Town.

32. Miscellaneous Powers. The District shall have the power to provide any facility, service, or program allowed by C.R.S. § 32-1-1004(1).

33. New Powers. If, after the Service Plan is approved, the Colorado General Assembly grants new or broader powers for metropolitan districts, to the extent permitted by law, any or all such powers shall be deemed to be a part hereof and available to be exercised by the District only following written approval by the Town, subject to the Town's sole discretion.

B. Service Plan Amendment Requirement.

This Service Plan has been designed with sufficient flexibility to enable the District to provide required services and facilities under evolving circumstances without the need for numerous amendments. Provided, however, the District shall not have the authority to issue Debt until it has received approval of an amendment to this Service Plan in the form of an Amended and Restated Service Plan. Actions of the District which violate the limitations set forth in this Service Plan shall be deemed to be material modifications to this Service Plan and the Town shall be entitled to all remedies available under State and local law to enjoin such actions of the District,

including the remedy of enjoining the issuance of additional authorized but unissued debt, until such material modification is remedied.

C. Capital Plan.

The District shall have authority to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements within and without the boundaries of the District to the extent necessary to improve or construct Public Improvements, as more specifically defined in this Service Plan, the Special District Act and Approved Development Plan(s) for the Project. A Capital Plan, attached hereto as **Exhibit E**, includes: (1) a list of the Public Improvements to be developed by the District, supported by an engineering or architectural survey; (2) a good faith estimate of the cost of the Public Improvements; and (3) a pro forma capital expenditure plan correlating expenditures with development. The Public Improvements described in the Capital Plan may be modified in an Approved Development Plan or an intergovernmental agreement with the Town and may differ from the Capital Plan without constituting a material modification of this Service Plan. To the extent that the Capital Plan sets forth the timing of the construction of the Public Improvements, such timing may also deviate from the Capital Plan without constituting a material modification of this Service Plan. As shown in the Capital Plan, the estimated cost of the Public Improvements for the initial District boundaries (of approximately 35.857 acres) and future inclusion area boundaries (of approximately 80.804 acres) is approximately One Hundred Fifty-Two Million, Fifty-Four Thousand, Eight Hundred Twelve Dollars (\$152,054,812). Costs of required Public Improvements that cannot be financed by the District within the parameters of this Service Plan and the financial capability of the District are expected to be financed by the Developer of the Project or through private financing.

The District shall be permitted to allocate costs between such categories of the Public Improvements as deemed necessary in its discretion.

All of the Public Improvements described herein shall be designed in such a way as to assure that the Public Improvements are constructed are in accordance with Town standards and with the requirements of Approved Development Plans related to the Project. All descriptions of the Public Improvements to be constructed, and their related costs, are estimates only and are subject to modification as engineering, development plans, economics, the Town's requirements, and construction scheduling may require. Upon approval of this Service Plan, the District shall continue to develop and refine the Capital Plan and the Map Depicting Public Improvements, as necessary, and prepare for issuance of Debt. All cost estimates will be adjusted to reflect then-current dollars at the time of the issuance of Debt and construction. All construction cost estimates contained in **Exhibit E** assume construction to applicable standards and specifications of the Town and state or federal requirements.

D. Intergovernmental Agreements.

The Town anticipates that the District will undertake the planning, design, acquisition, construction, installation and financing of the Public Improvements contemplated herein. All intergovernmental agreements and amendments thereto proposed to be entered into by the District shall be submitted to the Town at least forty-five (45) days prior to their execution by the District, for Town review and approval. Such Town review and approval shall be with

reference to whether the intergovernmental agreements are in compliance with this Service Plan, the Intergovernmental Agreement, and the terms of any Approved Development Plan or other instrument related to the Public Improvements. If the Town within such forty-five (45) days submits qualified objections (based on the factors listed above) to the proposed agreement or amendment, then the District shall work with the Town to resolve such objections and obtain Town Manager approval or, at the discretion of the Town Manager, Town Council approval, prior to the District's execution thereof. The Town by a writing signed by the Town Manager may elect to waive such forty-five (45) day period.

VI. FINANCIAL PLAN

A. General.

The District shall be authorized to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements from its revenues and by and through the proceeds of Debt to be issued by the District. The Financial Plan for the District shall be to issue such Debt as the District can reasonably pay from revenues derived the CPIF, Add-on PIF, Maximum Debt Mill Levy and other legally available revenues of the District. The District may also rely upon various other revenue sources within the limitations set forth in the Development and Reimbursement Agreement and as authorized by law, such as interest, specific ownership taxes, Development Fees or any other Fees, rates, tolls, penalties, or charges, advances from the Project developer and grants, subject to the limitations of this Service Plan.

The total Debt that the District shall be permitted to issue shall not exceed the Maximum Debt Authorization of \$173,785,000, which is estimated to be the amount necessary to net approximately \$114,422,092 in proceeds or reimbursements or any combination thereof from the public financing package from the CPIF, and Add-on PIF and other available District revenues for Public Improvements serving the Service Area, as well as the traditional transactional and financing costs. Debt of the District shall be permitted to be issued on a schedule and in such year or years as the District determines to meet the needs of the Financial Plan referenced above and phased to serve development as it occurs. This Maximum Debt Authorization of \$173,785,000 allows for approximately 120% coverage of the estimated financial plan and pro-forma projections to provide an additional contingency for changes in actual construction, increases in assessed valuation and unforeseen changes and contingencies.

(1) The Financial Plan, prepared by Piper Sandler & Co., attached hereto as **Exhibit F**, sets forth (i) how the Public Improvements are to be financed; (ii) the proposed indebtedness with a schedule indicating the years in which the Debt is scheduled to be issued; and (iii) the estimated revenue for both debt and operating revenue derived from property taxes and estimated retail sales fees and other legally available revenues for the District. The Maximum Debt Authorization is supported by the Financial Plan.

(2) At least ten (10) business days prior to the issuance of Publicly-Marketed Debt, the District shall provide the Town with the marketing documents that have been or shall be published. Within ten (10) days subsequent to the issuance of Publicly-Marketed Debt, the District shall provide the Town with the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt and copies of the relevant Debt documents.

(3) In addition to the other requirements of this Service Plan, at least forty-five (45) days prior to the issuance of any Debt, the District shall submit to the Town the then-current financial forecasts and feasibility reports for such proposed issuance, together with a current certification, of the Board issuing such Debt, dated within sixty (60) days of such submittal, that such proposed Debt is in compliance with the Service Plan. This provision shall apply to all Bonds issued by the District.

In its discretion, the Town may require additional financial forecasts and feasibility reports to evaluate the Financial Plan.

B. Maximum Voted Interest Rate, Maximum Underwriting Discount, Maximum Interest Rate on Developer Debt.

The interest rate on any Debt is limited to the market rate at the time the Debt is issued. In the event of a default, the proposed maximum interest rate on any Debt is not to exceed twelve percent (12%). The proposed maximum underwriting discount will be four percent (4%). Debt, when issued, shall comply with all relevant requirements of this Service Plan, State law and Federal law as then applicable to the issuance of public securities.

The interest rate on Developer Debt shall not exceed the lesser of the current Bond Buyer 20-Bond GO index plus four percent (4%) or eight percent (8%) simple interest. Developer Debt shall be subordinate to other Debt of the District and shall be subject to the debt limitation term provided in Section VI.D below.

C. Mill Levies.

1. Maximum Debt Mill Levy. The Maximum Debt Mill Levy that may be imposed on property within the District shall be twenty-five (25) mills subject to an Assessment Ratio Adjustment. For the portion of any aggregate Debt which is equal to or less than fifty percent (50%) of the District's assessed valuation, either on the date of issuance or at any time thereafter, the mill levy to be imposed to repay such portion of Debt shall not be subject to the Maximum Debt Mill Levy and, as a result, the mill levy may be such amount as is necessary to pay the Debt service on such Debt, without limitation of rate.

2. Operations and Maintenance Mill Levy. The Operations and Maintenance Mill Levy shall be a mill levy the District is permitted to impose for payment of the District's administrative, operations and maintenance costs, which shall include, but not be limited to, the funding of operating reserves and sufficient ending fund balances to assure sufficient cash flow to fund expenses as they come due. Prior to the imposition of a mill levy for payment of Debt, the District may impose a maximum Operations and Maintenance Mill Levy of be twenty-five (25) mills. After the imposition of a mill levy for the payment of Debt, the District shall not impose an Operations and Mill Levy that exceeds ten (10) mills, subject to an Assessment Ratio Adjustment, and shall at all times not exceed the maximum mill levy necessary to pay those expenses.

3. Maximum Aggregate Mill Levy. The maximum aggregate mill levy of the District shall be twenty-five (25) mills, inclusive of both Debt and operations and maintenance, subject to an Assessment Ratio Adjustment.

4. Unless otherwise provided in the Development and Reimbursement Agreement, the imposition of mill levies does not preclude the District from receiving CPIF or Add-on PIF Revenues.

D. Mill Levy Imposition Term.

1. Developer Debt Mill Levy Imposition Term. Developer Debt shall expire and be forgiven twenty (20) years after the date of the initial imposition by the District of an ad valorem property tax to pay any Debt, unless such term is otherwise extended pursuant to an intergovernmental agreement with the Town. Refunding Bonds shall not be subject to this Developer Debt Mill Levy Imposition Term so long as such Refunding Bonds are not owned by the Developer or by a person or party related to the Developer. Developer Debt shall not have any call protection.

2. Maximum Debt Mill Levy Imposition Term: In addition to the Developer Debt Mill Levy Imposition Term, the District shall not impose a levy for repayment of any and all Debt (or use the proceeds of any mill levy for repayment of Debt) on any single property developed which exceeds forty (40) years after the year of the initial imposition of such mill levy unless a refunding of part of all of the Debt will result in a net present value savings as set forth in Section 11-56-101, *et seq.*, C.R.S.

E. Debt Repayment Sources.

Debt may be repaid from CPIF and Add-on PIF Revenue, or any other revenues, gifts, grants, ad valorem taxes, and any source of payment permitted by law and by this Service Plan.

F. Debt Instrument Disclosure Requirement.

In the text of each Bond and any other instrument representing and constituting Debt, the District shall set forth a statement in substantially the following form:

By acceptance of this instrument, the owner of this Bond agrees and consents to all of the limitations in respect of the payment of the principal of and interest on this Bond contained herein, in the resolution of the District authorizing the issuance of this Bond and in the Service Plan for creation of the District.

Similar language describing the limitations in respect of the payment of the principal of and interest on Debt set forth in this Service Plan shall be included in any document used for the offering of the Debt for sale to persons, including, but not limited to, a developer of property within the boundaries of the District.

G. Security for Debt.

The District shall not pledge any revenue or property of the Town as security for any District indebtedness set forth in this Service Plan. The Town's approval of this Service Plan shall not be construed as a guarantee by the Town of payment of any of the District's obligations;

nor shall anything in the Service Plan be construed so as to create any responsibility or liability on the part of the Town in the event of default by the District in the payment of any such obligation.

H. District's Operating Costs.

The estimated cost of engineering services, legal services and administrative services, together with the estimated costs of the District's organization and initial operations, are anticipated to be Two Hundred Fifty Thousand Dollars (\$250,000), which will be eligible for reimbursement from Debt proceeds as provided in this Service Plan.

In addition to the capital costs of the Public Improvements, the District will require operating funds for administration and to plan and cause the Public Improvements to be constructed and maintained pursuant to the Operations and Maintenance Intergovernmental Agreement. The first year's operating budget is estimated to be Seventy Five Thousand Dollars (\$75,000) which is anticipated to be derived from property taxes and other revenues.

I. Annual Budget Submittals to Town While Tax-Exempt Debt is Outstanding.

Until such time as there is delivered to the Town and the District a Favorable Opinion of Bond Counsel with respect to the provisions of this subparagraph, the District shall cause a copy of its annual budget to be delivered to the Town on or before October 15 of each year. The Town shall have the right to review and object to the District's budget on or before November 15 of the same calendar year, with any objections stated with specificity. If the Town objects to any provision of the District's budget, the District shall cause its budget to be revised on or before the immediately succeeding December 15. If the Town does not object to the District's budget on or before November 15 of the same calendar year, the District's budget shall be deemed approved by the Town and the District shall be permitted to collect and expend any and all revenues of the District so long as in accordance with such budget submitted to the Town for review and approval. The Town's right to object shall not extend to the budget provisions regarding the payment or refunding of outstanding Debt.

The District shall not be permitted to expend any moneys in excess of the total amount appropriated under the budget submitted to the Town for review and approval, unless and until, either the Town approves or does not object the budget, or the District amends the applicable budget to allow for the proposed expenditure (where objected to by the Town). In the event the District determines to amend its budget following Town approval thereof, the District shall cause a copy of the proposed budget amendment to be delivered to Town at least forty-five (45) days prior to the date the District determines to adopt the same. The Town shall have thirty (30) days to review the same. In the event the Town does not object to the proposed budget amendment within thirty (30) days following the Town's receipt of the same, the proposed budget amendment shall be deemed approved by the Town and the District shall be permitted to expend any and all revenues of the District so long as in accordance with the budget amendment approved by the Town. If the Town objects to any provision of the District's budget amendment, the District shall cause the budget amendment to be revised and shall not exceed its previously approved budget

until such time as the Town approves the budget amendment. The Town's right to object shall not extend to the budget provisions regarding the payment or refunding of outstanding Debt.

Notwithstanding anything to the contrary contained herein, in the event the District determines that it will not be issuing Tax-Exempt Debt, or the District does not have Tax-exempt Debt outstanding, the District shall not be obligated to submit annual budgets to the Town. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with the review contemplated herein, and the Town may require a deposit of the estimated costs thereof.

J. Town Approval of Tax-Exempt Debt Issuance.

Until such time as there is delivered to the Town and the District a Favorable Opinion of Bond Counsel with respect to the provisions of this subparagraph, if the District determines to issue any federally tax-exempt Debt (such term includes otherwise federally tax-advantaged debt), the District shall submit to the Town, for the Town's reasonable approval: (i) a financial plan which demonstrates the structure of the proposed Debt issuance, including the anticipated use of net proceeds thereof, and the District's plan to repay the same; and (ii) near final federal tax-exempt Debt issuance documents. The Town shall have thirty (30) days to review and consent to the same. In any event, the District shall not be permitted to issue any federal tax-exempt Debt unless and until the District receives a written consent signed by the Town Manager with respect to such Debt issuance. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with the review contemplated herein, and the Town may require a deposit of the estimated costs thereof.

VII. ANNUAL REPORT

A. General.

The District shall file an annual report with the Town Clerk no later than August 1st of each year following the year in which the Order and Decree creating the District has been issued (the "report year") that complies with Section 32-1-207, C.R.S., as amended.

B. Reporting of Significant Events.

In addition to the information required to be disclosed under Section 32-1-207, C.R.S., the annual report required by this Section VII shall include information as to any of the following events that occurred during the report year:

1. Narrative of the District's progress in implementing the Service Plan and a summary of the development in the Project.
2. Boundary changes made or proposed.
3. Intergovernmental agreements executed.
4. A summary of any litigation involving the District.

5. Proposed plans for the year immediately following the report year.
6. Construction contracts executed and the name of the contractors as well as the principal of each contractor.
7. Status of the District's Public Improvement construction schedule and the Public Improvement schedule for the following five years.
8. Notice of any uncured defaults.
9. A list of all Public Improvements constructed by the District that have been dedicated to and accepted by the Town.
10. If requested by the Town, copies of minutes of all meetings of the District's Board of Directors.
11. The name, business address and telephone number of each member of the Board and its chief administrative officer and general counsel and the date, place and time of the regular meetings of the Board.
12. Certification from the Board that the District is in compliance with all provisions of the Service Plan.
13. Copies of any agreements with the Developer entered into in the report year.
14. Copies of any Cost Verification Reports provided to the District in the report year.

C. Summary of Financial Information.

In addition to the information required to be disclosed under Section 32-1-207, C.R.S., the annual report shall include a summary of the following information for the report year:

1. Assessed value of Taxable Property within the District's boundaries.
2. Total acreage of property within the District's boundaries.
3. Most recently filed audited financial statements of the District, to the extent audit financial statements are required by state law or most recently filed audit exemption.
4. Annual budget of the District.
5. Resolutions regarding issuance of Debt or other financial obligations, including relevant financing documents, credit agreements, and official statements.
6. Outstanding Debt (stated separately for each class of Debt).
7. Outstanding Debt service (stated separately for each class of Debt).

8. The District's tax revenue.
9. Other revenues of the District.
10. The District's Public Improvements expenditures.
11. The District's other expenditures.
12. The District's inability to pay any financial obligations as they come due.
13. The amount and terms of any new Debt issued.
14. Any Developer Debt.

VIII. DISSOLUTION

Upon a determination of the Town Council that the purposes for which the District was created have been accomplished or as set forth in the Intergovernmental Agreement, the District shall file a petition in the District Court for dissolution, pursuant to the applicable State statutes. Dissolution shall not occur until the District has provided for the payment or discharge of all of its outstanding indebtedness and other financial obligations as required pursuant to State statutes. Except as otherwise required in the Intergovernmental Agreement or in the Development and Reimbursement Agreement, dissolution shall not be required if the District elects to finance, construct and acquire the parking areas, common areas, and other common areas, facilities and improvements, as such Public Improvements would be owned, operated and maintained by the District or if the District is responsible for ongoing operations and maintenance under this Service Plan or the Operations and Maintenance Intergovernmental Agreement.

IX. INTERGOVERNMENTAL AGREEMENT

The form of Intergovernmental Agreement to be entered into between the Town and the District at the District's organizational meeting is attached as **Exhibit D**. The District shall submit the executed Intergovernmental Agreement to the Town within ten (10) days of the District's organizational meeting.

In addition to the Intergovernmental Agreement, the District shall enter into the Operations and Maintenance Intergovernmental Agreement and the Development and Reimbursement Agreement. Any intergovernmental agreement proposed regarding the subject matter of this Service Plan shall be subject to review and approval by the Town Council prior to its execution by the District.

The District and the Developer shall also execute indemnification letters in the form attached hereto as **Exhibit H**. The Developer's indemnification letter shall be submitted to the Town as part of this Service Plan. The District shall approve and execute the indemnification letter at its first Board meeting after its organizational election, in the same form as the indemnification letter set forth as **Exhibit H**, and shall deliver an executed original to the Town within ten (10) days of the District's organizational meeting.

X. NON-COMPLIANCE WITH SERVICE PLAN

In the event it is determined that the District has undertaken any act or omission which violates the Service Plan or constitutes a material departure from the Service Plan, the Town may impose any of the sanctions set forth in the Town Code and pursue any sanctions or remedies available under law, including but, not limited to, affirmative relief to require the District to act in accordance with the provisions of this Service Plan.

XI. MISCELLANEOUS

A. Headings. Paragraph headings and titles contained herein are intended for convenience and reference only and are not intended to define, limit or describe the scope or intent of any provision of this Service Plan.

B. Town Consent. Unless otherwise provided herein or provided in an intergovernmental agreement with the Town, references in this Service Plan to Town consent or Town approval shall require prior written approval of the Town. At the Town Manager's discretion, the Town Manager shall decide if (1) he or she can provide the written Town approval, if approval is warranted; (2) the matter should be referred to Town Council for consideration and, if appropriate, approval by resolution; (3) the matter requires consideration for approval in the form of an agreement with the Town; or (4) the matter requires an amendment to the Service Plan.

C. Town Expenses. The District shall pay any and all expenses, including but not limited to professional service fees and attorneys' fees, incurred by the Town in enforcing any provision of the Service Plan.

D. Disclosure Notice. The District's disclosure document required pursuant to Section 32-1-104.8, C.R.S. shall be in substantial conformance with form of such notice set forth in **Exhibit G**. In addition to the statutory notice, the District shall use reasonable efforts to assure that all End Users receive written notice regarding existing District mill levies, the Maximum Debt Mill Levy, and a general description of the District's authority to impose and collect fees.

XII. CONCLUSION

It is submitted that this Service Plan for the District, as required by Section 32-1-203(3), C.R.S., establishes that:

1. There is sufficient existing and projected need for organized service in the area to be serviced by the proposed special district;
2. The existing service in the area to be served by the proposed special district is inadequate for present and projected needs;
3. The proposed special district is capable of providing economical and sufficient service to the area within its proposed boundaries;
4. The area to be included in the proposed special district has, or will have, the financial ability to discharge the proposed indebtedness on a reasonable basis;

5. Adequate service is not, and will not be, available to the area through the county or other existing municipal or quasi-municipal corporations, including existing special districts, within a reasonable time and on a comparable basis;

6. The facility and service standards of the proposed special district are compatible with the facility and service standards of each county within which the proposed special district is to be located and each municipality which is an interested party under section 32-1-204(1);

7. The proposal is in substantial compliance with a master plan adopted pursuant to the Town Code;

8. The proposal is in compliance with any duly adopted Town, regional or state long-range water quality management plan for the area;

9. The creation of the special district is in the best interests of the area proposed to be served;

This Service Plan is submitted to the Town on behalf of the Developer, who is the District petitioner and has contracted for the purchase of the real properties within the Initial Area Boundaries of the proposed District. The Developer has caused written notice of the Town's hearing on the proposed Service Plan to be duly given to all "interested parties" within the meaning of and at the times required by § 32-1-204, C.R.S., and will or has caused all other required filings to be made and all other applicable procedural requirements to be met. The information contained in this Service Plan is true and correct as of this date.

EXHIBIT A

Legal Descriptions

Commercial District – Northwestern Area of NE Quarter Section

Legal Description:

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And more particularly described as follows:

Commencing at the southwest corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the center quarter corner of Section 11, N00°26'18"W along the west line of the northeast quarter of said section, a distance of 1,333.97 feet to the POINT OF BEGINNING;

Thence continuing N00°26'18"W along said section line, a distance of 1,285.42 feet to point being the northwest corner of Lot B and being 8.80 feet South of the north quarter corner of Section 11;

Thence departing said section line S89°50'18"E along the north line of Lot B and the south line of Right of Way Deed, Book 1477 Page 290, a distance of 905.22 feet to point being on the north edge of the Consolidated Home Supply Ditch, Reception Number 1602319;

Thence along said lot line and ditch the following seven courses:

- 1) Departing said Right of Way S00°09'42"W, a distance of 12.82 feet to the start of a non-tangential curve;
- 2) Thence along said curve to the right having a radius of 350.79 feet, a delta angle of 8°12'05", a chord bearing of S74°01'29"E, a chord length of 50.17 feet, an arc length of 50.21 feet to the start of a non-tangential curve;
- 3) Thence along said curve to the right having a radius of 888.38 feet, a delta angle of 5°34'19", a chord bearing of S67°31'38"E, a chord length of 86.36 feet, an arc length of 86.39 feet;
- 4) Thence S65°14'36"E, a distance of 65.45 feet to the start of a non-tangential curve;
- 5) Thence along said curve to the left having a radius of 300.68 feet, a delta angle of 10°38'40", a chord bearing of S69°44'24"E, a chord length of 55.78 feet, an arc length of 55.86 feet;
- 6) Thence S76°41'48"E, a distance of 65.78 feet to the start of a non-tangential curve;
- 7) Thence along said curve to the left having a radius of 406.56 feet, a delta angle of 2°27'10", a chord bearing of S78°05'43"E, a chord length of 17.40 feet, an arc length of 17.40 feet;

Thence departing said lot line and crossing over said ditch S00°26'18"E, a distance of 859.21 feet;

Thence S11°14'20"W, a distance of 380.83 feet;

Thence S28°50'21"W, a distance of 80.00 feet;

Thence N61°09'39"W, a distance of 248.67 feet to the start of a tangential curve;

Thence along said curve to the left having a radius of 250.00 feet, a delta angle of 29°16'39", a chord bearing of N75°47'59"W, a chord length of 126.36 feet, and arc length of 125.75 feet;

Thence S89°33'42"W, a distance of 769.64 feet to the POINT OF BEGINNING.

Containing 1,561,938 square feet or 35.857 acres, more or less.

Commercial District – Future Inclusion Area 1 NW Quarter Section

Legal Description:

A parcel of land, being a part of the Northwest One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And more particularly described as follows:

Commencing at the southwest corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the center quarter corner of Section 11, S89°05'20"W along the north right of way deed granted to the Great Western Railway Company, recorded Book 190, Page 81, a distance of 70 feet to the POINT OF BEGINNING;

Thence continuing along said right of way S89°05'20"W, a distance of 557.48 feet to a point being on the east line of a 50' pipeline easement, Reception # 1930795 and Reception # 1930796;

Thence along said easement line the following two courses:

- 1) Departing said right of way deed N05°59'46"W, a distance of 98.32 feet;
- 2) Thence N10°30'55"W, a distance of 1,272.92 feet;

Thence departing and crossing over said easement line and easement S89°33'42"W, a distance of 2,283.50 feet;

Thence N00°26'18"W, a distance of 80.00 feet;

Thence S89°33'42"W, a distance of 236.26 feet to point of the east line of a Town of Johnstown deed, Reception Number 4676830;

Thence along said east line the following two courses:

- 1) N04°06'02"E, a distance of 215.84 feet;
- 2) Thence N14°43'44"E, a distance of 222.01 feet to a point on the south line of a right of way deed, Reception Number 4690405;

Thence departing said Town of Johnstown deed and along the south and east lines of said right of way deed the following nine courses:

- 1) N89°59'49"E, a distance of 52.93 feet;
- 2) Thence 14°42'53"E, a distance of 148.15 feet;
- 3) Thence S80°35'17"E, a distance of 117.16 feet;
- 4) Thence N14°43'24"E, a distance of 437.57 feet;
- 5) Thence N83°18'42"E, a distance of 1,000.62 feet;
- 6) Thence N88°55'34"E, a distance of 962.64 feet;
- 7) Thence S00°00'04"E, a distance of 640.26 feet;
- 8) Thence N89°59'56"E, a distance of 170.70 feet;
- 9) Thence S00°26'18"E, a distance of 1,878.95 feet to the POINT OF BEGINNING.

Containing 3,453,246 square feet or 79.276 acres, more or less.

Commercial District – Future Inclusion Area 2 NW Quarter Section**Legal Description:**

A parcel of land, being a part of the Northwest One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And more particularly described as follows:

Commencing at the southwest corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the center quarter corner of Section 11, S89°05'20"W along the north right of way deed granted to the Great Western Railway Company, recorded Book 190, Page 81, a distance of 70 feet to the southernmost corner of a right of way deed granted to the Town of Johnstown;

Thence departing said railroad right of way and continuing along the western edge of said Johnstown right of way N00°26'18"W, a distance of 1,878.95 feet to the POINT OF BEGINNING;

Thence continuing along said western edge the following two courses:

- 1) S89°59'56"W, a distance of 170.70 feet;
- 2) Thence N00°00'04"W, a distance of 640.26 feet to a point being a corner of said right of way;

Thence departing said western edge and over said right of way N88°55'34"E, a distance of 165.82 feet;

Thence S00°26'18"E, a distance of 643.38 feet to the POINT OF BEGINNING.

Containing 107,986 square feet or 2.479 acres, more or less.

Commercial District – Future Inclusion Area 3 NE Quarter Section**Legal Description:**

A parcel of land being Lot "A" RE 2092 , of Recorded Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

Containing 307,037 square feet or 7.049 acres, more or less.

Commercial District – Northwestern Area of NE Quarter Section

Legal Description:

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And more particularly described as follows:

Commencing at the southwest corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the center quarter corner of Section 11, N00°26'18"W along the west line of the northeast quarter of said section, a distance of 1,333.97 feet to the POINT OF BEGINNING;

Thence continuing N00°26'18"W along said section line, a distance of 1,285.42 feet to point being the northwest corner of Lot B and being 8.80 feet South of the north quarter corner of Section 11;

Thence departing said section line S89°50'18"E along the north line of Lot B and the south line of Right of Way Deed, Book 1477 Page 290, a distance of 905.22 feet to point being on the north edge of the Consolidated Home Supply Ditch, Reception Number 1602319;

Thence along said lot line and ditch the following seven courses:

- 1) Departing said Right of Way S00°09'42"W, a distance of 12.82 feet to the start of a non-tangential curve;
- 2) Thence along said curve to the right having a radius of 350.79 feet, a delta angle of 8°12'05", a chord bearing of S74°01'29"E, a chord length of 50.17 feet, an arc length of 50.21 feet to the start of a non-tangential curve;
- 3) Thence along said curve to the right having a radius of 888.38 feet, a delta angle of 5°34'19", a chord bearing of S67°31'38"E, a chord length of 86.36 feet, an arc length of 86.39 feet;
- 4) Thence S65°14'36"E, a distance of 65.45 feet to the start of a non-tangential curve;
- 5) Thence along said curve to the left having a radius of 300.68 feet, a delta angle of 10°38'40", a chord bearing of S69°44'24"E, a chord length of 55.78 feet, an arc length of 55.86 feet;
- 6) Thence S76°41'48"E, a distance of 65.78 feet to the start of a non-tangential curve;
- 7) Thence along said curve to the left having a radius of 406.56 feet, a delta angle of 2°27'10", a chord bearing of S78°05'43"E, a chord length of 17.40 feet, an arc length of 17.40 feet;

Thence departing said lot line and crossing over said ditch S00°26'18"E, a distance of 859.21 feet;

Thence S11°14'20"W, a distance of 380.83 feet;

Thence S28°50'21"W, a distance of 80.00 feet;

Thence N61°09'39"W, a distance of 248.67 feet to the start of a tangential curve;

Thence along said curve to the left having a radius of 250.00 feet, a delta angle of 29°16'39", a chord bearing of N75°47'59"W, a chord length of 126.36 feet, and arc length of 125.75 feet;

Thence S89°33'42"W, a distance of 769.64 feet to the POINT OF BEGINNING.

Containing 1,561,938 square feet or 35.857 acres, more or less.

Single Family Residential District – Southeast Area of NE Quarter Section

Legal Description:

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And More Particularly Described as follows:

Commencing at the southeast corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the east quarter corner of section 11, the northeast corner of right of way deed, Great Western Construction Company, Book 190 Page 77, and the POINT OF BEGINNING:

Thence N89°05'16"E along the north line of said right of way, a distance of 1,817.38 feet;

Thence N00°26'18"W departing said right of way line, a distance of 1,318.38 feet to the start of a non-tangential curve;

Thence along said curve to the right having a radius of 250.00 feet, a delta angle of 14°08'10", a chord bearing of S68°13'44"E, a chord length of 61.52 feet, an arc length of 61.68 feet;

Thence S61°09'39"W, a distance of 766.56 feet to the start of a tangential curve;

Thence along said curve to the left having a radius of 410.00 feet, a delta angle of 29°14'12", a chord bearing of S75°46'45"E, a chord length of 206.95 feet, an arc length of 209.21 feet;

Thence N89°36'09"E, a distance of 892.11 feet to a point being on the east line of Lot B and the east section line of the northeast quarter of Section 11;

Thence along said section line S00°23'51"E, a distance of 852.22 feet to the POINT OF BEGINNING.

Containing 1,752,361 square feet or 40.229 acres, more or less.

Single Family Residential District – Northeast Area of NE Quarter Section

Legal Description:

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And More Particularly Described as follows:

Commencing at the southeast corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the east quarter corner of section 11, N00°23'51"W along the east line of the northeast quarter of section 11, a distance of 852.22 feet to the POINT OF BEGINNING;

Thence S89°36'09"W, a distance of 762.13 feet;

Thence N00°23'51"W, a distance of 80.00 feet to the start of a non-tangential curve;

Thence along said curve to the left having a radius of 25.00 feet, a delta angle of 78°21'49", a chord bearing of N50°25'15"E, a chord length of 31.59 feet, an arc length of 34.19 feet;

Thence N11°14'20"E, a distance of 779.61 feet to the start of a tangential curve;

Thence along said curve to the left having a radius of 18.00 feet, a delta angle of 11°38'11", a chord bearing of N05°25'15"E, a chord length of 3.65 feet, an arc length of 3.66 feet;

Thence N00°23'51"W, a distance of 379.44 feet to a point being on the north edge of the Consolidated Home Supply Ditch, Reception Number 1602319, the south line of Lot "A" RE2092 Recorded Exemption No. 1060-11-1RE2092, Reception Number 2585002, and the north line of Lot B;

Thence along said line the following five courses:

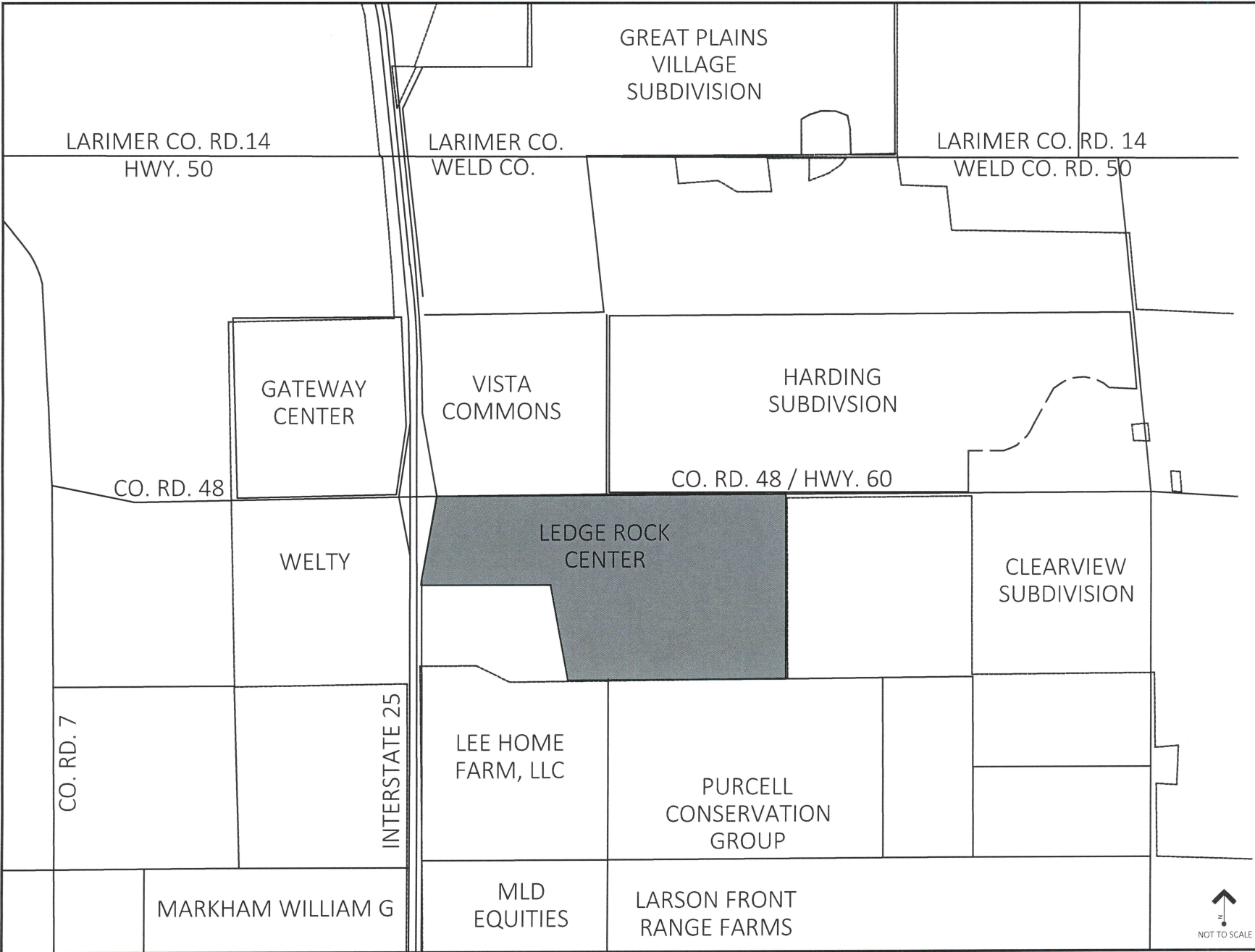
- 1) Starting on a curve to the left having a radius of 255.94 feet, a delta angle of 46°16'11", a chord bearing of N66°19'37"E, a chord length of 201.12 feet, an arc length of 206.69 feet;
- 2) Thence N40°52'40"E, a distance of 302.80 feet to the start of a non-tangential curve;
- 3) Thence along said curve to the right having a radius of 260.33 feet, a delta angle of 10°16'04", a chord bearing of N42°36'05"E, a chord length of 46.59 feet, an arc length of 46.65 feet;
- 4) Thence N49°50'24"E, a distance of 127.53 feet to the start of a non-tangential curve;
- 5) Thence along said curve to the right having a radius of 646.96 feet, a delta angle of 7°00'50", a chord bearing of N55°44'14"E, a chord length of 79.15 feet, an arc length of 79.20 feet to a point being on the east line of Lot B and the east section line of the northeast quarter of Section 11;

Thence along said section line S00°23'51"E, a distance of 1,713.41 feet to the POINT OF BEGINNING.

Containing 919,417 square feet or 21.107 acres, more or less.

EXHIBIT B

Johnstown Vicinity Map



POINT CONSULTING, LLC
8460 W KEN CARY AVE #101
LITTLETON, CO 80120
720-238-6886
www.pointconsulting.com
CIVIL ENGINEERING
PLANNING
LANDSCAPE ARCHITECTURE
AND SURVEYING

PROJECT EXHIBITS
Ledge Rock Center
JOHNSTOWN, COLORADO

VICINITY MAP | JOB NO. 21-022

DATE	DESCRIPTION
2021/06/03	ORIGINAL PREPARATION
2021/06/30	PROJECT UPDATE
2021/06/29	2025 SURVEY UNIT EXHIBIT

EXHIBIT C-1

Initial District Boundary Map

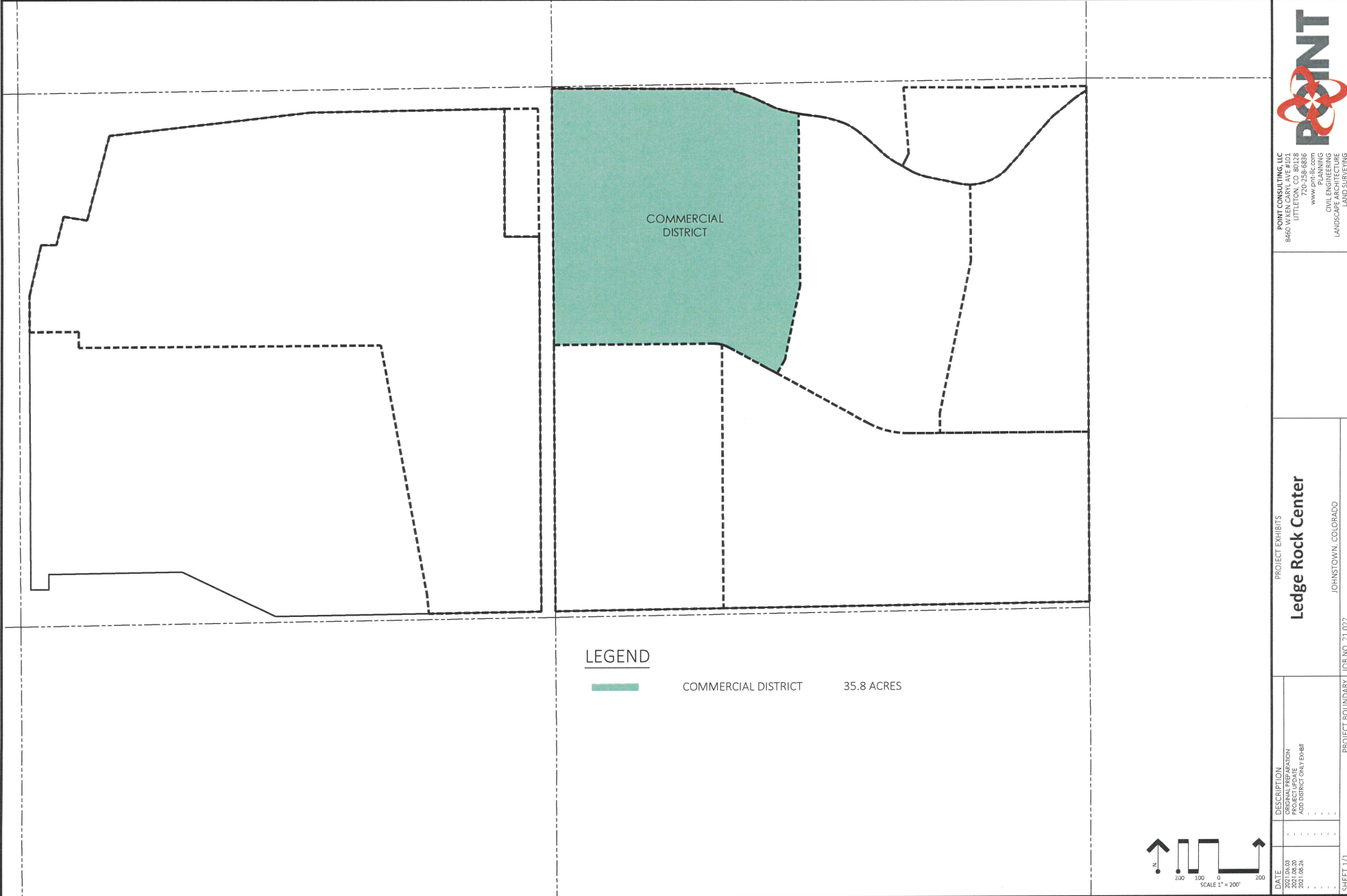
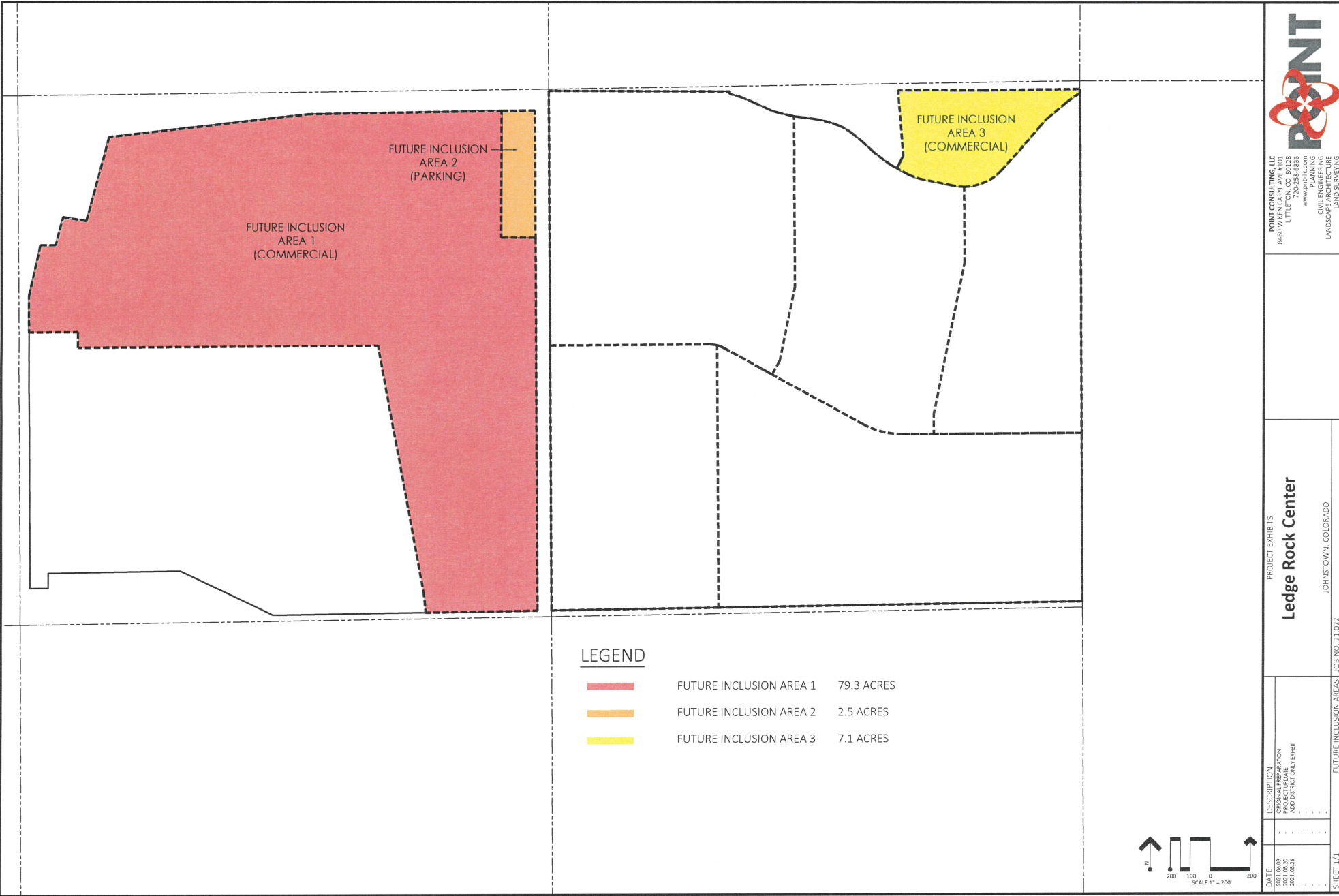


EXHIBIT C-2

Inclusion Area Boundary Map



DATE	DESCRIPTION
2021.03.03	ORIGINAL PREPARATION
2021.08.26	REVISIONS AND DISTRICT ONLY EXHIBIT
2021.08.26	ADD DISTRICT ONLY EXHIBIT

FUTURE INCLUSION AREAS | JOB NO. 21.022

SHEET 1/1

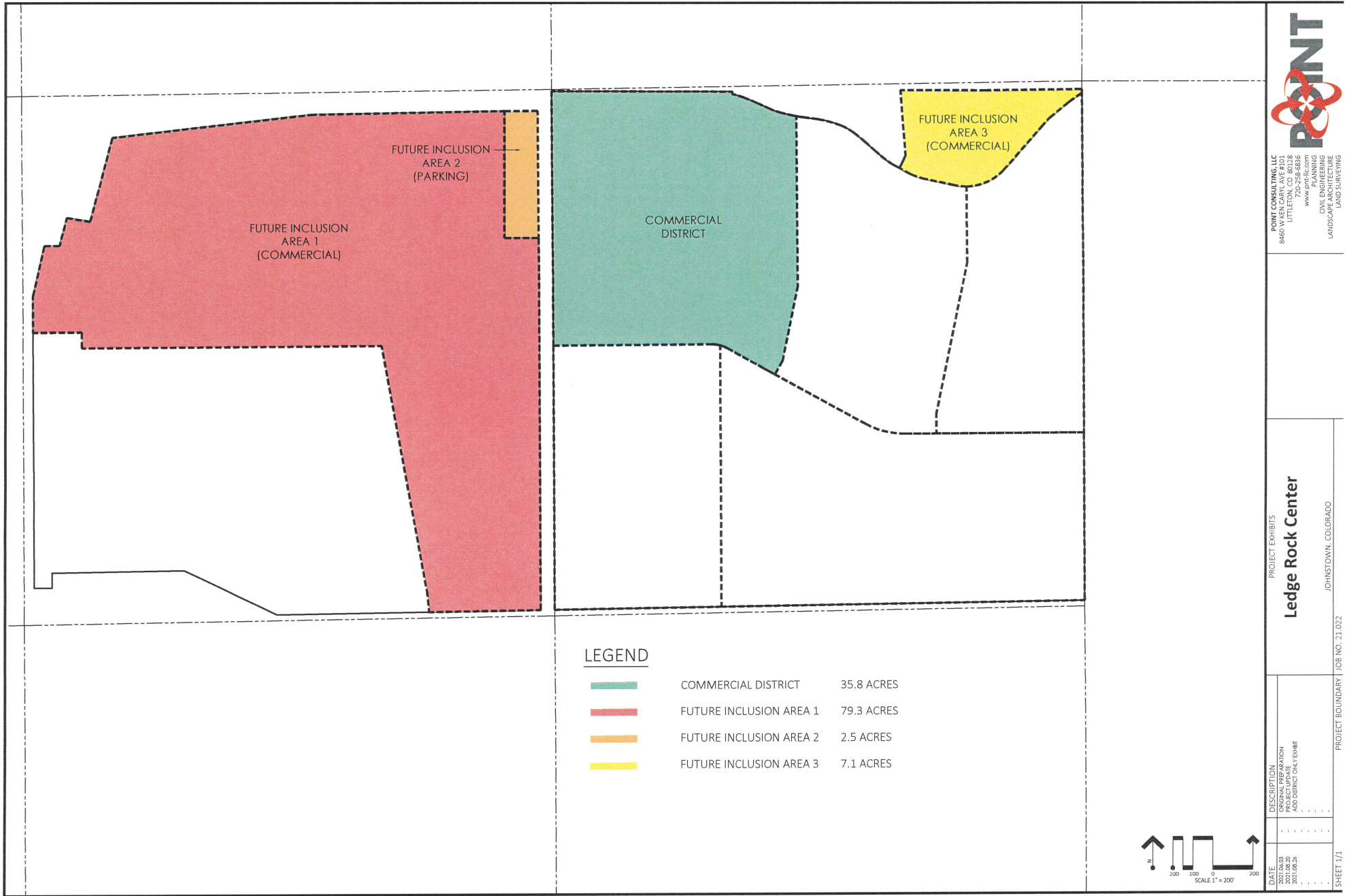


EXHIBIT C-3

Proofs of Ownership and Consent of Owners

Ellen Anderson
109138 County Road 13
Johnstown, CO 80534

Kevin J. Cook
PO BOX 1020
Berthoud, CO 80513

Town Council
 Town of Johnstown, Colorado
 450 S Parish Ave
 Johnstown, CO 80534

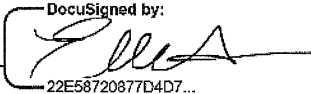
RE: Proposed Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2 (collectively, the “Districts”)

To the Town Council of the Town of Johnstown:

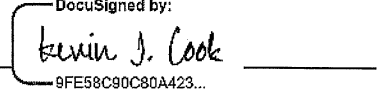
Ellen Anderson (as to a 72.45% interest as tenant in common) and Kevin J. Cook (as to a 27.55% interest as tenant in common) constitute all owners of the property within the initial boundaries of the proposed Districts, excluding rights of way and tracts dedicated to the Town. These initial approximate 148 acres more or less (the “Property”) has been under contract since April 6, 2021 with Michael Schlup, who is in the process of forming the Districts to contain the Property in the initial boundaries of the proposed Service Plans for the Districts. The purpose of this letter is to advise that the following property owners consent to the organization of the District.

Property Owners:

Ellen Anderson (72.45%)

By: _____  22E58720877D4D7...

Kevin J. Cook (27.55%)

By: _____  9FE58C90C80A423...

Certificate Of Taxes Due

Item #9.

Account Number R7288598

Parcel 106111200023

Assessed To

ANDERSON ELLEN (72.45% INT)

PO BOX 1020

BERTHOUD, CO 80513-2020

Certificate Number 237221

Order Number 25186901

Vendor ID 14

LAND TITLE GUARANTEE OF FT COLLINS

772 WHALERS WAY STE 100

FT COLLINS, CO 80525

Legal Description

JOH PT NE4 11-4-68 (RIDGEVIEW RANCH ANNEX) LOT B REC EXEMPT RE-2092 EXC UPRR RES

Situs Address

JOHNSTOWN

Year	Tax	Adjustments	Interest	Fees	Payments	Balance
Tax Charge						
2020	\$4,170.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4,170.00
Total Tax Charge						\$4,170.00
Grand Total Due as of 04/09/2021						\$4,170.00

Tax Billed at 2020 Rates for Tax Area 2963 - 2963

Authority	Mill Levy	Amount	Values	Actual	Assessed
WELD COUNTY	15.0380000*	\$593.70	AG-FLOOD IRRIGATED LAND	\$134,835	\$39,100
SCHOOL DIST RE5J	47.8090000*	\$1,887.51	AG-MEADOW HAY LAND	\$1,257	\$360
NORTHERN COLORADO WATER (NC	1.0000000	\$39.48	AG-WASTE LAND	\$74	\$20
JOHNSTOWN TOWN	23.9470000	\$945.42	Total	\$136,166	\$39,480
FRONT RANGE FIRE RESCUE (JO	11.5240000	\$454.97			
AIMS JUNIOR COLLEGE	6.3050000	\$248.92			
Taxes Billed 2020	105.6230000	\$4,170.00			
* Credit Levy					

All payments made are subject to final bank clearance.

WARNING - THIS TAX CERTIFICATE DOES NOT WARRANT ANY TAXES OWED ON UNDERLYING ACCOUNTS, INCLUDING PARENT OR SIBLING ACCOUNTS. ALL TAX LIEN SALE AMOUNTS ARE SUBJECT TO CHANGE DUE TO ENDORSEMENT OF CURRENT TAXES BY THE LIENHOLDER OR TO ADVERTISING AND DISTRAINT WARRANT FEES. CHANGES MAY OCCUR AND THE TREASURER'S OFFICE WILL NEED TO BE CONTACTED PRIOR TO REMITTANCE.

TAX LIEN SALE REDEMPTION AMOUNTS MUST BE PAID BY CASH OR CASHIER'S CHECK.

POSTMARKS ARE NOT ACCEPTED ON TAX LIEN SALE REDEMPTION PAYMENTS. PAYMENTS MUST BE IN OUR OFFICE AND PROCESSED BY THE LAST BUSINESS DAY OF THE MONTH.

SPECIAL TAXING DISTRICTS AND THE BOUNDARIES OF SUCH DISTRICTS MAY BE ON FILE WITH THE BOARD OF COUNTY COMMISSIONERS, THE COUNTY CLERK, OR THE COUNTY ASSESSOR.

This certificate does not include land or improvements assessed under a separate account number, personal property taxes, transfer tax or misc. tax collected on behalf of other entities, special or local improvement district assessments or mobile homes, unless specifically mentioned.

I, the undersigned, do hereby certify that the entire amount of taxes due upon the above described parcel of real property and all outstanding sales for unpaid taxes as shown by the records in my office from which the same may still be redeemed with the amount required for redemption are as noted herein. In witness whereof, I have hereunto set my hand and seal.

TREASURER, WELD COUNTY, John R. Lefebvre, Jr.

1400 N. 17th Avenue

Greeley, CO 80631

(970) 400-3290



**Land Title Guarantee Company
Customer Distribution**



PREVENT FRAUD - Please remember to call a member of our closing team when initiating a wire transfer or providing wiring instructions.

Order Number: **FCC25186901-3**

Date: **05/31/2021**

Property Address: **VACANT LAND, TBD, CO**

PLEASE CONTACT YOUR CLOSER OR CLOSER'S ASSISTANT FOR WIRE TRANSFER INSTRUCTIONS

For Closing Assistance

Trish Melendy
345 E 27TH STREET
LOVELAND, CO 80538
(970) 663-3628 (Work)
(800) 259-6360 (Work Fax)
tmelendy@ltgc.com
Contact License: CO361823
Company License: CO44565

Closers Assistant

Gwen Klein
345 E 27TH STREET
LOVELAND, CO 80538
(970) 663-3628 (Work)
(800) 820-5138 (Work Fax)
gklein@ltgc.com
Company License: CO44565

For Title Assistance

Land Title Customer Care Team
772 WHALERS WAY #100
FORT COLLINS, CO 80525
(970) 282-3649 (Work)
(970) 282-3652 (Work Fax)
customercare@ltgc.com

Buyer/Borrower

MICHAEL SCHLUP, AMY CARROLL
Delivered via: Electronic Mail

Attorney for Buyer

AD SCHLUP LAW LLC
Attention: ALLEN SCHLUP
allen.schlup@adschluplaw.com
Delivered via: Electronic Mail

Seller/Owner

ELLEN ANDERSON
Delivered via: Electronic Mail

Attorney for Seller

BERG HILL GREENLEAF RUSCITTI LLP
Attention: PETER SCHAUB
1712 PEAR ST
BOULDER, CO 80302
pcs@bhgrlaw.com
Delivered via: Electronic Mail

Seller/Owner

KEVIN COOK
Attention: KEVIN COOK
Delivered via: Electronic Mail

Attorney for Seller

FRASCONA JOINER GOODMAN & GREENSTEIN PC
Attention: FRASCONA JOINER GOODMAN &
GREENSTEIN PC
4750 TABLE MESA DRIVE
BOULDER, CO 80305
ben@frascona.com
Delivered via: Electronic Mail

Attorney for Buyer

SPENCER FANE LLP

Attention: ADAM A VELTRI

1700 LINCOLN ST #2000

DENVER, CO 80203

(303) 565-9127 (Cell)

(303) 839-3716 (Work)

(303) 839-3999 (Work Fax)

aveltri@spencerfane.com

Delivered via: Electronic Mail

Agent for Buyer

Spencer Fane

Attention: D O'LEARY/M BERGER

doleary@spencerfane.com

mberger@spencerfane.com

Delivered via: Electronic Mail

Michael Schlup
c/o Ledge Rock Center, LLC
6917 W 135th Street, Suite B29
Overland Park, KS 66223

Town Council
Town of Johnstown, Colorado
450 S Parish Ave
Johnstown, CO 80534

RE: Proposed Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2 (collectively, the "Districts")

To the Town Council of the Town of Johnstown:

The property owned by Ellen Anderson and Kevin Cook of approximately 148 acres more or less (the "Property") has been under contract since April 6, 2021 with Michael Schlup, who is in the process of forming the Districts to contain the Property in the initial boundaries of the proposed Service Plans for the Districts. As the contracting party for the purchase of this land, the purpose of this letter is to provide the Town, a letter to advise that Michael Schlup as purchaser and future property owner of the Property, provides his consent to the organization of the District.

Property Owner:

Michael Schlup

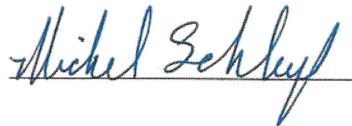
A handwritten signature in blue ink that reads "Michael Schlup". The signature is written in a cursive style and is positioned above a horizontal line.

EXHIBIT D

Intergovernmental Agreement between the District and Johnstown

INTERGOVERNMENTAL AGREEMENT BETWEEN

THE TOWN OF JOHNSTOWN, COLORADO AND

LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT

THIS AGREEMENT is made and entered into as of this ____ day of _____, _____, by and between the TOWN OF JOHNSTOWN, a home-rule municipal corporation of the State of Colorado ("Town"), and LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT, a quasi-municipal corporations and political subdivision of the State of Colorado (the "District"). The Town and the District are collectively referred to as the "Parties."

RECITALS

WHEREAS, the District was organized to provide those services and to exercise powers as are more specifically set forth in the District's Service Plan approved by the Town on _____ ("Service Plan"); and

WHEREAS, the Service Plan makes reference to the execution of an intergovernmental agreement between the Town and the District; and

WHEREAS, the Town and the District have determined it to be in the best interests of their respective taxpayers and property owners to enter into this Intergovernmental Agreement ("Agreement").

NOW, THEREFORE, in consideration of the covenants and mutual agreements herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

COVENANTS AND AGREEMENTS

1. Operations and Maintenance Limitation. The purpose of the District is to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The District shall only operate and maintain those Public Improvements that are not accepted for ownership, operations and maintenance by the Town or other appropriate entity in a manner consistent with Approved Development Plans, the Operations and Maintenance Intergovernmental Agreement, other rules and regulations of the Town and the Town Code.

For any Public Improvement that is not conveyed to the Town or other entity as directed by the Town, the District shall administer, operate, maintain, repair, remove, or replace such Public Improvement in compliance with the applicable standards of the Town and the terms of the Operations and Maintenance Intergovernmental Agreement. The District shall not have the authority to issue any Bonds until the District and the Town have entered into the Operations and Maintenance Intergovernmental Agreement. The District shall hold an election to approve a ballot issue or issues required to commit to the financial obligations in the Operations and Maintenance

Intergovernmental Agreement. Until such time as such ballot issue is approved, the District shall have no authority to incur Debt or certify a mill levy.

2. Trails and Amenities. The District may own, operate, and maintain trails and related amenities within the District. All parks and trails shall be open to the general public, including Town residents who do not reside in the District, free of charge, unless otherwise specified in an intergovernmental agreement with the Town.

3. Fire Protection, Ambulance and Emergency Services Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain fire protection facilities or services, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town. The authority to plan for, design, acquire, construct, install, relocate, redevelop or finance fire hydrants and related improvements installed as part of the water system shall not be limited by this provision. The District shall not be authorized to provide for ambulance or emergency medical services unless the provision of such service is approved by the Town in an intergovernmental agreement.

4. Television Relay and Translation Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain television relay and translation facilities and services, other than for the installation of conduit as a part of a street construction project, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town.

5. Telecommunication Facilities. The District agrees that no telecommunication facilities owned, operated or otherwise allowed by the District shall affect the ability of the Town to expand its public safety telecommunication facilities or impair the Town's existing telecommunication facilities.

6. Construction Standards Limitation. The District shall ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the Town and of other governmental entities having proper jurisdiction. The District shall obtain the Town's approval of civil engineering plans and applicable permits for construction and installation of Public Improvements prior to performing such work.

7. Zoning and Land Use Requirements; Sales and Use Tax. The District shall be subject to all of the Town's zoning, subdivision, building code and other land use requirements. The District shall not exercise any exemption from Town sales or use tax, whether directly or indirectly.

8. Growth Limitations. The District acknowledges that the Town shall not be limited in implementing Town Council or voter approved growth limitations, even though such actions may reduce or delay development within the District and the realization of District's revenue.

9. Conveyance. The District agrees to convey to the Town, at no expense to the Town and upon written notification from the Town, any real property owned by the District that is necessary, in the Town's sole discretion, for any Town capital improvement projects for transportation, utilities, drainage, streets or trails, unless such conveyance interferes with the public

improvements needed for the District or project. The District shall, at no expense to the Town and upon written notification from the Town, transfer to the Town all rights-of-way, fee interests and easements owned by the District that the Town determines are necessary for access to and operation and maintenance of the Public Improvements to be owned, operated and maintained by the Town, consistent with an Approved Development Plan.

10. Privately Placed Debt Limitation. Prior to the issuance of any Privately Placed Debt, including but not limited to any Developer Debt, the District shall obtain the certification of an External Financial Advisor approved by the Town, in the form substantially as follows:

We are [I am] an External Financial Advisor within the meaning of the District's Service Plan.

We [I] certify that (1) the net effective interest rate (calculated as defined in Section 32-1-103(12), C.R.S.) to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District and all Districts pledging revenue to the repayment of the Debt.

The District shall submit written notice to the Town Manager of the name of the proposed External Financial Advisor prior to the engagement of the External Financial Advisor which shall either be approved or objected to by the Town within twenty (20) days of the submittal of such written notice to the Town Manager. If the Town Manager does not object to such selection within the twenty (20) day period, the Town Manager's approval shall be deemed to have been given to the District retaining the External Financial Advisor named in the written notice.

Within ten (10) days subsequent to the issuance of Privately Placed Debt, the District shall provide the Town with copies of the relevant Debt documents, the External Financial Advisor Certification and the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt.

11. Inclusion Limitation. Upon written consent of the property owners, and as provided by the Special District Act, the District may include all property with the Inclusion Area Boundaries, and shall provide written notice to the Town of all such inclusions concurrently therewith. The District shall not include within its boundaries any property outside the Inclusion Area Boundaries without the prior written consent of the Town. The District shall only include within its boundaries property that has been annexed to the Town and no portion of any of the District shall ever consist of property not within the Town's corporate boundaries.

12. Overlap Limitation. The boundaries of the District shall not overlap with any other metropolitan district without the prior written consent of the Town.

13. Debt Limitation. Until the Development and Reimbursement Agreement with the District is approved and executed by the Town and until an Amended and Restated Service Plan is approved by Town Council, the District shall not: (a) issue any Debt; or (b) impose a mill

levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds.

14. Maximum Debt Authorization. The District shall not issue Debt in excess of One Hundred Seventy-Three Million, Seven Hundred Eighty-Five Thousand Dollars (\$173,785,000), except that the District shall not issue any Debt absent approval of an Amended and Restated Service Plan by Town Council. Refunded Debt, wherein the initial debt issuance counted toward the Maximum Debt Authorization shall not count against the Maximum Debt Authorization set forth herein.

15. Execution of Development and Reimbursement Agreement Among The Developer, The Town and The District; Dissolution Requirement. Pursuant to the Memorandum of Understanding between the Developer and the Town dated May 5, 2021, the Developer, the Town and the District anticipate the negotiation and execution of a Development and Reimbursement Agreement providing, among other matters, the terms and conditions relating to the collection, payment and use of the CPIF and Add-on PIF, including the amount of the CPIF and Add-on PIF and the amount of Debt that may be paid with such revenue, termination of the CPIF, maximum interest rates on Debt issued to the Developer or other landowners, and limitations on other revenue sources. If the Developer, the Town and the District do not execute the Development and Reimbursement Agreement by February 1, 2022, the District shall promptly file a petition in the District Court for dissolution of the District, unless such deadline is extended in writing by the Town.

16. Recurring Fee Limitation. The District may impose and collect Recurring Fees for administrative, operations and maintenance expenses and for services, programs or facilities furnished by the District. Any Recurring Fees for administrative, operations and maintenance expenses not specifically set forth in the Financial Plan, including a subsequent increase in such Recurring Fees, shall be subject to review and approval by the Town. At the discretion of the Town Manager, Town review and, if appropriate, approval shall be provided by the Town Manager in writing or referred by the Town Manager to Town Council. If the Town does not respond to a request for the imposition of the Recurring Fee or an increase in such Recurring Fee within forty-five (45) days of receipt of a written request from the District, the Town shall be deemed to have approved the ability of the District to impose or increase the Recurring Fee as described in the request. Any Recurring Fees imposed or increased for operation and maintenance expenses without approval as set forth herein shall constitute a material departure from the Service Plan. The revenue from a Recurring Fee shall not be used to pay for Debt.

17. Monies from Other Governmental Sources. The District shall not apply for or accept Conservation Trust Funds, Great Outdoors Colorado Funds or other funds available from or through governmental or non-profit entities for which the Town is eligible to apply, except pursuant to an intergovernmental agreement with the Town. This Section shall not apply to specific ownership taxes which shall be distributed to and a revenue source for the District without any limitation.

18. Consolidation Limitation. The District shall not file a request with any Court to consolidate with another Title 32 district without the prior written consent of the Town..

19. Public Improvement Fee Limitation. The District shall not collect, receive, spend or pledge to any Debt or use to pay for operations and maintenance services, any fee, assessment, tax or charge which is collected by a retailer in the District on the sale of goods or services by such retailer and which is measured by the sales price of such goods or services, except pursuant to an intergovernmental agreement with the Town. The District shall have the authority to receive a Credit PIF applied to Taxable Transactions during the Credit PIF Period only pursuant to the terms of the Development and Reimbursement Agreement. The District shall have the authority to receive an Add-on PIF only pursuant to the terms of the Development and Reimbursement Agreement. The Credit PIF and Add-on PIF may be applied by private covenant only pursuant to the terms of the Development and Reimbursement Agreement.

20. Bankruptcy Limitation. It is expressly intended that all of the limitations contained in this Service Plan, including, but not limited to, those pertaining to the Maximum Debt Mill Levy, Developer Debt Mill Levy Imposition Term, the Maximum Mill Levy Imposition Term, and the Recurring Fees, that have been established under the authority of the Town to approve a Service Plan with conditions pursuant to Section 32-1-204.5, C.R.S.:

(b) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent an amendment to the Service Plan; and

(c) Are, together with all other requirements of Colorado law, included in the “political or governmental powers” reserved to the State under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the “regulatory or electoral approval necessary under applicable nonbankruptcy law” as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

The filing of any bankruptcy petition by the District shall constitute, simultaneously with such filing, a material departure of the express terms of this Service Plan, and thus an express violation of the approval of this Service Plan.

21. Water Rights/Resources Limitation. Water to satisfy the needs of the Project shall be dedicated by the Developer to the Town or, in the discretion of Town Council, paid by cash in-lieu of such dedication. The District shall not acquire, own, manage, adjudicate or develop water rights or resources except pursuant to an intergovernmental agreement with the Town. If the District provide a non-potable irrigation system, which would be owned, operated and maintained by the District, the District would be permitted to manage the raw water for the District irrigation water system in the manner set forth in a subsequently executed intergovernmental agreement with the Town.

22. Eminent Domain Limitation. Absent the prior written approval of the Town, the District shall not exercise its statutory power of eminent domain or dominant eminent domain for the purpose of condemning property outside of the Service Area. Additional approval from the Town shall not be required prior to the District’s exercise of its statutory power of eminent domain or dominant eminent domain with respect to property within the Service Area. In no event shall the District exercise its statutory power of dominant eminent domain to condemn property owned by the Town.

23. Covenant Enforcement and Design Review Services. The District shall have the power, but not the obligation, to provide Covenant Enforcement and Design Review Services within the District in accordance with the Colorado Statutes as they are amended from time to time. The Town shall not bear any responsibility for Covenant Enforcement and Design Review Services within the boundaries of the District. The Town's architectural control, design review and other zoning, land use, development, design and other controls are separate requirements that must be met in addition to any similar controls or services undertaken by the District.

24. Special Improvement District. The District shall not be entitled to create a special improvement district pursuant to Section 32-1-1101.7, C.R.S., unless otherwise provided pursuant to an intergovernmental agreement with the Town.

25. Reimbursement Agreement with Adjacent Landowners. If the District utilizes reimbursement agreements to obtain reimbursements from adjacent landowners for costs of improvements that benefit the third-party landowners, such agreements shall be done in accordance with Town Code. Any and all resulting reimbursements received for such improvement shall be used to re-pay the cost of the Public Improvement that is the subject of the reimbursement agreement or shall be deposited in the District's debt service fund and used for the purpose of retiring Debt. The District shall maintain an accurate accounting of the funds received and disbursed pursuant to reimbursement agreements.

26. Land Purchase Limitation. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and improvements authorized by the Service Plan. Proceeds from the sale of Debt shall not be used to repay the Developer for any real property conveyed by the Town to the Developer or to the District or used for the Project. Examples of ineligible reimbursements include, but are not limited to: the acquisition of rights of way, easements, land for public drainage, parkland, or open space, unless separate consent is given by resolution of the Town Council.

27. Reimbursement of Public Improvement Related Costs. Prior to the reimbursement to the Developer for costs incurred in the organization of the District, for funds expended on the District behalf related to the Public Improvements, for the payment by the District for an invoice related to a Public Improvement cost, or for the acquisition of any part of the Public Improvements, the District shall receive: a) the report of an engineer retained by the District, independent of the Developer and licensed in Colorado verifying that, in such engineer's professional opinion, the reimbursement for the costs of the Public Improvements that are the subject of the reimbursement or acquisition, including the construction costs and the soft costs, but excluding the accounting and legal fees, are, in such engineer's opinion, reasonable and are related to the provision of the Public Improvements or are related to the District's organization; and b) the report of an accountant retained by the District, independent of the Developer and licensed in Colorado verifying that, in such accountant's professional opinion, the reimbursement for the accounting and legal fees that are the subject of the reimbursement or acquisition, are, in such accountants opinion, reasonable and related to the Public Improvements or the District's

organization. As set forth in the Development and Reimbursement Agreement, the District shall provide the reports to the Town.

28. Developer Reimbursement of Administration, Operations and Maintenance Related Costs. Prior to the reimbursement to the Developer for costs incurred or for funds expended on behalf of the District related to the administration of the District or the operation and maintenance of the Public Improvements, the District shall receive the report of an accountant retained by the District, who is independent of the Developer and licensed in Colorado, verifying that, in such accountant's professional opinion, the reimbursement of the funds advanced for such administration, operations or maintenance costs, are, in such accountant's opinion, receivable and related to the administration, operations or maintenance of the District or the Public Improvements. As set forth in the Development and Reimbursement Agreement, the District shall provide the report to the Town.

29. Board Meetings and Website Limitations. Once an End User owns property in the Service Area, the District's Board meeting(s) shall be conducted within the boundaries of the Town of Johnstown or conducted virtually via internet or telephone platform available for free access by the public. The District shall establish and maintain a public website and shall include the name of the Project or a name that allows property owners and tenants of the District to readily locate the District online and shall also include an updated street map for those properties within the Service Area that have constructed streets that are open for public use. In addition, the District shall timely post a copy of all of the following documents on its public website: (a) each call for nominations, required pursuant to Section 1-13.5-501, C.R.S., (b) the transparency notices provided pursuant to 32-1-809, C.R.S, (c) each recorded declaration of covenants if the District provides Covenant Enforcement and Design Review Services, (d) a copy of this Service Plan and all amendments thereto, (e) all approved budgets, audits, meeting minutes, Board orders and resolutions, (f) any Rules and Regulations adopted by the Board, and (g) all meeting agendas and meeting packets.

30. Transfer Fee Limitation. The District shall not be authorized to collect or spend revenue from a transfer fee on the sale of real property within the District, except pursuant to an intergovernmental agreement with the Town.

31. Financial Review. The Town shall be permitted to conduct periodic reviews of the financial powers of the District in the Service Plan in the manner and form provided in Section 32-1-1101.5, C.R.S. As provided in the statute, the Town may conduct the first financial review in the fifth calendar year after the calendar year in which a special district's ballot issue to incur general obligation indebtedness was approved by its electors. After such fifth calendar year and notwithstanding the provisions of the statute, the Town may conduct the financial review at any time, by providing sixty (60) days written notice to the District, except that the Town may not conduct a financial review within sixty (60) months of the completion of its most recent financial review. The Town's procedures for conducting a financial review under this Paragraph, and the remedies available to the Town as a result of such financial review, shall be identical to those provided for in Section 32-1-1101.5(2), C.R.S. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with such review, and the Town may require a deposit of the estimated costs thereof.

32. Use of Proceeds and Revenues Limitations. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and improvements authorized by the Service Plan. The District shall have ability to use CPIF and Add-on PIF revenues or any other revenues of the District to pay debt service, to pay for capital improvements authorized by this Service Plan, and after termination of the Credit PIF, may use Add-on PIF Revenues in addition to other revenues for operation, maintenance, and administrative costs of the District. Additionally, if the Developer constructs the public infrastructure and conveys it to the District in return for a reimbursement obligation from the District, prior to making such reimbursement for such amounts, the District must receive the report of an independent engineer or accountant licensed in Colorado confirming that in such engineer's or accountant's professional opinion, the amount of the reimbursement is reasonable (a "Cost Verification Report"). The District shall not use CPIF or Add-on PIF revenue to fund acquisitions of interest in land that the Town is contributing to the Project.

33. Miscellaneous Powers. The District shall have the power to provide any facility, service, or program allowed by C.R.S. § 32-1-1004(1).

34. New Powers. If, after the Service Plan is approved, the Colorado General Assembly grants new or broader powers for metropolitan districts, to the extent permitted by law, any or all such powers shall be deemed to be a part hereof and available to be exercised by the District only following written approval by the Town, subject to the Town's sole discretion.

35. Service Plan Amendment Requirement. Actions of the District which violate the limitations set forth in this Service Plan shall be deemed to be material modifications to this Service Plan and the Town shall be entitled to all remedies available under State and local law to enjoin such actions of the District, including the remedy of enjoining the issuance of additional authorized but unissued debt, until such material modification is remedied.

36. Maximum Debt Mill Levy. The Maximum Debt Mill Levy imposed upon property within the District shall be twenty-five (25) mills subject to an Assessment Ratio Adjustment. For the portion of any aggregate Debt which is equal to or less than fifty percent (50%) of the District's assessed valuation, either on the date of issuance or at any time thereafter, the mill levy to be imposed to repay such portion of Debt shall not be subject to the Maximum Debt Mill Levy and, as a result, the mill levy may be such amount as is necessary to pay the Debt service on such Debt, without limitation of rate.

37. Operations and Maintenance Mill Levy. The Operations and Maintenance Mill Levy shall be a mill levy the District is permitted to impose for payment of the District's administrative, operations and maintenance costs, which shall include, but not be limited to, the funding of operating reserves and sufficient ending fund balances to assure sufficient cash flow to fund expenses as they come due. Prior to the imposition of a mill levy for payment of Debt, the District may impose a maximum Operations and Maintenance Mill Levy of be twenty-five (25) mills. After the imposition of a mill levy for the payment of Debt, the District shall not impose an

Operations and Mill Levy that exceeds ten (10) mills, subject to an Assessment Ratio Adjustment, and shall at all times not exceed the maximum mill levy necessary to pay those expenses.

38. Maximum Aggregate Mill Levy. The maximum aggregate mill levy of the District shall be twenty-five (25) mills, inclusive of both Debt and operations and maintenance, subject to an Assessment Ratio Adjustment.

39. PIF Revenue. Unless otherwise provided in the Development and Reimbursement Agreement, the imposition of mill levies does not preclude the District from receiving CPIF or Add-on PIF Revenues.

40. Mill Levy Imposition Term.

(a) Developer Debt Mill Levy Imposition Term. Developer Debt shall expire and be forgiven twenty (20) years after the date of the initial imposition by the District of an ad valorem property tax to pay any Debt, unless otherwise provided pursuant to an intergovernmental agreement with the Town. Refunding Bonds shall not be subject to this Developer Debt Mill Levy Imposition Term so long as such Refunding Bonds are not owned by the Developer or by a person or party related to the Developer. Developer Debt shall not have any call protection.

(b) Maximum Debt Mill Levy Imposition Term: In addition to the Developer Debt Mill Levy Imposition Term, the District shall not impose a levy for repayment of any and all Debt (or use the proceeds of any mill levy for repayment of Debt) on any single property developed which exceeds forty (40) years after the year of the initial imposition of such mill levy unless a refunding of a part or all of the Debt will result in a net present value savings as set forth in 11-56-101, *et seq*, C.R.S.

41. Debt Repayment Sources. Debt may be repaid from CPIF and Add-on PIF Revenue, or any other revenues, gifts, grants, ad valorem taxes, and any source of payment permitted by law and by the Service Plan.

42. Dissolution. Upon a determination of the Town Council that the purposes for which the District was created have been accomplished or as set forth in Paragraph 15 above, the District shall file a petition in the District Court for dissolution, pursuant to the applicable State statutes. Except as provided in Paragraph 15 above, dissolution shall not occur until the District has provided for the payment or discharge of all of its outstanding indebtedness and other financial obligations as required pursuant to State statutes. Except as otherwise required in the Intergovernmental Agreement or in the Development and Reimbursement Agreement, dissolution shall not be required if the District elects to finance, construct and acquire the parking areas, common areas, and other common areas, facilities and improvements, as such Public Improvements would be owned, operated and maintained by the District or if the District is responsible for ongoing operations and maintenance under this Service Plan or the Operations and Maintenance Intergovernmental Agreement.

43. Notices. All notices, demands, requests or other communications to be sent by one party to the other hereunder or required by law shall be in writing and shall be deemed to have been validly given or served by delivery of same in person to the address or by courier delivery,

via United Parcel Service or other nationally recognized overnight air courier service, or by depositing same in the United States mail, postage prepaid, addressed as follows:

To the Town: Attn: Town Manager
 Town of Johnstown
 450 S. Parish Avenue
 Johnstown, CO 80534
 Phone: (970) 587-4664

To the District: Ledge Rock Center
 Commercial Metropolitan District
 Attn: District Manager
 c/o Pinnacle Consulting Group, Inc.
 550 W. Eisenhower Blvd.
 Loveland, Colorado 80537
 Phone: 970-669-3611
 Fax: 970-669-3612

With a copy to: Spencer Fane LLP
 Attn: David S. O'Leary, Esq.
 1700 Lincoln, Suite 2000
 Denver, CO 80203
 Phone: 303-839-3800
 Fax: 303-839-3838
 doleary@spencerfane.com

All notices, demands, requests or other communications shall be effective upon such personal delivery or one (1) business day after being deposited with United Parcel Service or other nationally recognized overnight air courier service or three (3) business days after deposit in the United States mail. By giving the other party hereto at least ten (10) days written notice thereof in accordance with the provisions hereof, each of the Parties shall have the right from time to time to change its address. Notice may also be provided by electronic mail on the condition that the intended recipient of the electronic mail acknowledges receipt thereof.

44. Amendment. This Agreement may be amended, modified, changed, or terminated in whole or in part only by a written agreement duly authorized and executed by the Parties hereto and, unless Town Council otherwise requires, without amendment to the Service Plan.

45. Assignment. Neither Party hereto shall assign any of its rights nor delegate any of its duties hereunder to any person or entity without having first obtained the prior written consent of the other Party, which consent will not be unreasonably withheld. Any purported assignment or delegation in violation of the provisions hereof shall be void and ineffectual.

46. Default/Remedies. Upon the occurrence of any event of breach or default by either Party, the non-defaulting party shall provide written notice to the other Party. The defaulting Party shall immediately proceed to cure or remedy such breach or default, and in any event, such breach or default shall be cured within fifteen (15) days after receipt of the notice. Following the cure period in the event of a breach or default of this Agreement by either Party, the non-defaulting Party shall be entitled to exercise all remedies available by law or in equity, specifically including suits for specific performance and/or monetary damages. In the event of any proceeding to enforce the terms, covenants or conditions hereof is brought by the Town to enforce the provisions of this Agreement, the Town, if the prevailing Party shall be entitled to obtain as part of its judgment or award, its reasonable attorneys' fees, to the extent permitted by law.

47. Governing Law and Venue. This Agreement shall be governed and construed under the laws of the State of Colorado and venue shall be in the County in which the District is located.

48. Inurement. Each of the terms, covenants and conditions hereof shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and assigns.

49. Integration. This Agreement constitutes the entire agreement between the Parties with respect to the matters addressed herein. All prior discussions and negotiations regarding the subject matter hereof are merged herein.

50. Parties Interested Herein. Nothing expressed or implied in this Agreement is intended or shall be construed to confer upon, or to give to, any person other than the District and the Town any right, remedy, or claim under or by reason of this Agreement or any covenants, terms, conditions, or provisions thereof, and all the covenants, terms, conditions, and provisions in this Agreement by and on behalf of the District and the Town shall be for the sole and exclusive benefit of the District and the Town.

51. Severability. If any covenant, term, condition, or provision under this Agreement shall, for any reason, be held to be invalid or unenforceable, the invalidity or unenforceability of such covenant, term, condition, or provision shall not affect any other provision contained herein, the intention being that such provisions are severable.

52. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall constitute an original and all of which shall constitute one and the same document.

53. Town Consent. Unless otherwise provided herein or provided in an intergovernmental agreement with the Town, references in this Agreement to Town consent or Town approval shall require prior written approval of the Town. At the Town Manager's discretion, the Town Manager shall decide if (1) he or she can provide the written Town approval, if approval is warranted; (2) the matter should be referred to Town Council for consideration and, if appropriate, approval by resolution; (3) the matter requires consideration for approval in the form of an agreement with the Town; or (4) the matter requires an amendment to the Service Plan.

54. No Liability of Town. The Town has no obligation whatsoever to construct any improvements that the District is required to construct, or pay any debt or liability of the District, including any Bonds.

55. Paragraph Headings. Paragraph headings are inserted for convenience of reference only.

56. Defined Terms. Capitalized terms used herein and not otherwise defined shall have the meanings ascribed to them in the Service Plan.

LEDGE ROCK CENTER COMMERCIAL
METROPOLITAN DISTRICT

By: _____
President

Attest:

Secretary

TOWN OF JOHNSTOWN, COLORADO

By: _____
Mayor

Attest:

By: _____
Its: _____

EXHIBIT E

Capital Plan



August 20, 2021

Town of Johnstown
Board of Trustees
450 Parish Avenue
Johnstown, Colorado 80534

Subject: Estimate of Preliminary District Expenditures for
Ledge Rock Center, Johnstown, Colorado 80534

To Whom It May Concern:

The letter serves to document that Point Consulting, LLC. prepared an Estimate of Preliminary District Expenditures for the Ledge Rock Center, dated August 20, 2021.

The estimate was based on a conceptual engineering plan for the subject proposed mixed-use development, and unit costs were based on comparable projects within the same geographic area during the year 2021.

It is our professional opinion that the construction costs presented in the estimate are reasonable and have been based on the best available information.

Should you have any questions related to this estimate, we can be reached at 720-258-6836, Ext. 1011.

Sincerely,
Point Consulting, LLC

Jim Shipton,
Partner

Tiffany Watson,
Partner



SUMMARY ESTIMATE OF PRELIMINARY PROJECT COSTS DISTRICT EXPENDITURES

August 20, 2021

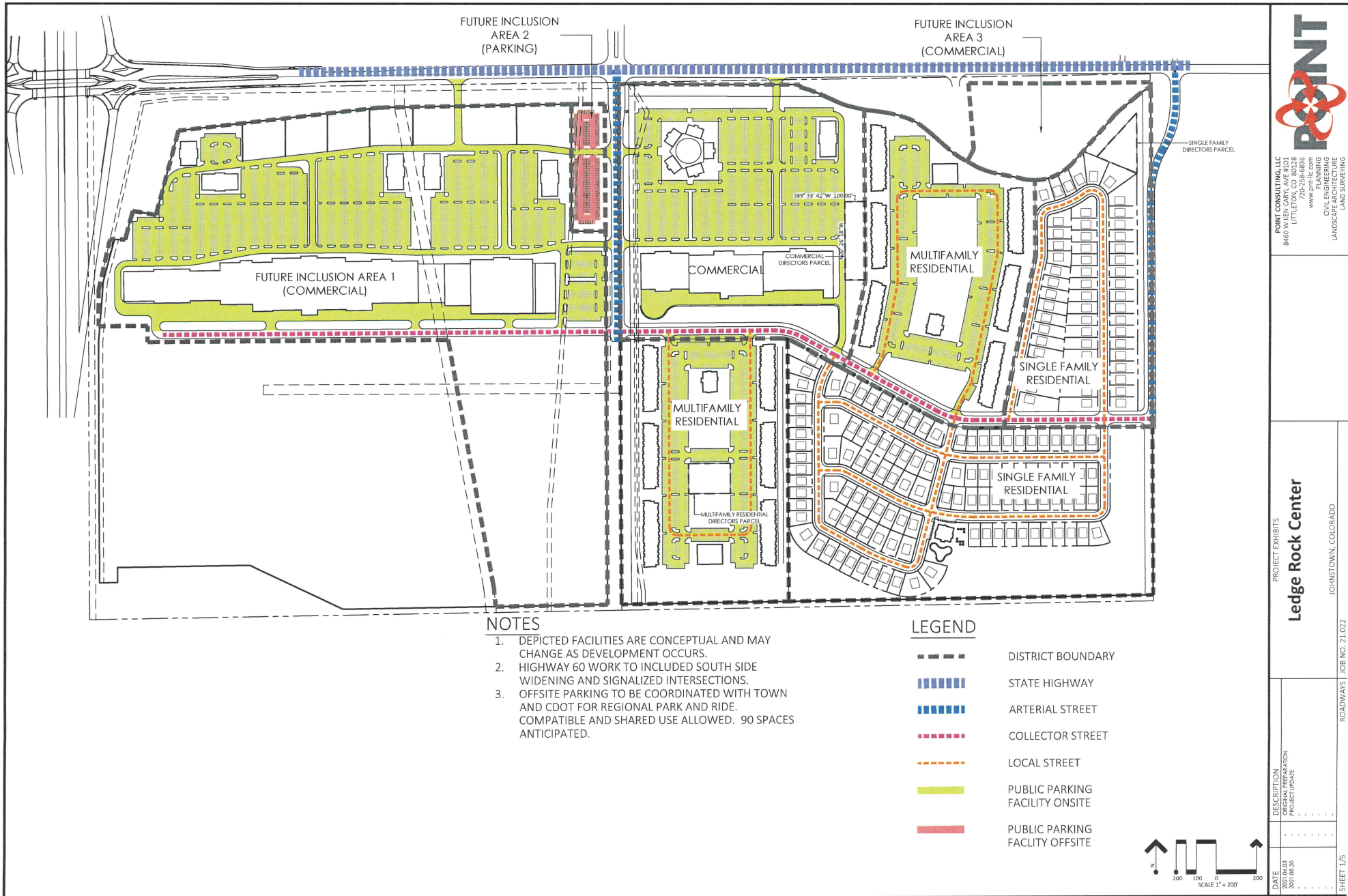
PUBLIC IMPROVEMENT COSTS FOR

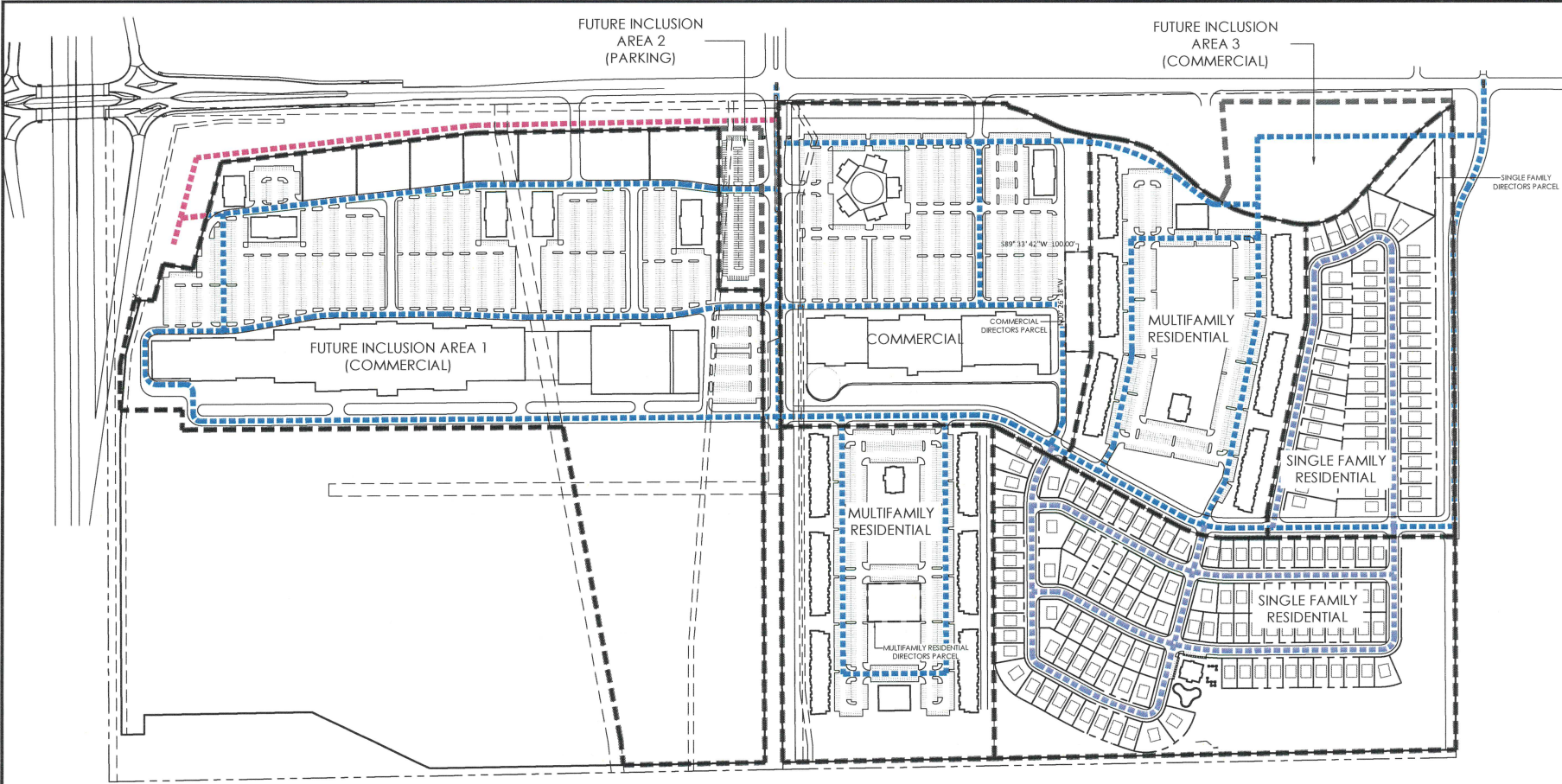
Ledge Rock Center

COMBINED AREA - 237 ACRES

	Public Improvements	Commercial	Multi-Family	Single Family	Total
1	Grading/Miscellaneous	\$ 24,290,042	\$ 1,139,625	\$ 559,198	\$ 25,988,865
2	Roadway Improvements	\$ 31,249,897	\$ 6,118,760	\$ 138,600	\$ 37,507,256
3	Potable Waterline Improvements	\$ 3,490,750	\$ 726,500	\$ 350,000	\$ 4,567,250
4	Sanitary Sewer Improvements	\$ 4,093,782	\$ 833,625	\$ 437,500	\$ 5,364,907
5	Storm Drainage Improvements	\$ 9,645,276	\$ 1,138,253	\$ -	\$ 10,783,529
6	Open Space, Parks and Trails	\$ 16,302,519	\$ 4,283,716	\$ 3,709,077	\$ 24,295,311
	Infrastructure Subtotal	\$ 89,072,265	\$ 14,240,479	\$ 5,194,375	\$ 108,507,118
	Contingency (15%)	\$ 13,360,840	\$ 2,136,072	\$ 779,156	\$ 16,276,068
	Infrastructure Total Cost	\$ 102,433,104	\$ 16,376,551	\$ 5,973,531	\$ 124,783,186
7	Admin. / Design / Permitting / Etc.	\$ 15,877,131	\$ 2,538,365	\$ 925,897	\$ 19,341,394
8	Land Cost	\$ 33,744,576	\$ -	\$ -	\$ 33,744,576
	Total Hard/Soft Cost	\$ 152,054,812	\$ 18,914,916	\$ 6,899,428	\$ 177,869,156

SUMMARY ESTIMATE OF PRELIMINARY PROJECT COSTS DISTRICT EXPENDITURES				
August 20, 2021				
PUBLIC IMPROVEMENT COSTS FOR				
Ledge Rock Center - Commercial District				
COMBINED AREA - 125 ACRES				
	Quantity	Unit	Unit Cost	Total Cost
Public Improvements				
1 Grading/Miscellaneous				
Mobilization/General Conditions	10,313,534	SF	\$ 0.25	\$ 2,578,384
Clearing Grubbing and Topsoil Stripping	5,430,061	SF	\$ 0.05	\$ 271,503
Earthwork (cut/fill/place)	1,819,185	CY	\$ 3.00	\$ 5,457,555
Erosion Control	10,313,534	SF	\$ 0.15	\$ 1,547,030
Dewatering	237	AC	\$ 10,000.00	\$ 2,370,000
Traffic Control	1	LS	\$ 300,000.00	\$ 300,000
MSE Block Wall	37,350	SFF	\$ 45.00	\$ 1,680,750
Offsite Work	1,008,482	SF	\$ 10.00	\$ 10,084,820
Subtotal				\$ 24,290,042
2 Roadway Improvements/Miscellaneous Concrete Work				
CDOT State Highway 60 (82' section)	4,450	LF	\$ 820.00	\$ 3,649,000
Park n Ride Facility	68,121	SF	\$ 7.70	\$ 524,532
Signal	2	LS	\$ 400,000.00	\$ 800,000
Major Arterial (74' section)	2,640	LF	\$ 630.00	\$ 1,663,200
Major Collector (40' section)	1,745	LF	\$ 340.00	\$ 593,300
Minor Collector (36' section)	5,040	LF	\$ 310.00	\$ 1,562,400
Local Street (36' section)	9,762	LF	\$ 310.00	\$ 3,026,220
Asphalt Prep.	1,886,888	SF	\$ 1.10	\$ 2,075,577
Asphalt Place.	1,886,888	SF	\$ 6.60	\$ 12,453,461
Concrete Prep.	557,069	SF	\$ 2.20	\$ 1,225,552
Concrete Place.	557,069	SF	\$ 6.60	\$ 3,676,655
Subtotal				\$ 31,249,897
3 Potable Waterline Improvements				
12" Water Offsite	2,622	LF	\$ 125.00	\$ 327,750
12" Water Onsite	4,116	LF	\$ 125.00	\$ 514,500
8" Water Onsite	23,405	LF	\$ 100.00	\$ 2,340,500
Fire Hydrant	88	EA	\$ 3,500.00	\$ 308,000
Subtotal				\$ 3,490,750
4 Sanitary Sewer				
Offsite 18" Sewer	2,800	LF	\$ 160.00	\$ 448,000
Offsite 12" Sewer	1,599	LF	\$ 127.00	\$ 203,073
Onsite 12" Sewer	1,577	LF	\$ 127.00	\$ 200,279
Onsite 8" Sewer	22,026	LF	\$ 90.00	\$ 1,982,340
Offsite Underdrain	4,399	LF	\$ 45.00	\$ 197,955
Onsite Underdrain	23,603	LF	\$ 45.00	\$ 1,062,135
Subtotal				\$ 4,093,782
5 Storm Drainage Improvements				
Offsite 48" Farm Irrigation	2,368	LF	\$ 282.00	\$ 667,776
Offsite 24" Farm Irrigation	2,600	LF	\$ 210.00	\$ 546,000
Offsite 66" StormSewer	180	LF	\$ 336.00	\$ 60,480
Offsite 48" StormSewer	3,358	LF	\$ 282.00	\$ 946,956
Offsite 42" StormSewer	3,414	LF	\$ 264.00	\$ 901,296
Onsite 36" StormSewer	3,187	LF	\$ 246.00	\$ 784,002
Onsite 30" StormSewer	3,336	LF	\$ 228.00	\$ 760,608
Onsite 24" StormSewer	7,549	LF	\$ 210.00	\$ 1,585,290
Onsite 18" StormSewer	10,324	LF	\$ 192.00	\$ 1,982,208
Offsite Underdrain	3,476	LF	\$ 90.00	\$ 312,840
Onsite Underdrain	12,198	LF	\$ 90.00	\$ 1,097,820
Subtotal				\$ 9,645,276
6 Open Space, Parks and Trails				
Landscape/Irrigation/Amentities	2,260,563	LS	\$ 3.50	\$ 7,911,971
Regional Trails/Parks	166,020	SF	\$ 10.00	\$ 1,660,200
Site Lighting Cable	50,029	LF	\$ 12.00	\$ 600,348
Light Poles	384	EA	\$ 7,500.00	\$ 2,880,000
Monumentation	5	EA	\$ 50,000.00	\$ 250,000
Project Monument Tower	3	EA	\$ 1,000,000.00	\$ 3,000,000
Subtotal				\$ 16,302,519
Infrastructure Subtotal				\$ 89,072,265
Contingency (15%)				\$ 13,360,840
Infrastructure Total Cost				\$ 102,433,104
7 Admin. / Design / Permitting / Etc.				
Engineering/Surveying	1	LS	3.5%	\$ 3,585,159
Con. Man. / Inspection	1	LS	7.0%	\$ 7,170,317
Admin / Planning	1	LS	5.0%	\$ 5,121,655
Subtotal				\$ 15,877,131
8 Land Aquisition				
Land (parking, common and public areas)	1,605,456	SF	\$ 21.00	\$ 33,714,576
Real Estate Appraisal	1	LS	\$ 30,000.00	\$ 30,000
Subtotal				\$ 33,744,576
Total Hard/Soft Cost				\$ 152,054,812



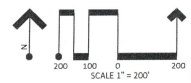


NOTES

1. OFFSITE WATERLINE DESIGNED AND INSTALLED BY TOWN, ANTICIPATED 2021.

LEGEND

- DISTRICT BOUNDARY
- 8" WATERLINE
- 12" WATERLINE ON SITE
- 12" WATERLINE OFFSITE



POINT CONSULTING, LLC
8460 W KEN CARYL AVE #101
LITTLETON, CO 80128
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CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
LAND SURVEYING

PROJECT EXHIBITS

Ledge Rock Center

JOHNSTOWN, COLORADO

WATERLINES | JOB NO. 21.022

SHEET 2/5

DATE

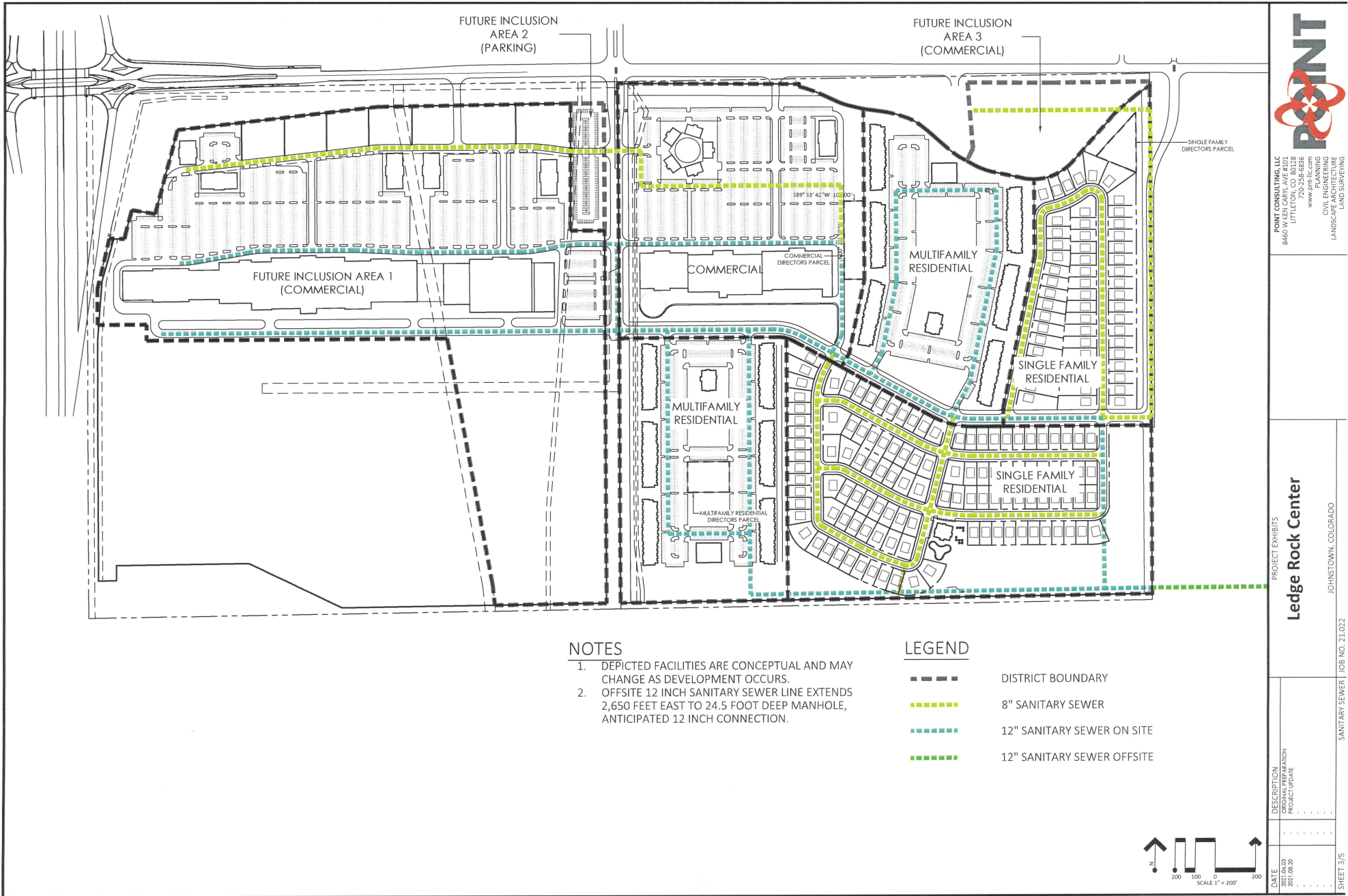
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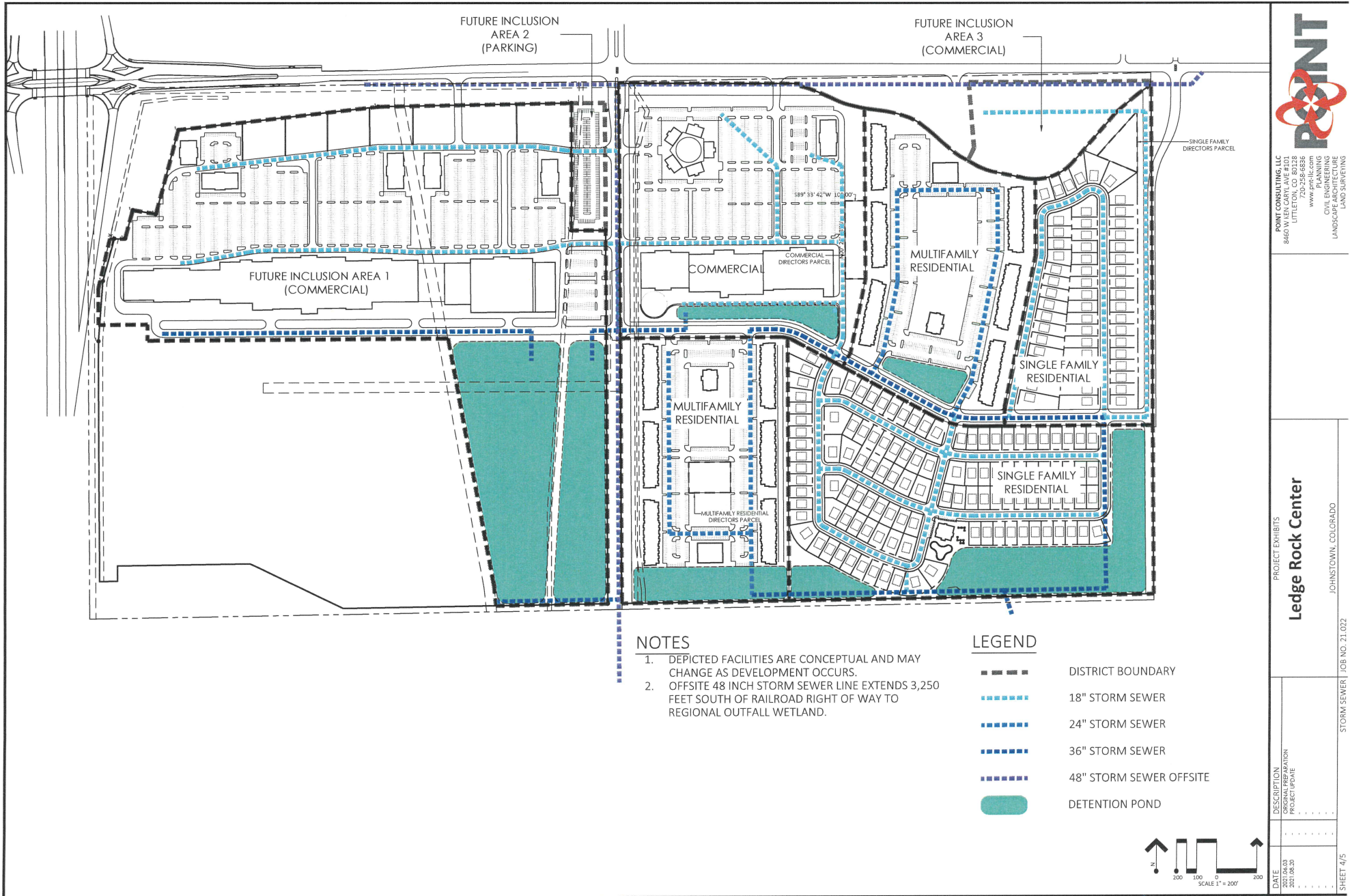
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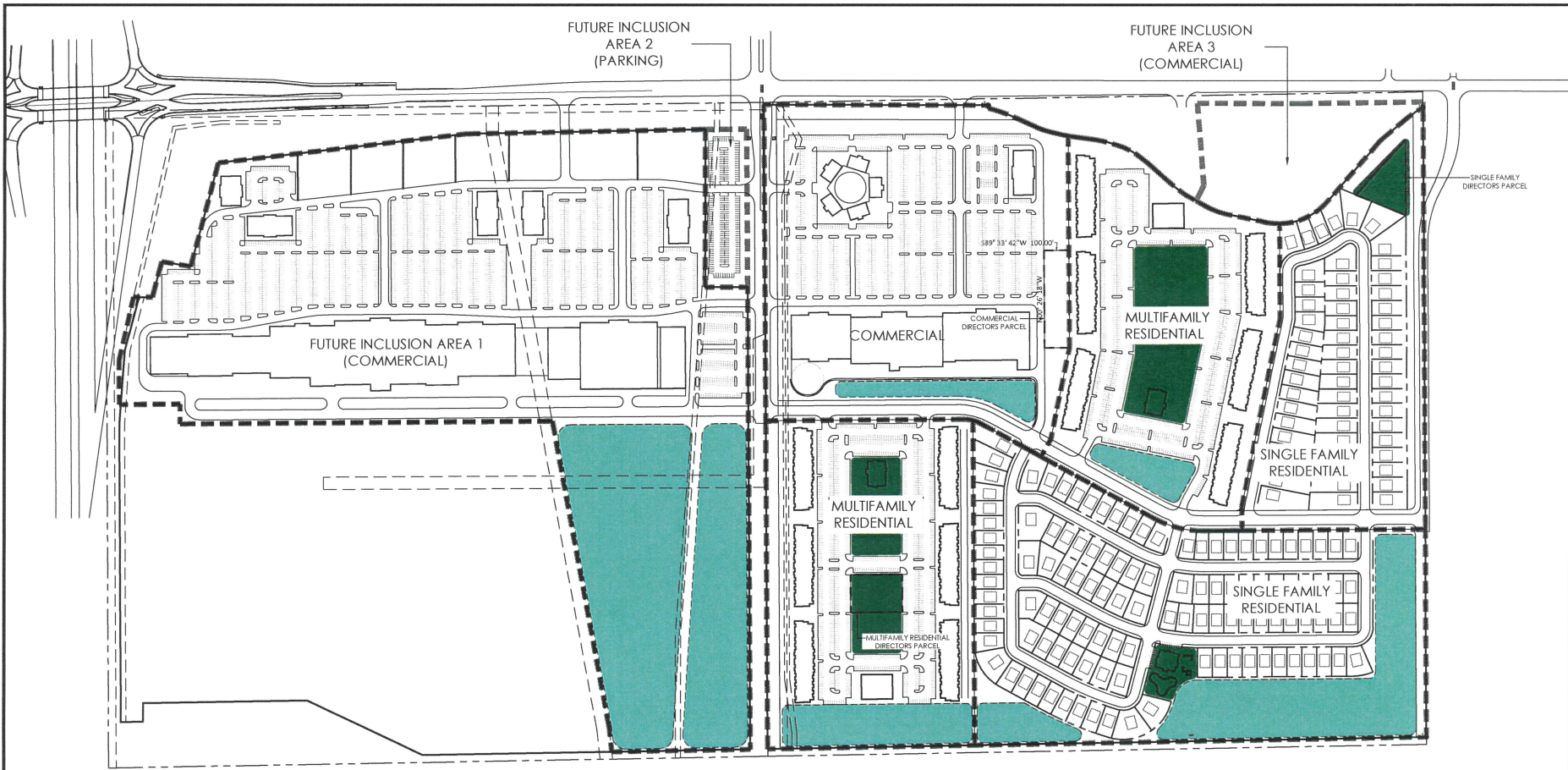
DESCRIPTION

ORIGINAL PREPARATION

PROJECT UPDATE







NOTES

1. DEPICTED FACILITIES ARE CONCEPTUAL AND MAY CHANGE AS DEVELOPMENT OCCURS.

LEGEND

- PARK FACILITIES
- OPEN SPACE PASSIVE RECREATION

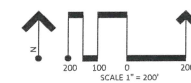


EXHIBIT F

Financial Plan

**Ledge Rock Center Commercial Metropolitan District
Larimer County, Colorado**

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**General Obligation Bonds, Series 2022A  
Subordinate Cash Flow Bonds, Series 2022B**

| <b>Bond Assumptions</b>             | <b>Series 2022A</b> | <b>Series 2022B</b> | <b>Total</b>       |
|-------------------------------------|---------------------|---------------------|--------------------|
| Closing Date                        | 3/15/2022           | 3/15/2022           |                    |
| First Call Date                     | 3/1/2027            | 3/1/2027            |                    |
| Final Maturity                      | 12/1/2051           | 12/15/2051          |                    |
| Discharge Date                      | 12/1/2061           | 12/1/2061           |                    |
| <b>Sources of Funds</b>             |                     |                     |                    |
| Par Amount                          | 129,580,000         | 15,241,000          | 144,821,000        |
| Total                               | 129,580,000         | 15,241,000          | 144,821,000        |
| <b>Uses of Funds</b>                |                     |                     |                    |
| Project Fund                        | <b>99,638,322</b>   | <b>14,783,770</b>   | <b>114,422,092</b> |
| Capitalized Interest                | 15,042,078          | 0                   | 15,042,078         |
| Reserve Fund                        | 11,808,000          | 0                   | 11,808,000         |
| Cost of Issuance                    | 3,091,600           | 457,230             | 3,548,830          |
| Total                               | 129,580,000         | 15,241,000          | 144,821,000        |
| <b>Debt Features</b>                |                     |                     |                    |
| Projected Coverage at Mill Levy Cap | 1.30x               | 1.00x               |                    |
| Tax Status                          | Tax-Exempt          | Tax-Exempt          |                    |
| Rating                              | Non-Rated           | Non-Rated           |                    |
| Average Coupon                      | 5.250%              | 8.250%              |                    |
| Annual Trustee Fee                  | \$4,000             | \$3,000             |                    |
| <b>Biennial Reassessment</b>        |                     |                     |                    |
| Commercial                          | 2.00%               | 2.00%               |                    |
| <b>Tax Authority Assumptions</b>    |                     |                     |                    |
| Metropolitan District Revenue       |                     |                     |                    |
| Residential Assessment Ratio        |                     |                     |                    |
| Service Plan Gallagherization Base  | 7.15%               |                     |                    |
| Current Assumption                  | 7.15%               |                     |                    |
| Debt Service Mills                  |                     |                     |                    |
| Service Plan Mill Levy Cap          | 5.000               |                     |                    |
| Target Mill Levy                    | 5.000               |                     |                    |
| Specific Ownership Tax              | 6.00%               |                     |                    |
| County Treasurer Fee                | 2.00%               |                     |                    |
| Sales Tax Revenue                   |                     |                     |                    |
| Credit PIF                          | 2.00%               |                     |                    |
| Add-on PIF                          | 2.50%               |                     |                    |
| PIF Collection Fee                  | 0.50%               |                     |                    |
| Operations                          |                     |                     |                    |
| Mill Levy                           | 5.000               |                     |                    |



**Ledge Rock Center Commercial Metropolitan District  
Development Summary**

| Statutory Actual<br>Value (2021)<br><br>Sales per Unit | Commercial          |                     |                     |                     |                     |                     | Total                | Hotel               | Total               |
|--------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|---------------------|---------------------|
|                                                        | Retail              | Retail              | Retail              | Retail              | Retail              | Retail              |                      | Hotel               |                     |
|                                                        | \$200               | \$200               | \$200               | \$200               | \$200               | \$200               |                      | \$277,778           |                     |
|                                                        | \$300               | \$300               | \$300               | \$300               | \$300               | \$300               |                      | -                   |                     |
| 2021                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2022                                                   | 125,000             | -                   | -                   | -                   | -                   | -                   | 125,000              | -                   | -                   |
| 2023                                                   | -                   | 125,000             | -                   | -                   | -                   | -                   | 125,000              | -                   | -                   |
| 2024                                                   | -                   | -                   | 125,000             | -                   | -                   | -                   | 125,000              | -                   | -                   |
| 2025                                                   | -                   | -                   | -                   | 125,000             | -                   | -                   | 125,000              | 90                  | 90                  |
| 2026                                                   | -                   | -                   | -                   | -                   | 125,000             | -                   | 125,000              | -                   | -                   |
| 2027                                                   | -                   | -                   | -                   | -                   | -                   | 125,000             | 125,000              | -                   | -                   |
| 2028                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2029                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2030                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2031                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2032                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2033                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2034                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2035                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2036                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2037                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2038                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2039                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2040                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2041                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2042                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2043                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2044                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2045                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2046                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2047                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2048                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2049                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2050                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| 2051                                                   | -                   | -                   | -                   | -                   | -                   | -                   | -                    | -                   | -                   |
| <b>Total Units</b>                                     | <b>125,000</b>      | <b>125,000</b>      | <b>125,000</b>      | <b>125,000</b>      | <b>125,000</b>      | <b>125,000</b>      | <b>750,000</b>       | <b>90</b>           | <b>90</b>           |
| <b>Total Statutory<br/>Actual Value</b>                | <b>\$25,000,000</b> | <b>\$25,000,000</b> | <b>\$25,000,000</b> | <b>\$25,000,000</b> | <b>\$25,000,000</b> | <b>\$25,000,000</b> | <b>\$150,000,000</b> | <b>\$25,000,000</b> | <b>\$25,000,000</b> |
| <b>Annual Sales</b>                                    | <b>\$37,500,000</b> | <b>\$37,500,000</b> | <b>\$37,500,000</b> | <b>\$37,500,000</b> | <b>\$37,500,000</b> | <b>\$37,500,000</b> | <b>\$225,000,000</b> | <b>-</b>            | <b>-</b>            |

**Ledge Rock Center Commercial Metropolitan District**  
**Assessed Value**

|       | Vacant and Improved Land                          |                                      | Commercial                 |                          |                          |                                      |                                      | Total                                |
|-------|---------------------------------------------------|--------------------------------------|----------------------------|--------------------------|--------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|       | Cumulative Statutory<br>Actual Value <sup>1</sup> | Assessed Value in<br>Collection Year | Commercial SF<br>Delivered | Hotel Rooms<br>Delivered | Biennial<br>Reassessment | Cumulative Statutory<br>Actual Value | Assessed Value in<br>Collection Year | Assessed Value in<br>Collection Year |
|       |                                                   | 2 Year Lag<br>29.00%                 |                            |                          | 2.00%                    |                                      | 2 Year Lag<br>29.00%                 | 2 Year Lag                           |
| 2021  | 2,500,000                                         | 0                                    | -                          | -                        | -                        | 0                                    | 0                                    | 0                                    |
| 2022  | 2,500,000                                         | 0                                    | 125,000                    | -                        | -                        | 25,500,000                           | 0                                    | 0                                    |
| 2023  | 2,500,000                                         | 725,000                              | 125,000                    | -                        | -                        | 51,510,000                           | 0                                    | 725,000                              |
| 2024  | 5,000,000                                         | 725,000                              | 125,000                    | -                        | 1,030,200                | 79,070,400                           | 7,395,000                            | 8,120,000                            |
| 2025  | 2,500,000                                         | 725,000                              | 125,000                    | 90                       | -                        | 133,192,008                          | 14,937,900                           | 15,662,900                           |
| 2026  | 2,500,000                                         | 1,450,000                            | 125,000                    | -                        | 2,663,840                | 163,457,868                          | 22,930,416                           | 24,380,416                           |
| 2027  | 0                                                 | 725,000                              | 125,000                    | -                        | -                        | 191,611,929                          | 38,625,682                           | 39,350,682                           |
| 2028  | 0                                                 | 725,000                              | -                          | -                        | 3,832,239                | 195,444,167                          | 47,402,782                           | 48,127,782                           |
| 2029  | 0                                                 | 0                                    | -                          | -                        | -                        | 195,444,167                          | 55,567,459                           | 55,567,459                           |
| 2030  | 0                                                 | 0                                    | -                          | -                        | 3,908,883                | 199,353,051                          | 56,678,809                           | 56,678,809                           |
| 2031  | 0                                                 | 0                                    | -                          | -                        | -                        | 199,353,051                          | 56,678,809                           | 56,678,809                           |
| 2032  | 0                                                 | 0                                    | -                          | -                        | 3,987,061                | 203,340,112                          | 57,812,385                           | 57,812,385                           |
| 2033  | 0                                                 | 0                                    | -                          | -                        | -                        | 203,340,112                          | 57,812,385                           | 57,812,385                           |
| 2034  | 0                                                 | 0                                    | -                          | -                        | 4,066,802                | 207,406,914                          | 58,968,632                           | 58,968,632                           |
| 2035  | 0                                                 | 0                                    | -                          | -                        | -                        | 207,406,914                          | 58,968,632                           | 58,968,632                           |
| 2036  | 0                                                 | 0                                    | -                          | -                        | 4,148,138                | 211,555,052                          | 60,148,005                           | 60,148,005                           |
| 2037  | 0                                                 | 0                                    | -                          | -                        | -                        | 211,555,052                          | 60,148,005                           | 60,148,005                           |
| 2038  | 0                                                 | 0                                    | -                          | -                        | 4,231,101                | 215,786,153                          | 61,350,965                           | 61,350,965                           |
| 2039  | 0                                                 | 0                                    | -                          | -                        | -                        | 215,786,153                          | 61,350,965                           | 61,350,965                           |
| 2040  | 0                                                 | 0                                    | -                          | -                        | 4,315,723                | 220,101,876                          | 62,577,984                           | 62,577,984                           |
| 2041  | 0                                                 | 0                                    | -                          | -                        | -                        | 220,101,876                          | 62,577,984                           | 62,577,984                           |
| 2042  | 0                                                 | 0                                    | -                          | -                        | 4,402,038                | 224,503,914                          | 63,829,544                           | 63,829,544                           |
| 2043  | 0                                                 | 0                                    | -                          | -                        | -                        | 224,503,914                          | 63,829,544                           | 63,829,544                           |
| 2044  | 0                                                 | 0                                    | -                          | -                        | 4,490,078                | 228,993,992                          | 65,106,135                           | 65,106,135                           |
| 2045  | 0                                                 | 0                                    | -                          | -                        | -                        | 228,993,992                          | 65,106,135                           | 65,106,135                           |
| 2046  | 0                                                 | 0                                    | -                          | -                        | 4,579,880                | 233,573,872                          | 66,408,258                           | 66,408,258                           |
| 2047  | 0                                                 | 0                                    | -                          | -                        | -                        | 233,573,872                          | 66,408,258                           | 66,408,258                           |
| 2048  | 0                                                 | 0                                    | -                          | -                        | 4,671,477                | 238,245,349                          | 67,736,423                           | 67,736,423                           |
| 2049  | 0                                                 | 0                                    | -                          | -                        | -                        | 238,245,349                          | 67,736,423                           | 67,736,423                           |
| 2050  | 0                                                 | 0                                    | -                          | -                        | 4,764,907                | 243,010,256                          | 69,091,151                           | 69,091,151                           |
| 2051  | 0                                                 | 0                                    | -                          | -                        | -                        | 243,010,256                          | 69,091,151                           | 69,091,151                           |
| Total |                                                   |                                      | 750,000                    | 90                       | 55,092,368               |                                      |                                      |                                      |

1. Vacant land value calculated in year prior to construction as 10% build-out market value

**Ledge Rock Center Commercial Metropolitan District  
Revenue**

|       | Total                                | District Mill Levy Revenue |                               |                             | Sales Tax Revenue       |             |             | Expense                 |                    |                    | Total                                 |
|-------|--------------------------------------|----------------------------|-------------------------------|-----------------------------|-------------------------|-------------|-------------|-------------------------|--------------------|--------------------|---------------------------------------|
|       | Assessed Value in<br>Collection Year | Debt Mill Levy             | Debt Mill Levy<br>Collections | Specific Ownership<br>Taxes | Taxable Retail<br>Sales | Credit PIF  | Add-On PIF  | County Treasurer<br>Fee | PIF Collection Fee | Annual Trustee Fee | Revenue Available<br>for Debt Service |
|       |                                      | 5.000 Cap<br>5.000 Target  | 99.50%                        | 6.00%                       |                         | 2.00%       | 2.50%       | 2.00%                   | 0.50%              | \$7,000            |                                       |
| 2021  | 0                                    | 0.000                      | 0                             | 0                           | 0                       | 0           | 0           | 0                       | 0                  | 0                  | 0                                     |
| 2022  | 0                                    | 5.000                      | 0                             | 0                           | 18,937,500              | 378,750     | 473,438     | 0                       | (4,261)            | 0                  | 847,927                               |
| 2023  | 725,000                              | 5.000                      | 3,607                         | 216                         | 47,817,188              | 956,344     | 1,195,430   | (72)                    | (10,759)           | (7,000)            | 2,137,766                             |
| 2024  | 8,120,000                            | 5.000                      | 40,397                        | 2,424                       | 86,931,647              | 1,738,633   | 2,173,291   | (808)                   | (19,560)           | (7,000)            | 3,927,377                             |
| 2025  | 15,662,900                           | 5.000                      | 77,923                        | 4,675                       | 126,823,614             | 2,536,472   | 3,170,590   | (1,558)                 | (28,535)           | (7,000)            | 5,752,567                             |
| 2026  | 24,380,416                           | 5.000                      | 121,293                       | 7,278                       | 167,504,727             | 3,350,095   | 4,187,618   | (2,426)                 | (37,689)           | (7,000)            | 7,619,168                             |
| 2027  | 39,350,682                           | 5.000                      | 195,770                       | 11,746                      | 208,986,780             | 4,179,736   | 5,224,669   | (3,915)                 | (47,022)           | (7,000)            | 9,553,983                             |
| 2028  | 48,127,782                           | 5.000                      | 239,436                       | 14,366                      | 231,179,185             | 4,623,584   | 5,779,480   | (4,789)                 | (52,015)           | (7,000)            | 10,593,061                            |
| 2029  | 55,567,459                           | 5.000                      | 276,448                       | 16,587                      | 243,642,759             | 4,872,855   | 6,091,069   | (5,529)                 | (54,820)           | (7,000)            | 11,189,611                            |
| 2030  | 56,678,809                           | 5.000                      | 281,977                       | 16,919                      | 246,079,186             | 4,921,584   | 6,151,980   | (5,640)                 | (55,368)           | (7,000)            | 11,304,452                            |
| 2031  | 56,678,809                           | 5.000                      | 281,977                       | 16,919                      | 248,539,978             | 4,970,800   | 6,213,499   | (5,640)                 | (55,921)           | (7,000)            | 11,414,634                            |
| 2032  | 57,812,385                           | 5.000                      | 287,617                       | 17,257                      | 251,025,378             | 5,020,508   | 6,275,634   | (5,752)                 | (56,481)           | (7,000)            | 11,531,783                            |
| 2033  | 57,812,385                           | 5.000                      | 287,617                       | 17,257                      | 253,535,632             | 5,070,713   | 6,338,391   | (5,752)                 | (57,046)           | (7,000)            | 11,644,179                            |
| 2034  | 58,968,632                           | 5.000                      | 293,369                       | 17,602                      | 256,070,988             | 5,121,420   | 6,401,775   | (5,867)                 | (57,616)           | (7,000)            | 11,763,682                            |
| 2035  | 58,968,632                           | 5.000                      | 293,369                       | 17,602                      | 258,631,698             | 5,172,634   | 6,465,792   | (5,867)                 | (58,192)           | (7,000)            | 11,878,338                            |
| 2036  | 60,148,005                           | 5.000                      | 299,236                       | 17,954                      | 261,218,015             | 5,224,360   | 6,530,450   | (5,985)                 | (58,774)           | (7,000)            | 12,000,242                            |
| 2037  | 60,148,005                           | 5.000                      | 299,236                       | 17,954                      | 263,830,195             | 5,276,604   | 6,595,755   | (5,985)                 | (59,362)           | (7,000)            | 12,117,203                            |
| 2038  | 61,350,965                           | 5.000                      | 305,221                       | 18,313                      | 266,468,497             | 5,329,370   | 6,661,712   | (6,104)                 | (59,955)           | (7,000)            | 12,241,557                            |
| 2039  | 61,350,965                           | 5.000                      | 305,221                       | 18,313                      | 269,133,182             | 5,382,664   | 6,728,330   | (6,104)                 | (60,555)           | (7,000)            | 12,360,868                            |
| 2040  | 62,577,984                           | 5.000                      | 311,325                       | 18,680                      | 271,824,514             | 5,436,490   | 6,795,613   | (6,227)                 | (61,161)           | (7,000)            | 12,487,721                            |
| 2041  | 62,577,984                           | 5.000                      | 311,325                       | 18,680                      | 274,542,759             | 5,490,855   | 6,863,569   | (6,227)                 | (61,772)           | (7,000)            | 12,609,431                            |
| 2042  | 63,829,544                           | 5.000                      | 317,552                       | 19,053                      | 277,288,187             | 5,545,764   | 6,932,205   | (6,351)                 | (62,390)           | (7,000)            | 12,738,833                            |
| 2043  | 63,829,544                           | 5.000                      | 317,552                       | 19,053                      | 280,061,068             | 5,601,221   | 7,001,527   | (6,351)                 | (63,014)           | (7,000)            | 12,862,988                            |
| 2044  | 65,106,135                           | 5.000                      | 323,903                       | 19,434                      | 282,861,679             | 5,657,234   | 7,071,542   | (6,478)                 | (63,644)           | (7,000)            | 12,994,991                            |
| 2045  | 65,106,135                           | 5.000                      | 323,903                       | 19,434                      | 285,690,296             | 5,713,806   | 7,142,257   | (6,478)                 | (64,280)           | (7,000)            | 13,121,642                            |
| 2046  | 66,408,258                           | 5.000                      | 330,381                       | 19,823                      | 288,547,199             | 5,770,944   | 7,213,680   | (6,608)                 | (64,923)           | (7,000)            | 13,256,297                            |
| 2047  | 66,408,258                           | 5.000                      | 330,381                       | 19,823                      | 291,432,671             | 5,828,653   | 7,285,817   | (6,608)                 | (65,572)           | (7,000)            | 13,385,494                            |
| 2048  | 67,736,423                           | 5.000                      | 336,989                       | 20,219                      | 294,346,998             | 5,886,940   | 7,358,675   | (6,740)                 | (66,228)           | (7,000)            | 13,522,855                            |
| 2049  | 67,736,423                           | 5.000                      | 336,989                       | 20,219                      | 297,290,468             | 5,945,809   | 7,432,262   | (6,740)                 | (66,890)           | (7,000)            | 13,654,649                            |
| 2050  | 69,091,151                           | 5.000                      | 343,728                       | 20,624                      | 300,263,372             | 6,005,267   | 7,506,584   | (6,875)                 | (67,559)           | (7,000)            | 13,794,770                            |
| 2051  | 69,091,151                           | 5.000                      | 343,728                       | 20,624                      | 303,266,006             | 6,065,320   | 7,581,650   | (6,875)                 | (68,235)           | (7,000)            | 13,929,213                            |
| Total |                                      |                            | 7,817,470                     | 469,048                     |                         | 143,075,427 | 178,844,284 | (156,349)               | (1,609,599)        | (203,000)          | 328,237,282                           |

**Ledge Rock Center Commercial Metropolitan District**  
**Debt Service**

|       | Total<br><br>Revenue Available<br>for Debt Service | Net Debt Service                                                 | Surplus Fund   |                                           |                  | Ratio Analysis           |                                  |
|-------|----------------------------------------------------|------------------------------------------------------------------|----------------|-------------------------------------------|------------------|--------------------------|----------------------------------|
|       |                                                    | Series 2022A                                                     |                |                                           |                  | Debt Service<br>Coverage | Senior Debt to<br>Assessed Value |
|       |                                                    | Dated: 3/15/2022<br><br>Par: \$129,580,000<br>Proj: \$99,638,322 | Annual Surplus | Cumulative<br>Balance<br><br>\$12,958,000 | Released Revenue |                          |                                  |
| 2021  | 0                                                  |                                                                  | 0              | 0                                         | 0                | n/a                      | n/a                              |
| 2022  | 847,927                                            | 0                                                                | 847,927        | 847,927                                   | 0                | n/a                      | n/a                              |
| 2023  | 2,137,766                                          | 0                                                                | 2,137,766      | 2,985,692                                 | 0                | n/a                      | n/a                              |
| 2024  | 3,927,377                                          | 3,401,475                                                        | 525,902        | 3,511,595                                 | 0                | 115%                     | 17873%                           |
| 2025  | 5,752,567                                          | 6,802,950                                                        | (1,050,383)    | 2,461,212                                 | 0                | 85%                      | 1596%                            |
| 2026  | 7,619,168                                          | 6,802,950                                                        | 816,218        | 3,277,430                                 | 0                | 112%                     | 827%                             |
| 2027  | 9,553,983                                          | 7,347,950                                                        | 2,206,033      | 5,483,464                                 | 0                | 130%                     | 529%                             |
| 2028  | 10,593,061                                         | 8,144,338                                                        | 2,448,724      | 7,932,187                                 | 0                | 130%                     | 324%                             |
| 2029  | 11,189,611                                         | 8,602,413                                                        | 2,587,198      | 10,519,385                                | 0                | 130%                     | 261%                             |
| 2030  | 11,304,452                                         | 8,692,663                                                        | 2,611,789      | 12,958,000                                | 173,175          | 130%                     | 223%                             |
| 2031  | 11,414,634                                         | 8,777,938                                                        | 2,636,696      | 12,958,000                                | 2,636,696        | 130%                     | 214%                             |
| 2032  | 11,531,783                                         | 8,867,975                                                        | 2,663,808      | 12,958,000                                | 2,663,808        | 130%                     | 210%                             |
| 2033  | 11,644,179                                         | 8,951,988                                                        | 2,692,192      | 12,958,000                                | 2,692,192        | 130%                     | 201%                             |
| 2034  | 11,763,682                                         | 9,044,713                                                        | 2,718,970      | 12,958,000                                | 2,718,970        | 130%                     | 196%                             |
| 2035  | 11,878,338                                         | 9,135,100                                                        | 2,743,238      | 12,958,000                                | 2,743,238        | 130%                     | 187%                             |
| 2036  | 12,000,242                                         | 9,227,625                                                        | 2,772,617      | 12,958,000                                | 2,772,617        | 130%                     | 181%                             |
| 2037  | 12,117,203                                         | 9,316,500                                                        | 2,800,703      | 12,958,000                                | 2,800,703        | 130%                     | 171%                             |
| 2038  | 12,241,557                                         | 9,416,200                                                        | 2,825,357      | 12,958,000                                | 2,825,357        | 130%                     | 164%                             |
| 2039  | 12,360,868                                         | 9,505,413                                                        | 2,855,456      | 12,958,000                                | 2,855,456        | 130%                     | 154%                             |
| 2040  | 12,487,721                                         | 9,603,875                                                        | 2,883,846      | 12,958,000                                | 2,883,846        | 130%                     | 147%                             |
| 2041  | 12,609,431                                         | 9,695,275                                                        | 2,914,156      | 12,958,000                                | 2,914,156        | 130%                     | 136%                             |
| 2042  | 12,738,833                                         | 9,799,088                                                        | 2,939,745      | 12,958,000                                | 2,939,745        | 130%                     | 127%                             |
| 2043  | 12,862,988                                         | 9,893,738                                                        | 2,969,251      | 12,958,000                                | 2,969,251        | 130%                     | 116%                             |
| 2044  | 12,994,991                                         | 9,993,700                                                        | 3,001,291      | 12,958,000                                | 3,001,291        | 130%                     | 106%                             |
| 2045  | 13,121,642                                         | 10,092,663                                                       | 3,028,980      | 12,958,000                                | 3,028,980        | 130%                     | 94%                              |
| 2046  | 13,256,297                                         | 10,194,575                                                       | 3,061,722      | 12,958,000                                | 3,061,722        | 130%                     | 83%                              |
| 2047  | 13,385,494                                         | 10,293,125                                                       | 3,092,369      | 12,958,000                                | 3,092,369        | 130%                     | 70%                              |
| 2048  | 13,522,855                                         | 10,397,263                                                       | 3,125,593      | 12,958,000                                | 3,125,593        | 130%                     | 59%                              |
| 2049  | 13,654,649                                         | 10,500,413                                                       | 3,154,236      | 12,958,000                                | 3,154,236        | 130%                     | 45%                              |
| 2050  | 13,794,770                                         | 10,606,263                                                       | 3,188,508      | 12,958,000                                | 3,188,508        | 130%                     | 32%                              |
| 2051  | 13,929,213                                         | 10,710,238                                                       | 3,218,976      | 0                                         | 16,176,976       | 130%                     | 0%                               |
| Total | 328,237,282                                        | 253,818,400                                                      | 74,418,882     | 309,136,892                               | 74,418,882       |                          |                                  |

**Ledge Rock Center Commercial Metropolitan District  
Subordinate Debt Service**

|       | Revenue Available<br>for Debt Service | Interest Payment<br><br>8.250%<br><br>Balance of<br>Accrued Interest<br><br>Principal Payment<br><br>Principal Balance |            |            |            | Debt Service                                                    |        | Released<br>Revenue |
|-------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-----------------------------------------------------------------|--------|---------------------|
|       |                                       |                                                                                                                        |            |            |            | Series 2022B                                                    |        |                     |
|       |                                       |                                                                                                                        |            |            |            | Dated: 3/15/2022<br><br>Par: \$15,241,000<br>Proj: \$14,783,770 |        |                     |
|       |                                       |                                                                                                                        |            |            | 15,241,000 |                                                                 |        |                     |
| 2022  | -                                     | -                                                                                                                      | 943,037    | -          | 15,241,000 | -                                                               | -      | -                   |
| 2023  | -                                     | -                                                                                                                      | 2,278,220  | -          | 15,241,000 | -                                                               | -      | -                   |
| 2024  | -                                     | -                                                                                                                      | 3,723,556  | -          | 15,241,000 | -                                                               | -      | -                   |
| 2025  | -                                     | -                                                                                                                      | 5,288,131  | -          | 15,241,000 | -                                                               | -      | -                   |
| 2026  | -                                     | -                                                                                                                      | 6,981,785  | -          | 15,241,000 | -                                                               | -      | -                   |
| 2027  | -                                     | -                                                                                                                      | 8,815,164  | -          | 15,241,000 | -                                                               | -      | -                   |
| 2028  | -                                     | -                                                                                                                      | 10,799,798 | -          | 15,241,000 | -                                                               | -      | -                   |
| 2029  | -                                     | -                                                                                                                      | 12,948,164 | -          | 15,241,000 | -                                                               | -      | -                   |
| 2030  | 173,175                               | 173,175                                                                                                                | 15,100,595 | -          | 15,241,000 | 173,175                                                         | -      | -                   |
| 2031  | 2,636,696                             | 2,636,696                                                                                                              | 14,967,081 | -          | 15,241,000 | 2,636,696                                                       | -      | -                   |
| 2032  | 2,663,808                             | 2,663,808                                                                                                              | 14,795,440 | -          | 15,241,000 | 2,663,808                                                       | -      | -                   |
| 2033  | 2,692,192                             | 2,692,192                                                                                                              | 14,581,254 | -          | 15,241,000 | 2,692,192                                                       | -      | -                   |
| 2034  | 2,718,970                             | 2,718,970                                                                                                              | 14,322,621 | -          | 15,241,000 | 2,718,970                                                       | -      | -                   |
| 2035  | 2,743,238                             | 2,743,238                                                                                                              | 14,018,381 | -          | 15,241,000 | 2,743,238                                                       | -      | -                   |
| 2036  | 2,772,617                             | 2,772,617                                                                                                              | 13,659,663 | -          | 15,241,000 | 2,772,617                                                       | -      | -                   |
| 2037  | 2,800,703                             | 2,800,703                                                                                                              | 13,243,265 | -          | 15,241,000 | 2,800,703                                                       | -      | -                   |
| 2038  | 2,825,357                             | 2,825,357                                                                                                              | 12,767,860 | -          | 15,241,000 | 2,825,357                                                       | -      | -                   |
| 2039  | 2,855,456                             | 2,855,456                                                                                                              | 12,223,135 | -          | 15,241,000 | 2,855,456                                                       | -      | -                   |
| 2040  | 2,883,846                             | 2,883,846                                                                                                              | 11,605,080 | -          | 15,241,000 | 2,883,846                                                       | -      | -                   |
| 2041  | 2,914,156                             | 2,914,156                                                                                                              | 10,905,726 | -          | 15,241,000 | 2,914,156                                                       | -      | -                   |
| 2042  | 2,939,745                             | 2,939,745                                                                                                              | 10,123,086 | -          | 15,241,000 | 2,939,745                                                       | -      | -                   |
| 2043  | 2,969,251                             | 2,969,251                                                                                                              | 9,246,372  | -          | 15,241,000 | 2,969,251                                                       | -      | -                   |
| 2044  | 3,001,291                             | 3,001,291                                                                                                              | 8,265,290  | -          | 15,241,000 | 3,001,291                                                       | -      | -                   |
| 2045  | 3,028,980                             | 3,028,980                                                                                                              | 7,175,579  | -          | 15,241,000 | 3,028,980                                                       | -      | -                   |
| 2046  | 3,061,722                             | 3,061,722                                                                                                              | 5,963,225  | -          | 15,241,000 | 3,061,722                                                       | -      | -                   |
| 2047  | 3,092,369                             | 3,092,369                                                                                                              | 4,620,204  | -          | 15,241,000 | 3,092,369                                                       | -      | -                   |
| 2048  | 3,125,593                             | 3,125,593                                                                                                              | 3,133,161  | -          | 15,241,000 | 3,125,593                                                       | -      | -                   |
| 2049  | 3,154,236                             | 3,154,236                                                                                                              | 1,494,793  | -          | 15,241,000 | 3,154,236                                                       | -      | -                   |
| 2050  | 3,188,508                             | 2,875,495                                                                                                              | -          | 313,000    | 14,928,000 | 3,188,495                                                       | 12     | -                   |
| 2051  | 16,176,976                            | 1,231,560                                                                                                              | -          | 14,928,000 | -          | 16,159,560                                                      | 17,416 | -                   |
| Total | 74,418,882                            | 59,160,454                                                                                                             |            | 15,241,000 |            | 74,401,454                                                      | 17,428 |                     |



**Ledge Rock Center Commercial Metropolitan District  
Revenue**

|       | Total                                | Operations Mill Levy Revenue |                              |                             | Expense                 | Total                               |
|-------|--------------------------------------|------------------------------|------------------------------|-----------------------------|-------------------------|-------------------------------------|
|       | Assessed Value in<br>Collection Year | O&M Mill Levy                | O&M Mill Levy<br>Collections | Specific Ownership<br>Taxes | County Treasurer<br>Fee | Revenue Available<br>for Operations |
|       |                                      | 5.000 Cap<br>5.000 Target    | 99.50%                       | 6.00%                       | 2.00%                   |                                     |
| 2021  | 0                                    | 0.000                        | 0                            | 0                           | 0                       | 0                                   |
| 2022  | 0                                    | 5.000                        | 0                            | 0                           | 0                       | 0                                   |
| 2023  | 725,000                              | 5.000                        | 3,625                        | 216                         | (73)                    | 3,769                               |
| 2024  | 8,120,000                            | 5.000                        | 40,600                       | 2,424                       | (812)                   | 42,212                              |
| 2025  | 15,662,900                           | 5.000                        | 78,315                       | 4,675                       | (1,566)                 | 81,424                              |
| 2026  | 24,380,416                           | 5.000                        | 121,902                      | 7,278                       | (2,438)                 | 126,742                             |
| 2027  | 39,350,682                           | 5.000                        | 196,753                      | 11,746                      | (3,935)                 | 204,565                             |
| 2028  | 48,127,782                           | 5.000                        | 240,639                      | 14,366                      | (4,813)                 | 250,192                             |
| 2029  | 55,567,459                           | 5.000                        | 277,837                      | 16,587                      | (5,557)                 | 288,867                             |
| 2030  | 56,678,809                           | 5.000                        | 283,394                      | 16,919                      | (5,668)                 | 294,645                             |
| 2031  | 56,678,809                           | 5.000                        | 283,394                      | 16,919                      | (5,668)                 | 294,645                             |
| 2032  | 57,812,385                           | 5.000                        | 289,062                      | 17,257                      | (5,781)                 | 300,538                             |
| 2033  | 57,812,385                           | 5.000                        | 289,062                      | 17,257                      | (5,781)                 | 300,538                             |
| 2034  | 58,968,632                           | 5.000                        | 294,843                      | 17,602                      | (5,897)                 | 306,548                             |
| 2035  | 58,968,632                           | 5.000                        | 294,843                      | 17,602                      | (5,897)                 | 306,548                             |
| 2036  | 60,148,005                           | 5.000                        | 300,740                      | 17,954                      | (6,015)                 | 312,679                             |
| 2037  | 60,148,005                           | 5.000                        | 300,740                      | 17,954                      | (6,015)                 | 312,679                             |
| 2038  | 61,350,965                           | 5.000                        | 306,755                      | 18,313                      | (6,135)                 | 318,933                             |
| 2039  | 61,350,965                           | 5.000                        | 306,755                      | 18,313                      | (6,135)                 | 318,933                             |
| 2040  | 62,577,984                           | 5.000                        | 312,890                      | 18,680                      | (6,258)                 | 325,312                             |
| 2041  | 62,577,984                           | 5.000                        | 312,890                      | 18,680                      | (6,258)                 | 325,312                             |
| 2042  | 63,829,544                           | 5.000                        | 319,148                      | 19,053                      | (6,383)                 | 331,818                             |
| 2043  | 63,829,544                           | 5.000                        | 319,148                      | 19,053                      | (6,383)                 | 331,818                             |
| 2044  | 65,106,135                           | 5.000                        | 325,531                      | 19,434                      | (6,511)                 | 338,454                             |
| 2045  | 65,106,135                           | 5.000                        | 325,531                      | 19,434                      | (6,511)                 | 338,454                             |
| 2046  | 66,408,258                           | 5.000                        | 332,041                      | 19,823                      | (6,641)                 | 345,223                             |
| 2047  | 66,408,258                           | 5.000                        | 332,041                      | 19,823                      | (6,641)                 | 345,223                             |
| 2048  | 67,736,423                           | 5.000                        | 338,682                      | 20,219                      | (6,774)                 | 352,128                             |
| 2049  | 67,736,423                           | 5.000                        | 338,682                      | 20,219                      | (6,774)                 | 352,128                             |
| 2050  | 69,091,151                           | 5.000                        | 345,456                      | 20,624                      | (6,909)                 | 359,170                             |
| 2051  | 69,091,151                           | 5.000                        | 345,456                      | 20,624                      | (6,909)                 | 359,170                             |
| Total |                                      |                              | 7,856,754                    | 469,048                     | (157,135)               | 8,168,667                           |

## SOURCES AND USES OF FUNDS

### LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT Larimer County, Colorado

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GENERAL OBLIGATION BONDS, SERIES 2022A SUBORDINATE CASH FLOW BONDS, SERIES 2022B

Dated Date 03/15/2022
Delivery Date 03/15/2022

Sources:	Series 2022A	Series 2022B	Total
Bond Proceeds:			
Par Amount	129,580,000.00	15,241,000.00	144,821,000.00
	129,580,000.00	15,241,000.00	144,821,000.00
Uses:	Series 2022A	Series 2022B	Total
Project Fund Deposits:			
Project Fund	99,638,321.67	14,783,770.00	114,422,091.67
Other Fund Deposits:			
Capitalized Interest Fund	15,042,078.33		15,042,078.33
Debt Service Reserve Fund	11,808,000.00		11,808,000.00
	26,850,078.33		26,850,078.33
Cost of Issuance:			
Other Cost of Issuance	500,000.00		500,000.00
Delivery Date Expenses:			
Underwriter's Discount	2,591,600.00	457,230.00	3,048,830.00
	129,580,000.00	15,241,000.00	144,821,000.00

BOND SUMMARY STATISTICS

LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT Larimer County, Colorado

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#### GENERAL OBLIGATION BONDS, SERIES 2022A 5.000 Debt Service Mills plus PIF Revenues Non-Rated, 1.30x, 30-yr. Maturity

|                                 |                |
|---------------------------------|----------------|
| Dated Date                      | 03/15/2022     |
| Delivery Date                   | 03/15/2022     |
| Last Maturity                   | 12/01/2051     |
| Arbitrage Yield                 | 5.250649%      |
| True Interest Cost (TIC)        | 5.411274%      |
| Net Interest Cost (NIC)         | 5.340053%      |
| All-In TIC                      | 5.442820%      |
| Average Coupon                  | 5.250000%      |
| Average Life (years)            | 22.209         |
| Duration of Issue (years)       | 12.856         |
| Par Amount                      | 129,580,000.00 |
| Bond Proceeds                   | 129,580,000.00 |
| Total Interest                  | 151,088,478.33 |
| Net Interest                    | 153,680,078.33 |
| Total Debt Service              | 280,668,478.33 |
| Maximum Annual Debt Service     | 22,518,237.50  |
| Average Annual Debt Service     | 9,446,583.04   |
| Underwriter's Fees (per \$1000) |                |
| Average Takedown                |                |
| Other Fee                       | 20.000000      |
| Total Underwriter's Discount    | 20.000000      |
| Bid Price                       | 98.000000      |

| <i><b>Bond Component</b></i> | <i><b>Par Value</b></i> | <i><b>Price</b></i> | <i><b>Average Coupon</b></i> | <i><b>Average Life</b></i> |
|------------------------------|-------------------------|---------------------|------------------------------|----------------------------|
| Term Bond due 2051           | 129,580,000.00          | 100.000             | 5.250%                       | 22.209                     |
|                              | 129,580,000.00          |                     |                              | 22.209                     |

|                            | <i><b>TIC</b></i> | <i><b>All-In TIC</b></i> | <i><b>Arbitrage Yield</b></i> |
|----------------------------|-------------------|--------------------------|-------------------------------|
| Par Value                  | 129,580,000.00    | 129,580,000.00           | 129,580,000.00                |
| + Accrued Interest         |                   |                          |                               |
| + Premium (Discount)       |                   |                          |                               |
| - Underwriter's Discount   | (2,591,600.00)    | (2,591,600.00)           |                               |
| - Cost of Issuance Expense |                   | (500,000.00)             |                               |
| - Other Amounts            |                   |                          |                               |
| Target Value               | 126,988,400.00    | 126,488,400.00           | 129,580,000.00                |
| Target Date                | 03/15/2022        | 03/15/2022               | 03/15/2022                    |
| Yield                      | 5.411274%         | 5.442820%                | 5.250649%                     |

# NET DEBT SERVICE

## LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT Larimer County, Colorado

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GENERAL OBLIGATION BONDS, SERIES 2022A 5.000 Debt Service Mills plus PIF Revenues Non-Rated, 1.30x, 30-yr. Maturity

<i>Period Ending</i>	<i>Principal</i>	<i>Coupon</i>	<i>Interest</i>	<i>Total Debt Service</i>	<i>Capitalized Interest Fund</i>	<i>Debt Service Reserve Fund</i>	<i>Net Debt Service</i>
12/01/2022			4,837,653.33	4,837,653.33	4,837,653.33		
12/01/2023			6,802,950.00	6,802,950.00	6,802,950.00		
12/01/2024			6,802,950.00	6,802,950.00	3,401,475.00		3,401,475.00
12/01/2025			6,802,950.00	6,802,950.00			6,802,950.00
12/01/2026			6,802,950.00	6,802,950.00			6,802,950.00
12/01/2027	545,000	5.250%	6,802,950.00	7,347,950.00			7,347,950.00
12/01/2028	1,370,000	5.250%	6,774,337.50	8,144,337.50			8,144,337.50
12/01/2029	1,900,000	5.250%	6,702,412.50	8,602,412.50			8,602,412.50
12/01/2030	2,090,000	5.250%	6,602,662.50	8,692,662.50			8,692,662.50
12/01/2031	2,285,000	5.250%	6,492,937.50	8,777,937.50			8,777,937.50
12/01/2032	2,495,000	5.250%	6,372,975.00	8,867,975.00			8,867,975.00
12/01/2033	2,710,000	5.250%	6,241,987.50	8,951,987.50			8,951,987.50
12/01/2034	2,945,000	5.250%	6,099,712.50	9,044,712.50			9,044,712.50
12/01/2035	3,190,000	5.250%	5,945,100.00	9,135,100.00			9,135,100.00
12/01/2036	3,450,000	5.250%	5,777,625.00	9,227,625.00			9,227,625.00
12/01/2037	3,720,000	5.250%	5,596,500.00	9,316,500.00			9,316,500.00
12/01/2038	4,015,000	5.250%	5,401,200.00	9,416,200.00			9,416,200.00
12/01/2039	4,315,000	5.250%	5,190,412.50	9,505,412.50			9,505,412.50
12/01/2040	4,640,000	5.250%	4,963,875.00	9,603,875.00			9,603,875.00
12/01/2041	4,975,000	5.250%	4,720,275.00	9,695,275.00			9,695,275.00
12/01/2042	5,340,000	5.250%	4,459,087.50	9,799,087.50			9,799,087.50
12/01/2043	5,715,000	5.250%	4,178,737.50	9,893,737.50			9,893,737.50
12/01/2044	6,115,000	5.250%	3,878,700.00	9,993,700.00			9,993,700.00
12/01/2045	6,535,000	5.250%	3,557,662.50	10,092,662.50			10,092,662.50
12/01/2046	6,980,000	5.250%	3,214,575.00	10,194,575.00			10,194,575.00
12/01/2047	7,445,000	5.250%	2,848,125.00	10,293,125.00			10,293,125.00
12/01/2048	7,940,000	5.250%	2,457,262.50	10,397,262.50			10,397,262.50
12/01/2049	8,460,000	5.250%	2,040,412.50	10,500,412.50			10,500,412.50
12/01/2050	9,010,000	5.250%	1,596,262.50	10,606,262.50			10,606,262.50
12/01/2051	21,395,000	5.250%	1,123,237.50	22,518,237.50		11,808,000	10,710,237.50
	129,580,000		151,088,478.33	280,668,478.33	15,042,078.33	11,808,000	253,818,400.00

BOND SOLUTION**LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT**
Larimer County, Colorado

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**GENERAL OBLIGATION BONDS, SERIES 2022A**  
**5.000 Debt Service Mills plus PIF Revenues**  
**Non-Rated, 1.30x, 30-yr. Maturity**

| <i>Period<br/>Ending</i> | <i>Proposed<br/>Principal</i> | <i>Proposed<br/>Debt Service</i> | <i>CAPI &amp; DSRF<br/>Adjustments</i> | <i>Total Adj<br/>Debt Service</i> | <i>Revenue<br/>Constraints</i> | <i>Unused<br/>Revenues</i> | <i>Debt Serv<br/>Coverage</i> |
|--------------------------|-------------------------------|----------------------------------|----------------------------------------|-----------------------------------|--------------------------------|----------------------------|-------------------------------|
| 12/01/2022               |                               | 4,837,653                        | (4,837,653)                            |                                   | 847,927                        | 847,927                    |                               |
| 12/01/2023               |                               | 6,802,950                        | (6,802,950)                            |                                   | 2,137,766                      | 2,137,766                  |                               |
| 12/01/2024               |                               | 6,802,950                        | (3,401,475)                            | 3,401,475                         | 3,927,377                      | 525,902                    | 115.46101%                    |
| 12/01/2025               |                               | 6,802,950                        |                                        | 6,802,950                         | 5,752,567                      | (1,050,383)                | 84.55989%                     |
| 12/01/2026               |                               | 6,802,950                        |                                        | 6,802,950                         | 7,619,168                      | 816,218                    | 111.99801%                    |
| 12/01/2027               | 545,000                       | 7,347,950                        |                                        | 7,347,950                         | 9,553,983                      | 2,206,033                  | 130.02243%                    |
| 12/01/2028               | 1,370,000                     | 8,144,338                        |                                        | 8,144,338                         | 10,593,061                     | 2,448,724                  | 130.06658%                    |
| 12/01/2029               | 1,900,000                     | 8,602,413                        |                                        | 8,602,413                         | 11,189,611                     | 2,587,198                  | 130.07526%                    |
| 12/01/2030               | 2,090,000                     | 8,692,663                        |                                        | 8,692,663                         | 11,304,452                     | 2,611,789                  | 130.04591%                    |
| 12/01/2031               | 2,285,000                     | 8,777,938                        |                                        | 8,777,938                         | 11,414,634                     | 2,636,696                  | 130.03776%                    |
| 12/01/2032               | 2,495,000                     | 8,867,975                        |                                        | 8,867,975                         | 11,531,783                     | 2,663,808                  | 130.03851%                    |
| 12/01/2033               | 2,710,000                     | 8,951,988                        |                                        | 8,951,988                         | 11,644,179                     | 2,692,192                  | 130.07368%                    |
| 12/01/2034               | 2,945,000                     | 9,044,713                        |                                        | 9,044,713                         | 11,763,682                     | 2,718,970                  | 130.06143%                    |
| 12/01/2035               | 3,190,000                     | 9,135,100                        |                                        | 9,135,100                         | 11,878,338                     | 2,743,238                  | 130.02964%                    |
| 12/01/2036               | 3,450,000                     | 9,227,625                        |                                        | 9,227,625                         | 12,000,242                     | 2,772,617                  | 130.04692%                    |
| 12/01/2037               | 3,720,000                     | 9,316,500                        |                                        | 9,316,500                         | 12,117,203                     | 2,800,703                  | 130.06175%                    |
| 12/01/2038               | 4,015,000                     | 9,416,200                        |                                        | 9,416,200                         | 12,241,557                     | 2,825,357                  | 130.00528%                    |
| 12/01/2039               | 4,315,000                     | 9,505,413                        |                                        | 9,505,413                         | 12,360,868                     | 2,855,456                  | 130.04031%                    |
| 12/01/2040               | 4,640,000                     | 9,603,875                        |                                        | 9,603,875                         | 12,487,721                     | 2,883,846                  | 130.02794%                    |
| 12/01/2041               | 4,975,000                     | 9,695,275                        |                                        | 9,695,275                         | 12,609,431                     | 2,914,156                  | 130.05748%                    |
| 12/01/2042               | 5,340,000                     | 9,799,088                        |                                        | 9,799,088                         | 12,738,833                     | 2,939,745                  | 130.00019%                    |
| 12/01/2043               | 5,715,000                     | 9,893,738                        |                                        | 9,893,738                         | 12,862,988                     | 2,969,251                  | 130.01142%                    |
| 12/01/2044               | 6,115,000                     | 9,993,700                        |                                        | 9,993,700                         | 12,994,991                     | 3,001,291                  | 130.03183%                    |
| 12/01/2045               | 6,535,000                     | 10,092,663                       |                                        | 10,092,663                        | 13,121,642                     | 3,028,980                  | 130.01170%                    |
| 12/01/2046               | 6,980,000                     | 10,194,575                       |                                        | 10,194,575                        | 13,256,297                     | 3,061,722                  | 130.03286%                    |
| 12/01/2047               | 7,445,000                     | 10,293,125                       |                                        | 10,293,125                        | 13,385,494                     | 3,092,369                  | 130.04305%                    |
| 12/01/2048               | 7,940,000                     | 10,397,263                       |                                        | 10,397,263                        | 13,522,855                     | 3,125,593                  | 130.06169%                    |
| 12/01/2049               | 8,460,000                     | 10,500,413                       |                                        | 10,500,413                        | 13,654,649                     | 3,154,236                  | 130.03917%                    |
| 12/01/2050               | 9,010,000                     | 10,606,263                       |                                        | 10,606,263                        | 13,794,770                     | 3,188,508                  | 130.06250%                    |
| 12/01/2051               | 21,395,000                    | 22,518,238                       | (11,808,000)                           | 10,710,238                        | 13,929,213                     | 3,218,976                  | 130.05513%                    |
|                          | 129,580,000                   | 280,668,478                      | (26,850,078)                           | 253,818,400                       | 328,237,282                    | 74,418,882                 |                               |



## **EXHIBIT G**

### Form of District Disclosure Notice

**EXHIBIT G**  
**Disclosure Notice**

SPECIAL DISTRICT PUBLIC DISCLOSURE  
Pursuant to § 32-1-104.8 C.R.S.

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of the District:                 | Ledge Rock Commercial Metropolitan District ("District")                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Contact Information for the District: | Ledge Rock Commercial Metropolitan District<br>c/o Pinnacle Consulting Group, Inc.<br>550 W. Eisenhower Blvd., Loveland, CO 80537                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Powers of the District:               | <p>All powers authorized in § 32-1-1004, C.R.S., including, but not limited to, mosquito control, parks or recreational facilities or programs, traffic and safety controls, sanitation services, street improvements, and water services, subject to the limitations contained in the District's Service Plan regarding the exercise of such powers.</p> <p>The District's Service Plan specifically limits the District's authority to exercise the following powers without an intergovernmental agreement with the Town of Johnstown: fire protection, ambulance and emergency services, television relay and translator facilities, telecommunication and solid waste collection, and transportation services.</p>                                                                             |
| Service Plan:                         | The District's Service Plan, which may be amended from time to time, includes a description of the District's powers and authority. A copy of the District's Service Plan is available from the District and from the Division of Local Government.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Financial Powers of the District:     | The District is authorized by Title 32 of the Colorado Revised Statutes to use a number of methods to raise revenues for capital needs and general operations costs. These methods, subject to the limitations imposed by Section 20 of Article X of the Colorado Constitution, include issuing debt, levying taxes, and imposing fees and charges. Information concerning directors, management, meetings, elections and current taxes are provided annually in the Notice to Electors described § 32-1-809(1), C.R.S., which may be found at the District's office, on the District's web site, on file at the Division of Local Government in the State Department of Local Affairs, or on file at the office of the clerk and recorder of each county in which the special district is located. |
| District Boundaries:                  | A map of the District's boundaries is attached hereto as <u>Exhibit A</u> . Please note that the District's boundaries may change from time to time. Please contact the District for the latest information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**District Taxes and Fees:**

The District has authority to impose property taxes for the construction, operation, and maintenance of the improvements identified in the Service Plan. The District has the authority to issue debt and, in order to pay debt and for operations and maintenance costs, the District may impose a Debt Mill Levy and an Operations and Maintenance Mill Levy, and collect property taxes on properties within the District. The District may also establish a one-time Development Fee that may be imposed on a per-square foot basis for commercial property, and may impose other fees and charges. The Service Plan establishes a Maximum Debt Mill Levy, and a maximum Operations and Maintenance Mill Levy. The District has the authority to exceed these mill levy caps as provided in the Service Plan. The District's taxes are in addition to other property taxes imposed and collected by other governments such as the Town of Johnstown, Weld County, and other jurisdictions. Below are samples of potential property taxes of the District, based on assumed mill levies. Actual mill levies and property taxes in any year may be higher or lower.

## LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT PROPERTY TAX ILLUSTRATION

The following is a sample calculation of the property taxes that will be imposed by and paid solely to the District. This calculation does not include the property taxes that will be due and owing to other public taxing entities, such as to the Town of Johnstown, the Weld County Reorganized School District RE-5J or the Thompson School District R2-J and the Thompson Rivers Parks and Recreation District.

### Sample Calculation of Property Tax for a Commercial, Office or Industrial Property based on the Commercial Mill Levy Cap:

#### **Assumptions:**

Market value of commercial property is \$750,000

Mill levy cap is 25 mills \*

#### **Calculation:**

$\$750,000 \times .29 = \$217,500$  (Assessed Valuation)

$\$217,500 \times .025 \text{ mills} = \textbf{\$5,437.50 per year in taxes owed solely to the District}$

\* Per the Service Plan, the District is entitled to adjust the mill levy cap under certain circumstances, without a corresponding increase in the amount of taxes due and owing. For example, if the assessed valuation ratio for commercial property is reduced below .0715, the District is entitled to increase the mill levy to recover the same amount of taxes that would have been paid based on the assessed valuation ratio on the date of approval of the Service Plan.

## **EXHIBIT H**

### Part I – Developer Indemnity Letter



**EXHIBIT H**  
Part I – Developer Indemnity Letter

September 8, 2021

Town of Johnstown  
450 S. Parish Avenue  
Johnstown, CO 80534

**RE: Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2**

To the Town Council:

This Indemnification Letter (the “Letter”) is delivered by the undersigned (the “Developer”) in connection with the review by the Town of Johnstown (the “Town”) of the Service Plan, including all amendments heretofore or hereafter made thereto (the “Service Plan”) for the Ledge Rock Center Commercial Metropolitan District (the “District”). Developer, for and on behalf of itself and its transferees, successors and assigns, represents, warrants, covenants and agrees to and for the benefit of the Town as follows:

1. Developer hereby waives and releases any present or future claims it might have against the Town or the Town’s elected or appointed officers, employees, agents, contractors or insurers (the “Released Persons”) in any manner related to or connected with the adoption of a Resolution of Approval regarding the Town’s approval of the District’s Service Plan or any action or omission with respect thereto. Developer further hereby agrees to indemnify and hold harmless the Released Persons from and against any and all liabilities costs and expenses (including reasonable attorneys’ fees and expenses and court costs) resulting from any and all claims, demands, suits, actions or other proceedings of whatsoever kind or nature made or brought by any end user, property owner or other person or third party which directly or indirectly or purportedly arise out of or are in any manner related to or connected with any of the following: (a) the Service Plan or any document or instrument contained or referred to therein; or (b) the formation of the District; or (c) any actions or omissions of the Developer or the District, or their agents, in connection with the District, including, without limitation, any actions or omissions of the Developer or District, or their agents, in relation to any bonds or other financial obligations of the District or any offering documents or other disclosures made in connection therewith.

2. This Letter has been duly authorized and executed on behalf of Developer.

Very truly yours,

DEVELOPER:  
LEDGE ROCK CENTER, LLC

By: Michael G. Schuyf  
Title: Member

## Part II - District Indemnity Letter

## Part II - District Indemnity Letter

{date – date of organizational meeting}

Town of Johnstown  
450 S. Parish Avenue  
Johnstown, CO 80534

**RE: Ledge Rock Center Commercial Metropolitan District**

To the Town Council:

This Indemnification Letter (the “Letter”) is delivered by Ledge Rock Center Commercial Metropolitan District (the “District”) in order to comply with the Service Plan, including all amendments heretofore or hereafter made thereto (the “Service Plan”) for the District. The District, for and on behalf of itself and its transferees, successors and assigns, covenant and agree to and for the benefit of the Town as follows:

1. The District hereby waive and release any present or future claims they might have against the Town or the Town’s elected or appointed officers, employees, agents, contractors or insurers (the “Released Persons”) in any manner related to or connected with the adoption of a Resolution of Approval of the Town of the District’s Service Plan or any action or omission with respect thereto. To the fullest extent permitted by law, the District hereby agree to indemnify and hold harmless the Released Persons from and against any and all liabilities costs and expenses (including reasonable attorneys’ fees and expenses and court costs) resulting from any and all claims, demands, suits, actions or other proceedings of whatsoever kind or nature made or brought by any end user, property owner or other person which directly or indirectly or purportedly arise out of or are in any manner related to or connected with any of the following: (a) the Service Plan or any document or instrument contained or referred to therein; or (b) the formation of the District; or (c) any actions or omissions of Ledge Rock Center, LLC (the “Developer”), or their agents, in connection with the formation and organization of the District, including, without limitation, any actions or omissions of the District or Developer, or their agents, in relation to any bonds or other financial obligations of the District or any offering documents or other disclosures made in connection therewith, including any claims disputing the validity of the Service Plan and said Resolution of Approval of the Town.

2. It is understood and agreed that neither the District nor the Town waive or intend to waive the monetary limits or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, § 24-10-101, *et seq.*, C.R.S., as from time to time amended, or any other defenses, immunities, or limitations of liability otherwise available to the Town, the District, its officers, or its employees by law.

3. This Letter has been duly authorized and executed on behalf of the District.

Very truly yours,

LEDGE ROCK CENTER COMMERCIAL  
METROPOLITAN DISTRICT

By: \_\_\_\_\_  
President

Attest:

\_\_\_\_\_  
Secretary



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**Memorandum**

File No. 5501871

TO: Town of Johnstown

FROM: David S. O'Leary, Esq.

RE: Executive Summary for Proposed Ledge Rock Center Commercial Metropolitan District

DATE: August 31, 2021

The proposed formation of the Ledge Rock Center Commercial Metropolitan District (the "District") encompasses the land generally located south of Highway 60/County Road 48 and east of Interstate I-25. The proposed service area includes approximately 35.857 acres of commercial land in its initial boundaries and approximately 88.804 acres of additional commercial development that is anticipated to be included into the Commercial District from the future inclusion area properties (for a total of 124.661 acres of commercial property within the Commercial District Service Area).

The service area is anticipated to include potential public infrastructure, improvements and amenities/uses upon acquisition and development including, but not limited to requested location of approximately 90 Park and Ride parking spaces to be included in the Project based upon a request of the Department of Transit and Rail of the Town, on-site and off-site public improvements that will be determined during the land use review process in accordance with the Town's ordinances, rules and regulations which include, among other potential improvements: (i) improvements to State Highway 60, as required by and in coordination with the Town and CDOT; (ii) improvements to High Plains Boulevard, as required by and in coordination with the Town and Weld County; (iii) improvements to the Home Supply Ditch, as required by and in coordination with the Town and Consolidated Home Supply Reservoir and Ditch Company; and (iv) undergrounding electric utilities adjacent to the Town Parcel, as required by the Town and in coordination with the Town and the electric utility provider.

The Ledge Rock Center Commercial Metropolitan District Service Plan is proposed to contain the commercial development within the Ledge Rock Center development. All property within the proposed initial and future inclusion area boundaries has been annexed within the boundaries of the Town of Johnstown ("Town").

The primary purpose of the District is to provide public improvements consistent with Town-approved development plans that will be dedicated to the Town or dedicated to another public entity (or if permitted by IGA with the Town, retained by the District) for the use and benefit of the District's constituents, end users, the taxpayers, visitors and the public.

Considerable infrastructure will be constructed to provide the public improvements needed to support the development in and around the District. This Service Plan addresses the improvements to be provided by the District and demonstrates how the District proposed to serve the development will work together to provide the necessary public improvements.

Services and powers provided for metropolitan districts authorized by the Special District Act, pursuant to Title 32, C.R.S. and provided within similar districts within the Town, for consideration on the next possible public hearing of the Town Council in order to meet the requirements of a formation election in November 2021.





**I. Major Service Plan Points for the Ledge Rock Commercial Metropolitan District.**

- The owners of the property are proposed to be Ledge Rock Center, LLC and its affiliated entities.
- Developer of the property is Ledge Rock Center, LLC, and their affiliated entities (Michael Schlup and Allen Schlup are their consultants and their representatives)
- The Draft Financing Plan was provided by Piper Sandler & Company.
- Construction cost estimates were assembled by the Developer with consultation with the District Engineer, Point Consulting which has experience in the costing and construction of similar facilities.

**II. The Project:**

- 124.661 total acres of service area: initial boundaries are anticipating to include approximately 35.857 acres of commercial property, with 88.804 acres of future inclusion area property. All acres of property in the initial boundaries and future inclusion area boundaries are annexed to and within the Town of Johnstown.
- Assumptions upon which this Service Plan is based are reflective of the anticipated initial zoning for the property within the proposed District, the cost estimates, and the Financing Plan are sufficiently flexible to enable the District to provide necessary services and facilities without the need for repeated amendments to the Service Plan.
- Modification of the proposed configuration of improvements, scheduling of construction of such improvements, as well as the locations and dimensions of various facilities and improvements shall be permitted to accommodate development needs consistent with zoning and future development approvals for the property, but consistent with approved development plans of the Town
- Anticipated development of approximately 750,000 square feet of retail space, with approximately 125,000 square feet of retail space being developed annually from 2022 through 2027 with pricing inflated as the development occurs.
- An economic analysis and impact study will be done by the Town to discuss the use of a Town parcel, and for an incentive package where current sales tax revenue is proposed to be shared between the Town and the District for the purposes of financing the commercial public improvements and acquisition of land for public purposes.
- A future inclusion area adjacent to I-25 and Hwy 60 (future inclusion area 1 – Town Parcel) of approximately 79.276 acres is anticipated to be included acquired by the Developer and included within District No. 2 shortly after formation once the property is closed upon and transferred to the Developer for the purposes of financing and constructing commercial public improvements and common areas for parking and retail areas. A future inclusion area for the proposed park and ride 90 potential spaces (future inclusion area 2) consists of approximately 2.479 acres. An additional future inclusion area (future inclusion area 3) of 7.049 acres anticipated to consist of two hotels and a conference center containing approximately 35,000 square feet of hotel and conference center property, with 219 units estimated to be valued at \$25,000,000 in value.



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- Assuming development occurs as projected the commercial assessed valuation at full buildout for collection year 2029 is expected to be \$55,567,459 for District No. 2. These values may differ based upon changes in assessed value of the property upon final completion of construction and development with additional assessed valuation possible depending upon final approved development plans with the Town and addition of the future inclusion area and potential additional public improvement costs and expenses as well as additional assessed valuation possible for a potential \$25,000,000 in actual value and \$277,778 in assessed valuation from that real property contained in the hotel and conference center site within the commercial development and future inclusion area.
- Additional revenue has been projected for Credit PIF and Ad-On PIF revenue for retail sales within District No. 2 of \$37,500,000 per year beginning in 2023 corresponding with each year's absorption of 125,000 sf per year of retail commercial space (totaling upon full build out, approximately \$150,000,000 in actual property value and \$47,562,874 in assessed value in 2029. The estimated retail sales of approximately \$37,500,000 per year has been projected for each year beginning in 2022 following absorption, totaling \$225,000,000 in annual sales upon full buildout and absorption).
- The estimated cost of the public improvements needed for the commercial property portion of the Ledge Rock Center project is currently estimated to be \$152,054,812 for onsite and offsite public improvements based upon current plans. Additional public improvements may be needed for future inclusion areas 2 and 3 depending upon approved development plans which must be approved by the Town prior to construction and development of the commercial property.
- The proposed financing plan provides for an aggregate mill levy cap of 25 mills for both debt and operations purposes. Initially, the commercial financing plan estimates provide for 5 mills for debt and 5 mills for operations within the commercial district and the primary source of revenue being credit PIF and add on PIF revenue generated from retail sales taxes on commercial property. The additional mill levies may be used in the future depending upon needs of the project with all intergovernmental agreements of the Commercial District requiring Town review and approval.
- Additionally, a Credit PIF of 2.0% and an Add-On PIF of up to 2.5% is anticipated to be assessed and collected against retail sales within projected 750,000 sf of space within the commercial/retail district as well as the property 7.1 acres and 35,000 sf of hotel/conference center commercial property within future inclusion area 3 (hotel site).
- The proposed and projected public improvements needed for the project will require additional financing to construct and complete. District financing is projected to pay for public improvements constructed through one or more bond issuances for each District. The total par amount of bonds estimated in 2022 is approximately \$144,821,000, which is anticipated to generate approximately \$114,422,092 in net proceeds provided full buildout occurs as anticipated using a 30 year amortization schedule. Additional financing may be needed for the future inclusion area parcels 2 and 3 depending upon the construction and completion the 90 park and ride spaces and related facilities and the potential development of a hotel/conference center on the 7.049 acre future inclusion area parcel number 3 (Rogers Parcel).
- Debt is proposed to be issued in one or more series of bond issuances to allow for financing of constructed infrastructure and expedient completion of the Development.



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- One or more hotels have approached the developer regarding the potential construction of a hotel/conference center within the future inclusion/commercial areas of the District. A financial pro forma demonstrating the additional value and revenue generated from a \$25,000,000+ hotel/conference center with 219 rooms, running at 75% capacity is estimated to generate an additional \$2,874,375 annually of revenue based upon that a similar Credit PIF and Add-On PIF structure, depending upon successful completion and construction of the hotels and conference center and potentially increases the debt capacity and revenue of the commercial district upon completion.
- Requested Debt Authorization of \$173,785,000 allows for approximately 120% coverage (based upon the financing plan run at \$144,422,092 in capacity with Credit PIF, Add-On PIF, revenue from the proposed hotel, and limited mill levies and operations and maintenance costs included) which would allow for contingencies and financing variations based upon changes to construction costs, development build out and absorption of the project. The net proceeds of the initial estimated bond issuances would be approximately \$114,422,092. Current modeling has not been projected to provide any additional revenue other than property tax for the hotel/commercial site initially. Additionally capacity may be available based upon what is ultimately constructed in the project based upon approved development plans. Public improvement costs not financed through the District would be funded through developer advances, private contributions or other financing contributions.
- Maximum voted interest rate of 12%, maximum underwriting discount of 4%. Interest on Developer Debt shall be limited to 8% simple interest.
- Metropolitan district powers allowed by the Special District Act and consistent with other Town of Johnstown metropolitan districts.
- Formation Election after approval of the Service Plan in November 2021.
- There are no current residents within the District and no debt or bonds have been issued.
- Mill levies, interest rate limitations and underwriting discounts will be consistent with the present Town imposed limitations with other service plans approved by the Town.
- Maximum term of any bond issue is 30 years for General Obligation Bonds.
- Intergovernmental Agreement with Town of Johnstown to implement Service Plan restrictions. No operations are currently authorized and future operations and maintenance of public improvements are subject to prior approval and authorization pursuant to intergovernmental agreement with the Town of Johnstown
- Ledge Rock Center Commercial Metropolitan District shall develop and finance its own property.
- Ledge Rock Center, LLC is actively developing and meeting with the Town to complete both onsite and offsite public improvements for the commercial property, residential development and multi-family and hotel/conference center property and park and recreation improvements for the residential property.



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The Ledge Rock Center Commercial Metropolitan District Service Plan will serve the best interests of the taxpayers, property owners and development of the property within the Ledge Rock Center development, will maximize both development and absorption within the District and Town without delays in development. The formation of the District will allow for financing and development to pay for only those improvements and costs which are a direct benefit to the property within the District.

**TOWN OF JOHNSTOWN, COLORADO  
RESOLUTION NO. 2021-28**

**RESOLUTION APPROVING THE SERVICE PLAN FOR  
LEDGE ROCK CENTER COMMERCIAL METROPOLITAN DISTRICT**

**WHEREAS**, the Town of Johnstown, Colorado (“Town”) is a Colorado home rule municipality, duly organized and existing under the laws of the State of Colorado and the Town’s Home Rule Charter; and

**WHEREAS**, the Town Council of the Town (“Town Council”) is vested with authority to administer the affairs of the Town; and

**WHEREAS**, pursuant to Section 32-1-204.5, C.R.S., a Service Plan for the Ledge Rock Center Commercial Metropolitan District (“Service Plan”), a copy of which is attached hereto and incorporated herein by reference as Exhibit A, was submitted to the Town Council for approval; and

**WHEREAS**, Ledge Rock Center, LLC, a Kansas limited liability company (“Developer”), the purchaser of the real property within the initial proposed boundaries of the Ledge Rock Center Commercial Metropolitan District (“District”), with the consent of the owners of the real property, as evidenced in the Service Plan, has requested approval of the Service Plan; and

**WHEREAS**, pursuant to the provisions of Title 32, Article 1, Part 2, C.R.S., on September 8, 2021, the Town Council, following due notice, held a public hearing on the proposed Service Plan; and

**WHEREAS**, the Town Council considered the Service Plan and all other testimony and evidence presented at the hearing; and

**WHEREAS**, based upon the testimony and evidence presented at the hearing, the Town Council finds that the Service Plan should be approved, subject to the conditions set forth below, in accordance with Section 32-1-204.5(1)(c), C.R.S.

**NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF JOHNSTOWN, COLORADO, THAT:**

1. **Satisfaction of Statutory Requirements as to Filing and Notice.** The Town Council, as the governing body of the Town of Johnstown, Colorado, does hereby determine, based on representations made by and on behalf of the Developer and proponents of the formation of the District, that all of the requirements of Title 32, Article 1, Part 2, C.R.S., as amended, relating to the filing of the proposed Service Plan for the District have been fulfilled and that notice of the hearing was given in the time and manner as provided in Section 32-1-204, C.R.S.

2. **Jurisdiction.** Based on representations by and on behalf of the Developer and proponents of the formation of the District, the Town Council of the Town of Johnstown,



Colorado, has jurisdiction over the subject matter of the proposed Service Plan pursuant to Title 32, Article 1, Part 2, C.R.S., as amended.

3. **Findings.** That, pursuant to Section 32-1-204.5, C.R.S., Section 32-1-202(2), C.R.S., and Section 32-1-203(2), C.R.S., the Town Council does hereby find and determine, based on the Service Plan, the representations by and on behalf of the Developer and proponents of the formation of the District, and other evidence presented at the public hearing, that:

- (a) There is sufficient existing and projected need for organized service in the area to be serviced by the District;
- (b) The existing service in the area to be served by the District is inadequate for present and projected needs;
- (c) The District is capable of providing economical and sufficient service to the area within its proposed boundaries; and
- (d) The area to be included in the District has, or will have, the financial ability to discharge the proposed indebtedness on a reasonable basis.

4. **Service Plan Approved; Conditions and Limitations.** The Town Council hereby approves the Ledge Rock Center Commercial Metropolitan District, attached as Exhibit A. This approval is given specifically subject to the following conditions and limitations pursuant to Section 32-1-204.5(1)(c), C.R.S.:

- (a) At its first meeting after the effective date of this Resolution and in no event later than sixty (60) days after the formation election of the District, the Board of Directors of the District shall execute the Intergovernmental Agreement with the Town (“IGA”) and the District’s Indemnity Letter in the forms set forth as exhibits to the Service Plan presented to the Town Council at its September 8, 2021, public hearing, or in forms otherwise acceptable to the Town Attorney, and shall deliver the fully executed originals of the IGA and Indemnity Letter to the Town within ten (10) days of the District’s organizational meeting.
- (b) The Town’s approval of the Service Plan shall not relieve the Developer or any other owner of property in the District of any requirement, under the annexation agreement pertaining to the property within the District’s boundaries or otherwise, to provide financial guarantees for construction of, and dedicate to the Town, the required public improvements.
- (c) Once the District has been duly organized, any material modification of the Service Plan shall require an amendment to the Service Plan, which must be approved by Town Council.
- (d) The conditions set forth in this Resolution are not intended and shall not be construed to enlarge, diminish, or otherwise affect any of the requirements, limitations or other provisions of the Service Plan or IGA.

5. **Execution of Town IGA.** The IGA referred to in Section 4(a) above is hereby approved in essentially the same form as the copy of such IGA set forth as Exhibit D to the Service Plan, which was presented to the Town Council at the September 8, 2021, public hearing. The Mayor and Town Clerk are hereby authorized to execute the IGA on behalf of the Town provided the same has first been executed by the District.

6. **Filing of Resolution.** A certified copy of this Resolution shall be filed in the records of the Town and submitted to the Developer for the purpose of filing in the District Court of Weld County.

PASSED, SIGNED, APPROVED, AND ADOPTED this \_\_\_\_ day of \_\_\_\_\_, 2021.

**ATTEST:**

**TOWN OF JOHNSTOWN, COLORADO**

By: \_\_\_\_\_  
Diana Seele, Town Clerk

By: \_\_\_\_\_  
Gary Lebsack, Mayor



# Town of Johnstown

## TOWN COUNCIL AGENDA COMMUNICATIONS

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**AGENDA DATE:** September 8, 2021

**SUBJECT:** **Public Hearing** – Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 1

**ACTION PROPOSED:** Consider Resolution No. 2021-29

**ATTACHMENTS:**

1. Proposed Service Plan
2. Executive Summary prepared by David O’Leary, counsel for the Developer
3. Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 1

**PRESENTED BY:** Town Attorney, Avi Rocklin, and Special Counsel, MaryAnn McGeady

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### AGENDA ITEM DESCRIPTION:

An application for approval of a Service Plan for the Ledge Rock Center Residential Metropolitan District No. 1 (“Service Plan”) was submitted on behalf of Ledge Rock Center, LLC, a Kansas limited liability company (“Developer”), pursuant to the requirements of the Special District Control Act, Title 32, Article 1, Part 2, C.R.S. The Service Plan was submitted in connection with a development known as Ledge Rock Center, generally located east of U.S. Interstate 25 and south of Highway 60/County Road 48 (“Property”). The Ledge Rock Center development is anticipated to include commercial development, multi-family development and single-family residential homes. The service area of the proposed District includes the multi-family portion of the Ledge Rock Center development. The Developer is under contract to purchase the Property. The owners of the Property provided consent to the organization of the District, as evidenced in Exhibit C-3 to the Service Plan.

To satisfy the statutory requirements, the Service Plan includes (1) a description of the proposed services, (2) a financial plan as to how the services are to be financed, (3) a preliminary engineering or architectural survey showing how the proposed services are to be provided, (4) a map of the proposed boundaries of the District, (5) an estimate of the population and valuation for assessment of the proposed district, (6) a description of the facilities to be constructed and the standards for construction, (7) a general description of the estimated cost of acquiring land, engineering services, legal services, administrative services, initial proposed indebtedness and estimated proposed maximum interest rates and discounts, and other major expenses related to the organization and initial operation of the District, and (8) a proposed intergovernmental agreement between the Town and the District.

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The service area for the proposed Ledge Rock Center Residential Metropolitan District No. 1 (“District”) includes approximately 50.733 acres of land with an anticipated 1008 multi-family units.

The Service Plan is generally consistent with the Model Service Plan adopted by Town Council on February 22, 2017.

The maximum debt mill levy is 40 mills and the maximum operations and maintenance mill levy is 10 mills. The mill levies are subject to an assessed valuation adjustment, meaning, primarily, that if the residential assessment rate is changed (the ratio of assessed valuation to actual valuation), the mill levy may be increased above the cap so that the rate change is revenue neutral to the District.

The maximum term for developer debt is 20 years from the initial imposition of an ad valorem property tax, unless the Town approves a longer term by intergovernmental agreement, and 40 years for all other debt.

The capital plan, attached as Exhibit E to the Service Plan, estimates public improvement project costs of approximately \$18,914,916. Given the timing of the submittals, Greg Weeks, the Town’s Engineer, did not have an opportunity to review the capital plan.

The financial plan, attached as Exhibit F to the Service Plan, provides that the District will have the ability to issue debt in the amount of \$2,993,000, which is anticipated to generate approximately \$1,797,587 in net proceeds to the project. The maximum debt authorization under the Service Plan is \$3,600,000.

Importantly, the District is not entitled to issue any debt until an Amended and Restated Service Plan is presented to and approved by the Town Council. The methodology allows the Developer to form the District during the November election but provides the Town Council with an opportunity to review and, if appropriate, modify the terms of the Service Plan once the development plans are better understood.

Pursuant to state law, the Town Council must approve the Service Plan before the District is formed and entitled to operate. The Service Plan must be approved through a public hearing process. Upon approval, the Service Plan, along with a petition for organization of the District, must be submitted to the Weld County District Court, who will then hold a hearing on the petition and order an election regarding the organization of the District. Notice of this public hearing before the Town Council was published in *The Johnstown Breeze* and provided to interested persons by the proponents of the District.

#### **LEGAL ADVICE:**

The Town Attorney and the Town’s Special Counsel have reviewed the proposed Service Plan.

#### **FINANCIAL ADVICE :**

The Town’s Special Counsel has reviewed the financial plan.

**RECOMMENDED ACTION:** Approve Resolution No. 2021-29

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#### **SUGGESTED MOTIONS:**

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**For Approval:** I move to approve Resolution No. 2021-29, a Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 1.

**For Approval with Conditions:** I move to approve Resolution No. 2021-29, a Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 1, with the following modifications to the proposed Service Plan, \_\_\_\_\_, and direct the Town Attorney to revise the Service Plan accordingly.

**For Denial:** I move to deny approval of Resolution No. 2021-29, a Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 1.

*Reviewed and Approved for Presentation,*



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Town Manager



**SERVICE PLAN**  
**FOR**  
**LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 1**  
**TOWN OF JOHNSTOWN, COLORADO**

Prepared  
by

SPENCER FANE, LLP  
1700 Lincoln Street, Suite 2000  
Denver, Colorado 80203

Resubmitted: August 30, 2021

Approved: \_\_\_\_\_, 2021

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| <b>EXHIBIT G</b>   | Form of District Disclosure Notice                             |
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## I. INTRODUCTION

### A. Intent and Purpose.

The Town intends that this Service Plan grant authority to the District to provide for the planning, design, acquisition, construction, installation and financing of Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The Town and the District acknowledge that the District is an independent unit of local government, separate and distinct from the Town, and, except as may otherwise be provided for by State or local law, this Service Plan or an intergovernmental agreement with the Town, the District's activities are subject to review by the Town only insofar as the activities may deviate in a material manner from the requirements of the Service Plan. The primary purpose of the District will be to finance the construction of these Public Improvements.

The District may also provide ongoing operations and maintenance services as set forth in this Service Plan.

### B. Need for the District.

There are currently no other governmental entities, including the Town, located in the immediate vicinity of the District that consider it desirable, feasible or practical to undertake the planning, design, acquisition, construction, installation, and financing of the Public Improvements or the ownership, operation and maintenance by the Town or another entity. Formation of the District is therefore necessary in order for the Public Improvements to be provided in the most economic manner possible.

### C. Town's Objective Regarding the District's Service Plan.

The Town's objective in approving the Service Plan is to authorize the District to provide for the planning, design, acquisition, construction, installation, relocation, redevelopment, financing, repair, replacement and operations and maintenance of the Public Improvements from the proceeds of Debt that may be issued by the District and to provide for the ownership, operation or maintenance by the Town or District where appropriate. Debt is expected to be repaid by an ad valorem property tax no higher than the Maximum Debt Mill Levy. Debt issued within these parameters and, as further described in the Financial Plan, is intended to insulate property owners from excessive tax and financial burdens and result in a timely and reasonable repayment. Generally, the cost of Public Improvements that cannot be funded within these parameters and the financing capacity of the District are not costs to be paid by the District.

The Town intends to authorize the District to have the ability to plan, design, acquire, construct, install and finance the initial Public Improvements necessary to develop the Project and seeks the timely payment of Debt related to those initial Public Improvements so that the financial burden on End Users is minimized. The District shall not be entitled to issue any Debt until it has received approval of a Service Plan Amendment in the form of an Amended and Restated Service Plan and shall be required to obtain authorization of the Town, in the form of an intergovernmental agreement, prior to issuing Debt for the redevelopment of an existing Public Improvement.



The Town prefers that all property classified as “residential” shall be located solely within the boundaries of a residential district and that all property classified as “commercial” shall be located solely within the boundaries of a commercial district. For purposes of this distinction “commercial property” shall mean all property other than “residential real property” as that term is defined in Article X, Section 3(1)(b) of the Colorado Constitution. The distinction facilitates two goals: (1) to have similarly situated properties governed by common interests, and (2) to apply a lower maximum tax burden on residential owners. The foregoing shall not prohibit residential and commercial Districts from sharing the costs of Public Improvements in compliance with the provisions of this Service Plan and applicable law, provided, however, that no fees derived from retail sales shall be used to pay the costs of the Public Improvements .

Unless the District has operational responsibilities for any of the Public Improvements or Covenant Enforcement and Design Review Services, the Town intends that the District dissolve upon payment or defeasance of all Debt incurred or upon a court determination that adequate provision has been made for the payment of all Debt and for continuation of any operations.

## **II. DEFINITIONS**

In this Service Plan, the following terms shall have the meanings indicated below, unless the context hereof clearly requires otherwise:

Amended and Restated Service Plan: means an amendment to this Service Plan approved by the Town Council that may, among other potential matters, authorize the issuance of Debt in compliance with the terms thereof.

Approved Development Plan: means a subdivision improvement development agreement, preliminary or final plat or other process established by the Town for identifying, among other matters, Public Improvements necessary for facilitating development for property within a part or all of the Service Area as approved by the Town pursuant to the Town Code, as amended from time to time.

Assessment Ratio Adjustment: means, if, on or after January 1, 2021, there are changes in the method of calculating assessed valuation or any constitutionally mandated tax credit, cut or abatement, the Maximum Debt Mill Levy and Maximum Operations and Maintenance Mill Levy may be increased or decreased to reflect such changes, such increases and decreases to be determined by the Board in good faith (such determination to be binding and final) so that to the extent possible, the actual tax revenues generated by the applicable mill levy, as adjusted for changes occurring after January 1, 2021, are neither diminished nor enhanced as a result of such changes. For purposes of the foregoing, a change in the ratio of actual valuation to assessed valuation shall be deemed to be a change in the method of calculating assessed valuation.

Board: means the Board of Directors of the District.

Bond, Bonds or Debt: means bonds, notes, contracts, reimbursement agreements or other multiple fiscal year financial obligations issued by the District or other obligations for the

payment of which the District has promised to impose an ad valorem property tax mill levy and/or impose and collect Development Fees.

Bond Counsel Opinion: means the opinion, to be provided by an attorney licensed in Colorado and published in the then current publication of the Bond Buyer Directory of Municipal Bond Attorneys, providing that the Debt that is the subject of the opinion was issued in accordance with the provisions of the Service Plan.

Capital Plan: means the Capital Plan described in Section V.C. which includes: (a) a list of the Public Improvements which may be developed by the District; (b) an engineer's estimate of the cost of the Public Improvements; and (c) a pro forma capital expenditure plan correlating expenditures with development.

Cost Verification Report: means a report provided by an engineer or accountant as required pursuant to Section V.A.28

Covenant Enforcement and Design Review Services: means those covenant enforcement and design review services authorized in the Special District Act.

Debt: See Bond, Bonds or Debt.

Developer: means the owner or owners of the property within the Service Area, any affiliates of such owner or owners and their successors and assigns other than End Users. As of the date of this Service Plan, the Developer is Ledge Rock Center, LLC, and may include its heirs, affiliates, successors and assigns designated by the Developer to the Town from time to time.

Developer Debt: means bonds, notes, contracts, reimbursement agreements or other multiple fiscal year financial obligations issued by the District to the Developer within the District for reimbursement of sums advanced or paid for funding of Public Improvements and/or operation and maintenances expenses. Developer Debt shall be subordinate to other Debt of the District.

Developer Debt Mill Levy Limitation Term: means the Developer Debt Mill Levy Imposition Term set forth in Section VI.D.1.

Development and Reimbursement Agreement: means an agreement, as amended from time to time, between the Town and the Ledge Rock Center Residential Metropolitan District No. 1, and the Developer as to those items which the Developer may be a party, that provides, among other matters, the terms and conditions relating to maximum interest rates on Debt issued to the Developer or other landowners, and limitations on other revenue sources.

District: means Ledge Rock Center Residential Metropolitan District No. 1.

End User: means any owner or occupant of any taxable residential real property within the District after such property has been vertically developed. By way of illustration, a resident

homeowner or renter, is an End User. The Developer and any business entity that constructs homes is not an End User.

External Financial Advisor: means a consultant that: (1) advises Colorado governmental entities on matters relating to the issuance of securities by Colorado governmental entities, including matters such as the pricing, sales and marketing of such securities and the procuring of bond ratings, credit enhancement and insurance in respect of such securities; (2) shall be an underwriter, investment banker, or individual listed as a public finance advisor in the Bond Buyer's Municipal Market Place; and (3) is not an officer or employee of the District.

External Financial Advisor Certification: means the certification required to be provided pursuant to Section V.A.10. below.

Fee or Fees: means any fee, rate, toll, penalty, or charge imposed by the District for services, programs or facilities provided or to be provided by the District.

Financial Plan: means the initial proposed Financial Plan described in Section VI, which describes (i) how the Public Improvements are to be financed; (ii) how Debt may be incurred; and (iii) the estimated operating revenue derived from property taxes for the first budget year. Such costs shall not constitute legal limits on the financial powers of the District; provided, however, that the District shall not be permitted to issue Bonds which are not in compliance with the bond registration and issuance requirements of Colorado law and which are not in compliance with the terms of the Development and Reimbursement Agreement, this Service Plan and any other agreements between the District and the Town.

District Boundaries: means the boundaries of the area described in the District Boundary Map.

District Boundary Map: means the map attached hereto as **Exhibit C-1**, describing the boundaries of the District.

Intergovernmental Agreement: means the Intergovernmental Agreement required by the Town, a form of which is attached hereto as **Exhibit D** and described in Article IX hereof.

Map Depicting Public Improvements: means the map attached hereto as **Exhibit E**, showing the initial proposed location(s) of the Public Improvements listed in the Capital Plan. The location and specifications of the Public Improvements may change from time to time without a requirement to amend the Map Depicting the Public Improvements or an amendment to the Service Plan.

Maximum Debt Authorization: means the total Debt the District is permitted to incur as set forth in Section V.A.14. below.

Maximum Debt Mill Levy: means the maximum mill levy the District is permitted to impose for payment of Debt as set forth in Section VI.C below.

Maximum Debt Mill Levy Imposition Term: means the maximum term for imposition of a mill levy as set forth in Section VI.D. below.

Maximum Operations and Maintenance Mill Levy: means the maximum mill levy the District is permitted to impose for payment of Operation and Maintenance Expenses, as set forth in Section VI.C.2. below.

Operations and Maintenance Mill Levy: means the mill levy the District is permitted to impose for payment of administrative, operations and maintenance expenses as set forth in Section VI.C.2. below.

Privately Placed Debt: means Debt that is issued by the placement of the Debt directly with the Debt purchaser and without the use of an underwriter as a purchaser and reseller of the Debt, and includes, but is not limited to, Developer Debt and bank loans.

Project: means the multi-family residential development in a development to be known as Ledge Rock Center.

Proof of Ownership: means a current title commitment or ownership and encumbrance report showing ownership and all encumbrances on all properties within the District Boundaries, or other documentation acceptable to the Town Attorney.

Public Improvements: means a part or all of the improvements authorized to be planned, designed, acquired, constructed, installed and financed as listed on the Capital Plan, attached as **Exhibit E**, and generally described in the Special District Act, or as set forth in an Approved Development Plan or intergovernmental agreement with the Town, to serve the anticipated inhabitants and taxpayers of the Service Area, except as specifically limited in Section V below, and as approved by the Board from time to time.

Publicly Marketed Debt: means Debt that is offered for sale to the public by the District with the use of an underwriter as a purchaser and reseller of the Debt.

Recurring Fee(s): means any recurring fee, rate, toll, penalty or charge imposed by the District for administrative, operations and maintenance costs and for services, programs or facilities provided by the District as limited by the provisions of Section V.A.15. below, but in no event to be used for payment of Debt.

Refunding Bonds or Refunding Debt: means Debt issued for purposes of refunding any Bond or Debt.

Service Area: means the property within the District Boundary Map and the area legally permitted to be served by the District and approved by the Town.

Service Plan: means this Service Plan for the District approved by Town Council.

Service Plan Amendment: means an amendment to the Service Plan approved by Town Council in accordance with the applicable state law.

Special District Act: means Section 32-1-101, *et seq.*, of the Colorado Revised Statutes, as amended from time to time.

State: means the State of Colorado.

Taxable Property: means real or personal property within the Service Area subject to ad valorem property taxes imposed by the District.

Taxable Transactions: means sales subject to payment of the Sales Tax.

Tax-exempt Debt: means Debt issued by the District for which the interest paid may be exempt from federal income tax of the recipient.

Total Debt Issuance Limitation: means the amount of Debt authorized by this Service Plan as provided in Section V.A.14.

Town: means the Town of Johnstown, Colorado.

Town Code: means the Town of Johnstown Municipal Code, as may be amended and in effect from time to time.

Town Council: means the governing body of the Town of Johnstown, Colorado.

Transfer Fee: means a fee assessed upon each sale of real property within the District.

### **III. BOUNDARIES**

The area of the District Boundaries includes approximately Fifty and 773/1000 (50.773) acres, generally located south of Highway 60/County Road 48 and east of Interstate I-25. The proposed Service Area of the District includes approximately 50.773 acres of residential multi-family development. Legal descriptions of the District Boundaries are attached hereto as **Exhibit A**. A vicinity map is attached hereto as **Exhibit B**. A map of the District Boundaries is attached hereto as **Exhibit C**. Proofs of Ownership and consents of the owners to organization of the District for all properties within the District Boundaries are attached hereto as **Exhibit C-2**. The District's boundaries may change from time to time as the District undergoes inclusions and exclusions pursuant to the Special District Act, subject to the limitations set forth in Section V below and as authorized by the Town.

### **IV. PROPOSED LAND USE / POPULATION PROJECTIONS / ASSESSED VALUATION**

The Service Area, upon full build-out, will consist of approximately 50.773 acres of residential property. The current assessed valuation of the Service Area is assumed to be \$0 for purposes of this Service Plan and, at build-out, is expected to be sufficient to reasonably discharge the Debt under the Financial Plan.

At build-out, the residential building area is estimated to include approximately 1008 multi-family units comprising 1,218,000 square feet.



The Town's approval of this Service Plan does not imply approval of the development of a specific area within the District, nor does it imply approval of the total number of residential lots or residential units which may be identified in this Service Plan. The total number of residential lots or residential units will be determined at the time of approval of a plat by the Town.

Approval of this Service Plan by the Town in no way releases or relieves the Developer of the Project, or the landowner or any subdivider of any portion of the Project property, or any of their respective successors or assigns, of obligations to construct Public Improvements for the Project or of obligations to provide to the Town such financial guarantees as may be required by the Town to ensure the completion of the Public Improvements, or of any other obligations to the Town under the Town Code or any applicable annexation agreement, subdivision agreement, or other agreements affecting the Project property or development thereof.

## **V. DESCRIPTION OF PROPOSED POWERS, IMPROVEMENTS AND SERVICES**

### **A. Powers of the District and Service Plan Amendment.**

The District shall have the power and authority to provide the Public Improvements and operations and maintenance within and without the boundaries of the District as such power and authority is described in the Special District Act and other applicable statutes, common law and the Constitution, subject to the limitations set forth herein.

1. **Operations and Maintenance Limitation.** The purpose of the District is to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The District shall only operate and maintain those Public Improvements that are not accepted for ownership, operations and maintenance by the Town or other appropriate entity in a manner consistent with Approved Development Plans and other rules and regulations of the Town and the Town Code.

2. **Trails and Amenities.** The District may own, operate, and maintain trails and related amenities within the District. All parks and trails shall be open to the general public, including Town residents who do not reside in the District, free of charge. Any fee imposed by the District for access to recreation improvements owned by the District, other than parks and trails, shall not result in Town residents who reside outside the District paying a user fee that is greater than, or otherwise disproportionate to, amounts paid by owners or tenants of the District and shall not result in the District's owners or tenants subsidizing the use by non-District's residents. The District shall be entitled to impose a reasonable administrative fee to cover additional expenses associated with use of District recreational improvements, other than parks and trails, by Town residents who do not reside in the District to ensure that such use is not subsidized by the District's owners or tenants.

3. **Fire Protection, Ambulance and Emergency Services Limitation.** The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain fire protection facilities or services, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town. The authority to plan for, design, acquire, construct, install, relocate, redevelop or finance fire hydrants and related

improvements installed as part of the water system shall not be limited by this provision. The District shall not be authorized to provide for ambulance or emergency medical services unless the provision of such service is approved by the Town in an intergovernmental agreement.

4. Television Relay and Translation Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain television relay and translation facilities and services, other than for the installation of conduit as a part of a street construction project, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town.

5. Telecommunication Facilities. The District agrees that no telecommunication facilities owned, operated or otherwise allowed by the District shall affect the ability of the Town to expand its public safety telecommunication facilities or impair the Town's existing telecommunication facilities.

6. Construction Standards Limitation. The District shall ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the Town and of other governmental entities having proper jurisdiction. The District shall obtain the Town's approval of civil engineering plans and applicable permits for construction and installation of Public Improvements prior to performing such work.

7. Zoning and Land Use Requirements; Sales and Use Tax. The District shall be subject to all of the Town's zoning, subdivision, building code and other land use requirements. The District shall not exercise any exemption from Town sales or use tax, whether directly or indirectly.

8. Growth Limitations. The District acknowledges that the Town shall not be limited in implementing Town Council or voter approved growth limitations, even though such actions may reduce or delay development within the District and the realization of District's revenue.

9. Conveyance. The District agrees to convey to the Town, at no expense to the Town and upon written notification from the Town, any real property owned by the District that is necessary, in the Town's sole discretion, for any Town capital improvement projects for transportation, utilities, drainage, streets or trails. The District shall, at no expense to the Town and upon written notification from the Town, transfer to the Town all rights-of-way, fee interests and easements owned by the District that the Town determines are necessary for access to and operation and maintenance of the Public Improvements to be owned, operated and maintained by the Town, consistent with an Approved Development Plan.

10. Privately Placed Debt Limitation. Prior to the issuance of any Privately Placed Debt, including but not limited to any Developer Debt, the District shall obtain the certification of an External Financial Advisor approved by the Town, in the form substantially as follows:

We are [I am] an External Financial Advisor within the meaning of the District's Service Plan.

We [I] certify that (1) the net effective interest rate (calculated as defined in Section 32-1-103(12), C.R.S.) to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District and all Districts pledging revenue to the repayment of the Debt.

The District shall submit written notice to the Town Manager of the name of the proposed External Financial Advisor prior to the engagement of the External Financial Advisor, which shall either be approved or objected to by the Town within twenty (20) days of the submittal of such written notice to the Town Manager. If the Town Manager does not object to such selection within the twenty (20) day period, the Town Manager's approval shall be deemed to have been given to the District retaining the External Financial Advisor named in the written notice.

Within ten (10) days subsequent to the issuance of Privately Placed Debt, the District shall provide the Town with copies of the relevant Debt documents, the External Financial Advisor Certification and the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt.

11. Inclusion Limitation. The District shall not include within its boundaries any property outside the District Boundaries without the prior written consent of the Town. The District shall only include within its boundaries property that has been annexed to the Town, and no portion of any of the District shall ever consist of property not within the Town's corporate boundaries.

12. Overlap Limitation. The boundaries of the District shall not overlap with another metropolitan district without the prior written consent of the Town.

13. Debt Limitation. Until the Development and Reimbursement Agreement is approved and executed between the Town and the District and until an Amended and Restated Service Plan is approved by Town Council, the District shall not: (a) issue any Debt; or (b) impose a mill levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds.

14. Maximum Debt Authorization. The District shall not issue Debt in excess of Three Million, Six Hundred Thousand (\$3,600,000), except that the District shall not issue any Debt absent approval of an Amended and Restated Service Plan by the Town Council. Refunded Debt, wherein the initial debt issuance counted toward the Maximum Debt Authorization shall not count against the Maximum Debt Authorization set forth herein.

15. Recurring Fee Limitation. The District may impose and collect Recurring Fees for administrative, operations and maintenance expenses and for services, programs or facilities furnished by the District. Any Recurring Fees for administrative, operations and maintenance expenses not specifically set forth in the Financial Plan, including a subsequent increase in such Recurring Fees, shall be subject to review and approval by the Town. At the

discretion of the Town Manager, Town review and, if appropriate, approval shall be provided by the Town Manager in writing or referred by the Town Manager to Town Council. If the Town does not respond to a request for the imposition of the Recurring Fee or an increase in such Recurring Fee within forty-five (45) days of receipt of a written request from the District, the Town shall be deemed to have approved the ability of the District to impose or increase the Recurring Fee as described in the request. Any Recurring Fees imposed or increased for operation and maintenance expenses without approval as set forth herein shall constitute a material departure from the Service Plan. The revenue from a Recurring Fee shall not be used to pay for Debt.

16. Monies from Other Governmental Sources. The District shall not apply for or accept Conservation Trust Funds, Great Outdoors Colorado Funds or other funds available from or through governmental or non-profit entities for which the Town is eligible to apply, except pursuant to an intergovernmental agreement with the Town. This Section shall not apply to specific ownership taxes, which shall be distributed to and a revenue source for the District without any limitation.

17. Consolidation Limitation. The District shall not file a request with any Court to consolidate with another Title 32 district without the prior written consent of the Town.

18. Bankruptcy Limitation. It is expressly intended that all of the limitations contained in this Service Plan, including, but not limited to, those pertaining to the Maximum Debt Mill Levy, Maximum Debt Mill Levy Limitation Term, Developer Debt Mill Levy Imposition Term, and the Recurring Fees, that have been established under the authority of the Town to approve a Service Plan with conditions pursuant to Section 32-1-204.5, C.R.S.:

(a) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent an amendment to the Service Plan; and

(b) Are, together with all other requirements of Colorado law, included in the “political or governmental powers” reserved to the State under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the “regulatory or electoral approval necessary under applicable nonbankruptcy law” as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

The filing of any bankruptcy petition by the District shall constitute, simultaneously with such filing, a material departure of the express terms of this Service Plan, and thus an express violation of the approval of this Service Plan.

19. Water Rights/Resources Limitation. Water to satisfy the needs of the Project shall be dedicated by the Developer to the Town. The District shall not acquire, own, manage, adjudicate or develop water rights or resources except pursuant to an intergovernmental agreement with the Town. If the District provides a non-potable irrigation system, which would be owned, operated and maintained by the District, the District would be permitted to manage the raw water for the District irrigation water system in the manner set forth in a subsequently executed intergovernmental agreement with the Town.

20. Eminent Domain Limitation. Absent the prior written approval of the Town, the District shall not exercise its statutory power of eminent domain or dominant eminent domain for the purpose of condemning property outside of the Service Area. Additional approval from the Town shall not be required prior to the District's exercise of its statutory power of eminent domain or dominant eminent domain with respect to property within the Service Area. In no event shall the District exercise its statutory power of dominant eminent domain to condemn property owned by the Town.

21. Covenant Enforcement and Design Review Services. The District shall have the power, but not the obligation, to provide Covenant Enforcement and Design Review Services within the District in accordance with the Colorado Statutes as they are amended from time to time. The Town shall not bear any responsibility for Covenant Enforcement and Design Review Services within the boundaries of the District. The Town's architectural control, design review and other zoning, land use, development, design and other controls are separate requirements that must be met in addition to any similar controls or services undertaken by the District.

22. Reimbursement Agreement with Adjacent Landowners. If the District utilizes reimbursement agreements to obtain reimbursements from adjacent landowners for costs of improvements that benefit the third-party landowners, such agreements shall be done in accordance with Town Code. Any and all resulting reimbursements received for such improvement shall be used to re-pay the cost of the Public Improvement that is the subject of the reimbursement agreement or shall be deposited in the District's debt service fund and used for the purpose of retiring Debt. The District shall maintain an accurate accounting of the funds received and disbursed pursuant to reimbursement agreements.

23. Land Purchase Limitation. Proceeds from the sale of Debt and other revenue of the District may be used to pay the Developer for the acquisition from the Developer of any real property, easements or other interests not required to be dedicated for public use by annexation agreements, pursuant to Approved Development Plans, the Town Code or other development requirements. Examples of ineligible reimbursements include, but are not limited to: the acquisition of rights of way, easements, land for public drainage, parkland, or open space, unless separate consent is given by resolution of the Town Council.

24. Reimbursement of Public Improvement Related Costs. Prior to the reimbursement to the Developer for costs incurred in the organization of the District, for funds expended on the District's behalf related to the Public Improvements, for the payment by the District for an invoice related to a Public Improvement cost, or for the acquisition of any part of the Public Improvements, the District shall receive: a) the report of an engineer retained by the District, independent of the Developer and licensed in Colorado verifying that, in such engineer's professional opinion, the reimbursement for the costs of the Public Improvements that are the subject of the reimbursement or acquisition, including the construction costs and the soft costs, but excluding the accounting and legal fees, are, in such engineer's opinion, reasonable and are related to the provision of the Public Improvements or are related to the District's organization; and b) the report of an accountant retained by the District, independent of the Developer and licensed in Colorado verifying that, in such accountant's professional opinion, the reimbursement for the accounting and legal fees that are the subject of the reimbursement or acquisition, are, in such

accountants opinion, reasonable and related to the Public Improvements or the District's organization. Upon request, the District shall provide the reports to the Town.

25. Developer Reimbursement of Administration, Operations and Maintenance Related Costs. Prior to the reimbursement to the Developer for costs incurred or for funds expended on behalf of the District related to the administration of the District or the operation and maintenance of the Public Improvements, the District shall receive the report of an accountant retained by the District, who is independent of the Developer and licensed in Colorado, verifying that, in such accountant's professional opinion, the reimbursement of the funds advanced for such administration, operations or maintenance costs, are, in such accountant's opinion, receivable and related to the administration, operations or maintenance of the District or the Public Improvements. Upon request, the District shall provide the report to the Town.

26. Board Meetings and Website Limitations. Once an End User owns property in the Service Area, the District's Board meeting(s) shall be conducted within the boundaries of the Town of Johnstown or conducted virtually via internet or telephone platform available for free access by the public. The District shall establish and maintain a public website and shall include the name of the Project or a name that allows property owners and residents of the District to readily locate the District online and shall also include an updated street map for those properties within the Service Area that have constructed streets that are open for public use. In addition, the District shall timely post a copy of all of the following documents on its public website: (a) each call for nominations, required pursuant to Section 1-13.5-501, C.R.S., (b) the transparency notices provided pursuant to 32-1-809, C.R.S, (c) each recorded declaration of covenants if the District provides Covenant Enforcement and Design Review Services, (d) a copy of this Service Plan and all amendments thereto, (e) all approved budgets, audits, meeting minutes, Board orders and resolutions, (f) any Rules and Regulations adopted by the Board, and (g) all meeting agendas and meeting packets.

27. Financial Review. The Town shall be permitted to conduct periodic reviews of the financial powers of the District in the Service Plan in the manner and form provided in Section 32-1-1101.5, C.R.S. As provided in the statute, the Town may conduct the first financial review in the fifth calendar year after the calendar year in which a special district's ballot issue to incur general obligation indebtedness was approved by its electors. After such fifth calendar year and notwithstanding the provisions of the statute, the Town may conduct the financial review at any time, by providing sixty (60) days written notice to the District, except that the Town may not conduct a financial review within sixty (60) months of the completion of its most recent financial review. The Town's procedures for conducting a financial review under this Paragraph, and the remedies available to the Town as a result of such financial review, shall be identical to those provided for in Section 32-1-1101.5(2), C.R.S. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with such review, and the Town may require a deposit of the estimated costs thereof.

28. Use of Proceeds and Revenues Limitations. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and



improvements authorized by the Service Plan. Additionally, if the Developer constructs the public infrastructure and conveys it to the District in return for a reimbursement obligation from the District, prior to making such reimbursement for such amounts, the District must receive the report of an independent engineer or accountant licensed in Colorado confirming that in such engineer's or accountant's professional opinion, the amount of the reimbursement is reasonable (a "Cost Verification Report").

29. Transfer Fee Limitation. The District shall not be authorized to collect or spend revenue from a transfer fee on the sale of real property within the District, except pursuant to an intergovernmental agreement with the Town.

30. Miscellaneous Powers. The District shall have the power to provide any facility, service, or program allowed by C.R.S. § 32-1-1004(1).

31. New Powers. If, after the Service Plan is approved, the Colorado General Assembly grants new or broader powers for metropolitan districts, to the extent permitted by law, any or all such powers shall be deemed to be a part hereof and available to be exercised by the District only following written approval by the Town, subject to the Town's sole discretion.

B. Service Plan Amendment Requirement.

This Service Plan has been designed with sufficient flexibility to enable the District to provide required services and facilities under evolving circumstances without the need for numerous amendments. Provided, however, the District shall not have the authority to issue Debt until it has received approval of an amendment to this Service Plan in the form of an Amended and Restated Service Plan. Actions of the District which violate the limitations set forth in this Service Plan shall be deemed to be material modifications to this Service Plan and the Town shall be entitled to all remedies available under State and local law to enjoin such actions of the District, including the remedy of enjoining the issuance of additional authorized but unissued Debt, until such material modification is remedied.

C. Capital Plan.

The District shall have authority to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements within and without the boundaries of the District to the extent necessary to improve or construct Public Improvements, as more specifically defined in this Service Plan, the Special District Act and Approved Development Plan(s) for the Project. A Capital Plan, attached hereto as **Exhibit E**, includes: (1) a list of the Public Improvements to be developed by the District, supported by an engineering or architectural survey; (2) a good faith estimate of the cost of the Public Improvements; and (3) a pro forma capital expenditure plan correlating expenditures with development. The Public Improvements described in the Capital Plan may be modified in an Approved Development Plan or an intergovernmental agreement with the Town and may differ from the Capital Plan without constituting a material modification of this Service Plan. To the extent that the Capital Plan sets forth the timing of the construction of the Public Improvements, such timing may also deviate from the Capital Plan without constituting a material modification of this Service Plan. As shown in the Capital Plan, the estimated cost of the Public Improvements for the District boundaries (of approximately 50.773

acres) is approximately Eighteen Million, Nine Hundred Fourteen Thousand, Nine Hundred Sixteen Dollars (\$18,914,916). Costs of required Public Improvements that cannot be financed by the District within the parameters of this Service Plan and the financial capability of the District are expected to be financed by the Developer of the Project or through private financing.

The District shall be permitted to allocate costs between such categories of the Public Improvements as deemed necessary in its discretion.

All of the Public Improvements described herein shall be designed in such a way as to assure that the Public Improvements are constructed in accordance with Town standards and with the requirements of Approved Development Plans related to the project. All descriptions of the Public Improvements to be constructed, and their related costs, are estimates only and are subject to modification as engineering, development plans, economics, the Town's requirements, and construction scheduling may require. Upon approval of this Service Plan, the District shall continue to develop and refine the Capital Plan and the Map Depicting Public Improvements, as necessary, and prepare for issuance of Debt. All cost estimates will be adjusted to reflect then-current dollars at the time of the issuance of Debt and construction. All construction cost estimates contained in **Exhibit E** assume construction to applicable standards and specifications of the Town and state or federal requirements.

## **VI. FINANCIAL PLAN**

### **A. General.**

The District shall be authorized to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements from its revenues and by and through the proceeds of Debt to be issued by the District. The Financial Plan for the District shall be to issue such Debt as the District can reasonably pay from revenues derived from the Maximum Debt Mill Levy and other legally available revenues. The District may only rely on specific ownership taxes, advances from the Developer and grants, subject to the limitations of this Service Plan.

The total Debt that the District shall be permitted to issue shall not exceed the Maximum Debt Authorization of \$3,600,000, which is estimated to be the amount necessary to net approximately \$1,797,587 in proceeds or reimbursements or any combination thereof from available District revenues for Public Improvements serving the District, as well as the traditional transactional and financing costs. Debt of the District shall be permitted to be issued on a schedule and in such year or years as the District determines to meet the needs of the Financial Plan referenced above and phased to serve development as it occurs. This Maximum Debt Authorization of \$3,600,000 allows for approximately 120% coverage of the estimated financial plan and pro-forma projections to provide an additional contingency for changes in actual construction, increases in assessed valuation and unforeseen changes and contingencies.

(1) The Financial Plan, prepared by Piper Sandler & Co., attached hereto as **Exhibit F**, sets forth (i) how the Public Improvements are to be financed; (ii) the proposed indebtedness with a schedule indicating the years in which the Debt is scheduled to be issued; and (iii) the estimated revenue for both debt and operating revenue derived from property taxes and

other legally available revenues for the District. The Maximum Debt Authorization is supported by the Financial Plan.

(2) In addition to the other requirements of this Service Plan, at least forty-five (45) days prior to the issuance of any Debt, the District shall submit to the Town the then-current financial forecasts and feasibility reports for such proposed issuance, together with a current certification, of the Board(s) issuing such Debt, dated within sixty (60) days of such submittal, that such proposed Debt is in compliance with the Service Plan.

(3) At least ten (10) business days prior to the issuance of Publicly-Marketed Debt, the District shall provide the Town with the marketing documents that have been or shall be published. Within ten (10) days subsequent to the issuance of Publicly-Marketed Debt, the District shall provide the Town with the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt and copies of the relevant Debt documents.

B. Maximum Voted Interest Rate, Maximum Underwriting Discount, Maximum Interest Rate on Developer Debt.

The interest rate on any Debt is limited to the market rate at the time the Debt is issued. In the event of a default, the proposed maximum interest rate on any Debt is not to exceed eight percent (8%) simple interest. The proposed maximum underwriting discount will be four percent (4%). Debt, when issued, shall comply with all relevant requirements of this Service Plan, State law and Federal law as then applicable to the issuance of public securities.

The interest rate on Developer Debt shall not exceed the lesser of the current Bond Buyer 20-Bond GO index plus four percent (4%) or eight percent (8%) simple interest. Developer Debt shall be subordinate to other Debt of the District and shall be subject to the debt limitation term provided in Section VI.D below.

C. Mill Levies.

1. Maximum Debt Mill Levy. The Maximum Debt Mill Levy shall be forty (40) mills subject to an Assessment Ratio Adjustment.

2. Operations and Maintenance Mill Levy. The Operations and Maintenance Mill Levy shall be a mill levy the District is permitted to impose for payment of the District's administrative, operations and maintenance costs, which shall include, but not be limited to, the funding of operating reserves and sufficient ending fund balances to assure sufficient cash flow to fund expenses as they come due. Prior to the imposition of a mill levy for payment of Debt, the District may impose a maximum Operations and Maintenance Mill Levy of fifty (50) mills. After the imposition of a mill levy for the payment of Debt, the District shall not impose an Operations and Mill Levy that exceeds ten (10) mills, subject to an Assessment Ratio Adjustment, and shall at all times not exceed the maximum mill levy necessary to pay those expenses.

D. Mill Levy Imposition Term.

1. Developer Debt Mill Levy Imposition Term. Developer Debt shall expire and be forgiven twenty (20) years after the date of the initial imposition by the District of an ad

valorem property tax to pay any Debt, unless such term is otherwise extended pursuant to an intergovernmental agreement with the Town. Refunding Bonds shall not be subject to this Developer Debt Mill Levy Imposition Term so long as such Refunding Bonds are not owned by the Developer or by a person or party related to the Developer. Developer Debt shall not have any call protection.

2. Maximum Debt Mill Levy Imposition Term: In addition to the Developer Debt Mill Levy Imposition Term, the District shall not impose a levy for repayment of any and all Debt (or use the proceeds of any mill levy for repayment of Debt) on any single property developed for residential uses which exceeds forty (40) years after the year of the initial imposition of such mill levy unless a majority of the Board of the District imposing the mill levy are End Users residing in such District and have voted in favor of a refunding of a part or all of the Debt and such refunding will result in a net present value savings as set forth in Section 11-56-101, et seq., C.R.S..

E. Debt Repayment Sources.

Debt may be repaid through gifts, grants, ad valorem taxes, and any source of payment permitted by law, this Service Plan or other agreement with the Town.

F. Debt Instrument Disclosure Requirement.

In the text of each Bond and any other instrument representing and constituting Debt, the District shall set forth a statement in substantially the following form:

By acceptance of this instrument, the owner of this Bond agrees and consents to all of the limitations in respect of the payment of the principal of and interest on this Bond contained herein, in the resolution of the District authorizing the issuance of this Bond and in the Service Plan for creation of the District.

Similar language describing the limitations in respect of the payment of the principal of and interest on Debt set forth in this Service Plan shall be included in any document used for the offering of the Debt for sale to persons, including, but not limited to, a developer of property within the boundaries of the District.

G. Security for Debt.

The District shall not pledge any revenue or property of the Town as security for any District indebtedness set forth in this Service Plan. The Town's approval of this Service Plan shall not be construed as a guarantee by the Town of payment of any of the District's obligations; nor shall anything in the Service Plan be construed so as to create any responsibility or liability on the part of the Town in the event of default by the District in the payment of any such obligation.

H. District's Operating Costs.

The estimated cost of engineering services, legal services and administrative services, together with the estimated costs of the District's organization and initial operations, are

anticipated to be Fifty Thousand Dollars (\$50,000) which will be eligible for reimbursement from Debt proceeds as provided in this Service Plan.

In addition to the capital costs of the Public Improvements, the District will require operating funds for administration and to plan and cause the Public Improvements to be constructed and maintained. The first year's operating budget is estimated to be Fifty Thousand (\$50,000), which is anticipated to be derived from property taxes and other revenues.

## **VII. ANNUAL REPORT**

### **A. General.**

The District shall file an annual report with the Town Clerk no later than August 1st of each year following the year in which the Order and Decree creating the District has been issued (the "report year") that complies with Section 32-1-207, C.R.S.

### **B. Reporting of Significant Events.**

In addition to the information required to be disclosed under Section 32-1-207, C.R.S., the annual report required by this Section VII shall include information as to any of the following events that occurred during the report year:

1. Narrative of the District's progress in implementing the Service Plan and a summary of the development in the Project.
2. Boundary changes made or proposed.
3. Intergovernmental agreements executed.
4. A summary of any litigation involving the District.
5. Proposed plans for the year immediately following the report year.
6. Construction contracts executed and the name of the contractors as well as the principal of each contractor.
7. Status of the District's Public Improvement construction schedule and the Public Improvement schedule for the following five years.
8. Notice of any uncured defaults.
9. A list of all Public Improvements constructed by the District that have been dedicated to and accepted by the Town.
10. If requested by the Town, copies of minutes of all meetings of the District's Board of Directors.

11. The name, business address and telephone number of each member of the Board and its chief administrative officer and general counsel and the date, place and time of the regular meetings of the Board.

12. Certification from the Board that the District is in compliance with all provisions of the Service Plan.

13. Copies of any agreements with the Developer entered into in the report year.

14. Copies of any Cost Verification Reports provided to the District in the report year.

C. Summary of Financial Information.

In addition to the information required to be disclosed under Section 32-1-207, C.R.S., the annual report shall include a summary of the following information for the report year:

1. Assessed value of Taxable Property within the District's boundaries.
2. Total acreage of property within the District's boundaries.
3. Most recently filed audited financial statements of the District, to the extent audit financial statements are required by state law or most recently filed audit exemption.
4. Annual budget of the District.
5. Resolutions regarding issuance of Debt or other financial obligations, including relevant financing documents, credit agreements, and official statements.
6. Outstanding Debt (stated separately for each class of Debt).
7. Outstanding Debt service (stated separately for each class of Debt).
8. The District's tax revenue.
9. Other revenues of the District.
10. The District's Public Improvements expenditures.
11. The District's other expenditures.
12. The District's inability to pay any financial obligations as they come due.
13. The amount and terms of any new Debt issued.
14. Any Developer Debt.



## **VIII. DISSOLUTION**

Upon a determination of the Town Council that the purposes for which the District was created have been accomplished or as set forth in the Intergovernmental Agreement with the Town, the District shall file a petition in the District Court for dissolution, pursuant to the applicable State statutes. Dissolution shall not occur until the District has provided for the payment or discharge of all of its outstanding indebtedness and other financial obligations as required pursuant to State statutes. Except as otherwise required in the Intergovernmental Agreement or in the Development and Reimbursement Agreement, dissolution shall not be required if the District elects to finance, construct and acquire the common areas, facilities and improvements, as such Public Improvements would be owned, operated and maintained by the District.

## **IX. INTERGOVERNMENTAL AGREEMENT**

The form of Intergovernmental Agreement to be entered into between the Town and the District at the District's organizational meeting is attached as **Exhibit D**. The District shall submit the executed Intergovernmental Agreement to the Town within ten (10) days of the District's organizational meeting.

Intergovernmental agreements and amendments thereto proposed to be entered into by the District shall be submitted to the Town at least forty-five (45) days prior to their execution by the District, for Town review. Such Town review and approval shall be with reference to whether the intergovernmental agreement(s) are in compliance with this Service Plan, the Intergovernmental Agreement, and the terms of any Approved Development Plan or other instrument related to the Public Improvements. Town Approval shall be at the discretion of the Town Manager who shall decide whether such request for approval shall be provided in a letter of response or if the matter requires additional consideration for approval by the Town Council, an agreement between the parties or an amendment to the Service Plan.

The District and the Developer shall also execute indemnification letters in the form attached hereto as **Exhibit H**. The Developer's indemnification letter shall be submitted to the Town as part of this Service Plan. The District shall approve and execute the indemnification letter at its first Board meeting after its organizational election, in the same form as the indemnification letter set forth as **Exhibit H**, and shall deliver an executed original to the Town within ten (10) days of the District's organizational meeting.

## **X. NON-COMPLIANCE WITH SERVICE PLAN**

In the event it is determined that the District has undertaken any act or omission which violates the Service Plan or constitutes a material departure from the Service Plan, the Town may impose any of the sanctions set forth in the Town Code and pursue any sanctions or remedies available under law, including but, not limited to, affirmative relief to require the District to act in accordance with the provisions of this Service Plan.

## **XI. MISCELLANEOUS**

A. Headings. Paragraph headings and titles contained herein are intended for convenience and reference only and are not intended to define, limit or describe the scope or intent of any provision of this Service Plan.

B. Town Consent. Unless otherwise provided herein or provided in an intergovernmental agreement with the Town, references in this Service Plan to Town consent or Town approval shall require prior written approval of the Town. At the Town Manager's discretion, the Town Manager shall decide if (1) he or she may provide the written Town approval, if approval is warranted; (2) the matter should be referred to the Town Council for consideration and, if appropriate, approval by Resolution; (3) the matter requires consideration for approval in the form of an agreement with the Town; or (4) the matter requires an amendment to the Service Plan.

C. Town Expenses. The District shall pay any and all expenses, including but not limited to professional service fees and attorneys' fees, incurred by the Town in enforcing any provision of the Service Plan.

D. Disclosure Notice. The District's disclosure document required pursuant to Section 32-1-104.8, C.R.S. shall be in substantial conformance with the form of such notice set forth in **Exhibit G**. In addition to the statutory notice, the District shall use reasonable efforts to assure that all End Users receive written notice regarding existing District mill levies, the Maximum Debt Mill Levy, and a general description of the District's authority to impose and collect fees. Among other means to accomplish the foregoing, the District shall use best efforts to ensure that the Developer and all builders provide notice to End Users by written disclosure and by posting such notices in all model homes and sales offices.

E. To the extent permitted by law, the District shall set forth a process for transition of the Board of Directors of the District to End Users of the District or set forth alternative means by which End Users may otherwise have control over the ongoing administration, operations, maintenance and financing responsibilities of the District and the Public Improvements that are owned and maintained by the District, but no sooner than after issuance of the Debt needed to finance the Public Improvements and completion of substantially all of the development within the District.

## **XII. CONCLUSION**

It is submitted that this Service Plan for the District, as required by Section 32-1-203(3), C.R.S., establishes that:

1. There is sufficient existing and projected need for organized service in the area to be serviced by the proposed special district;
2. The existing service in the area to be served by the proposed special district is inadequate for present and projected needs;
3. The proposed special district is capable of providing economical and sufficient service to the area within its proposed boundaries;

4. The area to be included in the proposed special district has, or will have, the financial ability to discharge the proposed indebtedness on a reasonable basis;

5. Adequate service is not, and will not be, available to the area through the county or other existing municipal or quasi-municipal corporations, including existing special districts, within a reasonable time and on a comparable basis;

6. The facility and service standards of the proposed special district are compatible with the facility and service standards of each county within which the proposed special district is to be located and each municipality which is an interested party under section 32-1-204(1);

7. The proposal is in substantial compliance with a master plan adopted pursuant to the Town Code;

8. The proposal is in compliance with any duly adopted Town, regional or state long-range water quality management plan for the area;

9. The creation of the special district is in the best interests of the area proposed to be served;

This Service Plan is submitted to the Town on behalf of the Developer, which is the District petitioner, which has contracted for the purchase of the real properties within the District Boundaries of the proposed District. The Developer has caused written notice of the Town's hearing on the proposed Service Plan to be duly given to all "interested parties" within the meaning of and at the times required by § 32-1-204, C.R.S., and will or has caused all other required filings to be made and all other applicable procedural requirements to be met. The information contained in this Service Plan is true and correct as of this date.

**EXHIBIT A**  
Legal Descriptions

Multifamily Residential District – Southwestern Area of NE Quarter Section

**Legal Description:**

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And more particularly described as follows:

Commencing at the southwest corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the center quarter corner of Section 11, the northwest corner of a 30 foot right of way deed, Great Western Construction Company, Book 190 Page 77, and the POINT OF BEGINNING;

Thence departing said right of way deed  $N00^{\circ}26'18''W$  along the west line of the northeast quarter of said section, a distance of 1,333.97 feet;

Thence deflecting off said section line  $N89^{\circ}33'42''E$ , a distance of 719.64 feet to the start of a tangential curve;

Thence along said curve to the right having a radius of 250.00 feet, a delta angle of  $15^{\circ}08'29''$ , a chord bearing of  $N82^{\circ}52'03''W$ , a chord length of 65.87 feet, an arc length of 66.07 feet;

Thence  $S00^{\circ}26'18''E$  a distance of 1318.38 feet to a point on the north line of the same right of way deed, Great Western Construction Company, Book 190 Page 77;

Thence  $S89^{\circ}05'16''W$  along said north line, a distance of 784.96 feet to the POINT OF BEGINNING.

Containing 1,110,709 square feet or 25.498 acres, more or less.

Multifamily Residential District – Northern Area of NE Quarter Section

**Legal Description:**

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And more particularly described as follows:

Commencing at the southwest corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the center quarter corner of section 11, N42°46'11"E, a distance of 1,619.52 feet to the POINT OF BEGINNING.

Thence N11°14'20"E, a distance of 380.83 feet;

Thence N00°26'18"W, a distance of 859.21 feet to a point on the south line of an adjoining parcel, Subdivision Exemption 665, Reception Number 2585002, and the north edge of the Consolidated Home Supply Ditch, Reception Number 1602319 and north line of Lot B;

Thence along said line the following fifteen courses:

- 1) Starting on a curve to the left having a radius of 406.56 feet, a delta angle of 4°55'27", a chord bearing of S81°47'02"E, a chord length of 34.93 feet, an arc length of 34.94 feet;
- 2) Thence S82°18'09"E, a distance of 72.95 feet to the start of a non-tangential curve;
- 3) Thence along said curve to the right having a radius of 456.82 feet, a delta angle of 10°12'37", a chord bearing of S76°56'40"E, a chord length of 81.30 feet, an arc length of 81.41 feet;
- 4) Thence S70°19'40"E, a distance of 40.88 feet to the start of a non-tangential curve;
- 5) Thence along said curve to the right having a radius of 275.76 feet, a delta angle of 15°37'23", a chord bearing of S59°44'23"E, a chord length of 74.96 feet, an arc length of 85.19 feet to the start of a non-tangential curve;
- 6) Thence along said curve to the right having a radius of 926.26 feet, a delta angle of 4°27'24", a chord bearing of S50°31'47"E, a chord length of 72.03 feet, an arc length of 72.05 feet;
- 7) Thence S47°51'00"E, a distance of 65.46 feet to the start of a non-tangential curve;
- 8) Thence along said curve to the left having a radius of 742.26 feet, a delta angle of 8°35'13", a chord bearing of S52°02'53"E, a chord length of 111.14 feet, an arc length of 111.24 feet;
- 9) Thence S60°31'04"E, a distance of 39.49 feet to a point being the southwest corner of Lot "A" RE2092 Recorded Exemption No. 1060-11-1RE2092, Reception Number 2585002,
- 10) Thence departing said Subdivision Exemption 665 line S60°33'11"E along the south line of said Lot "A", the north edge of said Consolidated Home Supply Ditch, and the north line of Lot B, a distance 50.17 feet to the start of a non-tangential curve;
- 11) Thence along said curve to the left having a radius of 170.43 feet, a delta angle of 9°32'43", a chord bearing of S64°29'22"E, a chord length of 28.36 feet, an arc length of 28.39 feet;
- 12) Thence S69°03'58"E, a distance of 21.67 feet to the start of a non-tangential curve;
- 13) Thence along said curve to the left having a radius of 209.92 feet, a delta angle of 8°31'15", a chord bearing of S72°33'42"E, a chord length of 31.19 feet, an arc length of 31.22 feet;
- 14) Thence S78°36'38"E, a distance of 150.86 feet to the start of a non-tangential curve;



15) Thence along said curve to the left having a radius of 255.94 feet, a delta angle of  $15^{\circ}34'55''$ , a chord bearing of  $S82^{\circ}44'50''E$ , a chord length of 69.39 feet, an arc length of 69.60 feet;

Thence departing said line  $S00^{\circ}23'51''E$ , a distance of 379.44 feet to the start of a tangential curve;

Thence along said curve to the right having a radius of 18.00 feet, a delta angle of  $11^{\circ}38'11''$ , a chord bearing of  $S05^{\circ}25'15''W$ , a chord length of 3.65 feet, an arc length of 3.66 feet;

Thence  $S11^{\circ}14'20''W$ , a distance of 779.61 feet to the start of a tangential curve;

Thence along said curve to the right having a radius of 25.00 feet, a delta angle of  $78^{\circ}21'49''$ , a chord bearing of  $S50^{\circ}25'15''W$ , a chord length of 31.59 feet, an arc length of 34.19 feet;

Thence  $S89^{\circ}36'09''W$ , a distance of 129.98 feet to the start of a tangential curve;

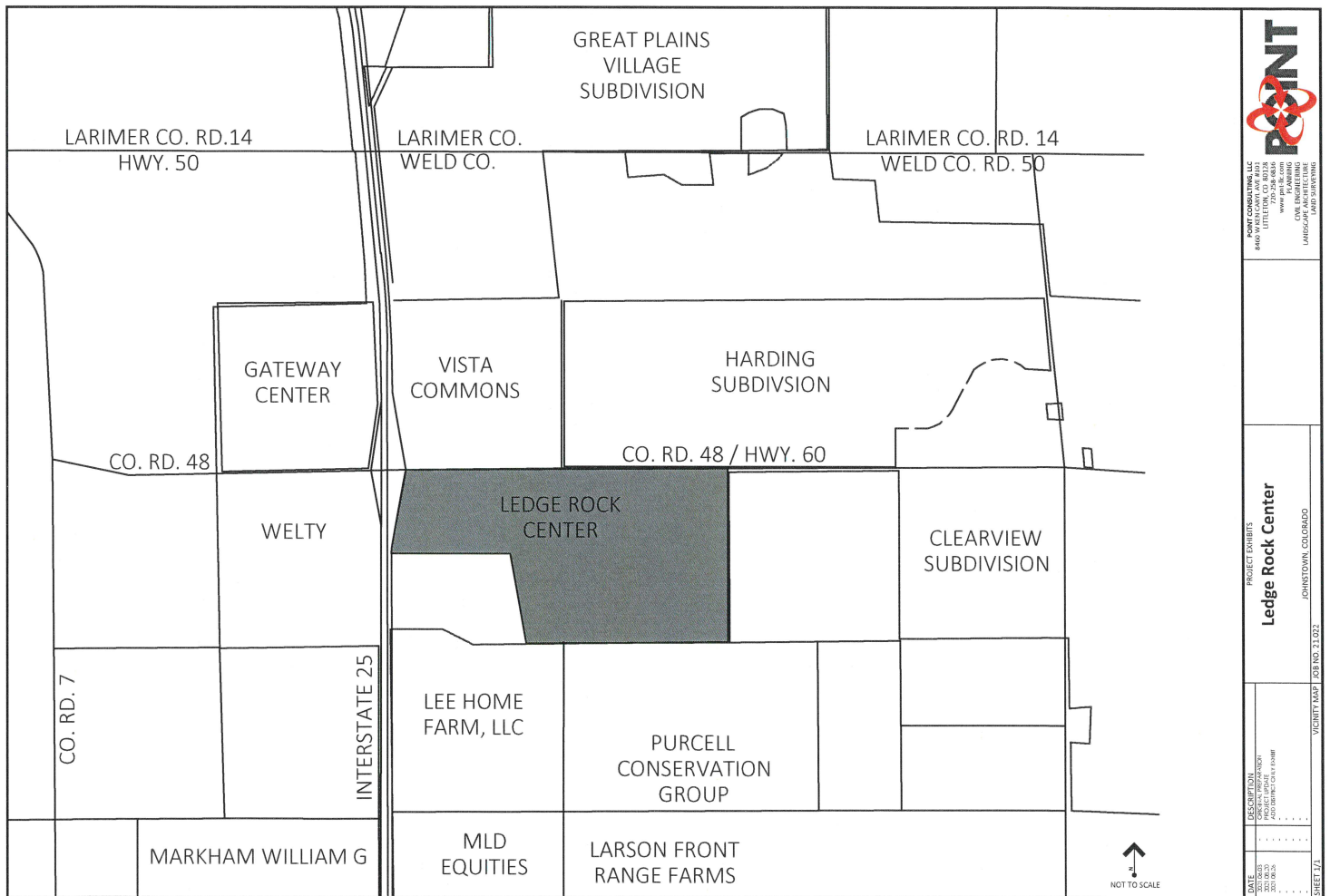
Thence along said curve to the right having a radius of 330.00 feet, a delta angle of  $29^{\circ}14'12''$ , a chord bearing of  $N75^{\circ}46'45''W$ , a chord length of 166.57 feet, an arc length of 168.39 feet;

Thence  $N61^{\circ}09'39''W$ , a distance of 517.89 feet to the POINT OF BEGINNING.

Containing 1,100,986 square feet or 25.275 acres, more or less.

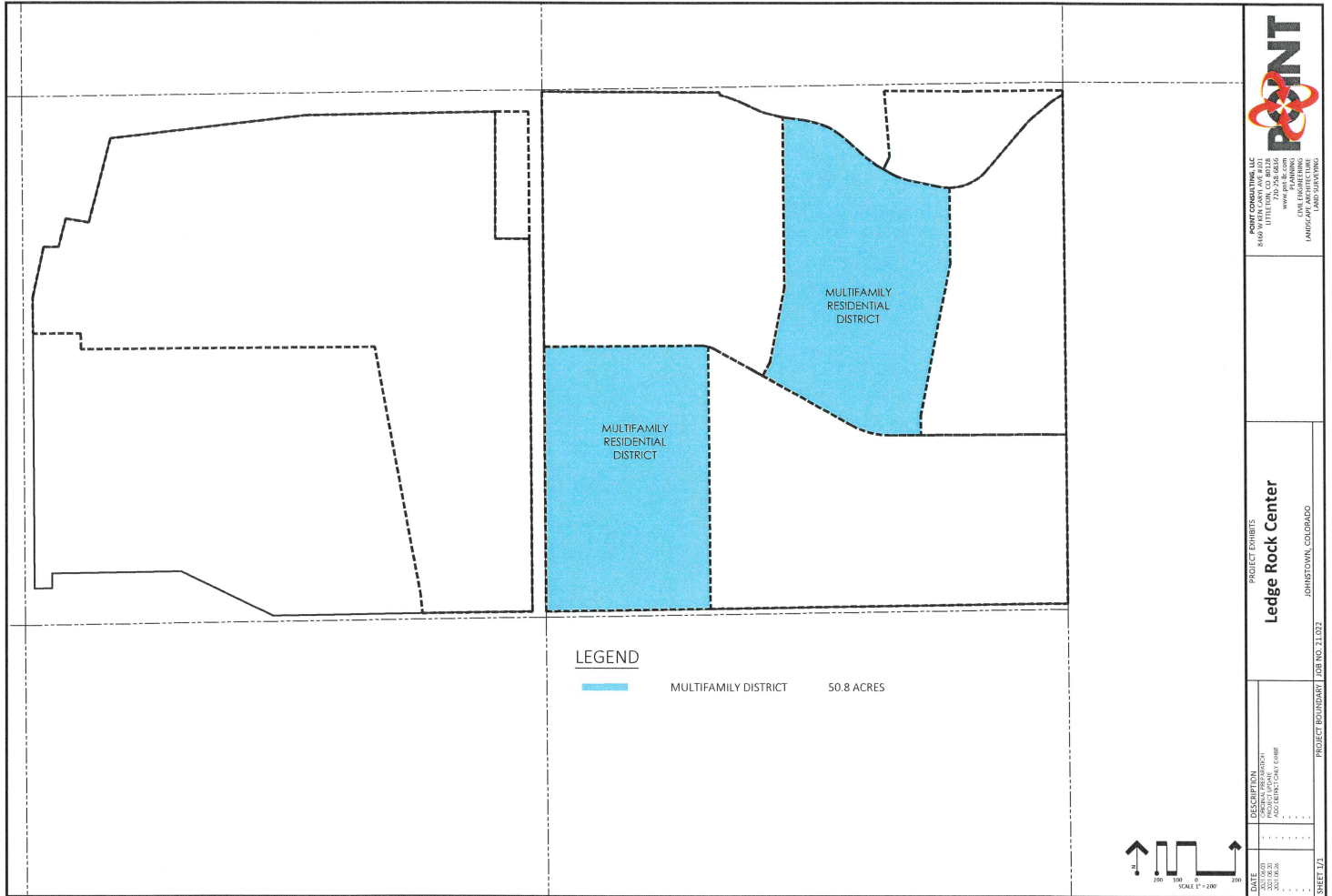
## **EXHIBIT B**

### Johnstown Vicinity Map



**EXHIBIT C-1**

District Boundary Map



## **EXHIBIT C-2**

### **Proofs of Ownership and Consent of Owners**



**Ellen Anderson**  
**109138 County Road 13**  
**Johnstown, CO 80534**

**Kevin J. Cook**  
**PO BOX 1020**  
**Berthoud, CO 80513**

Town Council  
 Town of Johnstown, Colorado  
 450 S Parish Ave  
 Johnstown, CO 80534

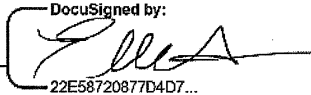
**RE: Proposed Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2 (collectively, the "Districts")**

To the Town Council of the Town of Johnstown:

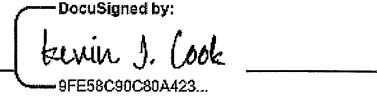
Ellen Anderson (as to a 72.45% interest as tenant in common) and Kevin J. Cook (as to a 27.55% interest as tenant in common) constitute all owners of the property within the initial boundaries of the proposed Districts, excluding rights of way and tracts dedicated to the Town. These initial approximate 148 acres more or less (the "Property") has been under contract since April 6, 2021 with Michael Schlup, who is in the process of forming the Districts to contain the Property in the initial boundaries of the proposed Service Plans for the Districts. The purpose of this letter is to advise that the following property owners consent to the organization of the District.

Property Owners:

Ellen Anderson (72.45%)

By: \_\_\_\_\_  DocuSigned by:  
22E58720877D4D7...

Kevin J. Cook (27.55%)

By: \_\_\_\_\_  DocuSigned by:  
9FE58C90C80A423...

# Certificate Of Taxes Due

Item #10.

Account Number R7288598

Certificate Number 237221

Parcel 106111200023

Order Number 25186901

Assessed To

Vendor ID 14

ANDERSON ELLEN (72.45% INT)

LAND TITLE GUARANTEE OF FT COLLINS

PO BOX 1020

772 WHALERS WAY STE 100

BERTHOUD, CO 80513-2020

FT COLLINS, CO 80525

## Legal Description

## Situs Address

JOH PT NE4 11-4-68 (RIDGEVIEW RANCH ANNEX) LOT B REC EXEMPT RE-2092 EXC UPRR RES

JOHNSTOWN

| Year                                    | Tax        | Adjustments | Interest | Fees   | Payments | Balance           |
|-----------------------------------------|------------|-------------|----------|--------|----------|-------------------|
| <b>Tax Charge</b>                       |            |             |          |        |          |                   |
| 2020                                    | \$4,170.00 | \$0.00      | \$0.00   | \$0.00 | \$0.00   | \$4,170.00        |
| Total Tax Charge                        |            |             |          |        |          | \$4,170.00        |
| <b>Grand Total Due as of 04/09/2021</b> |            |             |          |        |          | <b>\$4,170.00</b> |

Tax Billed at 2020 Rates for Tax Area 2963 - 2963

| Authority                   | Mill Levy   | Amount     | Values                  | Actual    | Assessed |
|-----------------------------|-------------|------------|-------------------------|-----------|----------|
| WELD COUNTY                 | 15.0380000* | \$593.70   | AG-FLOOD IRRIGATED LAND | \$134,835 | \$39,100 |
| SCHOOL DIST RE5J            | 47.8090000* | \$1,887.51 | AG-MEADOW HAY LAND      | \$1,257   | \$360    |
| NORTHERN COLORADO WATER (NC | 1.0000000   | \$39.48    | AG-WASTE LAND           | \$74      | \$20     |
| JOHNSTOWN TOWN              | 23.9470000  | \$945.42   | Total                   | \$136,166 | \$39,480 |
| FRONT RANGE FIRE RESCUE (JO | 11.5240000  | \$454.97   |                         |           |          |
| AIMS JUNIOR COLLEGE         | 6.3050000   | \$248.92   |                         |           |          |
| Taxes Billed 2020           | 105.6230000 | \$4,170.00 |                         |           |          |
| * Credit Levy               |             |            |                         |           |          |

All payments made are subject to final bank clearance.

WARNING - THIS TAX CERTIFICATE DOES NOT WARRANT ANY TAXES OWED ON UNDERLYING ACCOUNTS, INCLUDING PARENT OR SIBLING ACCOUNTS. ALL TAX LIEN SALE AMOUNTS ARE SUBJECT TO CHANGE DUE TO ENDORSEMENT OF CURRENT TAXES BY THE LIENHOLDER OR TO ADVERTISING AND DISTRAINT WARRANT FEES. CHANGES MAY OCCUR AND THE TREASURER'S OFFICE WILL NEED TO BE CONTACTED PRIOR TO REMITTANCE.

**TAX LIEN SALE REDEMPTION AMOUNTS MUST BE PAID BY CASH OR CASHIER'S CHECK.**

POSTMARKS ARE NOT ACCEPTED ON TAX LIEN SALE REDEMPTION PAYMENTS. PAYMENTS MUST BE IN OUR OFFICE AND PROCESSED BY THE LAST BUSINESS DAY OF THE MONTH.

SPECIAL TAXING DISTRICTS AND THE BOUNDARIES OF SUCH DISTRICTS MAY BE ON FILE WITH THE BOARD OF COUNTY COMMISSIONERS, THE COUNTY CLERK, OR THE COUNTY ASSESSOR.

This certificate does not include land or improvements assessed under a separate account number, personal property taxes, transfer tax or misc. tax collected on behalf of other entities, special or local improvement district assessments or mobile homes, unless specifically mentioned.

I, the undersigned, do hereby certify that the entire amount of taxes due upon the above described parcel of real property and all outstanding sales for unpaid taxes as shown by the records in my office from which the same may still be redeemed with the amount required for redemption are as noted herein. In witness whereof, I have hereunto set my hand and seal.

TREASURER, WELD COUNTY, John R. Lefebvre, Jr.

1400 N. 17th Avenue

Greeley, CO 80631

(970) 400-3290



## Land Title Guarantee Company Customer Distribution



**PREVENT FRAUD** - Please remember to call a member of our closing team when initiating a wire transfer or providing wiring instructions.

Order Number: **FCC25186901-3**

Date: **05/31/2021**

Property Address: **VACANT LAND, TBD, CO**

### PLEASE CONTACT YOUR CLOSER OR CLOSER'S ASSISTANT FOR WIRE TRANSFER INSTRUCTIONS

#### For Closing Assistance

Trish Melendy  
345 E 27TH STREET  
LOVELAND, CO 80538  
(970) 663-3628 (Work)  
(800) 259-6360 (Work Fax)  
[tmelendy@ltgc.com](mailto:tmelendy@ltgc.com)  
Contact License: CO361823  
Company License: CO44565

#### Closers Assistant

Gwen Klein  
345 E 27TH STREET  
LOVELAND, CO 80538  
(970) 663-3628 (Work)  
(800) 820-5138 (Work Fax)  
[gklein@ltgc.com](mailto:gklein@ltgc.com)  
Company License: CO44565

#### For Title Assistance

Land Title Customer Care Team  
772 WHALERS WAY #100  
FORT COLLINS, CO 80525  
(970) 282-3649 (Work)  
(970) 282-3652 (Work Fax)  
[customercare@ltgc.com](mailto:customercare@ltgc.com)

#### Buyer/Borrower

MICHAEL SCHLUP, AMY CARROLL  
Delivered via: Electronic Mail

#### Attorney for Buyer

AD SCHLUP LAW LLC  
Attention: ALLEN SCHLUP  
[allen.schlup@adschluplaw.com](mailto:allen.schlup@adschluplaw.com)  
Delivered via: Electronic Mail

#### Seller/Owner

ELLEN ANDERSON  
Delivered via: Electronic Mail

#### Attorney for Seller

BERG HILL GREENLEAF RUSCITTI LLP  
Attention: PETER SCHAUB  
1712 PEAR ST  
BOULDER, CO 80302  
[pcs@bhgrlaw.com](mailto:pcs@bhgrlaw.com)  
Delivered via: Electronic Mail

#### Seller/Owner

KEVIN COOK  
Attention: KEVIN COOK  
Delivered via: Electronic Mail

#### Attorney for Seller

FRASCONA JOINER GOODMAN & GREENSTEIN PC  
Attention: FRASCONA JOINER GOODMAN &  
GREENSTEIN PC  
4750 TABLE MESA DRIVE  
BOULDER, CO 80305  
[ben@frascona.com](mailto:ben@frascona.com)  
Delivered via: Electronic Mail

**Attorney for Buyer**

SPENCER FANE LLP

Attention: ADAM A VELTRI

1700 LINCOLN ST #2000

DENVER, CO 80203

(303) 565-9127 (Cell)

(303) 839-3716 (Work)

(303) 839-3999 (Work Fax)

aveltri@spencerfane.com

Delivered via: Electronic Mail

**Agent for Buyer**

Spencer Fane

Attention: D O'LEARY/M BERGER

doleary@spencerfane.com

mberger@spencerfane.com

Delivered via: Electronic Mail

**Michael Schlup**  
**c/o Ledge Rock Center, LLC**  
**6917 W 135th Street, Suite B29**  
**Overland Park, KS 66223**

Town Council  
Town of Johnstown, Colorado  
450 S Parish Ave  
Johnstown, CO 80534

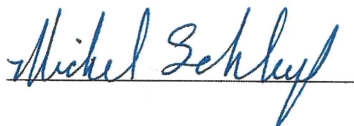
**RE: Proposed Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2 (collectively, the "Districts")**

To the Town Council of the Town of Johnstown:

The property owned by Ellen Anderson and Kevin Cook of approximately 148 acres more or less (the "Property") has been under contract since April 6, 2021 with Michael Schlup, who is in the process of forming the Districts to contain the Property in the initial boundaries of the proposed Service Plans for the Districts. As the contracting party for the purchase of this land, the purpose of this letter is to provide the Town, a letter to advise that Michael Schlup as purchaser and future property owner of the Property, provides his consent to the organization of the District.

Property Owner:

Michael Schlup

A handwritten signature in blue ink that reads "Michael Schlup". The signature is written in a cursive style and is positioned above a horizontal line.

## **EXHIBIT D**

### Intergovernmental Agreement between the District and Johnstown



**INTERGOVERNMENTAL AGREEMENT BETWEEN  
THE TOWN OF JOHNSTOWN, COLORADO  
AND  
LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 1**

THIS AGREEMENT is made and entered into as of this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, by and between the TOWN OF JOHNSTOWN, a home-rule municipal corporation of the State of Colorado ("Town"), and LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 1, a quasi-municipal corporation and political subdivision of the State of Colorado (the "District"). The Town and the District are collectively referred to as the "Parties."

**RECITALS**

WHEREAS, the District was organized to provide those services and to exercise powers as are more specifically set forth in the District's Service Plan approved by the Town on \_\_\_\_\_ ("Service Plan"); and

WHEREAS, the Service Plan makes reference to the execution of an intergovernmental agreement between the Town and the District; and

WHEREAS, the Town and the District have determined it to be in the best interests of their respective taxpayers, residents and property owners to enter into this Intergovernmental Agreement ("Agreement").

NOW, THEREFORE, in consideration of the covenants and mutual agreements herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

**COVENANTS AND AGREEMENTS**

1. Operations and Maintenance Limitation. The purpose of the District is to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The District shall only operate and maintain those Public Improvements that are not accepted for ownership, operations and maintenance by the Town or other appropriate entity in a manner consistent with Approved Development Plans and other rules and regulations of the Town and the Town Code.

2. Trails and Amenities. The District may own, operate, and maintain trails and related amenities within the District. All parks and trails shall be open to the general public, including Town residents who do not reside in the District. Any fee imposed by the District for access to recreation improvements owned by the District, other than parks and trails, shall not result in Town residents who reside outside the District paying a user fee that is greater than, or otherwise disproportionate to, amounts paid by owners or tenants of the District and shall not result in the District's owners or tenants subsidizing the use by non-District's residents. The District shall be entitled to impose a reasonable administrative fee to cover additional expenses associated

with use of District recreational improvements, other than parks and trails, by Town residents who do not reside in the District to ensure that such use is not subsidized by the District's owners or tenants.

3. Fire Protection, Ambulance and Emergency Services Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain fire protection facilities or services, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town. The authority to plan for, design, acquire, construct, install, relocate, redevelop or finance fire hydrants and related improvements installed as part of the water system shall not be limited by this provision. The District shall not be authorized to provide for ambulance or emergency medical services unless the provision of such service is approved by the Town in an intergovernmental agreement.

4. Television Relay and Translation Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain television relay and translation facilities and services, other than for the installation of conduit as a part of a street construction project, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town.

5. Telecommunication Facilities. The District agrees that no telecommunication facilities owned, operated or otherwise allowed by the District shall affect the ability of the Town to expand its public safety telecommunication facilities or impair the Town's existing telecommunication facilities.

6. Construction Standards Limitation. The District shall ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the Town and of other governmental entities having proper jurisdiction. The District shall obtain the Town's approval of civil engineering plans and applicable permits for construction and installation of Public Improvements prior to performing such work.

7. Zoning and Land Use Requirements; Sales and Use Tax. The District shall be subject to all of the Town's zoning, subdivision, building code and other land use requirements. The District shall not exercise any exemption from Town sales or use tax, whether directly or indirectly.

8. Growth Limitations. The District acknowledges that the Town shall not be limited in implementing Town Council or voter approved growth limitations, even though such actions may reduce or delay development within the District and the realization of District's revenue.

9. Conveyance. The District agrees to convey to the Town, at no expense to the Town and upon written notification from the Town, any real property owned by the District that is necessary, in the Town's sole discretion, for any Town capital improvement projects for transportation, utilities, drainage, streets or trails. The District shall, at no expense to the Town and upon written notification from the Town, transfer to the Town all rights-of-way, fee interests and easements owned by the District that the Town determines are necessary for access to and

operation and maintenance of the Public Improvements to be owned, operated and maintained by the Town, consistent with an Approved Development Plan.

10. Privately Placed Debt Limitation. Prior to the issuance of any Privately Placed Debt, including but not limited to any Developer Debt, the District shall obtain the certification of an External Financial Advisor approved by the Town, in the form substantially as follows:

We are [I am] an External Financial Advisor within the meaning of the District's Service Plan.

We [I] certify that (1) the net effective interest rate (calculated as defined in Section 32-1-103(12), C.R.S.) to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District and all Districts pledging revenue to the repayment of the Debt.

The District shall submit written notice to the Town Manager of the name of the proposed External Financial Advisor prior to the engagement of the External Financial Advisor which shall either be approved or objected to by the Town within twenty (20) days of the submittal of such written notice to the Town Manager. If the Town Manager does not object to such selection within the twenty (20) day period, the Town Manager's approval shall be deemed to have been given to the District retaining the External Financial Advisor named in the written notice.

Within ten (10) days subsequent to the issuance of Privately Placed Debt, the District shall provide the Town with copies of the relevant Debt documents, the External Financial Advisor Certification and the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt.

11. Inclusion Limitation. The District shall not include within its boundaries any property outside the District Boundaries without the prior written consent of the Town. The District shall only include within its boundaries property that has been annexed to the Town and no portion of any of the District shall ever consist of property not within the Town's corporate boundaries.

12. Overlap Limitation. The boundaries of the District shall not overlap with another metropolitan district without the prior written consent of the Town.

13. Debt Limitation. Until the Development and Reimbursement Agreement is approved and executed by the Town and until an Amended and Restated Service Plan is approved by Town Council, the District shall not: (a) issue any Debt; or (b) impose a mill levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds.

14. Maximum Debt Authorization. The District shall not issue Debt in excess of Three Million, Six Hundred Thousand Dollars (\$3,600,000), except that the District shall not issue any Debt absent approval of an Amended and Restated Service Plan by the Town Council. Refunded Debt, wherein the initial debt issuance counted toward the Maximum Debt Authorization shall not count against the Maximum Debt Authorization set forth herein.

15. Execution of Development and Reimbursement Agreement Among The Developer, The Town and The Ledge Rock Center Commercial Metropolitan District; Dissolution Requirement. Pursuant to the Memorandum of Understanding between the Developer and the Town dated May 5, 2021, the Developer, the Town and the Ledge Rock Center Commercial Metropolitan District, a quasi-municipal corporation and political subdivision of the State of Colorado ("Commercial District"), anticipate the negotiation and execution of a Development and Reimbursement Agreement, as that term is defined in the Service Plan for the Commercial District, providing for, among other matters, terms and conditions relating to the financing of public improvements for the Commercial District. If the Developer, the Town and the Commercial District do not execute such Development and Reimbursement Agreement by February 1, 2022, the District shall promptly file a petition in the District Court for dissolution of the District, unless such deadline is extended in writing by the Town.

16. Recurring Fee Limitation. The District may impose and collect Recurring Fees for administrative, operations and maintenance expenses and for services, programs or facilities furnished by the District. Any Recurring Fees for administrative, operations and maintenance expenses not specifically set forth in the Financial Plan, including a subsequent increase in such Recurring Fees, shall be subject to review and approval by the Town. At the discretion of the Town Manager, Town review and approval shall be provided by the Town Manager in writing or referred by the Town Manager to the Town Council. If the Town does not respond to a request for the imposition of the Recurring Fee or an increase in such Recurring Fee within forty-five (45) days of receipt of a written request from the District, the Town shall be deemed to have approved the ability of the District to impose or increase the Recurring Fee as described in the request. Any Recurring Fees imposed or increased for operation and maintenance expenses without approval as set forth herein shall constitute a material departure from the Service Plan. The revenue from a Recurring Fee shall not be used to pay for Debt.

17. Monies from Other Governmental Sources. The District shall not apply for or accept Conservation Trust Funds, Great Outdoors Colorado Funds or other funds available from or through governmental or non-profit entities for which the Town is eligible to apply, except pursuant to an intergovernmental agreement with the Town. This Section shall not apply to specific ownership taxes which shall be distributed to and a revenue source for the District without any limitation.

18. Consolidation Limitation. The District shall not file a request with any Court to consolidate with another Title 32 district without the prior written consent of the Town.

19. Bankruptcy Limitation. It is expressly intended that all of the limitations contained in this Service Plan, including, but not limited to, those pertaining to the Maximum Debt Mill Levy, Maximum Debt Mill Levy Limitation Term, Developer Debt Mill Levy Imposition

Term, and the Recurring Fees, that have been established under the authority of the Town to approve a Service Plan with conditions pursuant to Section 32-1-204.5, C.R.S.:

(a) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent an amendment to the Service Plan; and

(b) Are, together with all other requirements of Colorado law, included in the “political or governmental powers” reserved to the State under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the “regulatory or electoral approval necessary under applicable nonbankruptcy law” as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

The filing of any bankruptcy petition by the District shall constitute, simultaneously with such filing, a material departure of the express terms of this Service Plan, and thus an express violation of the approval of this Service Plan.

20. Water Rights/Resources Limitation. Water to satisfy the needs of the Project shall be dedicated by the Developer to the Town. The District shall not acquire, own, manage, adjudicate or develop water rights or resources except pursuant to an intergovernmental agreement with the Town. If the District provides a non-potable irrigation system, which would be owned, operated and maintained by the District, the District would be permitted to manage the raw water for the District irrigation water system in the manner set forth in a subsequently executed intergovernmental agreement with the Town.

21. Eminent Domain Limitation. Absent the prior written approval of the Town, the District shall not exercise its statutory power of eminent domain or dominant eminent domain for the purpose of condemning property outside of the Service Area. Additional approval from the Town shall not be required prior to the District’s exercise of its statutory power of eminent domain or dominant eminent domain with respect to property within the Service Area. In no event shall the District exercise its statutory power of dominant eminent domain to condemn property owned by the Town.

22. Covenant Enforcement and Design Review Services. The District shall have the power, but not the obligation, to provide Covenant Enforcement and Design Review Services within the District in accordance with the Colorado Statutes as they are amended from time to time. The Town shall not bear any responsibility for Covenant Enforcement and Design Review Services within the boundaries of the District. The Town’s architectural control, design review and other zoning, land use, development, design and other controls are separate requirements that must be met in addition to any similar controls or services undertaken by the District.

23. Special Improvement District. The District shall not be entitled to create a special improvement district pursuant to Section 32-1-1101.7, C.R.S., unless otherwise provided pursuant to an intergovernmental agreement with the Town.

24. Reimbursement Agreement with Adjacent Landowners. If the District utilizes reimbursement agreements to obtain reimbursements from adjacent landowners for costs of improvements that benefit the third-party landowners, such agreements shall be done in

accordance with Town Code. Any and all resulting reimbursements received for such improvement shall be used to re-pay the cost of the Public Improvement that is the subject of the reimbursement agreement or shall be deposited in the District's debt service fund and used for the purpose of retiring Debt. The District shall maintain an accurate accounting of the funds received and disbursed pursuant to reimbursement agreements.

25. Land Purchase Limitation. Proceeds from the sale of Debt and other revenue of the District may be used to pay the Developer for the acquisition from the Developer of any real property, easements or other interests not required to be dedicated for public use by annexation agreements pursuant to Approved Development Plans, the Town Code or other development requirements. Examples of ineligible reimbursements include, but are not limited to: the acquisition of rights of way, easements, land for public drainage, parkland, or open space, unless separate consent is given by resolution of the Town Council. If the Developer seeks reimbursement for the items described herein from the District, prior to providing reimbursement for such amounts, the District shall receive the report of an independent engineer or accountant licensed in Colorado confirming that in such engineer's or accountant's professional opinion, the amount of the reimbursement is reasonable.

26. Reimbursement of Public Improvement Related Costs. Prior to the reimbursement to the Developer for costs incurred in the organization of the District, for funds expended on the District behalf related to the Public Improvements, for the payment by the District for an invoice related to a Public Improvement cost, or for the acquisition of any part of the Public Improvements, the District shall receive: a) the report of an engineer retained by the District, independent of the Developer and licensed in Colorado verifying that, in such engineer's professional opinion, the reimbursement for the costs of the Public Improvements that are the subject of the reimbursement or acquisition, including the construction costs and the soft costs, but excluding the accounting and legal fees, are, in such engineer's opinion, reasonable and are related to the provision of the Public Improvements or are related to the District's organization; and b) the report of an accountant retained by the District, independent of the Developer and licensed in Colorado verifying that, in such accountant's professional opinion, the reimbursement for the accounting and legal fees that are the subject of the reimbursement or acquisition, are, in such accountants opinion, reasonable and related to the Public Improvements or the District's organization. Upon request, the District shall provide the reports to the Town.

27. Developer Reimbursement of Administration, Operations and Maintenance Related Costs. Prior to the reimbursement to the Developer for costs incurred or for funds expended on behalf of the District related to the administration of the District or the operation and maintenance of the Public Improvements, the District shall receive the report of an accountant retained by the District, who is independent of the Developer and licensed in Colorado, verifying that, in such accountant's professional opinion, the reimbursement of the funds advanced for such administration, operations or maintenance costs, are, in such accountant's opinion, receivable and related to the administration, operations or maintenance of the District or the Public Improvements. Upon request, the District shall provide the report to the Town.

28. Board Meetings and Website Limitations. Once an End User owns property in the Service Area, the District's Board meeting(s) shall be conducted within the boundaries of the Town of Johnstown or conducted virtually via internet or telephone platform available for free



access by the public. The District shall establish and maintain a public website and shall include the name of the Project or a name that allows property owners and residents of the District to readily locate the District online and shall also include an updated street map for those properties within the Service Area that have constructed streets that are open for public use. In addition, the District shall timely post a copy of all of the following documents on its public website: (a) each call for nominations, required pursuant to Section 1-13.5-501, C.R.S., (b) the transparency notices provided pursuant to 32-1-809, C.R.S, (c) each recorded declaration of covenants if the District provides Covenant Enforcement and Design Review Services, (d) a copy of this Service Plan and all amendments thereto, (e) all approved budgets, audits, meeting minutes, Board orders and resolutions, (f) any Rules and Regulations adopted by the Board, and (g) all meeting agendas and meeting packets.

29. Financial Review. The Town shall be permitted to conduct periodic reviews of the financial powers of the District in the Service Plan in the manner and form provided in Section 32-1-1101.5, C.R.S. As provided in the statute, the Town may conduct the first financial review in the fifth calendar year after the calendar year in which a special district's ballot issue to incur general obligation indebtedness was approved by its electors. After such fifth calendar year and notwithstanding the provisions of the statute, the Town may conduct the financial review at any time, by providing sixty (60) days written notice to the District, except that the Town may not conduct a financial review within sixty (60) months of the completion of its most recent financial review. The Town's procedures for conducting a financial review under this Paragraph, and the remedies available to the Town as a result of such financial review, shall be identical to those provided for in Section 32-1-1101.5(2), C.R.S. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with such review, and the Town may require a deposit of the estimated costs thereof.

30. Use of Proceeds and Revenues Limitations. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and improvements authorized by the Service Plan. Additionally, if the landowner/developer constructs the public infrastructure and conveys it to the District in return for a reimbursement obligation from the District, prior to making such reimbursement for such amounts, the District must receive a Cost Verification Report.

31. Transfer Fee Limitation. The District shall not be authorized to collect or spend revenue from a transfer fee on the sale of real property within the District, except pursuant to an intergovernmental agreement with the Town.

32. Miscellaneous Powers. The District shall have the power to provide any facility, service, or program allowed by C.R.S. § 32-1-1004(1).

33. New Powers. If, after the Service Plan is approved, the Colorado General Assembly grants new or broader powers for metropolitan districts, to the extent permitted by law, any or all such powers shall be deemed to be a part hereof and available to be exercised by the District only following written approval by the Town, subject to the Town's sole discretion.

34. Service Plan Amendment Requirement. Actions of the District which violate the limitations set forth in this Service Plan shall be deemed to be material modifications to this Service Plan and the Town shall be entitled to all remedies available under State and local law to enjoin such actions of the District, including the remedy of enjoining the issuance of additional authorized but unissued debt, until such material modification is remedied.

35. Maximum Residential Debt Mill Levy. The Maximum Residential Debt Mill Levy shall be forty (40) mills subject to an Assessment Ratio Adjustment.

36. Operations and Maintenance Mill Levy. The Operations and Maintenance Mill Levy shall be a mill levy the District is permitted to impose for payment of the District's administrative, operations and maintenance costs, which shall include, but not be limited to, the funding of operating reserves and sufficient ending fund balances to assure sufficient cash flow to fund expenses as they come due. Prior to the imposition of a mill levy for payment of Debt, the District may impose a maximum Operations and Maintenance Mill Levy of fifty (50) mills. After the imposition of a mill levy for the payment of Debt, the District shall not impose an Operations and Mill Levy that exceeds ten (10) mills, subject to an Assessment Ratio Adjustment, and shall at all times not exceed the maximum mill levy necessary to pay those expenses.

37. Mill Levy Imposition Term.

(a) Developer Debt Mill Levy Imposition Term. Developer Debt shall expire and be forgiven twenty (20) years after the date of the initial imposition by the District of an ad valorem property tax to pay any Debt, unless such term is otherwise extended pursuant to an intergovernmental agreement with the Town. Refunding Bonds shall not be subject to this Developer Debt Mill Levy Imposition Term so long as such Refunding Bonds are not owned by the Developer or by a person or party related to the Developer. Developer Debt shall not have any call protection.

(b) Maximum Debt Mill Levy Imposition Term: In addition to the Developer Debt Mill Levy Imposition Term, the District shall not impose a levy for repayment of any and all Debt (or use the proceeds of any mill levy for repayment of Debt) on any single property developed for residential uses which exceeds forty (40) years after the year of the initial imposition of such mill levy unless a majority of the Board of the District imposing the mill levy are End Users residing in such District and have voted in favor of a refunding of a part or all of the Debt and such refunding will result in a net present value savings as set forth in 11-56-101, et seq., C.R.S.

38. Debt Repayment Sources.

Debt may be repaid from gifts, grants, ad valorem taxes, and any source of payment permitted by law, this Service Plan or other agreement with the Town.

39. Dissolution. Upon a determination of the Town Council that the purposes for which the District was created have been accomplished or as set forth in Paragraph 15 above, the District shall file a petition in the District Court for dissolution, pursuant to the applicable State statutes. Except as provided in Paragraph 15 above, dissolution shall not occur until the District has provided for the payment or discharge of all of its outstanding indebtedness and other financial

obligations as required pursuant to State statutes. Except as otherwise required in the Intergovernmental Agreement or in the Development and Reimbursement Agreement, dissolution shall not be required if the District is responsible for ongoing operations and maintenance.

40. Notices. All notices, demands, requests or other communications to be sent by one party to the other hereunder or required by law shall be in writing and shall be deemed to have been validly given or served by delivery of same in person to the address or by courier delivery, via United Parcel Service or other nationally recognized overnight air courier service, or by depositing same in the United States mail, postage prepaid, addressed as follows:

To the Town:           Attn: Town Manager  
Town of Johnstown  
450 S. Parish Avenue  
Johnstown, CO 80534  
Phone: (970) 587-4664

To the District:       Ledge Rock Center Residential Metropolitan  
District No. 1  
Attn: District Manager  
c/o Pinnacle Consulting Group, Inc.  
550 W. Eisenhower Blvd.  
Loveland, Colorado 80537  
Phone: 970-669-3611  
Fax: 970-669-3612

*With a copy to:*     Spencer Fane LLP  
Attn: David S. O'Leary, Esq.  
1700 Lincoln, Suite 2000  
Denver, CO 80203  
Phone: 303-839-3800  
Fax: 303-839-3838  
[doleary@spencerfane.com](mailto:doleary@spencerfane.com)

All notices, demands, requests or other communications shall be effective upon such personal delivery or one (1) business day after being deposited with United Parcel Service or other nationally recognized overnight air courier service or three (3) business days after deposit in the United States mail. By giving the other party hereto at least ten (10) days written notice thereof in accordance with the provisions hereof, each of the Parties shall have the right from time to time to change its address. Notice may also be provided by electronic mail on the condition that the intended recipient of the electronic mail acknowledges receipt thereof.

41. Amendment. This Agreement may be amended, modified, changed, or terminated in whole or in part only by a written agreement duly authorized and executed by the Parties hereto and, unless Town Council otherwise requires, without amendment to the Service Plan.

42. Assignment. Neither Party hereto shall assign any of its rights nor delegate any of its duties hereunder to any person or entity without having first obtained the prior written consent of the other Party, which consent will not be unreasonably withheld. Any purported assignment or delegation in violation of the provisions hereof shall be void and ineffectual.

43. Default/Remedies. Upon the occurrence of any event of breach or default by either Party, the non-defaulting party shall provide written notice to the other Party. The defaulting Party shall immediately proceed to cure or remedy such breach or default, and in any event, such breach or default shall be cured within fifteen (15) days after receipt of the notice. Following the cure period in the event of a breach or default of this Agreement by either Party, the non-defaulting Party shall be entitled to exercise all remedies available by law or in equity, specifically including suits for specific performance and/or monetary damages. In the event of any proceeding to enforce the terms, covenants or conditions hereof is brought by the Town to enforce the provisions of this Agreement, the Town, if the prevailing Party, shall be entitled to obtain, as part of its judgment or award, its reasonable attorneys' fees, to the extent permitted by law.

44. Governing Law and Venue. This Agreement shall be governed and construed under the laws of the State of Colorado and venue shall be in the County in which the District is located.

45. Inurement. Each of the terms, covenants and conditions hereof shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and assigns.

46. Integration. This Agreement constitutes the entire agreement between the Parties with respect to the matters addressed herein. All prior discussions and negotiations regarding the subject matter hereof are merged herein.

47. Parties Interested Herein. Nothing expressed or implied in this Agreement is intended or shall be construed to confer upon, or to give to, any person other than the District and the Town any right, remedy, or claim under or by reason of this Agreement or any covenants, terms, conditions, or provisions thereof, and all the covenants, terms, conditions, and provisions in this Agreement by and on behalf of the District and the Town shall be for the sole and exclusive benefit of the District and the Town.

48. Severability. If any covenant, term, condition, or provision under this Agreement shall, for any reason, be held to be invalid or unenforceable, the invalidity or unenforceability of such covenant, term, condition, or provision shall not affect any other provision contained herein, the intention being that such provisions are severable.

49. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall constitute an original and all of which shall constitute one and the same document.

50. No Liability of Town. The Town has no obligation whatsoever to construct any improvements that the District is required to construct, or pay any debt or liability of the District, including any Bonds.

51. Paragraph Headings. Paragraph headings are inserted for convenience of reference only.

52. Defined Terms. Capitalized terms used herein and not otherwise defined shall have the meanings ascribed to them in the Service Plan.

LEDGE ROCK CENTER RESIDENTIAL  
METROPOLITAN DISTRICT NO. 1

By: \_\_\_\_\_  
President

Attest:

\_\_\_\_\_  
Secretary

TOWN OF JOHNSTOWN, COLORADO

By: \_\_\_\_\_  
Mayor

Attest:

By: \_\_\_\_\_  
Its: \_\_\_\_\_

## **EXHIBIT E**

### Capital Plan





August 20, 2021

Town of Johnstown  
Board of Trustees  
450 Parish Avenue  
Johnstown, Colorado 80534

Subject: Estimate of Preliminary District Expenditures for  
Ledge Rock Center, Johnstown, Colorado 80534

To Whom It May Concern:

The letter serves to document that Point Consulting, LLC. prepared an Estimate of Preliminary District Expenditures for the Ledge Rock Center, dated August 20, 2021.

The estimate was based on a conceptual engineering plan for the subject proposed mixed-use development, and unit costs were based on comparable projects within the same geographic area during the year 2021.

It is our professional opinion that the construction costs presented in the estimate are reasonable and have been based on the best available information.

Should you have any questions related to this estimate, we can be reached at 720-258-6836, Ext. 1011.

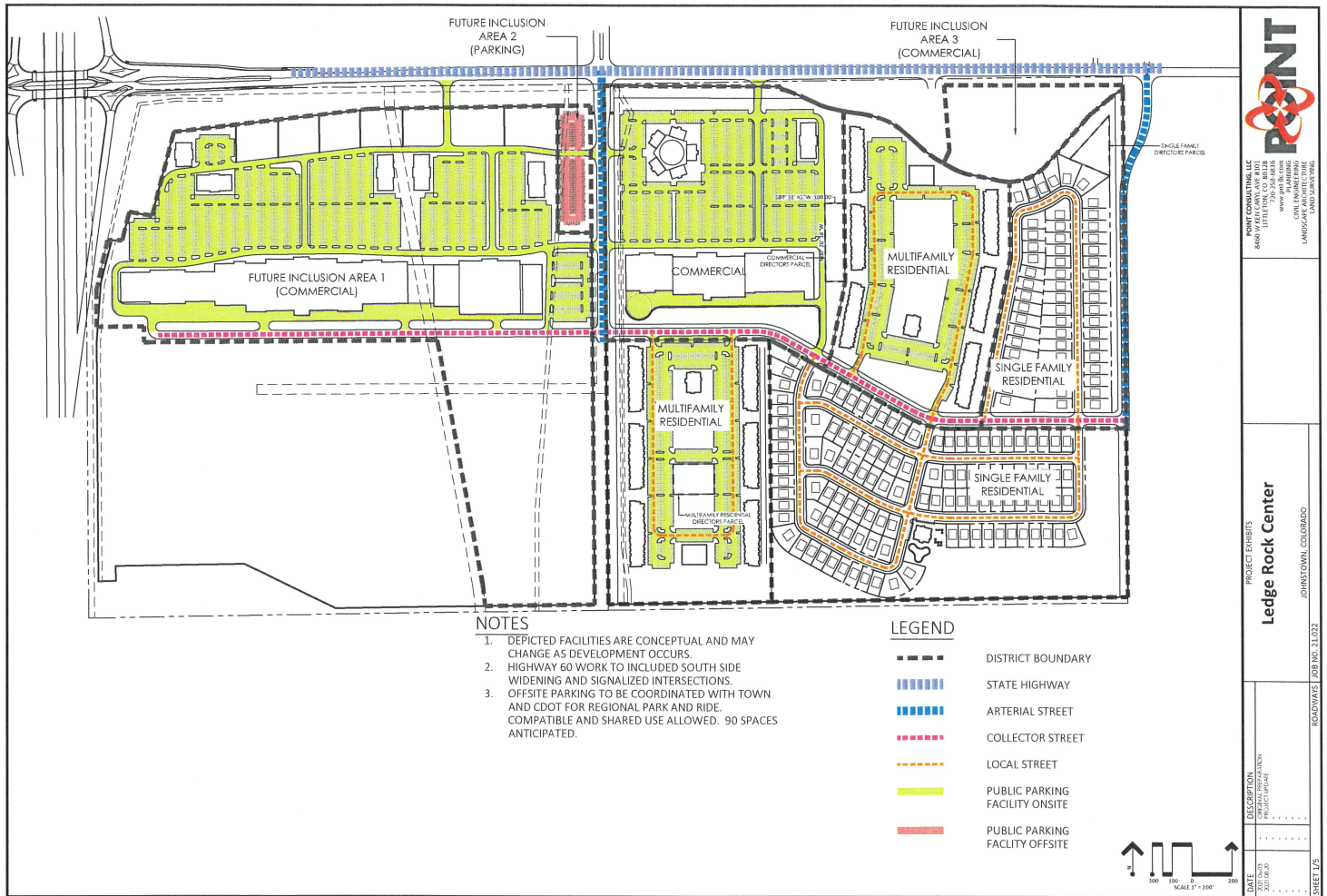
Sincerely,  
Point Consulting, LLC

Jim Shipton,  
Partner

Tiffany Watson,  
Partner

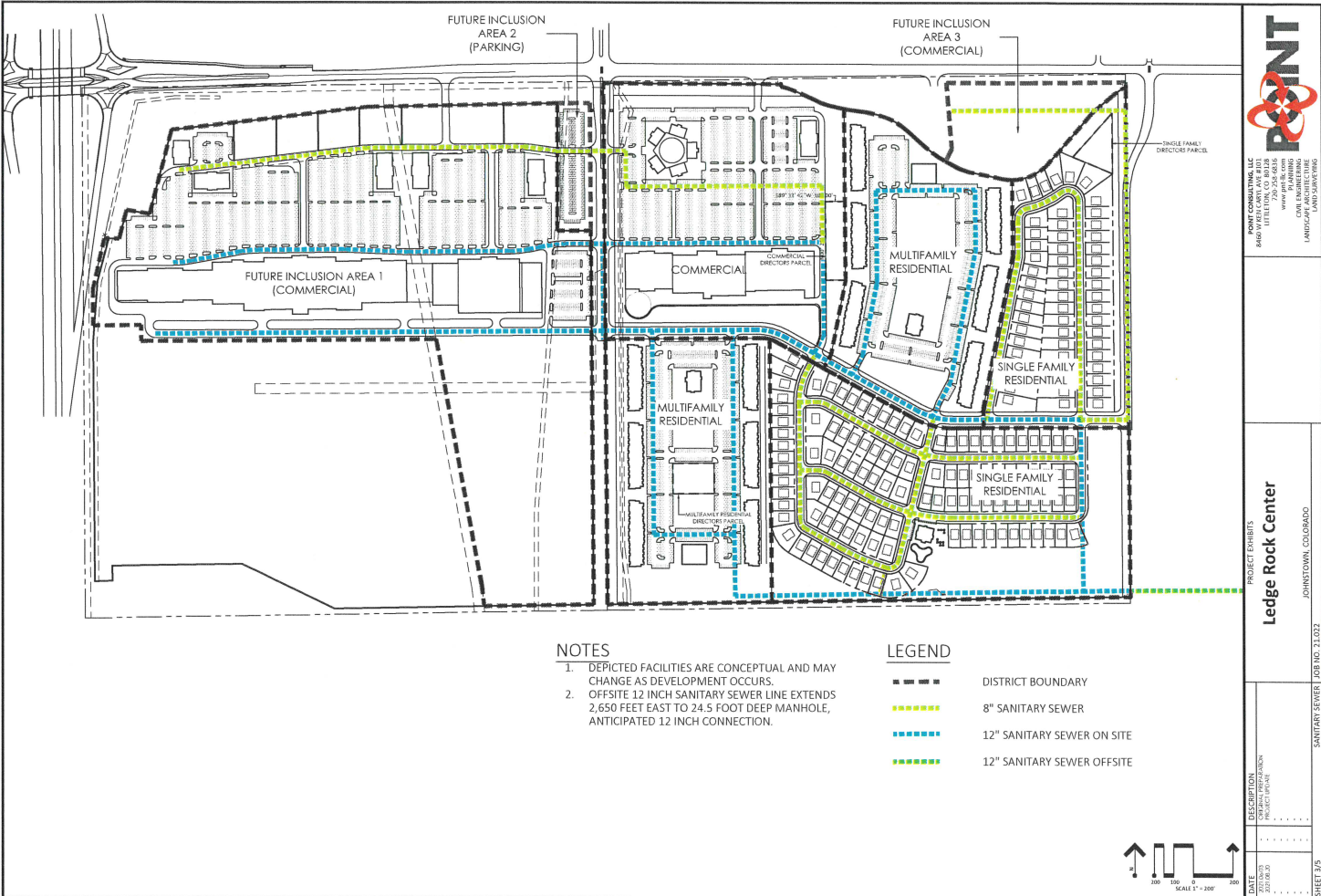


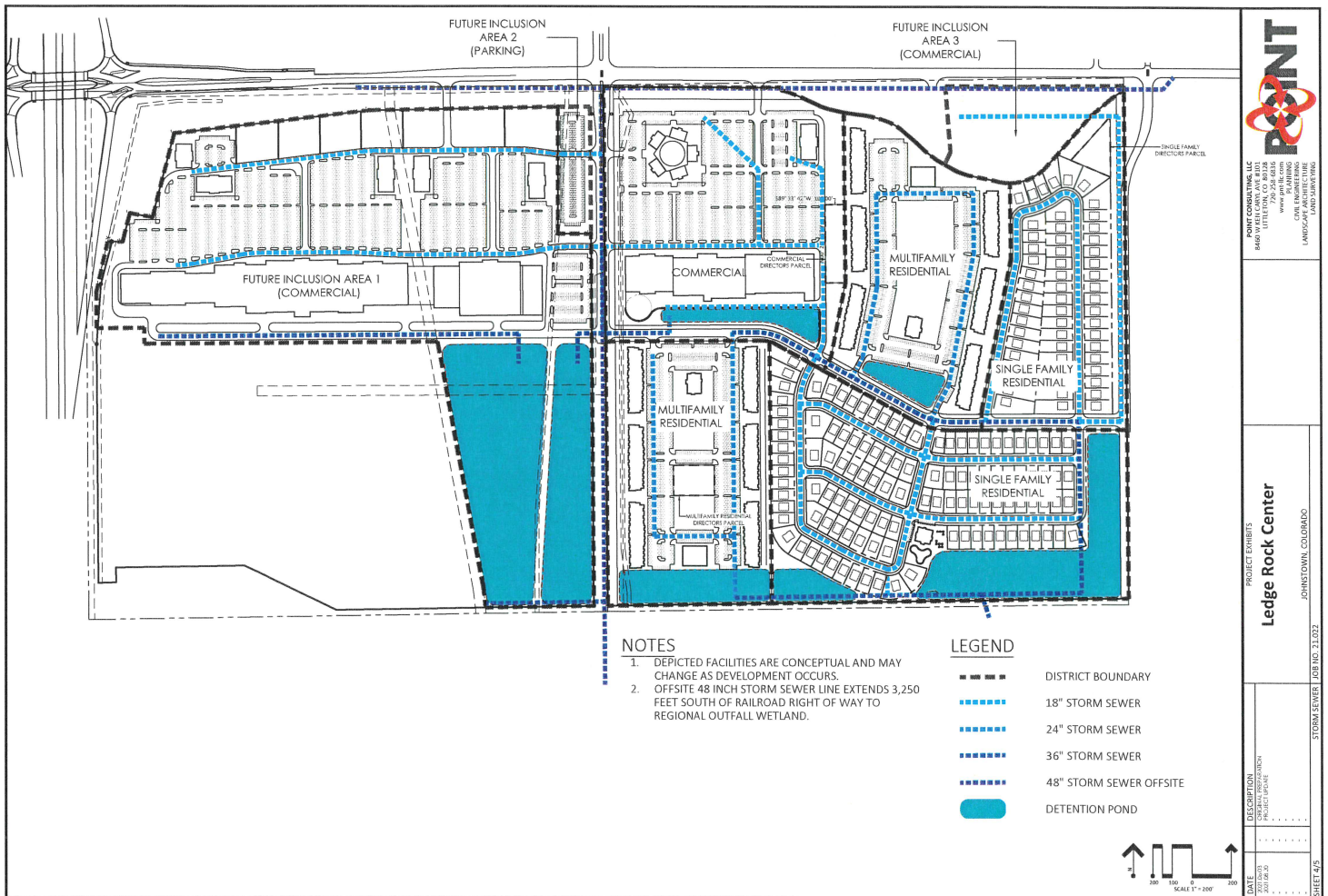
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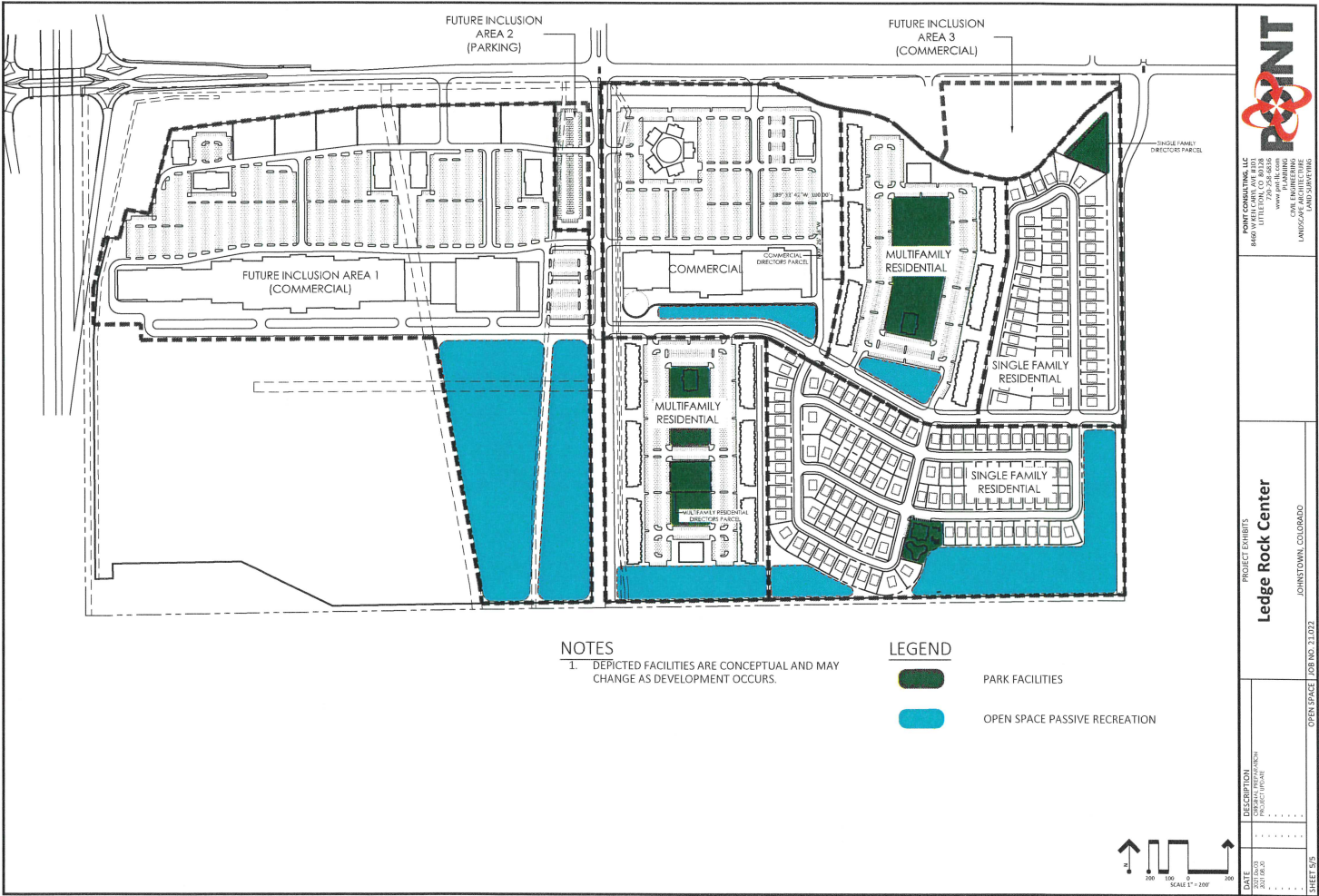












## **EXHIBIT F**

### Financial Plan

**Ledge Rock Center Residential Metropolitan District (Multi-Family)  
Larimer County, Colorado**

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**General Obligation Bonds, Series 2022A
Subordinate Cash Flow Bonds, Series 2022B**

Bond Assumptions	Series 2022A	Series 2022B	Total
Closing Date	3/15/2022	3/15/2022	
First Call Date	3/1/2027	3/1/2027	
Final Maturity	12/1/2051	12/15/2051	
Discharge Date	12/1/2061	12/1/2061	
Sources of Funds			
Par Amount	2,710,000	283,000	2,993,000
Total	2,710,000	283,000	2,993,000
Uses of Funds			
Project Fund	1,523,077	274,510	1,797,587
Capitalized Interest	385,723	0	385,723
Surplus Deposit	247,000	0	247,000
Cost of Issuance	554,200	8,490	562,690
Total	2,710,000	283,000	2,993,000
Debt Features			
Projected Coverage at Mill Levy Cap	1.30x	1.00x	
Tax Status	Tax-Exempt	Tax-Exempt	
Rating	Non-Rated	Non-Rated	
Average Coupon	5.250%	8.250%	
Annual Trustee Fee	\$4,000	\$3,000	
Biennial Reassessment			
Residential	2.00%	2.00%	
Tax Authority Assumptions			
Metropolitan District Revenue			
Residential Assessment Ratio			
Service Plan Gallagherization Base	7.15%		
Current Assumption	7.15%		
Debt Service Mills			
Service Plan Mill Levy Cap	10.000		
Target Mill Levy	10.000		
Specific Ownership Tax	6.00%		
County Treasurer Fee	2.00%		
Operations			
Mill Levy	5.000		

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Ledge Rock Center Residential Metropolitan District (Multi-Family)
Development Summary

Statutory Actual Value (2021)	Residential							Total
	Apartments	-	-	-	-	-	-	
	\$300,000	-	-	-	-	-	-	
2021	-	-	-	-	-	-	-	-
2022	168	-	-	-	-	-	-	168
2023	168	-	-	-	-	-	-	168
2024	168	-	-	-	-	-	-	168
2025	168	-	-	-	-	-	-	168
2026	168	-	-	-	-	-	-	168
2027	168	-	-	-	-	-	-	168
2028	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-
2050	-	-	-	-	-	-	-	-
2051	-	-	-	-	-	-	-	-
Total Units	1,008	-	-	-	-	-	-	1,008
Total Statutory Actual Value	\$302,400,000	-	-	-	-	-	-	\$302,400,000

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Ledge Rock Center Residential Metropolitan District (Multi-Family)
Assessed Value

	Vacant and Improved Land		Residential				Total
	Cumulative Statutory Actual Value ¹	Assessed Value in Collection Year	Residential Units Delivered	Biennial Reassessment	Cumulative Statutory Actual Value	Assessed Value in Collection Year	Assessed Value in Collection Year
		2 Year Lag 29.00%		2.00%		2 Year Lag 7.15%	2 Year Lag
2021	5,040,000	0	-	-	0	0	0
2022	5,040,000	0	168	-	51,408,000	0	0
2023	5,040,000	1,461,600	168	-	103,844,160	0	1,461,600
2024	5,040,000	1,461,600	168	2,076,883	159,405,926	3,675,672	5,137,272
2025	5,040,000	1,461,600	168	-	213,960,507	7,424,857	8,886,457
2026	5,040,000	1,461,600	168	4,279,210	273,885,390	11,397,524	12,859,124
2027	0	1,461,600	168	-	330,643,976	15,298,176	16,759,776
2028	0	1,461,600	-	6,612,880	337,256,855	19,582,805	21,044,405
2029	0	0	-	-	337,256,855	23,641,044	23,641,044
2030	0	0	-	6,745,137	344,001,992	24,113,865	24,113,865
2031	0	0	-	-	344,001,992	24,113,865	24,113,865
2032	0	0	-	6,880,040	350,882,032	24,596,142	24,596,142
2033	0	0	-	-	350,882,032	24,596,142	24,596,142
2034	0	0	-	7,017,641	357,899,673	25,088,065	25,088,065
2035	0	0	-	-	357,899,673	25,088,065	25,088,065
2036	0	0	-	7,157,993	365,057,666	25,589,827	25,589,827
2037	0	0	-	-	365,057,666	25,589,827	25,589,827
2038	0	0	-	7,301,153	372,358,820	26,101,623	26,101,623
2039	0	0	-	-	372,358,820	26,101,623	26,101,623
2040	0	0	-	7,447,176	379,805,996	26,623,656	26,623,656
2041	0	0	-	-	379,805,996	26,623,656	26,623,656
2042	0	0	-	7,596,120	387,402,116	27,156,129	27,156,129
2043	0	0	-	-	387,402,116	27,156,129	27,156,129
2044	0	0	-	7,748,042	395,150,158	27,699,251	27,699,251
2045	0	0	-	-	395,150,158	27,699,251	27,699,251
2046	0	0	-	7,903,003	403,053,162	28,253,236	28,253,236
2047	0	0	-	-	403,053,162	28,253,236	28,253,236
2048	0	0	-	8,061,063	411,114,225	28,818,301	28,818,301
2049	0	0	-	-	411,114,225	28,818,301	28,818,301
2050	0	0	-	8,222,284	419,336,509	29,394,667	29,394,667
2051	0	0	-	-	419,336,509	29,394,667	29,394,667
Total			1,008	95,048,627			

1. Vacant land value calculated in year prior to construction as 10% build-out market value

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Ledge Rock Center Residential Metropolitan District (Multi-Family)
Revenue

	Total	District Mill Levy Revenue			Expense		Total
	Assessed Value in Collection Year	Debt Mill Levy	Debt Mill Levy Collections	Specific Ownership Taxes	County Treasurer Fee	Annual Trustee Fee	Revenue Available for Debt Service
		10.000 Cap 10.000 Target	99.50%	6.00%	2.00%	\$7,000	
2021	0	0.000	0	0	0	0	0
2022	0	10.000	0	0	0	0	0
2023	1,461,600	10.000	14,543	873	(291)	(7,000)	8,125
2024	5,137,272	10.000	51,116	3,067	(1,022)	(7,000)	46,160
2025	8,886,457	10.000	88,420	5,305	(1,768)	(7,000)	84,957
2026	12,859,124	10.000	127,948	7,677	(2,559)	(7,000)	126,066
2027	16,759,776	10.000	166,760	10,006	(3,335)	(7,000)	166,430
2028	21,044,405	10.000	209,392	12,564	(4,188)	(7,000)	210,768
2029	23,641,044	10.000	235,228	14,114	(4,705)	(7,000)	237,638
2030	24,113,865	10.000	239,933	14,396	(4,799)	(7,000)	242,530
2031	24,113,865	10.000	239,933	14,396	(4,799)	(7,000)	242,530
2032	24,596,142	10.000	244,732	14,684	(4,895)	(7,000)	247,521
2033	24,596,142	10.000	244,732	14,684	(4,895)	(7,000)	247,521
2034	25,088,065	10.000	249,626	14,978	(4,993)	(7,000)	252,611
2035	25,088,065	10.000	249,626	14,978	(4,993)	(7,000)	252,611
2036	25,589,827	10.000	254,619	15,277	(5,092)	(7,000)	257,804
2037	25,589,827	10.000	254,619	15,277	(5,092)	(7,000)	257,804
2038	26,101,623	10.000	259,711	15,583	(5,194)	(7,000)	263,100
2039	26,101,623	10.000	259,711	15,583	(5,194)	(7,000)	263,100
2040	26,623,656	10.000	264,905	15,894	(5,298)	(7,000)	268,502
2041	26,623,656	10.000	264,905	15,894	(5,298)	(7,000)	268,502
2042	27,156,129	10.000	270,203	16,212	(5,404)	(7,000)	274,012
2043	27,156,129	10.000	270,203	16,212	(5,404)	(7,000)	274,012
2044	27,699,251	10.000	275,608	16,536	(5,512)	(7,000)	279,632
2045	27,699,251	10.000	275,608	16,536	(5,512)	(7,000)	279,632
2046	28,253,236	10.000	281,120	16,867	(5,622)	(7,000)	285,364
2047	28,253,236	10.000	281,120	16,867	(5,622)	(7,000)	285,364
2048	28,818,301	10.000	286,742	17,205	(5,735)	(7,000)	291,212
2049	28,818,301	10.000	286,742	17,205	(5,735)	(7,000)	291,212
2050	29,394,667	10.000	292,477	17,549	(5,850)	(7,000)	297,176
2051	29,394,667	10.000	292,477	17,549	(5,850)	(7,000)	297,176
Total			6,732,759	403,966	(134,655)	(203,000)	6,799,069

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Ledge Rock Center Residential Metropolitan District (Multi-Family)
Debt Service

	Total Revenue Available for Debt Service	Net Debt Service	Surplus Fund			Ratio Analysis	
		Series 2022A	Annual Surplus	Cumulative Balance ¹	Released Revenue	Debt Service Coverage	Senior Debt to Assessed Value
		Dated: 3/15/2022 Par: \$2,710,000 Proj: \$1,523,077					
2021							
2022	0	0	0	247,000	0	n/a	n/a
2023	8,125	0	8,125	255,125	0	n/a	n/a
2024	46,160	0	46,160	301,285	0	n/a	185%
2025	84,957	142,275	(57,318)	243,967	0	60%	53%
2026	126,066	142,275	(16,209)	227,758	0	89%	30%
2027	166,430	142,275	24,155	251,914	0	117%	21%
2028	210,768	157,275	53,493	305,406	0	134%	16%
2029	237,638	181,488	56,150	361,556	0	131%	13%
2030	242,530	184,388	58,143	419,699	0	132%	11%
2031	242,530	182,025	60,505	480,204	0	133%	11%
2032	247,521	189,663	57,858	538,063	0	131%	10%
2033	247,521	186,775	60,746	542,000	56,808	133%	10%
2034	252,611	193,888	58,724	542,000	58,724	130%	10%
2035	252,611	190,475	62,136	542,000	62,136	133%	9%
2036	257,804	197,063	60,741	542,000	60,741	131%	9%
2037	257,804	193,125	64,679	542,000	64,679	133%	8%
2038	263,100	199,188	63,912	542,000	63,912	132%	8%
2039	263,100	199,725	63,375	542,000	63,375	132%	8%
2040	268,502	205,000	63,502	542,000	63,502	131%	7%
2041	268,502	204,750	63,752	542,000	63,752	131%	7%
2042	274,012	209,238	64,774	542,000	64,774	131%	6%
2043	274,012	208,200	65,812	542,000	65,812	132%	6%
2044	279,632	211,900	67,732	542,000	67,732	132%	5%
2045	279,632	210,075	69,557	542,000	69,557	133%	5%
2046	285,364	217,988	67,377	542,000	67,377	131%	4%
2047	285,364	215,113	70,252	542,000	70,252	133%	4%
2048	291,212	221,975	69,237	542,000	69,237	131%	3%
2049	291,212	223,050	68,162	542,000	68,162	131%	2%
2050	297,176	223,600	73,576	542,000	73,576	133%	2%
2051	297,176	473,625	(176,449)	0	365,551	63%	0%
Total	6,799,069	5,506,413	1,292,657	13,387,977	1,539,657		

1. Assumes \$247,000 Deposit to Surplus Fund at Closing

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Ledge Rock Center Residential Metropolitan District (Multi-Family)
Subordinate Debt Service

	Revenue Available for Debt Service	Interest Payment 8.250%	Balance of Accrued Interest	Principal Payment	Principal Balance	Debt Service		Released Revenue
						Series 2022B		
						Dated: 3/15/2022		
						Par: \$283,000 Proj: \$274,510		
					283,000			
2022	-	-	17,511	-	283,000	-	-	-
2023	-	-	42,303	-	283,000	-	-	-
2024	-	-	69,140	-	283,000	-	-	-
2025	-	-	98,192	-	283,000	-	-	-
2026	-	-	129,640	-	283,000	-	-	-
2027	-	-	163,683	-	283,000	-	-	-
2028	-	-	200,534	-	283,000	-	-	-
2029	-	-	240,426	-	283,000	-	-	-
2030	-	-	283,608	-	283,000	-	-	-
2031	-	-	330,354	-	283,000	-	-	-
2032	-	-	380,955	-	283,000	-	-	-
2033	56,808	56,808	378,923	-	283,000	56,808	-	-
2034	58,724	58,724	374,808	-	283,000	58,724	-	-
2035	62,136	62,136	366,941	-	283,000	62,136	-	-
2036	60,741	60,741	359,820	-	283,000	60,741	-	-
2037	64,679	64,679	348,174	-	283,000	64,679	-	-
2038	63,912	63,912	336,334	-	283,000	63,912	-	-
2039	63,375	63,375	324,054	-	283,000	63,375	-	-
2040	63,502	63,502	310,635	-	283,000	63,502	-	-
2041	63,752	63,752	295,858	-	283,000	63,752	-	-
2042	64,774	64,774	278,840	-	283,000	64,774	-	-
2043	65,812	65,812	259,380	-	283,000	65,812	-	-
2044	67,732	67,732	236,395	-	283,000	67,732	-	-
2045	69,557	69,557	209,688	-	283,000	69,557	-	-
2046	67,377	67,377	182,957	-	283,000	67,377	-	-
2047	70,252	70,252	151,147	-	283,000	70,252	-	-
2048	69,237	69,237	117,727	-	283,000	69,237	-	-
2049	68,162	68,162	82,626	-	283,000	68,162	-	-
2050	73,576	73,576	39,214	-	283,000	73,576	-	-
2051	365,551	65,796	-	283,000	-	348,796	16,755	-
Total	1,539,657	1,239,902		283,000		1,522,902		16,755

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**Ledge Rock Center Residential Metropolitan District (Multi-Family)
Revenue**

	Total	Operations Mill Levy Revenue			Expense	Total
	Assessed Value in Collection Year	O&M Mill Levy	O&M Mill Levy Collections	Specific Ownership Taxes	County Treasurer Fee	Revenue Available for Operations
		5.000 Cap 5.000 Target	99.50%	6.00%	2.00%	
2021	0	0.000	0	0	0	0
2022	0	5.000	0	0	0	0
2023	1,461,600	5.000	7,308	436	(146)	7,598
2024	5,137,272	5.000	25,686	1,533	(514)	26,706
2025	8,886,457	5.000	44,432	2,653	(889)	46,196
2026	12,859,124	5.000	64,296	3,838	(1,286)	66,848
2027	16,759,776	5.000	83,799	5,003	(1,676)	87,126
2028	21,044,405	5.000	105,222	6,282	(2,104)	109,399
2029	23,641,044	5.000	118,205	7,057	(2,364)	122,898
2030	24,113,865	5.000	120,569	7,198	(2,411)	125,356
2031	24,113,865	5.000	120,569	7,198	(2,411)	125,356
2032	24,596,142	5.000	122,981	7,342	(2,460)	127,863
2033	24,596,142	5.000	122,981	7,342	(2,460)	127,863
2034	25,088,065	5.000	125,440	7,489	(2,509)	130,420
2035	25,088,065	5.000	125,440	7,489	(2,509)	130,420
2036	25,589,827	5.000	127,949	7,639	(2,559)	133,029
2037	25,589,827	5.000	127,949	7,639	(2,559)	133,029
2038	26,101,623	5.000	130,508	7,791	(2,610)	135,689
2039	26,101,623	5.000	130,508	7,791	(2,610)	135,689
2040	26,623,656	5.000	133,118	7,947	(2,662)	138,403
2041	26,623,656	5.000	133,118	7,947	(2,662)	138,403
2042	27,156,129	5.000	135,781	8,106	(2,716)	141,171
2043	27,156,129	5.000	135,781	8,106	(2,716)	141,171
2044	27,699,251	5.000	138,496	8,268	(2,770)	143,995
2045	27,699,251	5.000	138,496	8,268	(2,770)	143,995
2046	28,253,236	5.000	141,266	8,434	(2,825)	146,874
2047	28,253,236	5.000	141,266	8,434	(2,825)	146,874
2048	28,818,301	5.000	144,092	8,602	(2,882)	149,812
2049	28,818,301	5.000	144,092	8,602	(2,882)	149,812
2050	29,394,667	5.000	146,973	8,774	(2,939)	152,808
2051	29,394,667	5.000	146,973	8,774	(2,939)	152,808
Total			3,383,296	201,983	(67,666)	3,517,613

SOURCES AND USES OF FUNDS

LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (MULTI-FAMILY) Larimer County, Colorado

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### GENERAL OBLIGATION BONDS, SERIES 2022A SUBORDINATE CASH FLOW BONDS, SERIES 2022B

Dated Date                      03/15/2022  
Delivery Date                 03/15/2022

| <b>Sources:</b>           | <b>Series 2022A</b> | <b>Series 2022B</b> | <b>Total</b> |
|---------------------------|---------------------|---------------------|--------------|
| Bond Proceeds:            |                     |                     |              |
| Par Amount                | 2,710,000.00        | 283,000.00          | 2,993,000.00 |
|                           | 2,710,000.00        | 283,000.00          | 2,993,000.00 |
| <b>Uses:</b>              | <b>Series 2022A</b> | <b>Series 2022B</b> | <b>Total</b> |
| Project Fund Deposits:    |                     |                     |              |
| Project Fund              | 1,523,076.67        | 274,510.00          | 1,797,586.67 |
| Other Fund Deposits:      |                     |                     |              |
| Capitalized Interest Fund | 385,723.33          |                     | 385,723.33   |
| Surplus Deposit           | 247,000.00          |                     | 247,000.00   |
|                           | 632,723.33          |                     | 632,723.33   |
| Cost of Issuance:         |                     |                     |              |
| Other Cost of Issuance    | 500,000.00          |                     | 500,000.00   |
| Delivery Date Expenses:   |                     |                     |              |
| Underwriter's Discount    | 54,200.00           | 8,490.00            | 62,690.00    |
|                           | 2,710,000.00        | 283,000.00          | 2,993,000.00 |

## BOND SUMMARY STATISTICS

### LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (MULTI-FAMILY)

Larimer County, Colorado

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GENERAL OBLIGATION BONDS, SERIES 2022A

10.000 Debt Service Mills

Non-Rated, 1.30x, 30-yr. Maturity

Dated Date	03/15/2022
Delivery Date	03/15/2022
Last Maturity	12/01/2051
Arbitrage Yield	5.250645%
True Interest Cost (TIC)	5.410350%
Net Interest Cost (NIC)	5.339421%
All-In TIC	7.154795%
Average Coupon	5.250000%
Average Life (years)	22.366
Duration of Issue (years)	12.931
Par Amount	2,710,000.00
Bond Proceeds	2,710,000.00
Total Interest	3,182,135.83
Net Interest	3,236,335.83
Total Debt Service	5,892,135.83
Maximum Annual Debt Service	473,625.00
Average Annual Debt Service	198,314.22
Underwriter's Fees (per \$1000)	
Average Takedown	
Other Fee	20.000000
Total Underwriter's Discount	20.000000
Bid Price	98.000000

<i>Bond Component</i>	<i>Par Value</i>	<i>Price</i>	<i>Average Coupon</i>	<i>Average Life</i>
Term Bond due 2051	2,710,000.00	100.000	5.250%	22.366
	2,710,000.00			22.366

	<i>TIC</i>	<i>All-In TIC</i>	<i>Arbitrage Yield</i>
Par Value	2,710,000.00	2,710,000.00	2,710,000.00
+ Accrued Interest			
+ Premium (Discount)			
- Underwriter's Discount	(54,200.00)	(54,200.00)	
- Cost of Issuance Expense		(500,000.00)	
- Other Amounts			
Target Value	2,655,800.00	2,155,800.00	2,710,000.00
Target Date	03/15/2022	03/15/2022	03/15/2022
Yield	5.410350%	7.154795%	5.250645%

NET DEBT SERVICE**LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (MULTI-FAMILY)**

Larimer County, Colorado

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**GENERAL OBLIGATION BONDS, SERIES 2022A**

10.000 Debt Service Mills

Non-Rated, 1.30x, 30-yr. Maturity

| <i>Period<br/>Ending</i> | <i>Principal</i> | <i>Coupon</i> | <i>Interest</i> | <i>Total<br/>Debt Service</i> | <i>Capitalized<br/>Interest Fund</i> | <i>Net<br/>Debt Service</i> |
|--------------------------|------------------|---------------|-----------------|-------------------------------|--------------------------------------|-----------------------------|
| 12/01/2022               |                  |               | 101,173.33      | 101,173.33                    | 101,173.33                           |                             |
| 12/01/2023               |                  |               | 142,275.00      | 142,275.00                    | 142,275.00                           |                             |
| 12/01/2024               |                  |               | 142,275.00      | 142,275.00                    | 142,275.00                           |                             |
| 12/01/2025               |                  |               | 142,275.00      | 142,275.00                    |                                      | 142,275.00                  |
| 12/01/2026               |                  |               | 142,275.00      | 142,275.00                    |                                      | 142,275.00                  |
| 12/01/2027               |                  |               | 142,275.00      | 142,275.00                    |                                      | 142,275.00                  |
| 12/01/2028               | 15,000           | 5.250%        | 142,275.00      | 157,275.00                    |                                      | 157,275.00                  |
| 12/01/2029               | 40,000           | 5.250%        | 141,487.50      | 181,487.50                    |                                      | 181,487.50                  |
| 12/01/2030               | 45,000           | 5.250%        | 139,387.50      | 184,387.50                    |                                      | 184,387.50                  |
| 12/01/2031               | 45,000           | 5.250%        | 137,025.00      | 182,025.00                    |                                      | 182,025.00                  |
| 12/01/2032               | 55,000           | 5.250%        | 134,662.50      | 189,662.50                    |                                      | 189,662.50                  |
| 12/01/2033               | 55,000           | 5.250%        | 131,775.00      | 186,775.00                    |                                      | 186,775.00                  |
| 12/01/2034               | 65,000           | 5.250%        | 128,887.50      | 193,887.50                    |                                      | 193,887.50                  |
| 12/01/2035               | 65,000           | 5.250%        | 125,475.00      | 190,475.00                    |                                      | 190,475.00                  |
| 12/01/2036               | 75,000           | 5.250%        | 122,062.50      | 197,062.50                    |                                      | 197,062.50                  |
| 12/01/2037               | 75,000           | 5.250%        | 118,125.00      | 193,125.00                    |                                      | 193,125.00                  |
| 12/01/2038               | 85,000           | 5.250%        | 114,187.50      | 199,187.50                    |                                      | 199,187.50                  |
| 12/01/2039               | 90,000           | 5.250%        | 109,725.00      | 199,725.00                    |                                      | 199,725.00                  |
| 12/01/2040               | 100,000          | 5.250%        | 105,000.00      | 205,000.00                    |                                      | 205,000.00                  |
| 12/01/2041               | 105,000          | 5.250%        | 99,750.00       | 204,750.00                    |                                      | 204,750.00                  |
| 12/01/2042               | 115,000          | 5.250%        | 94,237.50       | 209,237.50                    |                                      | 209,237.50                  |
| 12/01/2043               | 120,000          | 5.250%        | 88,200.00       | 208,200.00                    |                                      | 208,200.00                  |
| 12/01/2044               | 130,000          | 5.250%        | 81,900.00       | 211,900.00                    |                                      | 211,900.00                  |
| 12/01/2045               | 135,000          | 5.250%        | 75,075.00       | 210,075.00                    |                                      | 210,075.00                  |
| 12/01/2046               | 150,000          | 5.250%        | 67,987.50       | 217,987.50                    |                                      | 217,987.50                  |
| 12/01/2047               | 155,000          | 5.250%        | 60,112.50       | 215,112.50                    |                                      | 215,112.50                  |
| 12/01/2048               | 170,000          | 5.250%        | 51,975.00       | 221,975.00                    |                                      | 221,975.00                  |
| 12/01/2049               | 180,000          | 5.250%        | 43,050.00       | 223,050.00                    |                                      | 223,050.00                  |
| 12/01/2050               | 190,000          | 5.250%        | 33,600.00       | 223,600.00                    |                                      | 223,600.00                  |
| 12/01/2051               | 450,000          | 5.250%        | 23,625.00       | 473,625.00                    |                                      | 473,625.00                  |
|                          | 2,710,000        |               | 3,182,135.83    | 5,892,135.83                  | 385,723.33                           | 5,506,412.50                |



**BOND SOLUTION****LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (MULTI-FAMILY)**  
**Larimer County, Colorado****GENERAL OBLIGATION BONDS, SERIES 2022A**  
**10.000 Debt Service Mills**  
**Non-Rated, 1.30x, 30-yr. Maturity**

| <b>Period<br/>Ending</b> | <b>Proposed<br/>Principal</b> | <b>Proposed<br/>Debt Service</b> | <b>CAPI &amp; DSRF<br/>Adjustments</b> | <b>Total Adj<br/>Debt Service</b> | <b>Revenue<br/>Constraints</b> | <b>Unused<br/>Revenues</b> | <b>Debt Serv<br/>Coverage</b> |
|--------------------------|-------------------------------|----------------------------------|----------------------------------------|-----------------------------------|--------------------------------|----------------------------|-------------------------------|
| 12/01/2022               |                               | 101,173                          | (101,173)                              |                                   |                                |                            |                               |
| 12/01/2023               |                               | 142,275                          | (142,275)                              |                                   | 8,125                          | 8,125                      |                               |
| 12/01/2024               |                               | 142,275                          | (142,275)                              |                                   | 46,160                         | 46,160                     |                               |
| 12/01/2025               |                               | 142,275                          |                                        | 142,275                           | 84,957                         | (57,318)                   | 59.71327%                     |
| 12/01/2026               |                               | 142,275                          |                                        | 142,275                           | 126,066                        | (16,209)                   | 88.60742%                     |
| 12/01/2027               |                               | 142,275                          |                                        | 142,275                           | 166,430                        | 24,155                     | 116.97780%                    |
| 12/01/2028               | 15,000                        | 157,275                          |                                        | 157,275                           | 210,768                        | 53,493                     | 134.01209%                    |
| 12/01/2029               | 40,000                        | 181,488                          |                                        | 181,488                           | 237,638                        | 56,150                     | 130.93879%                    |
| 12/01/2030               | 45,000                        | 184,388                          |                                        | 184,388                           | 242,530                        | 58,143                     | 131.53293%                    |
| 12/01/2031               | 45,000                        | 182,025                          |                                        | 182,025                           | 242,530                        | 60,505                     | 133.24009%                    |
| 12/01/2032               | 55,000                        | 189,663                          |                                        | 189,663                           | 247,521                        | 57,858                     | 130.50597%                    |
| 12/01/2033               | 55,000                        | 186,775                          |                                        | 186,775                           | 247,521                        | 60,746                     | 132.52356%                    |
| 12/01/2034               | 65,000                        | 193,888                          |                                        | 193,888                           | 252,611                        | 58,724                     | 130.28756%                    |
| 12/01/2035               | 65,000                        | 190,475                          |                                        | 190,475                           | 252,611                        | 62,136                     | 132.62176%                    |
| 12/01/2036               | 75,000                        | 197,063                          |                                        | 197,063                           | 257,804                        | 60,741                     | 130.82323%                    |
| 12/01/2037               | 75,000                        | 193,125                          |                                        | 193,125                           | 257,804                        | 64,679                     | 133.49050%                    |
| 12/01/2038               | 85,000                        | 199,188                          |                                        | 199,188                           | 263,100                        | 63,912                     | 132.08640%                    |
| 12/01/2039               | 90,000                        | 199,725                          |                                        | 199,725                           | 263,100                        | 63,375                     | 131.73093%                    |
| 12/01/2040               | 100,000                       | 205,000                          |                                        | 205,000                           | 268,502                        | 63,502                     | 130.97639%                    |
| 12/01/2041               | 105,000                       | 204,750                          |                                        | 204,750                           | 268,502                        | 63,752                     | 131.13631%                    |
| 12/01/2042               | 115,000                       | 209,238                          |                                        | 209,238                           | 274,012                        | 64,774                     | 130.95722%                    |
| 12/01/2043               | 120,000                       | 208,200                          |                                        | 208,200                           | 274,012                        | 65,812                     | 131.60981%                    |
| 12/01/2044               | 130,000                       | 211,900                          |                                        | 211,900                           | 279,632                        | 67,732                     | 131.96406%                    |
| 12/01/2045               | 135,000                       | 210,075                          |                                        | 210,075                           | 279,632                        | 69,557                     | 133.11048%                    |
| 12/01/2046               | 150,000                       | 217,988                          |                                        | 217,988                           | 285,364                        | 67,377                     | 130.90865%                    |
| 12/01/2047               | 155,000                       | 215,113                          |                                        | 215,113                           | 285,364                        | 70,252                     | 132.65826%                    |
| 12/01/2048               | 170,000                       | 221,975                          |                                        | 221,975                           | 291,212                        | 69,237                     | 131.19125%                    |
| 12/01/2049               | 180,000                       | 223,050                          |                                        | 223,050                           | 291,212                        | 68,162                     | 130.55897%                    |
| 12/01/2050               | 190,000                       | 223,600                          |                                        | 223,600                           | 297,176                        | 73,576                     | 132.90519%                    |
| 12/01/2051               | 450,000                       | 473,625                          |                                        | 473,625                           | 297,176                        | (176,449)                  | 62.74500%                     |
|                          | 2,710,000                     | 5,892,136                        | (385,723)                              | 5,506,413                         | 6,799,069                      | 1,292,657                  |                               |

## **EXHIBIT G**

### Form of District Disclosure Notice

**EXHIBIT G**  
**Disclosure Notice**

SPECIAL DISTRICT PUBLIC DISCLOSURE

Pursuant to § 32-1-104.8 C.R.S.

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of the District:                 | Ledge Rock Residential Metropolitan District No. 1 ("District")                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Contact Information for the District: | Ledge Rock Residential Metropolitan District No. 1<br>c/o Pinnacle Consulting Group, Inc.<br>550 W. Eisenhower Blvd., Loveland, CO 80537                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Powers of the District:               | <p>All powers authorized in § 32-1-1004, C.R.S., including, but not limited to, mosquito control, parks or recreational facilities or programs, traffic and safety controls, sanitation services, street improvements, and water services, subject to the limitations contained in the District's Service Plan regarding the exercise of such powers.</p> <p>The District's Service Plan specifically limits the District's authority to exercise the following powers without an intergovernmental agreement with the Town of Johnstown: fire protection, ambulance and emergency services, television relay and translator facilities, telecommunication and solid waste collection, and transportation services.</p>                                                                             |
| Service Plan:                         | The District's Service Plan, which may be amended from time to time, includes a description of the District's powers and authority. A copy of the District's Service Plan is available from the District and from the Division of Local Government.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Financial Powers of the District:     | The District is authorized by Title 32 of the Colorado Revised Statutes to use a number of methods to raise revenues for capital needs and general operations costs. These methods, subject to the limitations imposed by Section 20 of Article X of the Colorado Constitution, include issuing debt, levying taxes, and imposing fees and charges. Information concerning directors, management, meetings, elections and current taxes are provided annually in the Notice to Electors described § 32-1-809(1), C.R.S., which may be found at the District's office, on the District's web site, on file at the Division of Local Government in the State Department of Local Affairs, or on file at the office of the clerk and recorder of each county in which the special district is located. |
| District Boundaries:                  | A map of the District's boundaries is attached hereto as <u>Exhibit A</u> . Please note that the District's boundaries may change from time to time. Please contact the District for the latest information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>District Taxes and Fees:</b> | <p>The District has authority to impose property taxes for the construction, operation, and maintenance of the improvements identified in the Service Plan. The District has the authority to issue debt and, in order to pay debt and for operations and maintenance costs, the District may impose a Debt Mill Levy and an Operations and Maintenance Mill Levy, and collect property taxes on properties within the District. The District may also establish a one-time Development Fee that may be imposed on a per-unit basis for residential property or a per-square foot basis for non-residential property, and may impose other fees and charges. The Service Plan establishes a Maximum Residential Debt Mill Levy and a maximum Operations and Maintenance Mill Levy. The District has the authority to exceed these mill levy caps as provided in the Service Plan. The District's taxes are in addition to other property taxes imposed and collected by other governments such as the Town of Johnstown, Weld County, and other jurisdictions. Below are samples of potential property taxes of the District, based on assumed mill levies. Actual mill levies and property taxes in any year may be higher or lower.</p> |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**LEDGE ROCK CENTER RESIDENTIAL  
METROPOLITAN DISTRICT NO. 1  
PROPERTY TAX ILLUSTRATION**

The following is a sample calculation of the property taxes that will be imposed by and paid solely to the District. This calculation does not include the property taxes that will be due and owing to other public taxing entities, such as to the Town of Johnstown, the Weld County Reorganized School District RE-5J or the Thompson School District R2-J and the Thompson Rivers Parks and Recreation District.

Sample Calculation of Property Tax for a Residential Property based on the Residential Mill Levy Cap:

**Assumptions:**

Market value of residence is \$400,000

Mill levy cap is 50 mills \*

**Calculation:**

$\$400,000 \times .0715 = \$28,600$  (Assessed Valuation)

$\$28,600 \times .050 \text{ mills} = \textbf{\$1,440 per year in taxes owed solely to the District}$

\* Per the Service Plan, the District is entitled to adjust the mill levy cap under certain circumstances, without a corresponding increase in the amount of taxes due and owing. For example, if the assessed valuation ratio for residential property is reduced below .0715, the District is entitled to increase the mill levy to recover the same amount of taxes that would have been paid based on the assessed valuation ratio on the date of approval of the Service Plan.

## **EXHIBIT H**

### Part I – Developer Indemnity Letter



**EXHIBIT H**  
Part I – Developer Indemnity Letter

September 8, 2021

Town of Johnstown  
450 S. Parish Avenue  
Johnstown, CO 80534

**RE: Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2**

To the Town Council:

This Indemnification Letter (the “Letter”) is delivered by the undersigned (the “Developer”) in connection with the review by the Town of Johnstown (the “Town”) of the Service Plan, including all amendments heretofore or hereafter made thereto (the “Service Plan”) for the Ledge Rock Center Commercial Metropolitan District (the “District”). Developer, for and on behalf of itself and its transferees, successors and assigns, represents, warrants, covenants and agrees to and for the benefit of the Town as follows:

1. Developer hereby waives and releases any present or future claims it might have against the Town or the Town’s elected or appointed officers, employees, agents, contractors or insurers (the “Released Persons”) in any manner related to or connected with the adoption of a Resolution of Approval regarding the Town’s approval of the District’s Service Plan or any action or omission with respect thereto. Developer further hereby agrees to indemnify and hold harmless the Released Persons from and against any and all liabilities costs and expenses (including reasonable attorneys’ fees and expenses and court costs) resulting from any and all claims, demands, suits, actions or other proceedings of whatsoever kind or nature made or brought by any end user, property owner or other person or third party which directly or indirectly or purportedly arise out of or are in any manner related to or connected with any of the following: (a) the Service Plan or any document or instrument contained or referred to therein; or (b) the formation of the District; or (c) any actions or omissions of the Developer or the District, or their agents, in connection with the District, including, without limitation, any actions or omissions of the Developer or District, or their agents, in relation to any bonds or other financial obligations of the District or any offering documents or other disclosures made in connection therewith.

2. This Letter has been duly authorized and executed on behalf of Developer.

Very truly yours,

DEVELOPER:  
LEDGE ROCK CENTER, LLC

By: Michael S. Schlap  
Title: Member

## Part II - District Indemnity Letter

## Part II - District Indemnity Letter

{date – date of organizational meeting}

Town of Johnstown  
450 S. Parish Avenue  
Johnstown, CO 80534

**RE: Ledge Rock Center Residential Metropolitan District No. 1**

To the Town Council:

This Indemnification Letter (the “Letter”) is delivered by Ledge Rock Center Residential Metropolitan District No. 1 (the “District”) in order to comply with the Service Plan, including all amendments heretofore or hereafter made thereto (the “Service Plan”) for the District. The District, for and on behalf of itself and its transferees, successors and assigns, covenant and agree to and for the benefit of the Town as follows:

1. The District hereby waives and release any present or future claims they might have against the Town or the Town’s elected or appointed officers, employees, agents, contractors or insurers (the “Released Persons”) in any manner related to or connected with the adoption of a Resolution of Approval of the Town of the District’s Service Plan or any action or omission with respect thereto. To the fullest extent permitted by law, the District hereby agree to indemnify and hold harmless the Released Persons from and against any and all liabilities costs and expenses (including reasonable attorneys’ fees and expenses and court costs) resulting from any and all claims, demands, suits, actions or other proceedings of whatsoever kind or nature made or brought by any end user, property owner or other person which directly or indirectly or purportedly arise out of or are in any manner related to or connected with any of the following: (a) the Service Plan or any document or instrument contained or referred to therein; or (b) the formation of the District; or (c) any actions or omissions of Ledge Rock Center, LLC (the “Developer”), or its agents, in connection with the formation and organization of the District, including, without limitation, any actions or omissions of the District or Developer, or their agents, in relation to any bonds or other financial obligations of the District or any offering documents or other disclosures made in connection therewith, including any claims disputing the validity of the Service Plan and said Resolution of Approval of the Town.

2. It is understood and agreed that neither the District nor the Town waive or intend to waive the monetary limits or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, § 24-10-101, *et seq.*, C.R.S., as from time to time amended, or any other defenses, immunities, or limitations of liability otherwise available to the Town, the District, its officers, or its employees by law.

3. This Letter has been duly authorized and executed on behalf of the District.

Very truly yours,

LEDGE ROCK CENTER RESIDENTIAL  
METROPOLITAN DISTRICT NO. 1

By: \_\_\_\_\_  
President

Attest:

\_\_\_\_\_  
Secretary



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**Memorandum**

File No. 5501871

TO: Town of Johnstown

FROM: David S. O'Leary, Esq.

RE: Executive Summary for Proposed Ledge Rock Center Residential Metropolitan District No. 1 (Multi-Family)

DATE: August 31, 2021

The proposed formation of the Ledge Rock Center Residential Metropolitan District No. 1 (the "District") encompasses the land generally located south of Highway 60/County Road 48 and east of Interstate I-25. The proposed service area includes approximately 50.733 acres of residential land in its proposed boundaries and is anticipated to include the multi-family portion of the Ledge Rock Center project upon final development.

The service area is anticipated to include potential public infrastructure, improvements and amenities/uses upon acquisition and development. The improvements needed for the Ledge Rock Center Project include approximately 90 Park and Ride parking spaces to be included in the Project based upon a request of the Department of Transit and Rail of the Town, on-site and off-site public improvements that will be determined during the land use review process in accordance with the Town's ordinances, rules and regulations which include, among other potential improvements: (i) improvements to State Highway 60, as required by and in coordination with the Town and CDOT; (ii) improvements to High Plains Boulevard, as required by and in coordination with the Town and Weld County; (iii) improvements to the Home Supply Ditch, as required by and in coordination with the Town and Consolidated Home Supply Reservoir and Ditch Company; and (iv) undergrounding electric utilities adjacent to the Town Parcel, as required by the Town and in coordination with the Town and the electric utility provider.

The Ledge Rock Center Residential Metropolitan District No. 1 Service Plan is proposed to contain the multi-family residential development within the Ledge Rock Center development. All property within the proposed boundaries has been annexed within the boundaries of the Town of Johnstown ("Town").

The primary purpose of the District is to provide public improvements consistent with Town-approved development plans that will be dedicated to the Town or dedicated to another public entity (or if permitted by IGA with the Town, retained by the District) for the use and benefit of the District's constituents, end users, the taxpayers, visitors and the public.

Considerable infrastructure will be constructed to provide the public improvements needed to support the development in and around the District. This Service Plan addresses the improvements to be provided by the District and demonstrates how the District proposed to serve the development will work together to provide the necessary public improvements.

Services and powers provided for metropolitan districts authorized by the Special District Act, pursuant to Title 32, C.R.S. and provided within similar districts within the Town, for consideration on the next possible public hearing of the Town Council in order to meet the requirements of a formation election in November 2021.



**I. Major Service Plan Points for Ledge Rock Center Residential Metropolitan District No. 1.**

- The owners of the property are proposed to be Ledge Rock Center, LLC and its affiliated entities.
- Developer of the property is Ledge Rock Center, LLC, and their affiliated entities (Michael Schlup and Allen Schlup are their consultants and their representatives)
- The Draft Financing Plan was provided by Piper Sandler & Company.
- Construction cost estimates were assembled by the Developer with consultation with the District Engineer, Point Consulting which has experience in the costing and construction of similar facilities.

**II. The Project:**

- 50.733 total acres of service area within the boundaries are anticipating. All acres of property in the proposed boundaries are annexed to and within the Town of Johnstown.
- Assumptions upon which this Service Plan is based are reflective of the anticipated initial zoning for the property within the proposed District, the cost estimates, and the Financing Plan are sufficiently flexible to enable the District to provide necessary services and facilities without the need for repeated amendments to the Service Plan.
- Modification of the proposed configuration of improvements, scheduling of construction of such improvements, as well as the locations and dimensions of various facilities and improvements shall be permitted to accommodate development needs consistent with zoning and future development approvals for the property, but consistent with approved development plans of the Town
- Anticipated multi-family residential development is projected to begin in 2022 for a total of 1,218,000 square feet of multi-family property, comprising of 1,008 units absorbing at a rate of approximately 168 multi-family units per year with pricing inflated as the development occurs.
- An economic analysis and impact study will be done by the Town to discuss the use of a Town parcel, and for an incentive package where current sales tax revenue is proposed to be shared between the Town and the District for the purposes of financing the commercial public improvements and acquisition of land for public purposes as well as the economic impact of the residential development as well.
- Assuming development occurs as projected the residential assessed valuation at full buildout for collection year 2030 is expected to be \$24,113,865 for Ledge Rock Residential Metropolitan District No. 1. These values may differ based upon changes in assessed value of the property upon final completion of construction and development with additional assessed valuation possible depending upon final approved development plans with the Town.
- The estimated cost of the public improvements needed for the multi-family residential property portion of the Ledge Rock Center project is currently estimated to be \$18,914,916 for onsite and offsite public improvements based upon current plans, but final values and costs will depend upon approved





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development plans which must be approved by the Town prior to construction and development of the multi-family residential property.

- The proposed financing plan provides for a 10 mills for debt and 5 mills for operations purposes. The Service Plan provides for 40 mills for debt and 10 mills for operations pursuant to the Town model service plans, however, it is anticipated that many of the common area charges will be funded through multi-family leases or agreements. The additional mill levies may be used in the future depending upon needs of the project with all intergovernmental agreements which would require prior Town review and approval.
- The proposed and projected public improvements needed for the project will require additional financing to construct and complete. District financing is projected to pay for public improvements constructed through one or more bond issuances for each District. The total par amount of bonds estimated in 2022 is approximately \$2,993,000, which is anticipated to generate approximately \$1,797,587 in net proceeds provided full buildout occurs as anticipated using a 30 year amortization schedule.
- Debt is proposed to be issued in one or more series of bond issuances to allow for financing of constructed infrastructure and expedient completion of the Development.
- Requested Debt Authorization of \$3,600,000 allows for approximately 120% coverage (based upon the financing plan run at \$2,993,000 in capacity with revenue from the proposed ad valorem mill levies and operations and maintenance costs taken into consideration, the additional coverage would allow for contingencies and financing variations based upon changes to construction costs, development build out and absorption of the project. The net proceeds of the initial estimated bond issuances would be approximately \$1,797,587 for the multi-family portion of the Ledge Rock Center Project. Current modeling has not been projected to provide any additional revenue other than property tax for the site initially. Additionally capacity may be available based upon what is ultimately constructed in the project based upon approved development plans. Public improvement costs not financed through the District would be funded through developer advances, private contributions or other financing contributions.
- Maximum voted interest rate of 8%, maximum underwriting discount of 4%. Interest on Developer Debt shall be limited to 8% simple interest.
- Metropolitan district powers allowed by the Special District Act and consistent with other Town of Johnstown metropolitan districts.
- Formation Election after approval of the Service Plan in November 2021.
- There are no current residents within the District and no debt or bonds have been issued.
- Mill levies, interest rate limitations and underwriting discounts will be consistent with the present Town imposed limitations with other service plans approved by the Town.
- Maximum term of any bond issue is 30 years for General Obligation Bonds.
- Intergovernmental Agreement with Town of Johnstown to implement Service Plan restrictions. No operations are currently authorized and future operations and maintenance of public improvements



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are subject to prior approval and authorization pursuant to intergovernmental agreement with the Town of Johnstown. It is anticipated that there will be parking lots, lighting and storage structures as well as common areas within the multi-family property that may be dedicated to the District for operations if approved by the Town in the future upon approval of an intergovernmental agreement.

- Ledge Rock Center Residential Metropolitan District No. 1 shall develop and finance its own property.
- Ledge Rock Center, LLC is actively developing and meeting with the Town to complete both onsite and offsite public improvements for the commercial property, residential development and multi-family and hotel/conference center property and park and recreation improvements for the residential property.

The Ledge Rock Center Residential Metropolitan District No. 1 Service Plan will serve the best interests of the taxpayers, property owners and development of the property within the Ledge Rock Center development, will maximize both development and absorption within the District and Town without delays in development. The formation of the District will allow for financing and development to pay for only those improvements and costs which are a direct benefit to the property within the District.

**TOWN OF JOHNSTOWN, COLORADO  
RESOLUTION NO. 2021-29**

**RESOLUTION APPROVING THE SERVICE PLAN FOR  
LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 1**

**WHEREAS**, the Town of Johnstown, Colorado (“Town”) is a Colorado home rule municipality, duly organized and existing under the laws of the State of Colorado and the Town’s Home Rule Charter; and

**WHEREAS**, the Town Council of the Town (“Town Council”) is vested with authority to administer the affairs of the Town; and

**WHEREAS**, pursuant to Section 32-1-204.5, C.R.S., a Service Plan for the Ledge Rock Center Residential Metropolitan District No. 1 (“Service Plan”), a copy of which is attached hereto and incorporated herein by reference as Exhibit A, was submitted to the Town Council for approval; and

**WHEREAS**, Ledge Rock Center, LLC, a Kansas limited liability company (“Developer”), the purchaser of the real property within the initial proposed boundaries of the Ledge Rock Center Residential Metropolitan District No. 1 (“District”), with the consent of the owners of the real property, as evidenced in the Service Plan, has requested approval of the Service Plan; and

**WHEREAS**, pursuant to the provisions of Title 32, Article 1, Part 2, C.R.S., on September 8, 2021, the Town Council, following due notice, held a public hearing on the proposed Service Plan; and

**WHEREAS**, the Town Council considered the Service Plan and all other testimony and evidence presented at the hearing; and

**WHEREAS**, based upon the testimony and evidence presented at the hearing, the Town Council finds that the Service Plan should be approved, subject to the conditions set forth below, in accordance with Section 32-1-204.5(1)(c), C.R.S.

**NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF JOHNSTOWN, COLORADO, THAT:**

1. **Satisfaction of Statutory Requirements as to Filing and Notice.** The Town Council, as the governing body of the Town of Johnstown, Colorado, does hereby determine, based on representations made by and on behalf of the Developer and proponents of the formation of the District, that all of the requirements of Title 32, Article 1, Part 2, C.R.S., as amended, relating to the filing of the proposed Service Plan for the District have been fulfilled and that notice of the hearing was given in the time and manner as provided in Section 32-1-204, C.R.S.

2. **Jurisdiction.** Based on representations by and on behalf of the Developer and proponents of the formation of the District, the Town Council of the Town of Johnstown,

Colorado, has jurisdiction over the subject matter of the proposed Service Plan pursuant to Title 32, Article 1, Part 2, C.R.S., as amended.

3. **Findings.** That, pursuant to Section 32-1-204.5, C.R.S., Section 32-1-202(2), C.R.S., and Section 32-1-203(2), C.R.S., the Town Council does hereby find and determine, based on the Service Plan, the representations by and on behalf of the Developer and proponents of the formation of the District, and other evidence presented at the public hearing, that:

- (a) There is sufficient existing and projected need for organized service in the area to be serviced by the District;
- (b) The existing service in the area to be served by the District is inadequate for present and projected needs;
- (c) The District is capable of providing economical and sufficient service to the area within its proposed boundaries; and
- (d) The area to be included in the District has, or will have, the financial ability to discharge the proposed indebtedness on a reasonable basis.

4. **Service Plan Approved; Conditions and Limitations.** The Town Council hereby approves the Ledge Rock Center Residential Metropolitan District No. 1, attached as Exhibit A. This approval is given specifically subject to the following conditions and limitations pursuant to Section 32-1-204.5(1)(c), C.R.S.:

- (a) At its first meeting after the effective date of this Resolution and in no event later than sixty (60) days after the formation election of the District, the Board of Directors of the District shall execute the Intergovernmental Agreement with the Town (“IGA”) and the District’s Indemnity Letter in the forms set forth as exhibits to the Service Plan presented to the Town Council at its September 8, 2021, public hearing, or in forms otherwise acceptable to the Town Attorney, and shall deliver the fully executed originals of the IGA and Indemnity Letter to the Town within ten (10) days of the District’s organizational meeting.
- (b) The Town’s approval of the Service Plan shall not relieve the Developer or any other owner of property in the District of any requirement, under the annexation agreement pertaining to the property within the District’s boundaries or otherwise, to provide financial guarantees for construction of, and dedicate to the Town, the required public improvements.
- (c) Once the District has been duly organized, any material modification of the Service Plan shall require an amendment to the Service Plan, which must be approved by Town Council.
- (d) The conditions set forth in this Resolution are not intended and shall not be construed to enlarge, diminish, or otherwise affect any of the requirements, limitations or other provisions of the Service Plan or IGA.

5. **Execution of Town IGA.** The IGA referred to in Section 4(a) above is hereby approved in essentially the same form as the copy of such IGA set forth as Exhibit D to the Service Plan, which was presented to the Town Council at the September 8, 2021, public hearing. The Mayor and Town Clerk are hereby authorized to execute the IGA on behalf of the Town provided the same has first been executed by the District.

6. **Filing of Resolution.** A certified copy of this Resolution shall be filed in the records of the Town and submitted to the Developer for the purpose of filing in the District Court of Weld County.

PASSED, SIGNED, APPROVED, AND ADOPTED this \_\_\_\_ day of \_\_\_\_\_, 2021.

ATTEST:

**TOWN OF JOHNSTOWN, COLORADO**

By: \_\_\_\_\_  
Diana Seele, Town Clerk

By: \_\_\_\_\_  
Gary Lebsack, Mayor



# Town of Johnstown

## TOWN COUNCIL AGENDA COMMUNICATIONS

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**AGENDA DATE:** September 8, 2021

**SUBJECT:** **Public Hearing** – Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 2

**ACTION PROPOSED:** Consider Resolution No. 2021-30

**ATTACHMENTS:**

1. Proposed Service Plan
2. Executive Summary prepared by David O’Leary, counsel for the Developer
3. Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 2

**PRESENTED BY:** Town Attorney, Avi Rocklin, and Special Counsel, MaryAnn McGeady

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### AGENDA ITEM DESCRIPTION:

An application for approval of a Service Plan for the Ledge Rock Center Residential Metropolitan District No. 2 (“Service Plan”) was submitted on behalf of Ledge Rock Center, LLC, a Kansas limited liability company (“Developer”), pursuant to the requirements of the Special District Control Act, Title 32, Article 1, Part 2, C.R.S. The Service Plan was submitted in connection with a development known as Ledge Rock Center, generally located east of U.S. Interstate 25 and south of Highway 60/County Road 48 (“Property”). The Ledge Rock Center development is anticipated to include commercial development, multi-family development and single-family residential homes. The service area of the proposed District includes the single-family portion of the Ledge Rock Center development. The Developer is under contract to purchase the Property. The owners of the Property provided consent to the organization of the District, as evidenced in Exhibit C-3 to the Service Plan.

To satisfy the statutory requirements, the Service Plan includes (1) a description of the proposed services, (2) a financial plan as to how the services are to be financed, (3) a preliminary engineering or architectural survey showing how the proposed services are to be provided, (4) a map of the proposed boundaries of the District, (5) an estimate of the population and valuation for assessment of the proposed district, (6) a description of the facilities to be constructed and the standards for construction, (7) a general description of the estimated cost of acquiring land, engineering services, legal services, administrative services, initial proposed indebtedness and estimated proposed maximum interest rates and discounts, and other major expenses related to the organization and initial operation of the District, and (8) a proposed intergovernmental agreement between the Town and the District.

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[www.TownofJohnstown.com](http://www.TownofJohnstown.com)

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141



The service area for the proposed Ledge Rock Center Residential Metropolitan District No. 2 (“District”) includes approximately 61.336 acres of land with an anticipated 175 single-family residential units.

The Service Plan is generally consistent with the Model Service Plan adopted by Town Council on February 22, 2017.

The maximum debt mill levy is 40 mills and the maximum operations and maintenance mill levy is 10 mills. The mill levies are subject to an assessed valuation adjustment, meaning, primarily, that if the residential assessment rate is changed (the ratio of assessed valuation to actual valuation), the mill levy may be increased above the cap so that the rate change is revenue neutral to the District.

The maximum term for developer debt is 20 years from the initial imposition of an ad valorem property tax, unless the Town approves a longer term by intergovernmental agreement, and 40 years for all other debt.

The capital plan, attached as Exhibit E to the Service Plan, estimates public improvement project costs of approximately \$6,899,428. Given the timing of the submittals, Greg Weeks, the Town’s Engineer, did not have an opportunity to review the capital plan.

The financial plan, attached as Exhibit F to the Service Plan, provides that the District will have the ability to issue debt in the amount of \$3,232,000, which is anticipated to generate approximately \$1,997,567 in net proceeds to the project. The maximum debt authorization under the Service Plan is \$3,900,000.

Importantly, the District is not entitled to issue any debt until an Amended and Restated Service Plan is presented to and approved by the Town Council. The methodology allows the Developer to form the District during the November election but provides the Town Council with an opportunity to review and, if appropriate, modify the terms of the Service Plan once the development plans are better understood.

Pursuant to state law, the Town Council must approve the Service Plan before the District is formed and entitled to operate. The Service Plan must be approved through a public hearing process. Upon approval, the Service Plan, along with a petition for organization of the District, must be submitted to the Weld County District Court, who will then hold a hearing on the petition and order an election regarding the organization of the District. Notice of this public hearing before the Town Council was published in *The Johnstown Breeze* and provided to interested persons by the proponents of the District.

#### **LEGAL ADVICE:**

The Town Attorney and the Town’s Special Counsel have reviewed the proposed Service Plan.

#### **FINANCIAL ADVICE :**

The Town’s Special Counsel has reviewed the financial plan.

**RECOMMENDED ACTION:** Approve Resolution No. 2021-30

---

#### **SUGGESTED MOTIONS:**

*The Community That Cares*

[www.TownofJohnstown.com](http://www.TownofJohnstown.com)

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141

**For Approval:** I move to approve Resolution No. 2021-30, a Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 2.

**For Approval with Conditions:** I move to approve Resolution No. 2021-30, a Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 2, with the following modifications to the proposed Service Plan, \_\_\_\_\_, and direct the Town Attorney to revise the Service Plan accordingly.

**For Denial:** I move to deny approval of Resolution No. 2021-30, a Resolution Approving the Service Plan for Ledge Rock Center Residential Metropolitan District No. 2.

*Reviewed and Approved for Presentation,*



---

Town Manager

**SERVICE PLAN**  
**FOR**  
**LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 2**  
**TOWN OF JOHNSTOWN, COLORADO**

Prepared  
by

SPENCER FANE, LLP  
1700 Lincoln Street, Suite 2000  
Denver, Colorado 80203

Resubmitted: September 1, 2021

Approved: \_\_\_\_\_, 2021

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## I. INTRODUCTION

### A. Intent and Purpose.

The Town intends that this Service Plan grant authority to the District to provide for the planning, design, acquisition, construction, installation and financing of Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The Town and the District acknowledge that the District is an independent unit of local government, separate and distinct from the Town, and, except as may otherwise be provided for by State or local law, this Service Plan or an intergovernmental agreement with the Town, the District's activities are subject to review by the Town only insofar as the activities may deviate in a material manner from the requirements of the Service Plan. The primary purpose of the District will be to finance the construction of these Public Improvements.

The District may also provide ongoing operations and maintenance services as set forth in this Service Plan.

### B. Need for the District.

There are currently no other governmental entities, including the Town, located in the immediate vicinity of the District that consider it desirable, feasible or practical to undertake the planning, design, acquisition, construction, installation, and financing of the Public Improvements or the ownership, operation and maintenance by the Town or another entity. Formation of the District is therefore necessary in order for the Public Improvements to be provided in the most economic manner possible.

### C. Town's Objective Regarding the District's Service Plan.

The Town's objective in approving the Service Plan is to authorize the District to provide for the planning, design, acquisition, construction, installation, relocation, redevelopment, financing, repair, replacement and operations and maintenance of the Public Improvements from the proceeds of Debt that may be issued by the District and to provide for the ownership, operation or maintenance by the Town or District where appropriate. Debt is expected to be repaid by an ad valorem property tax no higher than the Maximum Debt Mill Levy. Debt issued within these parameters and, as further described in the Financial Plan, is intended to insulate property owners from excessive tax and financial burdens and result in a timely and reasonable repayment. Generally, the cost of Public Improvements that cannot be funded within these parameters and the financing capacity of the District are not costs to be paid by the District.

The Town intends to authorize the District to have the ability to plan, design, acquire, construct, install and finance the initial Public Improvements necessary to develop the Project and seeks the timely payment of Debt related to those initial Public Improvements so that the financial burden on End Users is minimized. The District shall not be entitled to issue any Debt until it has received approval of a Service Plan Amendment in the form of an Amended and Restated Service Plan and shall be required to obtain authorization of the Town, in the form of an intergovernmental agreement, prior to issuing Debt for the redevelopment of an existing Public Improvement.

The Town prefers that all property classified as “residential” shall be located solely within the boundaries of a residential district and that all property classified as “commercial” shall be located solely within the boundaries of a commercial district. For purposes of this distinction “commercial property” shall mean all property other than “residential real property” as that term is defined in Article X, Section 3(1)(b) of the Colorado Constitution. The distinction facilitates two goals: (1) to have similarly situated properties governed by common interests, and (2) to apply a lower maximum tax burden on residential owners. The foregoing shall not prohibit residential and commercial Districts from sharing the costs of Public Improvements in compliance with the provisions of this Service Plan and applicable law, provided, however, that no fees derived from retail sales shall be used to pay the costs of the Public Improvements.

Unless the District has operational responsibilities for any of the Public Improvements or Covenant Enforcement and Design Review Services, the Town intends that the District dissolve upon payment or defeasance of all Debt incurred or upon a court determination that adequate provision has been made for the payment of all Debt and for continuation of any operations.

## II. DEFINITIONS

In this Service Plan, the following terms shall have the meanings indicated below, unless the context hereof clearly requires otherwise:

Amended and Restated Service Plan: means an amendment to this Service Plan approved by the Town Council that may, among other potential matters, authorize the issuance of Debt in compliance with the terms thereof.

Approved Development Plan: means a subdivision improvement development agreement, preliminary or final plat or other process established by the Town for identifying, among other matters, Public Improvements necessary for facilitating development for property within a part or all of the Service Area as approved by the Town pursuant to the Town Code, as amended from time to time.

Assessment Ratio Adjustment: means, if, on or after January 1, 2021, there are changes in the method of calculating assessed valuation or any constitutionally mandated tax credit, cut or abatement, the Maximum Debt Mill Levy and Maximum Operations and Maintenance Mill Levy may be increased or decreased to reflect such changes, such increases and decreases to be determined by the Board in good faith (such determination to be binding and final) so that to the extent possible, the actual tax revenues generated by the applicable mill levy, as adjusted for changes occurring after January 1, 2021, are neither diminished nor enhanced as a result of such changes. For purposes of the foregoing, a change in the ratio of actual valuation to assessed valuation shall be deemed to be a change in the method of calculating assessed valuation.

Board: means the Board of Directors of the District.

Bond, Bonds or Debt: means bonds, notes, contracts, reimbursement agreements or other multiple fiscal year financial obligations issued by the District or other obligations for the

payment of which the District has promised to impose an ad valorem property tax mill levy and/or impose and collect Development Fees.

Bond Counsel Opinion: means the opinion, to be provided by an attorney licensed in Colorado and published in the then current publication of the Bond Buyer Directory of Municipal Bond Attorneys, providing that the Debt that is the subject of the opinion was issued in accordance with the provisions of the Service Plan.

Capital Plan: means the Capital Plan described in Section V.C. which includes: (a) a list of the Public Improvements which may be developed by the District; (b) an engineer's estimate of the cost of the Public Improvements; and (c) a pro forma capital expenditure plan correlating expenditures with development.

Cost Verification Report: means a report provided by an engineer or accountant as required pursuant to Section V.A.28.

Covenant Enforcement and Design Review Services: means those covenant enforcement and design review services authorized in the Special District Act.

Debt: See Bond, Bonds or Debt.

Developer: means the owner or owners of the property within the Service Area, any affiliates of such owner or owners and their successors and assigns other than End Users. As of the date of this Service Plan, the Developer is Ledge Rock Center, LLC, and may include its heirs, affiliates, successors and assigns designated by the Developer to the Town from time to time.

Developer Debt: means bonds, notes, contracts, reimbursement agreements or other multiple fiscal year financial obligations issued by the District to the Developer within the District for reimbursement of sums advanced or paid for funding of Public Improvements and/or operation and maintenances expenses. Developer Debt shall be subordinate to other Debt of the District.

Developer Debt Mill Levy Limitation Term: means the Developer Debt Mill Levy Imposition Term set forth in Section VI.D.1.

Development and Reimbursement Agreement: means an agreement, as amended from time to time, between the Town and the Ledge Rock Center Residential Metropolitan District No. 2, and the Developer as to those items which the Developer may be a party, that provides, among other matters, the terms and conditions relating to maximum interest rates on Debt issued to the Developer or other landowners, and limitations on other revenue sources.

District: means Ledge Rock Center Residential Metropolitan District No. 2.

End User: means any owner or occupant of any taxable residential real property within the District after such property has been vertically developed. By way of illustration, a resident

homeowner or renter is an End User. The Developer and any business entity that constructs homes is not an End User.

External Financial Advisor: means a consultant that: (1) advises Colorado governmental entities on matters relating to the issuance of securities by Colorado governmental entities, including matters such as the pricing, sales and marketing of such securities and the procuring of bond ratings, credit enhancement and insurance in respect of such securities; (2) shall be an underwriter, investment banker, or individual listed as a public finance advisor in the Bond Buyer's Municipal Market Place; and (3) is not an officer or employee of the District.

External Financial Advisor Certification: means the certification required to be provided pursuant to Section V.A.10. below.

Fee or Fees: means any fee, rate, toll, penalty, or charge imposed by the District for services, programs or facilities provided or to be provided by the District.

Financial Plan: means the initial proposed Financial Plan described in Section VI, which describes (i) how the Public Improvements are to be financed; (ii) how Debt may be incurred; and (iii) the estimated operating revenue derived from property taxes for the first budget year. Such costs shall not constitute legal limits on the financial powers of the District; provided, however, that the District shall not be permitted to issue Bonds which are not in compliance with the bond registration and issuance requirements of Colorado law and which are not in compliance with the terms of the Development and Reimbursement Agreement, this Service Plan and any other agreements between the District and the Town.

District Boundaries: means the boundaries of the area described in the District Boundary Map.

District Boundary Map: means the map attached hereto as **Exhibit C-1**, describing the boundaries of the District.

Intergovernmental Agreement: means the Intergovernmental Agreement required by the Town, a form of which is attached hereto as **Exhibit D** and described in Article IX hereof.

Map Depicting Public Improvements: means the map attached hereto as **Exhibit E**, showing the initial proposed location(s) of the Public Improvements listed in the Capital Plan. The location and specifications of the Public Improvements may change from time to time without a requirement to amend the Map Depicting the Public Improvements or an amendment to the Service Plan.

Maximum Debt Authorization: means the total Debt the District is permitted to incur as set forth in Section V.A.14. below.

Maximum Debt Mill Levy: means the maximum mill levy the District is permitted to impose for payment of Debt as set forth in Section VI.C below.

Maximum Debt Mill Levy Imposition Term: means the maximum term for imposition of a mill levy as set forth in Section VI.D. below.

Maximum Operations and Maintenance Mill Levy: means the maximum mill levy the District is permitted to impose for payment of Operation and Maintenance Expenses, as set forth in Section VI.C.2. below.

Operations and Maintenance Mill Levy: means the mill levy the District is permitted to impose for payment of administrative, operations and maintenance expenses as set forth in Section VI.C.2. below.

Privately Placed Debt: means Debt that is issued by the placement of the Debt directly with the Debt purchaser and without the use of an underwriter as a purchaser and reseller of the Debt, and includes, but is not limited to, Developer Debt and bank loans.

Project: means the single-family residential development in a development to be known as Ledge Rock Center.

Proof of Ownership: means a current title commitment or ownership and encumbrance report showing ownership and all encumbrances on all properties within the District Boundaries, or other documentation acceptable to the Town Attorney.

Public Improvements: means a part or all of the improvements authorized to be planned, designed, acquired, constructed, installed and financed as listed on the Capital Plan, attached as **Exhibit E**, and generally described in the Special District Act, or as set forth in an Approved Development Plan or intergovernmental agreement with the Town, to serve the anticipated inhabitants and taxpayers of the Service Area, except as specifically limited in Section V below, and as approved by the Board from time to time.

Publicly Marketed Debt: means Debt that is offered for sale to the public by the District with the use of an underwriter as a purchaser and reseller of the Debt.

Recurring Fee(s): means any recurring fee, rate, toll, penalty or charge imposed by the District for administrative, operations and maintenance costs and for services, programs or facilities provided by the District as limited by the provisions of Section V.A.15. below, but in no event to be used for payment of Debt.

Refunding Bonds or Refunding Debt: means Debt issued for purposes of refunding any Bond or Debt.

Service Area: means the property within the District Boundary Map and the area legally permitted to be served by the District and approved by the Town.

Service Plan: means this Service Plan for the District approved by Town Council.

Service Plan Amendment: means an amendment to the Service Plan approved by Town Council in accordance with the applicable state law.

Special District Act: means Section 32-1-101, *et seq.*, of the Colorado Revised Statutes, as amended from time to time.

State: means the State of Colorado.

Taxable Property: means real or personal property within the Service Area subject to ad valorem property taxes imposed by the District.

Taxable Transactions: means sales subject to payment of the Sales Tax.

Tax-exempt Debt: means Debt issued by the District for which the interest paid may be exempt from federal income tax of the recipient.

Total Debt Issuance Limitation: means the amount of Debt authorized by this Service Plan as provided in Section V.A.14

Town: means the Town of Johnstown, Colorado.

Town Code: means the Town of Johnstown Municipal Code, as may be amended and in effect from time to time.

Town Council: means the governing body of the Town of Johnstown, Colorado.

Transfer Fee: means a fee assessed upon each sale of real property within the District.

### III. BOUNDARIES

The area of the District Boundaries includes approximately Sixty-One and 336/1000 (61.336) acres, generally located south of Highway 60/County Road 48 and east of Interstate I-25. The proposed Service Area of the District includes approximately 61.336 acres of residential single-family development. Legal descriptions of the District Boundaries are attached hereto as **Exhibit A**. A vicinity map is attached hereto as **Exhibit B**. A map of the District Boundaries is attached hereto as **Exhibit C**. Proofs of Ownership and consents of the owners to organization of the District for all properties within the District Boundaries are attached hereto as **Exhibit C-2**. The District's boundaries may change from time to time as the District undergoes inclusions and exclusions pursuant to the Special District Act, subject to the limitations set forth in Section V below and as authorized by the Town.

### IV. PROPOSED LAND USE / POPULATION PROJECTIONS / ASSESSED VALUATION

The Service Area, upon full build-out, will consist of approximately 50.773 acres of residential property. The current assessed valuation of the Service Area is assumed to be \$0 for purposes of this Service Plan and, at build-out, is expected to be sufficient to reasonably discharge the Debt under the Financial Plan.

At build-out, the residential building area is estimated to include approximately 175 single-family units.

The Town's approval of this Service Plan does not imply approval of the development of a specific area within the District, nor does it imply approval of the total number of residential lots or residential units which may be identified in this Service Plan. The total number of residential lots or residential units will be determined at the time of approval of a plat by the Town.

Approval of this Service Plan by the Town in no way releases or relieves the Developer of the Project, or the landowner or any subdivider of any portion of the Project property, or any of their respective successors or assigns, of obligations to construct Public Improvements for the Project or of obligations to provide to the Town such financial guarantees as may be required by the Town to ensure the completion of the Public Improvements, or of any other obligations to the Town under the Town Code or any applicable annexation agreement, subdivision agreement, or other agreements affecting the Project property or development thereof.

## **V. DESCRIPTION OF PROPOSED POWERS, IMPROVEMENTS AND SERVICES**

### **A. Powers of the District and Service Plan Amendment.**

The District shall have the power and authority to provide the Public Improvements and operations and maintenance within and without the boundaries of the District as such power and authority is described in the Special District Act and other applicable statutes, common law and the Constitution, subject to the limitations set forth herein.

1. Operations and Maintenance Limitation. The purpose of the District is to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The District shall only operate and maintain those Public Improvements that are not accepted for ownership, operations and maintenance by the Town or other appropriate entity in a manner consistent with Approved Development Plans and other rules and regulations of the Town and the Town Code.

2. Trails and Amenities. The District may own, operate, and maintain trails and related amenities within the District. All parks and trails shall be open to the general public, including Town residents who do not reside in the District, free of charge. Any fee imposed by the District for access to recreation improvements owned by the District, other than parks and trails, shall not result in Town residents who reside outside the District paying a user fee that is greater than, or otherwise disproportionate to, amounts paid by owners or tenants of the District and shall not result in the District's owners or tenants subsidizing the use by non-District's residents. The District shall be entitled to impose a reasonable administrative fee to cover additional expenses associated with use of District recreational improvements, other than parks and trails, by Town residents who do not reside in the District to ensure that such use is not subsidized by the District's owners or tenants.

3. Fire Protection, Ambulance and Emergency Services Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain fire protection facilities or services, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town. The authority to plan for, design, acquire, construct, install, relocate, redevelop or finance fire hydrants and related



improvements installed as part of the water system shall not be limited by this provision. The District shall not be authorized to provide for ambulance or emergency medical services unless the provision of such service is approved by the Town in an intergovernmental agreement.

4. Television Relay and Translation Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain television relay and translation facilities and services, other than for the installation of conduit as a part of a street construction project, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town.

5. Telecommunication Facilities. The District agrees that no telecommunication facilities owned, operated or otherwise allowed by the District shall affect the ability of the Town to expand its public safety telecommunication facilities or impair the Town's existing telecommunication facilities.

6. Construction Standards Limitation. The District shall ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the Town and of other governmental entities having proper jurisdiction. The District shall obtain the Town's approval of civil engineering plans and applicable permits for construction and installation of Public Improvements prior to performing such work.

7. Zoning and Land Use Requirements; Sales and Use Tax. The District shall be subject to all of the Town's zoning, subdivision, building code and other land use requirements. The District shall not exercise any exemption from Town sales or use tax, whether directly or indirectly.

8. Growth Limitations. The District acknowledges that the Town shall not be limited in implementing Town Council or voter approved growth limitations, even though such actions may reduce or delay development within the District and the realization of District's revenue.

9. Conveyance. The District agrees to convey to the Town, at no expense to the Town and upon written notification from the Town, any real property owned by the District that is necessary, in the Town's sole discretion, for any Town capital improvement projects for transportation, utilities, drainage, streets or trails. The District shall, at no expense to the Town and upon written notification from the Town, transfer to the Town all rights-of-way, fee interests and easements owned by the District that the Town determines are necessary for access to and operation and maintenance of the Public Improvements to be owned, operated and maintained by the Town, consistent with an Approved Development Plan.

10. Privately Placed Debt Limitation. Prior to the issuance of any Privately Placed Debt, including but not limited to any Developer Debt, the District shall obtain the certification of an External Financial Advisor approved by the Town, in the form substantially as follows:

We are [I am] an External Financial Advisor within the meaning of the District's Service Plan.

We [I] certify that (1) the net effective interest rate (calculated as defined in Section 32-1-103(12), C.R.S.) to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District and all Districts pledging revenue to the repayment of the Debt.

The District shall submit written notice to the Town Manager of the name of the proposed External Financial Advisor prior to the engagement of the External Financial Advisor, which shall either be approved or objected to by the Town within twenty (20) days of the submittal of such written notice to the Town Manager. If the Town Manager does not object to such selection within the twenty (20) day period, the Town Manager's approval shall be deemed to have been given to the District retaining the External Financial Advisor named in the written notice.

Within ten (10) days subsequent to the issuance of Privately Placed Debt, the District shall provide the Town with copies of the relevant Debt documents, the External Financial Advisor Certification and the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt.

11. Inclusion Limitation. The District shall not include within its boundaries any property outside the District Boundaries without the prior written consent of the Town. The District shall only include within its boundaries property that has been annexed to the Town, and no portion of any of the District shall ever consist of property not within the Town's corporate boundaries.

12. Overlap Limitation. The boundaries of the District shall not overlap with another metropolitan district without the prior written consent of the Town.

13. Debt Limitation. Until the Development and Reimbursement Agreement is approved and executed between the Town and the District and until an Amended and Restated Service Plan is approved by Town Council, the District shall not: (a) issue any Debt; or (b) impose a mill levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds.

14. Maximum Debt Authorization. The District shall not issue Debt in excess of Three Million, Nine Hundred Thousand (\$3,900,000) except that the District shall not issue any Debt absent approval of an Amended and Restated Service Plan by the Town Council. Refunded Debt, wherein the initial debt issuance counted toward the Maximum Debt Authorization shall not count against the Maximum Debt Authorization set forth herein.

15. Recurring Fee Limitation. The District may impose and collect Recurring Fees for administrative, operations and maintenance expenses and for services, programs or facilities furnished by the District. Any Recurring Fees for administrative, operations and maintenance expenses not specifically set forth in the Financial Plan, including a subsequent increase in such Recurring Fees, shall be subject to review and approval by the Town. At the

discretion of the Town Manager, Town review and approval shall be provided by the Town Manager in writing or referred by the Town Manager to Town Council. If the Town does not respond to a request for the imposition of the Recurring Fee or an increase in such Recurring Fee within forty-five (45) days of receipt of a written request from the District, the Town shall be deemed to have approved the ability of the District to impose or increase the Recurring Fee as described in the request. Any Recurring Fees imposed or increased for operation and maintenance expenses without approval as set forth herein shall constitute a material departure from the Service Plan. The revenue from a Recurring Fee shall not be used to pay for Debt.

16. Monies from Other Governmental Sources. The District shall not apply for or accept Conservation Trust Funds, Great Outdoors Colorado Funds or other funds available from or through governmental or non-profit entities for which the Town is eligible to apply, except pursuant to an intergovernmental agreement with the Town. This Section shall not apply to specific ownership taxes, which shall be distributed to and a revenue source for the District without any limitation.

17. Consolidation Limitation. The District shall not file a request with any Court to consolidate with another Title 32 district without the prior written consent of the Town.

18. Bankruptcy Limitation. It is expressly intended that all of the limitations contained in this Service Plan, including, but not limited to, those pertaining to the Maximum Debt Mill Levy, Maximum Debt Mill Levy Limitation Term, Developer Debt Mill Levy Imposition Term, and the Recurring Fees, that have been established under the authority of the Town to approve a Service Plan with conditions pursuant to Section 32-1-204.5, C.R.S.:

(a) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent an amendment to the Service Plan; and

(b) Are, together with all other requirements of Colorado law, included in the “political or governmental powers” reserved to the State under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the “regulatory or electoral approval necessary under applicable nonbankruptcy law” as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

The filing of any bankruptcy petition by the District shall constitute, simultaneously with such filing, a material departure of the express terms of this Service Plan, and thus an express violation of the approval of this Service Plan.

19. Water Rights/Resources Limitation. Water to satisfy the needs of the Project shall be dedicated by the Developer to the Town. The District shall not acquire, own, manage, adjudicate or develop water rights or resources except pursuant to an intergovernmental agreement with the Town. If the District provides a non-potable irrigation system, which would be owned, operated and maintained by the District, the District would be permitted to manage the raw water for the District irrigation water system in the manner set forth in a subsequently executed intergovernmental agreement with the Town.

20. Eminent Domain Limitation. Absent the prior written approval of the Town, the District shall not exercise its statutory power of eminent domain or dominant eminent domain for the purpose of condemning property outside of the Service Area. Additional approval from the Town shall not be required prior to the District's exercise of its statutory power of eminent domain or dominant eminent domain with respect to property within the Service Area. In no event shall the District exercise its statutory power of dominant eminent domain to condemn property owned by the Town.

21. Covenant Enforcement and Design Review Services. The District shall have the power, but not the obligation, to provide Covenant Enforcement and Design Review Services within the District in accordance with the Colorado Statutes as they are amended from time to time. The Town shall not bear any responsibility for Covenant Enforcement and Design Review Services within the boundaries of the District. The Town's architectural control, design review and other zoning, land use, development, design and other controls are separate requirements that must be met in addition to any similar controls or services undertaken by the District.

22. Reimbursement Agreement with Adjacent Landowners. If the District utilizes reimbursement agreements to obtain reimbursements from adjacent landowners for costs of improvements that benefit the third-party landowners, such agreements shall be done in accordance with Town Code. Any and all resulting reimbursements received for such improvement shall be used to re-pay the cost of the Public Improvement that is the subject of the reimbursement agreement or shall be deposited in the District's debt service fund and used for the purpose of retiring Debt. The District shall maintain an accurate accounting of the funds received and disbursed pursuant to reimbursement agreements.

23. Land Purchase Limitation. Proceeds from the sale of Debt and other revenue of the District may be used to pay the Developer for the acquisition from the Developer of any real property, easements or other interests not required to be dedicated for public use by annexation agreements, pursuant to Approved Development Plans, the Town Code or other development requirements. Examples of ineligible reimbursements include, but are not limited to: the acquisition of rights of way, easements, land for public drainage, parkland, or open space, unless separate consent is given by resolution of the Town Council.

24. Reimbursement of Public Improvement Related Costs. Prior to the reimbursement to the Developer for costs incurred in the organization of the District, for funds expended on the District's behalf related to the Public Improvements, for the payment by the District for an invoice related to a Public Improvement cost, or for the acquisition of any part of the Public Improvements, the District shall receive: a) the report of an engineer retained by the District, independent of the Developer and licensed in Colorado verifying that, in such engineer's professional opinion, the reimbursement for the costs of the Public Improvements that are the subject of the reimbursement or acquisition, including the construction costs and the soft costs, but excluding the accounting and legal fees, are, in such engineer's opinion, reasonable and are related to the provision of the Public Improvements or are related to the District's organization; and b) the report of an accountant retained by the District, independent of the Developer and licensed in Colorado verifying that, in such accountant's professional opinion, the reimbursement for the accounting and legal fees that are the subject of the reimbursement or acquisition, are, in such

accountants' opinion, reasonable and related to the Public Improvements or the District's organization. Upon request, the District shall provide the reports to the Town.

25. Developer Reimbursement of Administration, Operations and Maintenance Related Costs. Prior to the reimbursement to the Developer for costs incurred or for funds expended on behalf of the District related to the administration of the District or the operation and maintenance of the Public Improvements, the District shall receive the report of an accountant retained by the District, who is independent of the Developer and licensed in Colorado, verifying that, in such accountant's professional opinion, the reimbursement of the funds advanced for such administration, operations or maintenance costs, are, in such accountant's opinion, receivable and related to the administration, operations or maintenance of the District or the Public Improvements. Upon request, the District shall provide the report to the Town.

26. Board Meetings and Website Limitations. Once an End User owns property in the Service Area, the District's Board meeting(s) shall be conducted within the boundaries of the Town of Johnstown or conducted virtually via internet or telephone platform available for free access by the public. The District shall establish and maintain a public website and shall include the name of the Project or a name that allows property owners and residents of the District to readily locate the District online and shall also include an updated street map for those properties within the Service Area that have constructed streets that are open for public use. In addition, the District shall timely post a copy of all of the following documents on its public website: (a) each call for nominations, required pursuant to Section 1-13.5-501, C.R.S., (b) the transparency notices provided pursuant to 32-1-809, C.R.S, (c) each recorded declaration of covenants if the District provides Covenant Enforcement and Design Review Services, (d) a copy of this Service Plan and all amendments thereto, (e) all approved budgets, audits, meeting minutes, Board orders and resolutions, (f) any Rules and Regulations adopted by the Board, and (g) all meeting agendas and meeting packets.

27. Financial Review. The Town shall be permitted to conduct periodic reviews of the financial powers of the District in the Service Plan in the manner and form provided in Section 32-1-1101.5, C.R.S. As provided in the statute, the Town may conduct the first financial review in the fifth calendar year after the calendar year in which a special district's ballot issue to incur general obligation indebtedness was approved by its electors. After such fifth calendar year and notwithstanding the provisions of the statute, the Town may conduct the financial review at any time, by providing sixty (60) days written notice to the District, except that the Town may not conduct a financial review within sixty (60) months of the completion of its most recent financial review. The Town's procedures for conducting a financial review under this Paragraph, and the remedies available to the Town as a result of such financial review, shall be identical to those provided for in Section 32-1-1101.5(2), C.R.S. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with such review, and the Town may require a deposit of the estimated costs thereof.

28. Use of Proceeds and Revenues Limitations. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and

improvements authorized by the Service Plan. Additionally, if the Developer constructs the public infrastructure and conveys it to the District in return for a reimbursement obligation from the District, prior to making such reimbursement for such amounts, the District must receive the report of an independent engineer or accountant licensed in Colorado confirming that in such engineer's or accountant's professional opinion, the amount of the reimbursement is reasonable (a "Cost Verification Report").

29. Transfer Fee Limitation. The District shall not be authorized to collect or spend revenue from a transfer fee on the sale of real property within the District, except pursuant to an intergovernmental agreement with the Town.

30. Miscellaneous Powers. The District shall have the power to provide any facility, service, or program allowed by C.R.S. § 32-1-1004(1).

31. New Powers. If, after the Service Plan is approved, the Colorado General Assembly grants new or broader powers for metropolitan districts, to the extent permitted by law, any or all such powers shall be deemed to be a part hereof and available to be exercised by the District only following written approval by the Town, subject to the Town's sole discretion.

B. Service Plan Amendment Requirement.

This Service Plan has been designed with sufficient flexibility to enable the District to provide required services and facilities under evolving circumstances without the need for numerous amendments. Provided, however, the District shall not have the authority to issue Debt until it has received approval of an amendment to this Service Plan in the form of an Amended and Restated Service Plan. Actions of the District which violate the limitations set forth in this Service Plan shall be deemed to be material modifications to this Service Plan and the Town shall be entitled to all remedies available under State and local law to enjoin such actions of the District, including the remedy of enjoining the issuance of additional authorized but unissued Debt, until such material modification is remedied.

C. Capital Plan.

The District shall have authority to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements within and without the boundaries of the District to the extent necessary to improve or construct Public Improvements, as more specifically defined in this Service Plan, the Special District Act and Approved Development Plan(s) for the Project. A Capital Plan, attached hereto as **Exhibit E**, includes: (1) a list of the Public Improvements to be developed by the District, supported by an engineering or architectural survey; (2) a good faith estimate of the cost of the Public Improvements; and (3) a pro forma capital expenditure plan correlating expenditures with development. The Public Improvements described in the Capital Plan may be modified in an Approved Development Plan or an intergovernmental agreement with the Town, and may differ from the Capital Plan without constituting a material modification of this Service Plan. To the extent that the Capital Plan sets forth the timing of the construction of the Public Improvements, such timing may also deviate from the Capital Plan without constituting a material modification of this Service Plan. As shown in the Capital Plan, the estimated cost of the Public Improvements for the District boundaries (of approximately 61.336

acres) is approximately Six Million, Eight Hundred Ninety-Nine Thousand, Four Hundred Twenty Eight Dollars (\$6,899,428). Costs of required Public Improvements that cannot be financed by the District within the parameters of this Service Plan and the financial capability of the District are expected to be financed by the Developer of the Project or through private financing.

The District shall be permitted to allocate costs between such categories of the Public Improvements as deemed necessary in its discretion.

All of the Public Improvements described herein shall be designed in such a way as to assure that the Public Improvements are constructed in accordance with Town standards and with the requirements of Approved Development Plans related to the project. All descriptions of the Public Improvements to be constructed, and their related costs, are estimates only and are subject to modification as engineering, development plans, economics, the Town's requirements, and construction scheduling may require. Upon approval of this Service Plan, the District shall continue to develop and refine the Capital Plan and the Map Depicting Public Improvements, as necessary, and prepare for issuance of Debt. All cost estimates will be adjusted to reflect then-current dollars at the time of the issuance of Debt and construction. All construction cost estimates contained in **Exhibit E** assume construction to applicable standards and specifications of the Town and state or federal requirements.

## **VI. FINANCIAL PLAN**

### **A. General.**

The District shall be authorized to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements from its revenues and by and through the proceeds of Debt to be issued by the District. The Financial Plan for the District shall be to issue such Debt as the District can reasonably pay from revenues derived from the Maximum Debt Mill Levy and other legally available revenues. The District may only rely on specific ownership taxes, advances from the Developer and grants, subject to the limitations of this Service Plan.

The total Debt that the District shall be permitted to issue shall not exceed the Maximum Debt Authorization of \$3,900,000, which is estimated to be the amount necessary to net approximately \$1,997,567 in proceeds or reimbursements or any combination thereof from available District revenues for Public Improvements serving the District, as well as the traditional transactional and financing costs. Debt of the District shall be permitted to be issued on a schedule and in such year or years as the District determines to meet the needs of the Financial Plan referenced above and phased to serve development as it occurs. This Maximum Debt Authorization of \$3,900,000 allows for approximately 120% coverage of the estimated financial plan and pro-forma projections to provide an additional contingency for changes in actual construction, increases in assessed valuation and unforeseen changes and contingencies.

(1) The Financial Plan, prepared by Piper Sandler & Co., attached hereto as **Exhibit F**, sets forth (i) how the Public Improvements are to be financed; (ii) the proposed indebtedness with a schedule indicating the years in which the Debt is scheduled to be issued; and (iii) the estimated revenue for both debt and operating revenue derived from property taxes and



other legally available revenues for the District. The Maximum Debt Authorization is supported by the Financial Plan.

(2) In addition to the other requirements of this Service Plan, at least forty-five (45) days prior to the issuance of any Debt, the District shall submit to the Town the then-current financial forecasts and feasibility reports for such proposed issuance, together with a current certification, of the Board(s) issuing such Debt, dated within sixty (60) days of such submittal, that such proposed Debt is in compliance with the Service Plan.

(3) At least ten (10) business days prior to the issuance of Publicly-Marketed Debt, the District shall provide the Town with the marketing documents that have been or shall be published. Within ten (10) days subsequent to the issuance of Publicly-Marketed Debt, the District shall provide the Town with the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt and copies of the relevant Debt documents.

B. Maximum Voted Interest Rate, Maximum Underwriting Discount, Maximum Interest Rate on Developer Debt.

The interest rate on any Debt is limited to the market rate at the time the Debt is issued. In the event of a default, the proposed maximum interest rate on any Debt is not to exceed eight percent (8%) simple interest. The proposed maximum underwriting discount will be four percent (4%). Debt, when issued, shall comply with all relevant requirements of this Service Plan, State law and Federal law as then applicable to the issuance of public securities.

The interest rate on Developer Debt shall not exceed the lesser of the current Bond Buyer 20-Bond GO index plus four percent (4%) or eight percent (8%) simple interest. Developer Debt shall be subordinate to other Debt of the District and shall be subject to the debt limitation term provided in Section VI.D below.

C. Mill Levies.

1. Maximum Debt Mill Levy. The Maximum Debt Mill Levy shall be forty (40) mills subject to an Assessment Ratio Adjustment.

2. Operations and Maintenance Mill Levy. The Operations and Maintenance Mill Levy shall be a mill levy the District is permitted to impose for payment of the District's administrative, operations and maintenance costs, which shall include, but not be limited to, the funding of operating reserves and sufficient ending fund balances to assure sufficient cash flow to fund expenses as they come due. Prior to the imposition of a mill levy for payment of Debt, the District may impose a maximum Operations and Maintenance Mill Levy of fifty (50) mills. After the imposition of a mill levy for the payment of Debt, the District shall not impose an Operations and Mill Levy that exceeds ten (10) mills, subject to an Assessment Ratio Adjustment, and shall at all times not exceed the maximum mill levy necessary to pay those expenses.

D. Mill Levy Imposition Term.

1. Developer Debt Mill Levy Imposition Term. Developer Debt shall expire and be forgiven twenty (20) years after the date of the initial imposition by the District of an ad

valorem property tax to pay any Debt, unless such term is otherwise extended pursuant to an intergovernmental agreement with the Town. Refunding Bonds shall not be subject to this Developer Debt Mill Levy Imposition Term so long as such Refunding Bonds are not owned by the Developer or by a person or party related to the Developer. Developer Debt shall not have any call protection.

2. Maximum Debt Mill Levy Imposition Term: In addition to the Developer Debt Mill Levy Imposition Term, the District shall not impose a levy for repayment of any and all Debt (or use the proceeds of any mill levy for repayment of Debt) on any single property developed for residential uses which exceeds forty (40) years after the year of the initial imposition of such mill levy unless a majority of the Board of the District imposing the mill levy are End Users residing in such District and have voted in favor of a refunding of a part or all of the Debt and such refunding will result in a net present value savings as set forth in Section 11-56-101, et seq., C.R.S.

E. Debt Repayment Sources.

Debt may be repaid through gifts, grants, ad valorem taxes, and any source of payment permitted by law, this Service Plan or other agreement with the Town.

F. Debt Instrument Disclosure Requirement.

In the text of each Bond and any other instrument representing and constituting Debt, the District shall set forth a statement in substantially the following form:

By acceptance of this instrument, the owner of this Bond agrees and consents to all of the limitations in respect of the payment of the principal of and interest on this Bond contained herein, in the resolution of the District authorizing the issuance of this Bond and in the Service Plan for creation of the District.

Similar language describing the limitations in respect of the payment of the principal of and interest on Debt set forth in this Service Plan shall be included in any document used for the offering of the Debt for sale to persons, including, but not limited to, a developer of property within the boundaries of the District.

G. Security for Debt.

The District shall not pledge any revenue or property of the Town as security for any District indebtedness set forth in this Service Plan. The Town's approval of this Service Plan shall not be construed as a guarantee by the Town of payment of any of the District's obligations; nor shall anything in the Service Plan be construed so as to create any responsibility or liability on the part of the Town in the event of default by the District in the payment of any such obligation.

H. District's Operating Costs.

The estimated cost of engineering services, legal services and administrative services, together with the estimated costs of the District's organization and initial operations, are

anticipated to be Fifty Thousand Dollars (\$50,000) which will be eligible for reimbursement from Debt proceeds as provided in this Service Plan.

In addition to the capital costs of the Public Improvements, the District will require operating funds for administration and to plan and cause the Public Improvements to be constructed and maintained. The first year's operating budget is estimated to be Fifty Thousand Dollars (\$50,000), which is anticipated to be derived from property taxes and other revenues.

## **VII. ANNUAL REPORT**

### **A. General.**

The District shall file an annual report with the Town Clerk no later than August 1st of each year following the year in which the Order and Decree creating the District has been issued (the "report year") that complies with Section 32-1-207, C.R.S.

### **B. Reporting of Significant Events.**

In addition to the information required to be disclosed under Section 32-1-207, C.R.S., the annual report required by this Section VII shall include information as to any of the following events that occurred during the report year:

1. Narrative of the District's progress in implementing the Service Plan and a summary of the development in the Project.
2. Boundary changes made or proposed.
3. Intergovernmental agreements executed.
4. A summary of any litigation involving the District.
5. Proposed plans for the year immediately following the report year.
6. Construction contracts executed and the name of the contractors as well as the principal of each contractor.
7. Status of the District's Public Improvement construction schedule and the Public Improvement schedule for the following five years.
8. Notice of any uncured defaults.
9. A list of all Public Improvements constructed by the District that have been dedicated to and accepted by the Town.
10. If requested by the Town, copies of minutes of all meetings of the District's Board of Directors.

11. The name, business address and telephone number of each member of the Board and its chief administrative officer and general counsel and the date, place and time of the regular meetings of the Board.

12. Certification from the Board that the District is in compliance with all provisions of the Service Plan.

13. Copies of any agreements with the Developer entered into in the report year.

14. Copies of any Cost Verification Reports provided to the District in the report year.

C. Summary of Financial Information.

In addition to the information required to be disclosed under Section 32-1-207, C.R.S., the annual report shall include a summary of the following information for the report year:

1. Assessed value of Taxable Property within the District's boundaries.
2. Total acreage of property within the District's boundaries.
3. Most recently filed audited financial statements of the District, to the extent audit financial statements are required by state law or most recently filed audit exemption.
4. Annual budget of the District.
5. Resolutions regarding issuance of Debt or other financial obligations, including relevant financing documents, credit agreements, and official statements.
6. Outstanding Debt (stated separately for each class of Debt).
7. Outstanding Debt service (stated separately for each class of Debt).
8. The District's tax revenue.
9. Other revenues of the District.
10. The District's Public Improvements expenditures.
11. The District's other expenditures.
12. The District's inability to pay any financial obligations as they come due.
13. The amount and terms of any new Debt issued.
14. Any Developer Debt.

## **VIII. DISSOLUTION**

Upon a determination of the Town Council that the purposes for which the District was created have been accomplished or as set forth in the Intergovernmental Agreement with the Town, the District shall file a petition in the District Court for dissolution, pursuant to the applicable State statutes. Dissolution shall not occur until the District has provided for the payment or discharge of all of its outstanding indebtedness and other financial obligations as required pursuant to State statutes. Except as otherwise required in the Intergovernmental Agreement or in the Development and Reimbursement Agreement, dissolution shall not be required if the District elects to finance, construct and acquire the common areas, facilities and improvements, as such Public Improvements would be owned, operated and maintained by the District.

## **IX. INTERGOVERNMENTAL AGREEMENT**

The form of Intergovernmental Agreement to be entered into between the Town and the District at the District's organizational meeting is attached as **Exhibit D**. The District shall submit the executed Intergovernmental Agreement to the Town within ten (10) days of the District's organizational meeting.

Intergovernmental agreements and amendments thereto proposed to be entered into by the District shall be submitted to the Town at least forty-five (45) days prior to their execution by the District, for Town review. Such Town review and approval shall be with reference to whether the intergovernmental agreement(s) are in compliance with this Service Plan, the Intergovernmental Agreement, and the terms of any Approved Development Plan or other instrument related to the Public Improvements. Town Approval shall be at the discretion of the Town Manager who shall decide whether such request for approval shall be provided in a letter of response or if the matter requires additional consideration for approval by the Town Council, an agreement between the parties, or an amendment to the Service Plan.

The District and the Developer shall also execute indemnification letters in the form attached hereto as **Exhibit H**. The Developer's indemnification letter shall be submitted to the Town as part of this Service Plan. The District shall approve and execute the indemnification letter at its first Board meeting after its organizational election, in the same form as the indemnification letter set forth as **Exhibit H**, and shall deliver an executed original to the Town within ten (10) days of the District's organizational meeting.

## **X. NON-COMPLIANCE WITH SERVICE PLAN**

In the event it is determined that the District has undertaken any act or omission which violates the Service Plan or constitutes a material departure from the Service Plan, the Town may impose any of the sanctions set forth in the Town Code and pursue any sanctions or remedies available under law, including but not limited to affirmative relief to require the District to act in accordance with the provisions of this Service Plan.

## **XI. MISCELLANEOUS**

A. Headings. Paragraph headings and titles contained herein are intended for convenience and reference only and are not intended to define, limit or describe the scope or intent of any provision of this Service Plan.

B. Town Consent. Unless otherwise provided herein or provided in an intergovernmental agreement with the Town, references in this Service Plan to Town consent or Town approval shall require prior written approval of the Town. At the Town Manager's discretion, the Town Manager shall decide if (1) he or she may provide the written Town approval, if approval is warranted; (2) the matter should be referred to the Town Council for consideration and, if appropriate, approval by Resolution; (3) the matter requires consideration for approval in the form of an agreement with the Town; or (4) the matter requires an amendment to the Service Plan.

C. Town Expenses. The District shall pay any and all expenses, including but not limited to professional service fees and attorneys' fees, incurred by the Town in enforcing any provision of the Service Plan.

D. Disclosure Notice. The District's disclosure document required pursuant to Section 32-1-104.8, C.R.S. shall be in substantial conformance with the form of such notice set forth in **Exhibit G**. In addition to the statutory notice, the District shall use reasonable efforts to assure that all End Users receive written notice regarding existing District mill levies, the Maximum Debt Mill Levy, and a general description of the District's authority to impose and collect fees. Among other means to accomplish the foregoing, the District shall use best efforts to ensure that the Developer and all builders provide notice to End Users by written disclosure and by posting such notices in all model homes and sales offices.

E. To the extent permitted by law, the District shall set forth a process for transition of the Board of Directors of the District to End Users of the District or set forth alternative means by which End Users may otherwise have control over the ongoing administration, operations, maintenance and financing responsibilities of the District and the Public Improvements that are owned and maintained by the District, but no sooner than after issuance of the Debt needed to finance the Public Improvements and completion of substantially all of the development within the District.

## **XII. CONCLUSION**

It is submitted that this Service Plan for the District, as required by Section 32-1-203(3), C.R.S., establishes that:

1. There is sufficient existing and projected need for organized service in the area to be serviced by the proposed special district;
2. The existing service in the area to be served by the proposed special district is inadequate for present and projected needs;
3. The proposed special district is capable of providing economical and sufficient service to the area within its proposed boundaries;

4. The area to be included in the proposed special district has, or will have, the financial ability to discharge the proposed indebtedness on a reasonable basis;

5. Adequate service is not, and will not be, available to the area through the county or other existing municipal or quasi-municipal corporations, including existing special districts, within a reasonable time and on a comparable basis;

6. The facility and service standards of the proposed special district are compatible with the facility and service standards of each county within which the proposed special district is to be located and each municipality which is an interested party under section 32-1-204(1);

7. The proposal is in substantial compliance with a master plan adopted pursuant to the Town Code;

8. The proposal is in compliance with any duly adopted Town, regional or state long-range water quality management plan for the area;

9. The creation of the special district is in the best interests of the area proposed to be served;

This Service Plan is submitted to the Town on behalf of the Developer, which is the District petitioner, which has contracted for the purchase of the real properties within the District Boundaries of the proposed District. The Developer has caused written notice of the Town's hearing on the proposed Service Plan to be duly given to all "interested parties" within the meaning of and at the times required by § 32-1-204, C.R.S., and will or has caused all other required filings to be made and all other applicable procedural requirements to be met. The information contained in this Service Plan is true and correct as of this date.



## **EXHIBIT A**

### Legal Descriptions

Single Family Residential District – Southeast Area of NE Quarter Section

**Legal Description:**

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And More Particularly Described as follows:

Commencing at the southeast corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the east quarter corner of section 11, the northeast corner of right of way deed, Great Western Construction Company, Book 190 Page 77, and the POINT OF BEGINNING:

Thence S89°05'16"W along the north line of said right of way, a distance of 1,817.38 feet;

Thence N00°26'18"W departing said right of way line, a distance of 1,318.38 feet to the start of a non-tangential curve;

Thence along said curve to the right having a radius of 250.00 feet, a delta angle of 14°08'10", a chord bearing of S68°13'44"E, a chord length of 61.52 feet, an arc length of 61.68 feet;

Thence S61°09'39"E, a distance of 766.56 feet to the start of a tangential curve;

Thence along said curve to the left having a radius of 410.00 feet, a delta angle of 29°14'12", a chord bearing of S75°46'45"E, a chord length of 206.95 feet, an arc length of 209.21 feet;

Thence N89°36'09"E, a distance of 892.11 feet to a point being on the east line of Lot B and the east section line of the northeast quarter of Section 11;

Thence along said section line S00°23'51"E, a distance of 852.22 feet to the POINT OF BEGINNING.

Containing 1,752,361 square feet or 40.229 acres, more or less.

Single Family Residential District – Northeast Area of NE Quarter Section

**Legal Description:**

A parcel of land, being a part of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, situated in the Northeast One-Quarter of Section 11, Township 4 North, Range 68 West of the Sixth Principal Meridian, County of Weld, State of Colorado.

And More Particularly Described as follows:

Commencing at the southeast corner of Lot B, of Exemption No. 1060-11-1-RE2092, Reception Number 2585002, said point being 30 feet North of the east quarter corner of section 11, N00°23'51"W along the east line of the northeast quarter of section 11, a distance of 852.22 feet to the POINT OF BEGINNING;

Thence S89°36'09"W, a distance of 762.13 feet;

Thence N00°23'51"W, a distance of 80.00 feet to the start of a non-tangential curve;

Thence along said curve to the left having a radius of 25.00 feet, a delta angle of 78°21'49", a chord bearing of N50°25'15"E, a chord length of 31.59 feet, an arc length of 34.19 feet;

Thence N11°14'20"E, a distance of 779.61 feet to the start of a tangential curve;

Thence along said curve to the left having a radius of 18.00 feet, a delta angle of 11°38'11", a chord bearing of N05°25'15"E, a chord length of 3.65 feet, an arc length of 3.66 feet;

Thence N00°23'51"W, a distance of 379.44 feet to a point being on the north edge of the Consolidated Home Supply Ditch, Reception Number 1602319, the south line of Lot "A" RE2092 Recorded Exemption No. 1060-11-1RE2092, Reception Number 2585002, and the north line of Lot B;

Thence along said line the following five courses:

- 1) Starting on a curve to the left having a radius of 255.94 feet, a delta angle of 46°16'11", a chord bearing of N66°19'37"E, a chord length of 201.12 feet, an arc length of 206.69 feet;
- 2) Thence N40°52'40"E, a distance of 302.80 feet to the start of a non-tangential curve;
- 3) Thence along said curve to the right having a radius of 260.33 feet, a delta angle of 10°16'04", a chord bearing of N42°36'05"E, a chord length of 46.59 feet, an arc length of 46.65 feet;
- 4) Thence N49°50'24"E, a distance of 127.53 feet to the start of a non-tangential curve;
- 5) Thence along said curve to the right having a radius of 646.96 feet, a delta angle of 7°00'50", a chord bearing of N55°44'14"E, a chord length of 79.15 feet, an arc length of 79.20 feet to a point being on the east line of Lot B and the east section line of the northeast quarter of Section 11;

Thence along said section line S00°23'51"E, a distance of 1,713.41 feet to the POINT OF BEGINNING.

Containing 919,417 square feet or 21.107 acres, more or less.

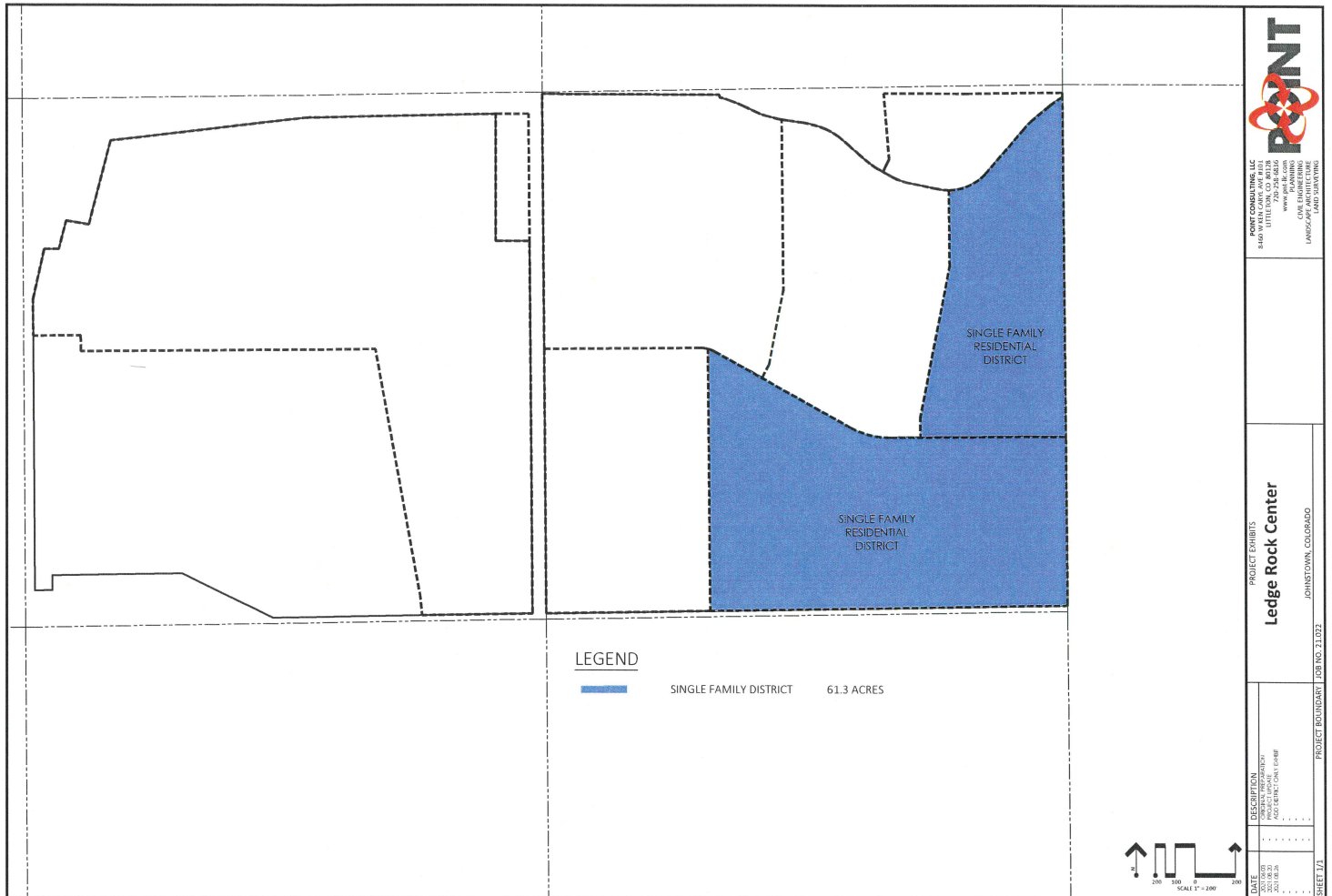
**EXHIBIT B**

Johnstown Vicinity Map



**EXHIBIT C-1**

District Boundary Map





## **EXHIBIT C-2**

### **Proofs of Ownership and Consent of Owners**

**Ellen Anderson**  
**109138 County Road 13**  
**Johnstown, CO 80534**

**Kevin J. Cook**  
**PO BOX 1020**  
**Berthoud, CO 80513**

Town Council  
 Town of Johnstown, Colorado  
 450 S Parish Ave  
 Johnstown, CO 80534

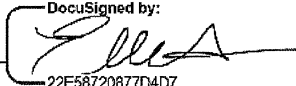
**RE: Proposed Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2 (collectively, the "Districts")**

To the Town Council of the Town of Johnstown:

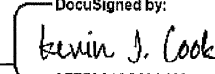
Ellen Anderson (as to a 72.45% interest as tenant in common) and Kevin J. Cook (as to a 27.55% interest as tenant in common) constitute all owners of the property within the initial boundaries of the proposed Districts, excluding rights of way and tracts dedicated to the Town. These initial approximate 148 acres more or less (the "Property") has been under contract since April 6, 2021 with Michael Schlup, who is in the process of forming the Districts to contain the Property in the initial boundaries of the proposed Service Plans for the Districts. The purpose of this letter is to advise that the following property owners consent to the organization of the District.

Property Owners:

Ellen Anderson (72.45%)

By: \_\_\_\_\_  DocuSigned by:  
22E58720877D4D7...

Kevin J. Cook (27.55%)

By: \_\_\_\_\_  DocuSigned by:  
9FE58C90C80A423...

DN 6143652.1

# Certificate Of Taxes Due

Account Number R7288598

Certificate Number 237221

Parcel 106111200023

Order Number 25186901

Assessed To

Vendor ID 14

ANDERSON ELLEN (72.45% INT)

LAND TITLE GUARANTEE OF FT COLLINS

PO BOX 1020

772 WHALERS WAY STE 100

BERTHOUD, CO 80513-2020

FT COLLINS , CO 80525

**Legal Description****Situs Address**

JOH PT NE4 11-4-68 (RIDGEVIEW RANCH ANNEX) LOT B REC EXEMPT RE-2092 EXC UPRR RES

JOHNSTOWN

| Year                                    | Tax        | Adjustments | Interest | Fees   | Payments | Balance           |
|-----------------------------------------|------------|-------------|----------|--------|----------|-------------------|
| <b>Tax Charge</b>                       |            |             |          |        |          |                   |
| 2020                                    | \$4,170.00 | \$0.00      | \$0.00   | \$0.00 | \$0.00   | \$4,170.00        |
| Total Tax Charge                        |            |             |          |        |          | \$4,170.00        |
| <b>Grand Total Due as of 04/09/2021</b> |            |             |          |        |          | <b>\$4,170.00</b> |

Tax Billed at 2020 Rates for Tax Area 2963 - 2963

| Authority                   | Mill Levy   | Amount     | Values                  | Actual    | Assessed |
|-----------------------------|-------------|------------|-------------------------|-----------|----------|
| WELD COUNTY                 | 15.0380000* | \$593.70   | AG-FLOOD IRRIGATED LAND | \$134,835 | \$39,100 |
| SCHOOL DIST RE5J            | 47.8090000* | \$1,887.51 | AG-MEADOW HAY LAND      | \$1,257   | \$360    |
| NORTHERN COLORADO WATER (NC | 1.0000000   | \$39.48    | AG-WASTE LAND           | \$74      | \$20     |
| JOHNSTOWN TOWN              | 23.9470000  | \$945.42   | Total                   | \$136,166 | \$39,480 |
| FRONT RANGE FIRE RESCUE (JO | 11.5240000  | \$454.97   |                         |           |          |
| AIMS JUNIOR COLLEGE         | 6.3050000   | \$248.92   |                         |           |          |
| Taxes Billed 2020           | 105.6230000 | \$4,170.00 |                         |           |          |

\* Credit Levy

All payments made are subject to final bank clearance.

WARNING - THIS TAX CERTIFICATE DOES NOT WARRANT ANY TAXES OWED ON UNDERLYING ACCOUNTS, INCLUDING PARENT OR SIBLING ACCOUNTS. ALL TAX LIEN SALE AMOUNTS ARE SUBJECT TO CHANGE DUE TO ENDORSEMENT OF CURRENT TAXES BY THE LIENHOLDER OR TO ADVERTISING AND DISTRAINT WARRANT FEES. CHANGES MAY OCCUR AND THE TREASURER'S OFFICE WILL NEED TO BE CONTACTED PRIOR TO REMITTANCE.

**TAX LIEN SALE REDEMPTION AMOUNTS MUST BE PAID BY CASH OR CASHIER'S CHECK.**

POSTMARKS ARE NOT ACCEPTED ON TAX LIEN SALE REDEMPTION PAYMENTS. PAYMENTS MUST BE IN OUR OFFICE AND PROCESSED BY THE LAST BUSINESS DAY OF THE MONTH.

SPECIAL TAXING DISTRICTS AND THE BOUNDARIES OF SUCH DISTRICTS MAY BE ON FILE WITH THE BOARD OF COUNTY COMMISSIONERS, THE COUNTY CLERK, OR THE COUNTY ASSESSOR.

This certificate does not include land or improvements assessed under a separate account number, personal property taxes, transfer tax or misc. tax collected on behalf of other entities, special or local improvement district assessments or mobile homes, unless specifically mentioned.

I, the undersigned, do hereby certify that the entire amount of taxes due upon the above described parcel of real property and all outstanding sales for unpaid taxes as shown by the records in my office from which the same may still be redeemed with the amount required for redemption are as noted herein. In witness whereof, I have hereunto set my hand and seal.

TREASURER, WELD COUNTY, John R. Lefebvre, Jr.

1400 N. 17th Avenue

Greeley, CO 80631

(970) 400-3290



**Land Title Guarantee Company  
Customer Distribution**



**PREVENT FRAUD - Please remember to call a member of our closing team when initiating a wire transfer or providing wiring instructions.**

Order Number: **FCC25186901-3**

Date: **05/31/2021**

Property Address: **VACANT LAND, TBD, CO**

**PLEASE CONTACT YOUR CLOSER OR CLOSER'S ASSISTANT FOR WIRE TRANSFER INSTRUCTIONS**

**For Closing Assistance**

Trish Melendy  
345 E 27TH STREET  
LOVELAND, CO 80538  
(970) 663-3628 (Work)  
(800) 259-6360 (Work Fax)  
[tmelendy@ltgc.com](mailto:tmelendy@ltgc.com)  
Contact License: CO361823  
Company License: CO44565

**Closers Assistant**

Gwen Klein  
345 E 27TH STREET  
LOVELAND, CO 80538  
(970) 663-3628 (Work)  
(800) 820-5138 (Work Fax)  
[gklein@ltgc.com](mailto:gklein@ltgc.com)  
Company License: CO44565

**For Title Assistance**

Land Title Customer Care Team  
772 WHALERS WAY #100  
FORT COLLINS, CO 80525  
(970) 282-3649 (Work)  
(970) 282-3652 (Work Fax)  
[customercare@ltgc.com](mailto:customercare@ltgc.com)

**Buyer/Borrower**

MICHAEL SCHLUP, AMY CARROLL  
Delivered via: Electronic Mail

**Attorney for Buyer**

AD SCHLUP LAW LLC  
Attention: ALLEN SCHLUP  
[allen.schlup@adschluplaw.com](mailto:allen.schlup@adschluplaw.com)  
Delivered via: Electronic Mail

**Seller/Owner**

ELLEN ANDERSON  
Delivered via: Electronic Mail

**Attorney for Seller**

BERG HILL GREENLEAF RUSCITTI LLP  
Attention: PETER SCHAUB  
1712 PEAR ST  
BOULDER, CO 80302  
[pcs@bhgrlaw.com](mailto:pcs@bhgrlaw.com)  
Delivered via: Electronic Mail

**Seller/Owner**

KEVIN COOK  
Attention: KEVIN COOK  
Delivered via: Electronic Mail

**Attorney for Seller**

FRASCONA JOINER GOODMAN & GREENSTEIN PC  
Attention: FRASCONA JOINER GOODMAN &  
GREENSTEIN PC  
4750 TABLE MESA DRIVE  
BOULDER, CO 80305  
[ben@frascona.com](mailto:ben@frascona.com)  
Delivered via: Electronic Mail

**Attorney for Buyer**

SPENCER FANE LLP

Attention: ADAM A VELTRI

1700 LINCOLN ST #2000

DENVER, CO 80203

(303) 565-9127 (Cell)

(303) 839-3716 (Work)

(303) 839-3999 (Work Fax)

aveltri@spencerfane.com

Delivered via: Electronic Mail

**Agent for Buyer**

Spencer Fane

Attention: D O'LEARY/M BERGER

doleary@spencerfane.com

mberger@spencerfane.com

Delivered via: Electronic Mail

**Michael Schlup**  
c/o Ledge Rock Center, LLC  
6917 W 135th Street, Suite B29  
Overland Park, KS 66223

Town Council  
Town of Johnstown, Colorado  
450 S Parish Ave  
Johnstown, CO 80534

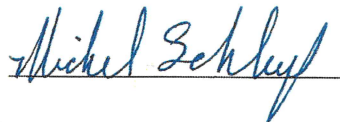
**RE: Proposed Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2 (collectively, the "Districts")**

To the Town Council of the Town of Johnstown:

The property owned by Ellen Anderson and Kevin Cook of approximately 148 acres more or less (the "Property") has been under contract since April 6, 2021 with Michael Schlup, who is in the process of forming the Districts to contain the Property in the initial boundaries of the proposed Service Plans for the Districts. As the contracting party for the purchase of this land, the purpose of this letter is to provide the Town, a letter to advise that Michael Schlup as purchaser and future property owner of the Property, provides his consent to the organization of the District.

Property Owner:

Michael Schlup

A handwritten signature in blue ink, reading "Michael Schlup", written over a horizontal line.

## **EXHIBIT D**

### Intergovernmental Agreement between the District and Johnstown



**INTERGOVERNMENTAL AGREEMENT BETWEEN**  
**THE TOWN OF JOHNSTOWN, COLORADO**  
**AND**  
**LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 2**

THIS AGREEMENT is made and entered into as of this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, by and between the TOWN OF JOHNSTOWN, a home-rule municipal corporation of the State of Colorado ("Town"), and LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 2, a quasi-municipal corporation and political subdivision of the State of Colorado (the "District"). The Town and the District are collectively referred to as the "Parties."

**RECITALS**

WHEREAS, the District was organized to provide those services and to exercise powers as are more specifically set forth in the District's Service Plan approved by the Town on \_\_\_\_\_ ("Service Plan"); and

WHEREAS, the Service Plan makes reference to the execution of an intergovernmental agreement between the Town and the District; and

WHEREAS, the Town and the District have determined it to be in the best interests of their respective taxpayers, residents and property owners to enter into this Intergovernmental Agreement ("Agreement").

NOW, THEREFORE, in consideration of the covenants and mutual agreements herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

**COVENANTS AND AGREEMENTS**

1. Operations and Maintenance Limitation. The purpose of the District is to provide for the planning, design, acquisition, construction, installation and financing of the Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The District shall only operate and maintain those Public Improvements that are not accepted for ownership, operations and maintenance by the Town or other appropriate entity in a manner consistent with Approved Development Plans and other rules and regulations of the Town and the Town Code.

2. Trails and Amenities. The District may own, operate, and maintain trails and related amenities within the District. All parks and trails shall be open to the general public, including Town residents who do not reside in the District, free of charge. Any fee imposed by the District for access to recreation improvements owned by the District, other than parks and trails, shall not result in Town residents who reside outside the District paying a user fee that is greater than, or otherwise disproportionate to, amounts paid by owners or tenants of the District and shall not result in the District's owners or tenants subsidizing the use by non-District's residents. The District shall be entitled to impose a reasonable administrative fee to cover additional expenses

associated with use of District recreational improvements, other than parks and trails, by Town residents who do not reside in the District to ensure that such use is not subsidized by the District's owners or tenants.

3. Fire Protection, Ambulance and Emergency Services Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain fire protection facilities or services, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town. The authority to plan for, design, acquire, construct, install, relocate, redevelop or finance fire hydrants and related improvements installed as part of the water system shall not be limited by this provision. The District shall not be authorized to provide for ambulance or emergency medical services unless the provision of such service is approved by the Town in an intergovernmental agreement.

4. Television Relay and Translation Limitation. The District shall not be authorized to plan for, design, acquire, construct, install, relocate, redevelop, finance, operate or maintain television relay and translation facilities and services, other than for the installation of conduit as a part of a street construction project, unless such facilities and services are provided pursuant to an intergovernmental agreement with the Town.

5. Telecommunication Facilities. The District agrees that no telecommunication facilities owned, operated or otherwise allowed by the District shall affect the ability of the Town to expand its public safety telecommunication facilities or impair the Town's existing telecommunication facilities.

6. Construction Standards Limitation. The District shall ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the Town and of other governmental entities having proper jurisdiction. The District shall obtain the Town's approval of civil engineering plans and applicable permits for construction and installation of Public Improvements prior to performing such work.

7. Zoning and Land Use Requirements; Sales and Use Tax. The District shall be subject to all of the Town's zoning, subdivision, building code and other land use requirements. The District shall not exercise any exemption from Town sales or use tax, whether directly or indirectly.

8. Growth Limitations. The District acknowledges that the Town shall not be limited in implementing Town Council or voter approved growth limitations, even though such actions may reduce or delay development within the District and the realization of District's revenue.

9. Conveyance. The District agrees to convey to the Town, at no expense to the Town and upon written notification from the Town, any real property owned by the District that is necessary, in the Town's sole discretion, for any Town capital improvement projects for transportation, utilities, drainage, streets or trails. The District shall, at no expense to the Town and upon written notification from the Town, transfer to the Town all rights-of-way, fee interests and easements owned by the District that the Town determines are necessary for access to and

operation and maintenance of the Public Improvements to be owned, operated and maintained by the Town, consistent with an Approved Development Plan.

10. Privately Placed Debt Limitation. Prior to the issuance of any Privately Placed Debt, including but not limited to any Developer Debt, the District shall obtain the certification of an External Financial Advisor approved by the Town, in the form substantially as follows:

We are [I am] an External Financial Advisor within the meaning of the District's Service Plan.

We [I] certify that (1) the net effective interest rate (calculated as defined in Section 32-1-103(12), C.R.S.) to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District and all Districts pledging revenue to the repayment of the Debt.

The District shall submit written notice to the Town Manager of the name of the proposed External Financial Advisor prior to the engagement of the External Financial Advisor which shall either be approved or objected to by the Town within twenty (20) days of the submittal of such written notice to the Town Manager. If the Town Manager does not object to such selection within the twenty (20) day period, the Town Manager's approval shall be deemed to have been given to the District retaining the External Financial Advisor named in the written notice.

Within ten (10) days subsequent to the issuance of Privately Placed Debt, the District shall provide the Town with copies of the relevant Debt documents, the External Financial Advisor Certification and the Bond Counsel Opinion addressed to the District and the Town regarding the issuance of the Debt.

11. Inclusion Limitation. The District shall not include within its boundaries any property outside the District Boundaries without the prior written consent of the Town. The District shall only include within its boundaries property that has been annexed to the Town and no portion of any of the District shall ever consist of property not within the Town's corporate boundaries.

12. Overlap Limitation. The boundaries of the District shall not overlap with another metropolitan district without the prior written consent of the Town.

13. Debt Limitation. Until the Development and Reimbursement Agreement is approved and executed by the Town and until an Amended and Restated Service Plan is approved by Town Council, the District shall not: (a) issue any Debt; or (b) impose a mill levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds.

14. Maximum Debt Authorization. The District shall not issue Debt in excess of Three Million, Nine Hundred Thousand Dollars (\$3,900,000), except that the District shall not issue any Debt absent the approval of an Amended and Restated Service Plan by the Town Council. Refunded Debt, wherein the initial debt issuance counted toward the Maximum Debt Authorization shall not count against the Maximum Debt Authorization set forth herein.

15. Execution of Development and Reimbursement Agreement Among The Developer, The Town and The Ledge Rock Center Commercial Metropolitan District; Dissolution Requirement. Pursuant to the Memorandum of Understanding between the Developer and the Town dated May 5, 2021, the Developer, the Town and the Ledge Rock Center Commercial Metropolitan District, a quasi-municipal corporation and political subdivision of the State of Colorado ("Commercial District"), anticipate the negotiation and execution of a Development and Reimbursement Agreement, as that term is defined in the Service Plan for the Commercial District, providing for, among other matters, terms and conditions relating to the financing of public improvements for the Commercial District. If the Developer, the Town and the Commercial District do not execute such Development and Reimbursement Agreement by February 1, 2022, the District shall promptly file a petition in the District Court for dissolution of the District, unless such deadline is extended in writing by the Town.

16. Recurring Fee Limitation. The District may impose and collect Recurring Fees for administrative, operations and maintenance expenses and for services, programs or facilities furnished by the District. Any Recurring Fees for administrative, operations and maintenance expenses not specifically set forth in the Financial Plan, including a subsequent increase in such Recurring Fees, shall be subject to review and approval by the Town. At the discretion of the Town Manager, Town review and approval shall be provided by the Town Manager in writing or referred by the Town Manager to the Town Council. If the Town does not respond to a request for the imposition of the Recurring Fee or an increase in such Recurring Fee within forty-five (45) days of receipt of a written request from the District, the Town shall be deemed to have approved the ability of the District to impose or increase the Recurring Fee as described in the request. Any Recurring Fees imposed or increased for operation and maintenance expenses without approval as set forth herein shall constitute a material departure from the Service Plan. The revenue from a Recurring Fee shall not be used to pay for Debt.

17. Monies from Other Governmental Sources. The District shall not apply for or accept Conservation Trust Funds, Great Outdoors Colorado Funds or other funds available from or through governmental or non-profit entities for which the Town is eligible to apply, except pursuant to an intergovernmental agreement with the Town. This Section shall not apply to specific ownership taxes which shall be distributed to and a revenue source for the District without any limitation.

18. Consolidation Limitation. The District shall not file a request with any Court to consolidate with another Title 32 district without the prior written consent of the Town.

19. Bankruptcy Limitation. It is expressly intended that all of the limitations contained in this Service Plan, including, but not limited to, those pertaining to the Maximum Debt Mill Levy, Maximum Debt Mill Levy Limitation Term, Developer Debt Mill Levy Imposition

Term, and the Recurring Fees, that have been established under the authority of the Town to approve a Service Plan with conditions pursuant to Section 32-1-204.5, C.R.S.:

(a) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent an amendment to the Service Plan; and

(b) Are, together with all other requirements of Colorado law, included in the “political or governmental powers” reserved to the State under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the “regulatory or electoral approval necessary under applicable nonbankruptcy law” as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

The filing of any bankruptcy petition by the District shall constitute, simultaneously with such filing, a material departure of the express terms of this Service Plan, and thus an express violation of the approval of this Service Plan.

20. Water Rights/Resources Limitation. Water to satisfy the needs of the Project shall be dedicated by the Developer to the Town. The District shall not acquire, own, manage, adjudicate or develop water rights or resources except pursuant to an intergovernmental agreement with the Town. If the District provides a non-potable irrigation system, which would be owned, operated and maintained by the District, the District would be permitted to manage the raw water for the District irrigation water system in the manner set forth in a subsequently executed intergovernmental agreement with the Town.

21. Eminent Domain Limitation. Absent the prior written approval of the Town, the District shall not exercise its statutory power of eminent domain or dominant eminent domain for the purpose of condemning property outside of the Service Area. Additional approval from the Town shall not be required prior to the District’s exercise of its statutory power of eminent domain or dominant eminent domain with respect to property within the Service Area. In no event shall the District exercise its statutory power of dominant eminent domain to condemn property owned by the Town.

22. Covenant Enforcement and Design Review Services. The District shall have the power, but not the obligation, to provide Covenant Enforcement and Design Review Services within the District in accordance with the Colorado Statutes as they are amended from time to time. The Town shall not bear any responsibility for Covenant Enforcement and Design Review Services within the boundaries of the District. The Town’s architectural control, design review and other zoning, land use, development, design and other controls are separate requirements that must be met in addition to any similar controls or services undertaken by the District.

23. Special Improvement District. The District shall not be entitled to create a special improvement district pursuant to Section 32-1-1101.7, C.R.S., unless otherwise provided pursuant to an intergovernmental agreement with the Town.

24. Reimbursement Agreement with Adjacent Landowners. If the District utilizes reimbursement agreements to obtain reimbursements from adjacent landowners for costs of improvements that benefit the third-party landowners, such agreements shall be done in

accordance with Town Code. Any and all resulting reimbursements received for such improvement shall be used to re-pay the cost of the Public Improvement that is the subject of the reimbursement agreement or shall be deposited in the District's debt service fund and used for the purpose of retiring Debt. The District shall maintain an accurate accounting of the funds received and disbursed pursuant to reimbursement agreements.

25. Land Purchase Limitation. Proceeds from the sale of Debt and other revenue of the District may be used to pay the Developer for the acquisition from the Developer of any real property, easements or other interests not required to be dedicated for public use by annexation agreements pursuant to Approved Development Plans, the Town Code or other development requirements. Examples of ineligible reimbursements include, but are not limited to: the acquisition of rights of way, easements, land for public drainage, parkland, or open space, unless separate consent is given by resolution of the Town Council. If the Developer seeks reimbursement for the items described herein from the District, prior to providing reimbursement for such amounts, the District shall receive the report of an independent engineer or accountant licensed in Colorado confirming that in such engineer's or accountant's professional opinion, the amount of the reimbursement is reasonable.

26. Reimbursement of Public Improvement Related Costs. Prior to the reimbursement to the Developer for costs incurred in the organization of the District, for funds expended on the District behalf related to the Public Improvements, for the payment by the District for an invoice related to a Public Improvement cost, or for the acquisition of any part of the Public Improvements, the District shall receive: a) the report of an engineer retained by the District, independent of the Developer and licensed in Colorado verifying that, in such engineer's professional opinion, the reimbursement for the costs of the Public Improvements that are the subject of the reimbursement or acquisition, including the construction costs and the soft costs, but excluding the accounting and legal fees, are, in such engineer's opinion, reasonable and are related to the provision of the Public Improvements or are related to the District's organization; and b) the report of an accountant retained by the District, independent of the Developer and licensed in Colorado verifying that, in such accountant's professional opinion, the reimbursement for the accounting and legal fees that are the subject of the reimbursement or acquisition, are, in such accountants opinion, reasonable and related to the Public Improvements or the District's organization. Upon request, the District shall provide the reports to the Town.

27. Developer Reimbursement of Administration, Operations and Maintenance Related Costs. Prior to the reimbursement to the Developer for costs incurred or for funds expended on behalf of the District related to the administration of the District or the operation and maintenance of the Public Improvements, the District shall receive the report of an accountant retained by the District, who is independent of the Developer and licensed in Colorado, verifying that, in such accountant's professional opinion, the reimbursement of the funds advanced for such administration, operations or maintenance costs, are, in such accountant's opinion, receivable and related to the administration, operations or maintenance of the District or the Public Improvements. Upon request, the District shall provide the report to the Town.

28. Board Meetings and Website Limitations. Once an End User owns property in the Service Area, the District's Board meeting(s) shall be conducted within the boundaries of the Town of Johnstown or conducted virtually via internet or telephone platform available for free

access by the public. The District shall establish and maintain a public website and shall include the name of the Project or a name that allows property owners and residents of the District to readily locate the District online and shall also include an updated street map for those properties within the Service Area that have constructed streets that are open for public use. In addition, the District shall timely post a copy of all of the following documents on its public website: (a) each call for nominations, required pursuant to Section 1-13.5-501, C.R.S., (b) the transparency notices provided pursuant to 32-1-809, C.R.S., (c) each recorded declaration of covenants if the District provides Covenant Enforcement and Design Review Services, (d) a copy of this Service Plan and all amendments thereto, (e) all approved budgets, audits, meeting minutes, Board orders and resolutions, (f) any Rules and Regulations adopted by the Board, and (g) all meeting agendas and meeting packets.

29. Financial Review. The Town shall be permitted to conduct periodic reviews of the financial powers of the District in the Service Plan in the manner and form provided in Section 32-1-1101.5, C.R.S. As provided in the statute, the Town may conduct the first financial review in the fifth calendar year after the calendar year in which a special district's ballot issue to incur general obligation indebtedness was approved by its electors. After such fifth calendar year and notwithstanding the provisions of the statute, the Town may conduct the financial review at any time, by providing sixty (60) days written notice to the District, except that the Town may not conduct a financial review within sixty (60) months of the completion of its most recent financial review. The Town's procedures for conducting a financial review under this Paragraph, and the remedies available to the Town as a result of such financial review, shall be identical to those provided for in Section 32-1-1101.5(2), C.R.S. The District shall be responsible for payment of the Town consultant and legal and administrative costs associated with such review, and the Town may require a deposit of the estimated costs thereof.

30. Use of Proceeds and Revenues Limitations. Proceeds from the sale of Debt instruments and other revenue of the District may be used to pay landowners within the District for any real property, easements or other interests not required to be dedicated for public use by annexation agreements or the Town's land use codes or development requirements and for the cost of any capital improvements, costs of issuance of any debt or other facilities, services and improvements authorized by the Service Plan. Additionally, if the landowner/developer constructs the public infrastructure and conveys it to the District in return for a reimbursement obligation from the District, prior to making such reimbursement for such amounts, the District must receive a Cost Verification Report.

31. Transfer Fee Limitation. The District shall not be authorized to collect or spend revenue from a transfer fee on the sale of real property within the District, except pursuant to an intergovernmental agreement with the Town.

32. Miscellaneous Powers. The District shall have the power to provide any facility, service, or program allowed by C.R.S. § 32-1-1004(1).

33. New Powers. If, after the Service Plan is approved, the Colorado General Assembly grants new or broader powers for metropolitan districts, to the extent permitted by law, any or all such powers shall be deemed to be a part hereof and available to be exercised by the District only following written approval by the Town, subject to the Town's sole discretion.



34. Service Plan Amendment Requirement. Actions of the District which violate the limitations set forth in this Service Plan shall be deemed to be material modifications to this Service Plan and the Town shall be entitled to all remedies available under State and local law to enjoin such actions of the District, including the remedy of enjoining the issuance of additional authorized but unissued debt, until such material modification is remedied.

35. Maximum Residential Debt Mill Levy. The Maximum Residential Debt Mill Levy shall be forty (40) mills subject to an Assessment Ratio Adjustment.

36. Operations and Maintenance Mill Levy. The Operations and Maintenance Mill Levy shall be a mill levy the District is permitted to impose for payment of the District's administrative, operations and maintenance costs, which shall include, but not be limited to, the funding of operating reserves and sufficient ending fund balances to assure sufficient cash flow to fund expenses as they come due. Prior to the imposition of a mill levy for payment of Debt, the District may impose a maximum Operations and Maintenance Mill Levy of fifty (50) mills. After the imposition of a mill levy for the payment of Debt, the District shall not impose an Operations and Mill Levy that exceeds ten (10) mills, subject to an Assessment Ratio Adjustment, and shall at all times not exceed the maximum mill levy necessary to pay those expenses.

37. Mill Levy Imposition Term.

(a) Developer Debt Mill Levy Imposition Term. Developer Debt shall expire and be forgiven twenty (20) years after the date of the initial imposition by the District of an ad valorem property tax to pay any Debt, unless such term is otherwise extended pursuant to an intergovernmental agreement with the Town. Refunding Bonds shall not be subject to this Developer Debt Mill Levy Imposition Term so long as such Refunding Bonds are not owned by the Developer or by a person or party related to the Developer. Developer Debt shall not have any call protection.

(b) Maximum Debt Mill Levy Imposition Term: In addition to the Developer Debt Mill Levy Imposition Term, the District shall not impose a levy for repayment of any and all Debt (or use the proceeds of any mill levy for repayment of Debt) on any single property developed for residential uses which exceeds forty (40) years after the year of the initial imposition of such mill levy unless a majority of the Board of the District imposing the mill levy are End Users residing in such District and have voted in favor of a refunding of a part or all of the Debt and such refunding will result in a net present value savings as set forth in 11-56-101, et seq., C.R.S.

38. Debt Repayment Sources. Debt may be repaid from gifts, grants, ad valorem taxes, and any source of payment permitted by law, this Service Plan or other agreement with the Town.

39. Dissolution. Upon a determination of the Town Council that the purposes for which the District was created have been accomplished or as set forth in Paragraph 15 above, the District shall file a petition in the District Court for dissolution, pursuant to the applicable State statutes. Except as provided in Paragraph 15 above, dissolution shall not occur until the District has provided for the payment or discharge of all of its outstanding indebtedness and other financial

obligations as required pursuant to State statutes. Except as otherwise required in the Intergovernmental Agreement or in the Development and Reimbursement Agreement, dissolution shall not be required if the District is responsible for ongoing operations and maintenance.

40. Notices. All notices, demands, requests or other communications to be sent by one party to the other hereunder or required by law shall be in writing and shall be deemed to have been validly given or served by delivery of same in person to the address or by courier delivery, via United Parcel Service or other nationally recognized overnight air courier service, or by depositing same in the United States mail, postage prepaid, addressed as follows:

To the Town:           Attn: Town Manager  
Town of Johnstown  
450 S. Parish Avenue  
Johnstown, CO 80534  
Phone: (970) 587-4664

To the District:       Ledge Rock Center Residential Metropolitan  
District No. 2  
Attn: District Manager  
c/o Pinnacle Consulting Group, Inc.  
550 W. Eisenhower Blvd.  
Loveland, Colorado 80537  
Phone: 970-669-3611  
Fax: 970-669-3612

*With a copy to:*       Spencer Fane LLP  
Attn: David S. O'Leary, Esq.  
1700 Lincoln, Suite 2000  
Denver, CO 80203  
Phone: 303-839-3800  
Fax: 303-839-3838  
[doleary@spencerfane.com](mailto:doleary@spencerfane.com)

All notices, demands, requests or other communications shall be effective upon such personal delivery or one (1) business day after being deposited with United Parcel Service or other nationally recognized overnight air courier service or three (3) business days after deposit in the United States mail. By giving the other party hereto at least ten (10) days written notice thereof in accordance with the provisions hereof, each of the Parties shall have the right from time to time to change its address. Notice may also be provided by electronic mail on the condition that the intended recipient of the electronic mail acknowledges receipt thereof.

41. Amendment. This Agreement may be amended, modified, changed, or terminated in whole or in part only by a written agreement duly authorized and executed by the Parties hereto and, unless Town Council otherwise requires, without amendment to the Service Plan.

42. Assignment. Neither Party hereto shall assign any of its rights nor delegate any of its duties hereunder to any person or entity without having first obtained the prior written consent of the other Party, which consent will not be unreasonably withheld. Any purported assignment or delegation in violation of the provisions hereof shall be void and ineffectual.

43. Default/Remedies. Upon the occurrence of any event of breach or default by either Party, the non-defaulting party shall provide written notice to the other Party. The defaulting Party shall immediately proceed to cure or remedy such breach or default, and in any event, such breach or default shall be cured within fifteen (15) days after receipt of the notice. Following the cure period in the event of a breach or default of this Agreement by either Party, the non-defaulting Party shall be entitled to exercise all remedies available by law or in equity, specifically including suits for specific performance and/or monetary damages. In the event of any proceeding to enforce the terms, covenants or conditions hereof is brought by the Town to enforce the provisions of this Agreement, the Town, if the prevailing Party shall be entitled to obtain as part of its judgment or award, its reasonable attorneys' fees, to the extent permitted by law.

44. Governing Law and Venue. This Agreement shall be governed and construed under the laws of the State of Colorado and venue shall be in the County in which the District is located.

45. Inurement. Each of the terms, covenants and conditions hereof shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and assigns.

46. Integration. This Agreement constitutes the entire agreement between the Parties with respect to the matters addressed herein. All prior discussions and negotiations regarding the subject matter hereof are merged herein.

47. Parties Interested Herein. Nothing expressed or implied in this Agreement is intended or shall be construed to confer upon, or to give to, any person other than the District and the Town any right, remedy, or claim under or by reason of this Agreement or any covenants, terms, conditions, or provisions thereof, and all the covenants, terms, conditions, and provisions in this Agreement by and on behalf of the District and the Town shall be for the sole and exclusive benefit of the District and the Town.

48. Severability. If any covenant, term, condition, or provision under this Agreement shall, for any reason, be held to be invalid or unenforceable, the invalidity or unenforceability of such covenant, term, condition, or provision shall not affect any other provision contained herein, the intention being that such provisions are severable.

49. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall constitute an original and all of which shall constitute one and the same document.

50. No Liability of Town. The Town has no obligation whatsoever to construct any improvements that the District is required to construct, or pay any debt or liability of the District, including any Bonds.

51. Paragraph Headings. Paragraph headings are inserted for convenience of reference only.

52. Defined Terms. Capitalized terms used herein and not otherwise defined shall have the meanings ascribed to them in the Service Plan.

LEDGE ROCK CENTER RESIDENTIAL  
METROPOLITAN DISTRICT NO. 2

By: \_\_\_\_\_  
President

Attest:

\_\_\_\_\_  
Secretary

TOWN OF JOHNSTOWN, COLORADO

By: \_\_\_\_\_  
Mayor

Attest:

By: \_\_\_\_\_  
Its: \_\_\_\_\_

## **EXHIBIT E**

### Capital Plan



August 20, 2021

Town of Johnstown  
Board of Trustees  
450 Parish Avenue  
Johnstown, Colorado 80534

Subject: Estimate of Preliminary District Expenditures for  
Ledge Rock Center, Johnstown, Colorado 80534

To Whom It May Concern:

The letter serves to document that Point Consulting, LLC. prepared an Estimate of Preliminary District Expenditures for the Ledge Rock Center, dated August 20, 2021.

The estimate was based on a conceptual engineering plan for the subject proposed mixed-use development, and unit costs were based on comparable projects within the same geographic area during the year 2021.

It is our professional opinion that the construction costs presented in the estimate are reasonable and have been based on the best available information.

Should you have any questions related to this estimate, we can be reached at 720-258-6836, Ext. 1011.

Sincerely,  
Point Consulting, LLC

Jim Shipton,  
Partner

Tiffany Watson,  
Partner



### SUMMARY ESTIMATE OF PRELIMINARY PROJECT COSTS DISTRICT EXPENDITURES

August 20, 2021

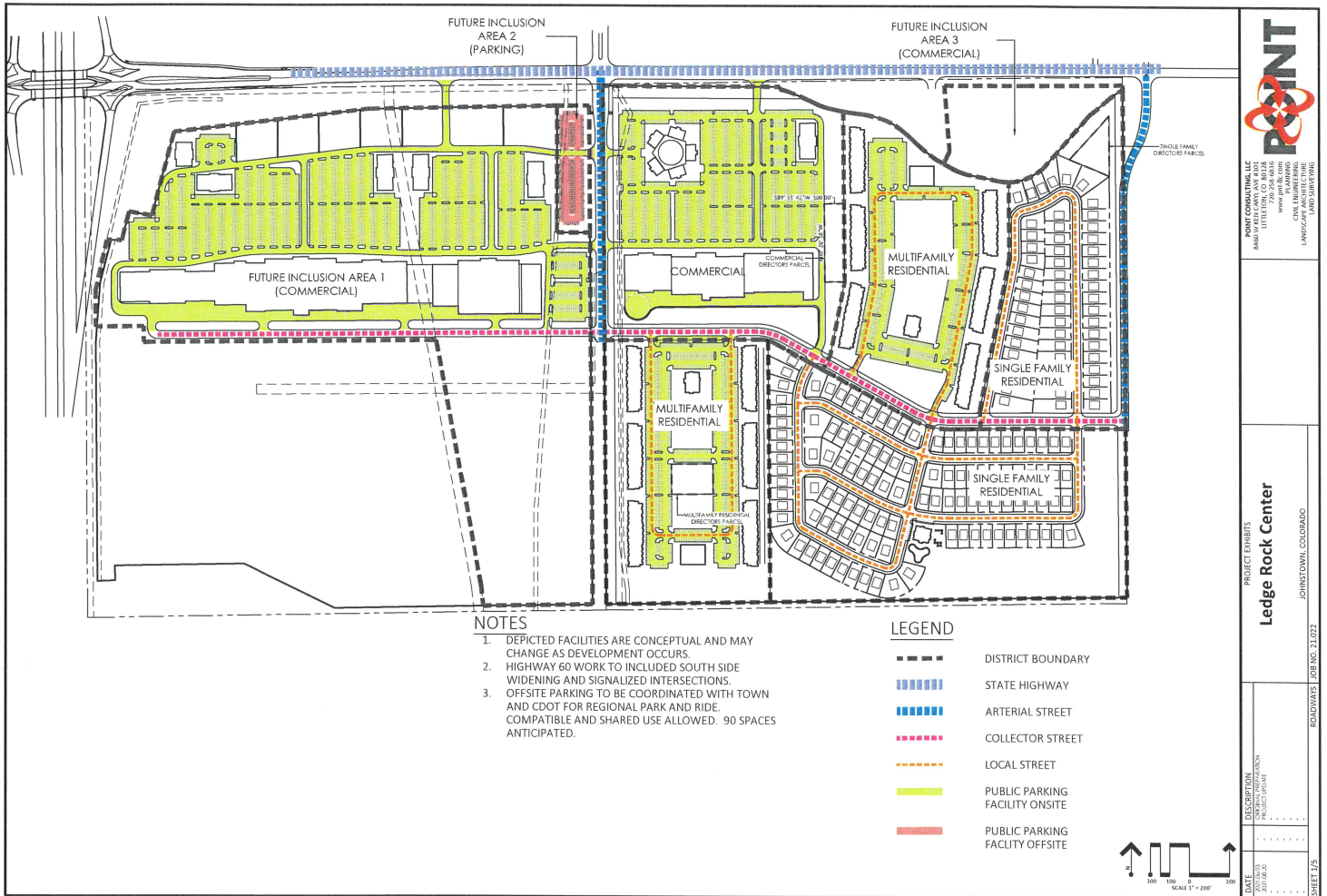
**PUBLIC IMPROVEMENT COSTS FOR**

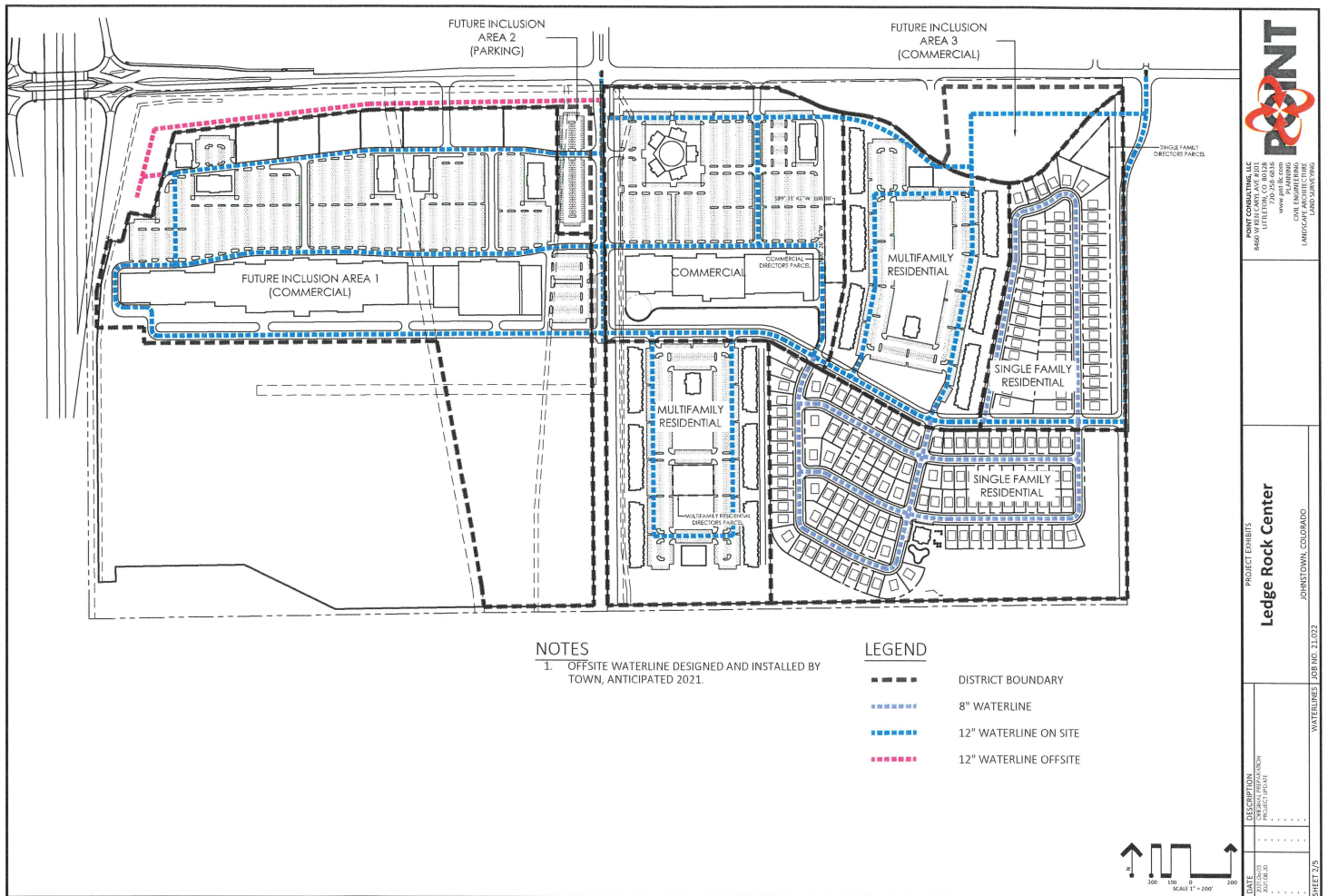
### Ledge Rock Center - Single Family District

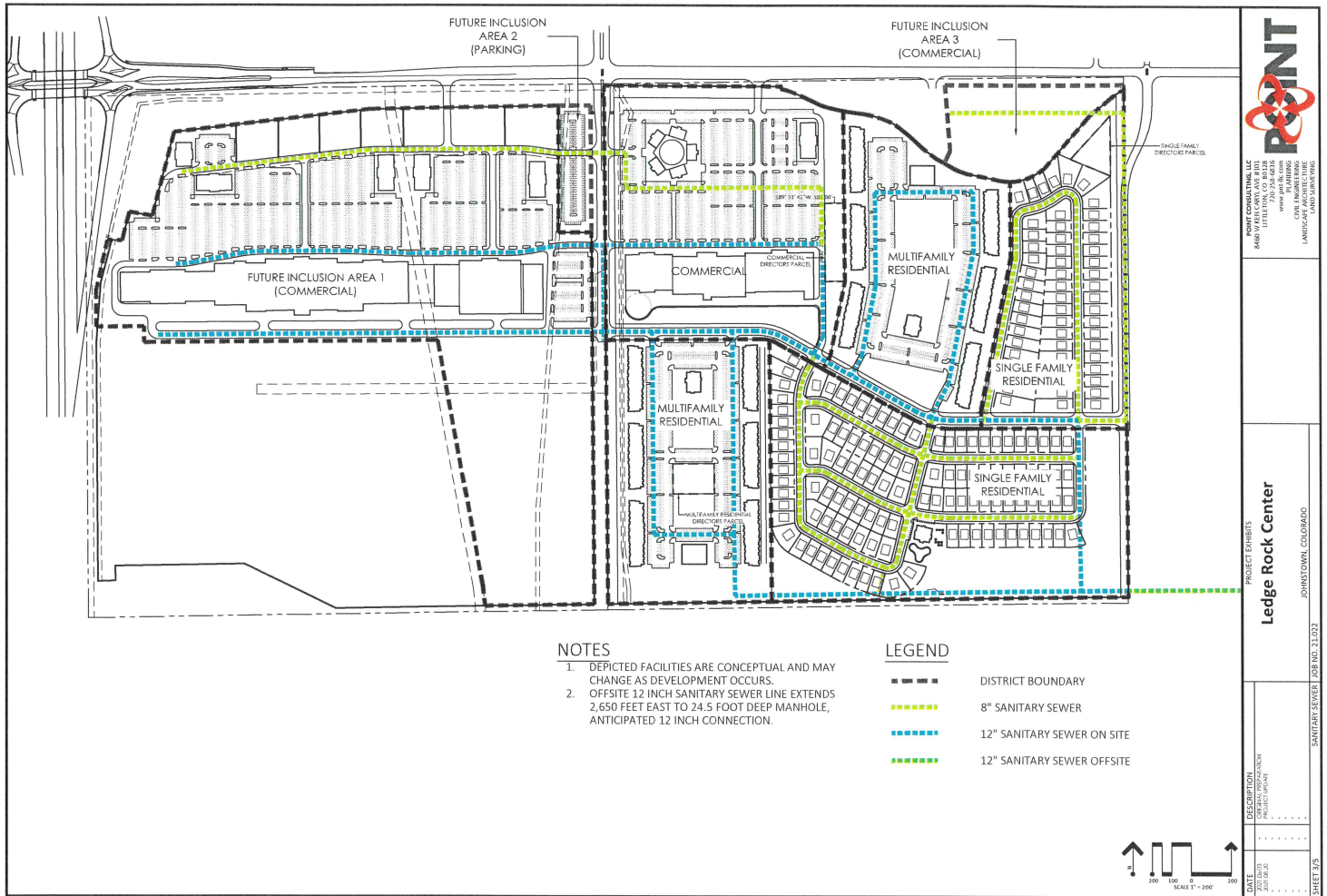
**COMBINED AREA - 61 ACRES**

[illegible]

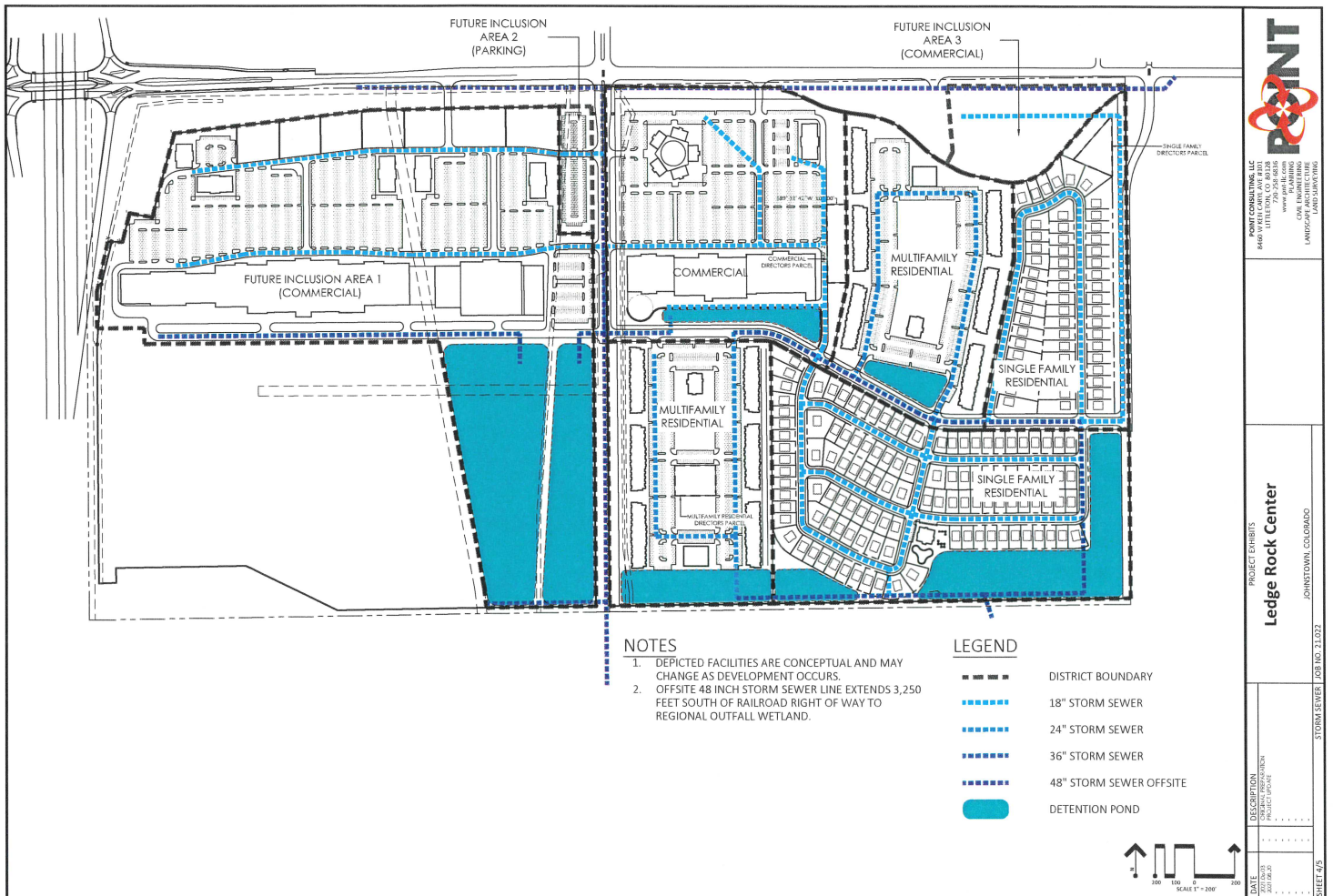


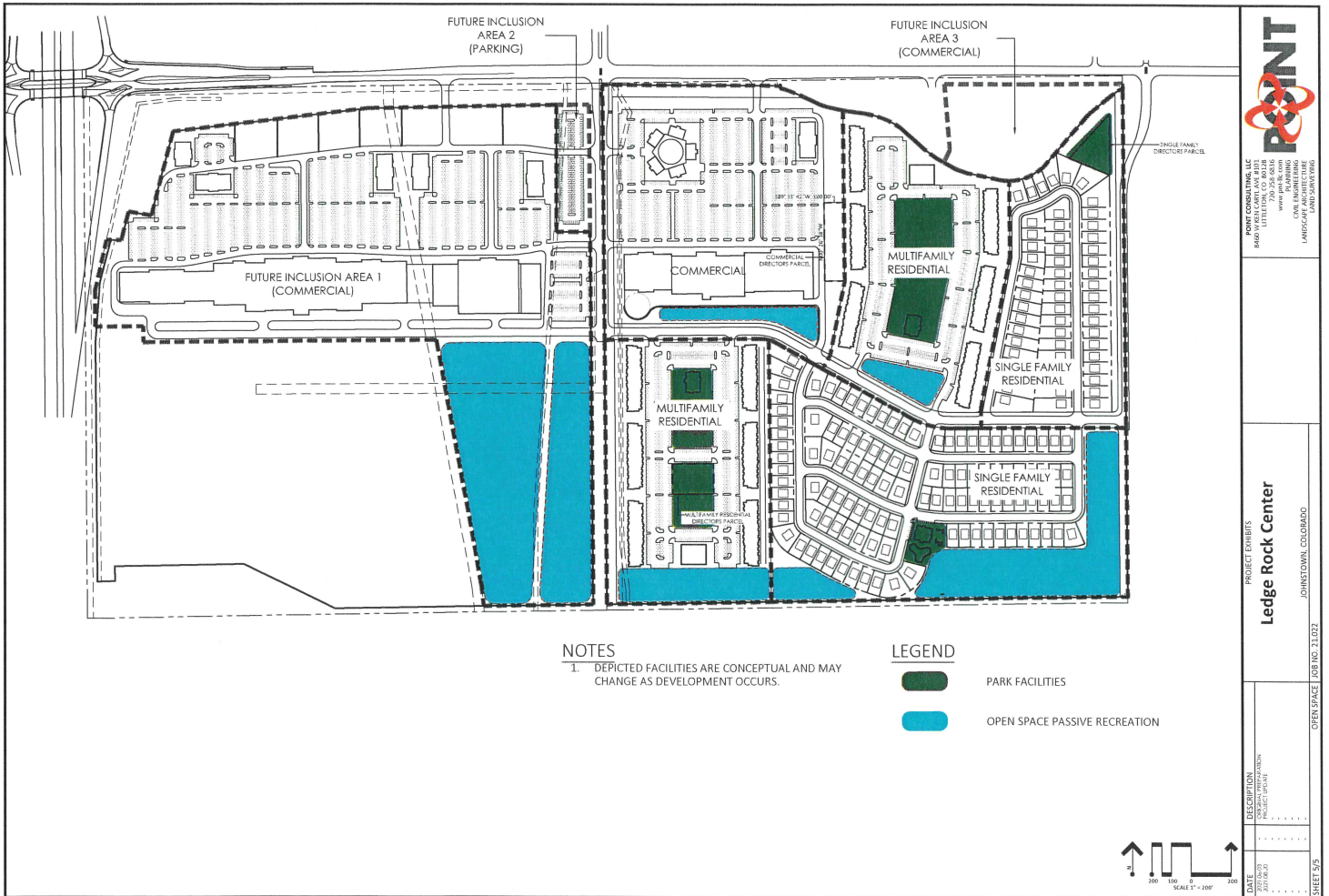












## **EXHIBIT F**

### Financial Plan

**Ledge Rock Center Residential Metropolitan District (Single-Family)**  
**Larimer County, Colorado**

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General Obligation Bonds, Series 2022A
Subordinate Cash Flow Bonds, Series 2022B

Bond Assumptions	Series 2022A	Series 2022B	Total
Closing Date	3/15/2022	3/15/2022	
First Call Date	3/1/2027	3/1/2027	
Final Maturity	12/1/2051	12/15/2051	
Discharge Date	12/1/2061	12/1/2061	
Sources of Funds			
Par Amount	2,860,000	372,000	3,232,000
Total	2,860,000	372,000	3,232,000
Uses of Funds			
Project Fund	1,636,727	360,840	1,997,567
Capitalized Interest	407,073	0	407,073
Surplus Deposit	259,000	0	259,000
Cost of Issuance	557,200	11,160	568,360
Total	2,860,000	372,000	3,232,000
Debt Features			
Projected Coverage at Mill Levy Cap	1.30x	1.00x	
Tax Status	Tax-Exempt	Tax-Exempt	
Rating	Non-Rated	Non-Rated	
Average Coupon	5.250%	8.250%	
Annual Trustee Fee	\$4,000	\$3,000	
Biennial Reassessment			
Residential	2.00%	2.00%	
Tax Authority Assumptions			
Metropolitan District Revenue			
Residential Assessment Ratio			
Service Plan Gallagherization Base	7.15%		
Current Assumption	7.15%		
Debt Service Mills			
Service Plan Mill Levy Cap	40.000		
Target Mill Levy	40.000		
Specific Ownership Tax	6.00%		
County Treasurer Fee	2.00%		
Operations			
Mill Levy	10.000		

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Ledge Rock Center Residential Metropolitan District (Single-Family)
Development Summary

Statutory Actual Value (2021)	Residential							Total
	SFD	-	-	-	-	-	-	
	\$450,000	-	-	-	-	-	-	
2021	-	-	-	-	-	-	-	-
2022	44	-	-	-	-	-	-	44
2023	44	-	-	-	-	-	-	44
2024	44	-	-	-	-	-	-	44
2025	43	-	-	-	-	-	-	43
2026	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-
2050	-	-	-	-	-	-	-	-
2051	-	-	-	-	-	-	-	-
Total Units	175	-	-	-	-	-	-	175
Total Statutory Actual Value	\$78,750,000	-	-	-	-	-	-	\$78,750,000

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Ledge Rock Center Residential Metropolitan District (Single-Family)**Assessed Value**

	Vacant and Improved Land		Residential				Total
	Cumulative Statutory Actual Value ¹	Assessed Value in Collection Year	Residential Units Delivered	Biennial Reassessment	Cumulative Statutory Actual Value	Assessed Value in Collection Year	Assessed Value in Collection Year
		2 Year Lag 29.00%		2.00%		2 Year Lag 7.15%	2 Year Lag
2021	1,980,000	0	-	-	0	0	0
2022	1,980,000	0	44	-	20,196,000	0	0
2023	1,980,000	574,200	44	-	40,795,920	0	574,200
2024	1,935,000	574,200	44	815,918	62,623,757	1,444,014	2,018,214
2025	0	574,200	43	-	83,568,819	2,916,908	3,491,108
2026	0	561,150	-	1,671,376	85,240,195	4,477,599	5,038,749
2027	0	0	-	-	85,240,195	5,975,171	5,975,171
2028	0	0	-	1,704,804	86,944,999	6,094,674	6,094,674
2029	0	0	-	-	86,944,999	6,094,674	6,094,674
2030	0	0	-	1,738,900	88,683,899	6,216,567	6,216,567
2031	0	0	-	-	88,683,899	6,216,567	6,216,567
2032	0	0	-	1,773,678	90,457,577	6,340,899	6,340,899
2033	0	0	-	-	90,457,577	6,340,899	6,340,899
2034	0	0	-	1,809,152	92,266,729	6,467,717	6,467,717
2035	0	0	-	-	92,266,729	6,467,717	6,467,717
2036	0	0	-	1,845,335	94,112,063	6,597,071	6,597,071
2037	0	0	-	-	94,112,063	6,597,071	6,597,071
2038	0	0	-	1,882,241	95,994,305	6,729,013	6,729,013
2039	0	0	-	-	95,994,305	6,729,013	6,729,013
2040	0	0	-	1,919,886	97,914,191	6,863,593	6,863,593
2041	0	0	-	-	97,914,191	6,863,593	6,863,593
2042	0	0	-	1,958,284	99,872,475	7,000,865	7,000,865
2043	0	0	-	-	99,872,475	7,000,865	7,000,865
2044	0	0	-	1,997,449	101,869,924	7,140,882	7,140,882
2045	0	0	-	-	101,869,924	7,140,882	7,140,882
2046	0	0	-	2,037,398	103,907,323	7,283,700	7,283,700
2047	0	0	-	-	103,907,323	7,283,700	7,283,700
2048	0	0	-	2,078,146	105,985,469	7,429,374	7,429,374
2049	0	0	-	-	105,985,469	7,429,374	7,429,374
2050	0	0	-	2,119,709	108,105,178	7,577,961	7,577,961
2051	0	0	-	-	108,105,178	7,577,961	7,577,961
Total			175	25,352,278			

1. Vacant land value calculated in year prior to construction as 10% build-out market value

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Ledge Rock Center Residential Metropolitan District (Single-Family)
Revenue

	Total	District Mill Levy Revenue			Expense		Total
	Assessed Value in Collection Year	Debt Mill Levy	Debt Mill Levy Collections	Specific Ownership Taxes	County Treasurer Fee	Annual Trustee Fee	Revenue Available for Debt Service
		40.000 Cap 40.000 Target	99.50%	6.00%	2.00%	\$7,000	
2021	0	0.000	0	0	0	0	0
2022	0	40,000	0	0	0	0	0
2023	574,200	40,000	22,853	1,371	(457)	(7,000)	16,767
2024	2,018,214	40,000	80,325	4,819	(1,606)	(7,000)	76,538
2025	3,491,108	40,000	138,946	8,337	(2,779)	(7,000)	137,504
2026	5,038,749	40,000	200,542	12,033	(4,011)	(7,000)	201,564
2027	5,975,171	40,000	237,812	14,269	(4,756)	(7,000)	240,324
2028	6,094,674	40,000	242,568	14,554	(4,851)	(7,000)	245,271
2029	6,094,674	40,000	242,568	14,554	(4,851)	(7,000)	245,271
2030	6,216,567	40,000	247,419	14,845	(4,948)	(7,000)	250,316
2031	6,216,567	40,000	247,419	14,845	(4,948)	(7,000)	250,316
2032	6,340,899	40,000	252,368	15,142	(5,047)	(7,000)	255,462
2033	6,340,899	40,000	252,368	15,142	(5,047)	(7,000)	255,462
2034	6,467,717	40,000	257,415	15,445	(5,148)	(7,000)	260,712
2035	6,467,717	40,000	257,415	15,445	(5,148)	(7,000)	260,712
2036	6,597,071	40,000	262,563	15,754	(5,251)	(7,000)	266,066
2037	6,597,071	40,000	262,563	15,754	(5,251)	(7,000)	266,066
2038	6,729,013	40,000	267,815	16,069	(5,356)	(7,000)	271,527
2039	6,729,013	40,000	267,815	16,069	(5,356)	(7,000)	271,527
2040	6,863,593	40,000	273,171	16,390	(5,463)	(7,000)	277,098
2041	6,863,593	40,000	273,171	16,390	(5,463)	(7,000)	277,098
2042	7,000,865	40,000	278,634	16,718	(5,573)	(7,000)	282,780
2043	7,000,865	40,000	278,634	16,718	(5,573)	(7,000)	282,780
2044	7,140,882	40,000	284,207	17,052	(5,684)	(7,000)	288,575
2045	7,140,882	40,000	284,207	17,052	(5,684)	(7,000)	288,575
2046	7,283,700	40,000	289,891	17,393	(5,798)	(7,000)	294,487
2047	7,283,700	40,000	289,891	17,393	(5,798)	(7,000)	294,487
2048	7,429,374	40,000	295,689	17,741	(5,914)	(7,000)	300,517
2049	7,429,374	40,000	295,689	17,741	(5,914)	(7,000)	300,517
2050	7,577,961	40,000	301,603	18,096	(6,032)	(7,000)	306,667
2051	7,577,961	40,000	301,603	18,096	(6,032)	(7,000)	306,667
Total			7,187,166	431,230	(143,743)	(203,000)	7,271,653

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Ledge Rock Center Residential Metropolitan District (Single-Family)
Debt Service

	Total Revenue Available for Debt Service	Net Debt Service	Surplus Fund			Ratio Analysis	
		Series 2022A	Annual Surplus	Cumulative Balance ¹	Released Revenue	Debt Service Coverage	Senior Debt to Assessed Value
		Dated: 3/15/2022 Par: \$2,860,000 Proj: \$1,636,727					
2021							
2022	0	0	0	259,000	0	n/a	n/a
2023	16,767	0	16,767	275,767	0	n/a	n/a
2024	76,538	0	76,538	352,305	0	n/a	498%
2025	137,504	150,150	(12,646)	339,659	0	92%	142%
2026	201,564	150,150	51,414	391,073	0	134%	82%
2027	240,324	180,150	60,174	451,247	0	133%	56%
2028	245,271	188,575	56,696	507,943	0	130%	47%
2029	245,271	186,475	58,796	566,739	0	132%	45%
2030	250,316	189,375	60,941	572,000	55,680	132%	44%
2031	250,316	192,013	58,304	572,000	58,304	130%	43%
2032	255,462	194,388	61,075	572,000	61,075	131%	42%
2033	255,462	196,500	58,962	572,000	58,962	130%	40%
2034	260,712	198,350	62,362	572,000	62,362	131%	39%
2035	260,712	199,938	60,774	572,000	60,774	130%	37%
2036	266,066	201,263	64,803	572,000	64,803	132%	36%
2037	266,066	202,325	63,741	572,000	63,741	132%	34%
2038	271,527	208,125	63,402	572,000	63,402	130%	33%
2039	271,527	208,400	63,127	572,000	63,127	130%	31%
2040	277,098	208,413	68,685	572,000	68,685	133%	29%
2041	277,098	208,163	68,935	572,000	68,935	133%	27%
2042	282,780	212,650	70,130	572,000	70,130	133%	25%
2043	282,780	216,613	66,167	572,000	66,167	131%	23%
2044	288,575	220,050	68,525	572,000	68,525	131%	21%
2045	288,575	217,963	70,613	572,000	70,613	132%	19%
2046	294,487	225,613	68,874	572,000	68,874	131%	17%
2047	294,487	222,475	72,012	572,000	72,012	132%	14%
2048	300,517	229,075	71,442	572,000	71,442	131%	12%
2049	300,517	229,888	70,629	572,000	70,629	131%	9%
2050	306,667	235,175	71,492	572,000	71,492	130%	6%
2051	306,667	494,675	(188,008)	0	383,992	62%	0%
Total	7,271,653	5,766,925	1,504,728	15,155,734	1,763,728		

1. Assumes \$259,000 Deposit to Surplus Fund at Closing

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Ledge Rock Center Residential Metropolitan District (Single-Family)
Subordinate Debt Service

	Revenue Available for Debt Service	Interest Payment 8.250%	Balance of Accrued Interest	Principal Payment	Principal Balance	Debt Service		Released Revenue
						Series 2022B		
						Dated: 3/15/2022		
						Par: \$372,000 Proj: \$360,840		
					372,000			
2022	-	-	23,018	-	372,000	-	-	
2023	-	-	55,606	-	372,000	-	-	
2024	-	-	90,884	-	372,000	-	-	
2025	-	-	129,072	-	372,000	-	-	
2026	-	-	170,410	-	372,000	-	-	
2027	-	-	215,159	-	372,000	-	-	
2028	-	-	263,600	-	372,000	-	-	
2029	-	-	316,037	-	372,000	-	-	
2030	55,680	55,680	317,120	-	372,000	55,680	-	
2031	58,304	58,304	315,669	-	372,000	58,304	-	
2032	61,075	61,075	311,326	-	372,000	61,075	-	
2033	58,962	58,962	308,738	-	372,000	58,962	-	
2034	62,362	62,362	302,537	-	372,000	62,362	-	
2035	60,774	60,774	297,413	-	372,000	60,774	-	
2036	64,803	64,803	287,836	-	372,000	64,803	-	
2037	63,741	63,741	278,531	-	372,000	63,741	-	
2038	63,402	63,402	268,798	-	372,000	63,402	-	
2039	63,127	63,127	258,536	-	372,000	63,127	-	
2040	68,685	68,685	241,870	-	372,000	68,685	-	
2041	68,935	68,935	223,579	-	372,000	68,935	-	
2042	70,130	70,130	202,584	-	372,000	70,130	-	
2043	66,167	66,167	183,820	-	372,000	66,167	-	
2044	68,525	68,525	161,150	-	372,000	68,525	-	
2045	70,613	70,613	134,522	-	372,000	70,613	-	
2046	68,874	68,874	107,436	-	372,000	68,874	-	
2047	72,012	72,012	74,977	-	372,000	72,012	-	
2048	71,442	71,442	40,411	-	372,000	71,442	-	
2049	70,629	70,629	3,806	-	372,000	70,629	-	
2050	71,492	34,810	-	36,000	336,000	70,810	682	
2051	383,992	27,720	-	336,000	-	363,720	20,272	
Total	1,763,728	1,370,774		372,000		1,742,774	20,954	

PIPER | SANDLER

**Ledge Rock Center Residential Metropolitan District (Single-Family)
Revenue**

	Total	Operations Mill Levy Revenue			Expense	Total
	Assessed Value in Collection Year	O&M Mill Levy	O&M Mill Levy Collections	Specific Ownership Taxes	County Treasurer Fee	Revenue Available for Operations
		10.000 Cap 10.000 Target	99.50%	6.00%	2.00%	
2021	0	0.000	0	0	0	0
2022	0	10.000	0	0	0	0
2023	574,200	10.000	5,742	343	(115)	5,970
2024	2,018,214	10.000	20,182	1,205	(404)	20,983
2025	3,491,108	10.000	34,911	2,084	(698)	36,297
2026	5,038,749	10.000	50,387	3,008	(1,008)	52,388
2027	5,975,171	10.000	59,752	3,567	(1,195)	62,124
2028	6,094,674	10.000	60,947	3,639	(1,219)	63,366
2029	6,094,674	10.000	60,947	3,639	(1,219)	63,366
2030	6,216,567	10.000	62,166	3,711	(1,243)	64,634
2031	6,216,567	10.000	62,166	3,711	(1,243)	64,634
2032	6,340,899	10.000	63,409	3,786	(1,268)	65,926
2033	6,340,899	10.000	63,409	3,786	(1,268)	65,926
2034	6,467,717	10.000	64,677	3,861	(1,294)	67,245
2035	6,467,717	10.000	64,677	3,861	(1,294)	67,245
2036	6,597,071	10.000	65,971	3,938	(1,319)	68,590
2037	6,597,071	10.000	65,971	3,938	(1,319)	68,590
2038	6,729,013	10.000	67,290	4,017	(1,346)	69,962
2039	6,729,013	10.000	67,290	4,017	(1,346)	69,962
2040	6,863,593	10.000	68,636	4,098	(1,373)	71,361
2041	6,863,593	10.000	68,636	4,098	(1,373)	71,361
2042	7,000,865	10.000	70,009	4,180	(1,400)	72,788
2043	7,000,865	10.000	70,009	4,180	(1,400)	72,788
2044	7,140,882	10.000	71,409	4,263	(1,428)	74,244
2045	7,140,882	10.000	71,409	4,263	(1,428)	74,244
2046	7,283,700	10.000	72,837	4,348	(1,457)	75,729
2047	7,283,700	10.000	72,837	4,348	(1,457)	75,729
2048	7,429,374	10.000	74,294	4,435	(1,486)	77,243
2049	7,429,374	10.000	74,294	4,435	(1,486)	77,243
2050	7,577,961	10.000	75,780	4,524	(1,516)	78,788
2051	7,577,961	10.000	75,780	4,524	(1,516)	78,788
Total			1,805,821	107,807	(36,116)	1,877,512

SOURCES AND USES OF FUNDS

LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (SINGLE-FAMILY) Larimer County, Colorado

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### GENERAL OBLIGATION BONDS, SERIES 2022A SUBORDINATE CASH FLOW BONDS, SERIES 2022B

Dated Date                      03/15/2022  
Delivery Date                03/15/2022

| <b>Sources:</b>           | <b>Series 2022A</b> | <b>Series 2022B</b> | <b>Total</b> |
|---------------------------|---------------------|---------------------|--------------|
| Bond Proceeds:            |                     |                     |              |
| Par Amount                | 2,860,000.00        | 372,000.00          | 3,232,000.00 |
|                           | 2,860,000.00        | 372,000.00          | 3,232,000.00 |
| <b>Uses:</b>              | <b>Series 2022A</b> | <b>Series 2022B</b> | <b>Total</b> |
| Project Fund Deposits:    |                     |                     |              |
| Project Fund              | 1,636,726.67        | 360,840.00          | 1,997,566.67 |
| Other Fund Deposits:      |                     |                     |              |
| Capitalized Interest Fund | 407,073.33          |                     | 407,073.33   |
| Surplus Deposit           | 259,000.00          |                     | 259,000.00   |
|                           | 666,073.33          |                     | 666,073.33   |
| Cost of Issuance:         |                     |                     |              |
| Other Cost of Issuance    | 500,000.00          |                     | 500,000.00   |
| Delivery Date Expenses:   |                     |                     |              |
| Underwriter's Discount    | 57,200.00           | 11,160.00           | 68,360.00    |
|                           | 2,860,000.00        | 372,000.00          | 3,232,000.00 |



## BOND SUMMARY STATISTICS

### LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (SINGLE-FAMILY) Larimer County, Colorado

#### ~~~ GENERAL OBLIGATION BONDS, SERIES 2022A 40.000 Debt Service Mills Non-Rated, 1.30x, 30-yr. Maturity

|                                 |              |
|---------------------------------|--------------|
| Dated Date                      | 03/15/2022   |
| Delivery Date                   | 03/15/2022   |
| Last Maturity                   | 12/01/2051   |
| Arbitrage Yield                 | 5.250652%    |
| True Interest Cost (TIC)        | 5.412143%    |
| Net Interest Cost (NIC)         | 5.340616%    |
| All-In TIC                      | 7.070346%    |
| Average Coupon                  | 5.250000%    |
| Average Life (years)            | 22.071       |
| Duration of Issue (years)       | 12.787       |
| Par Amount                      | 2,860,000.00 |
| Bond Proceeds                   | 2,860,000.00 |
| Total Interest                  | 3,313,998.33 |
| Net Interest                    | 3,371,198.33 |
| Total Debt Service              | 6,173,998.33 |
| Maximum Annual Debt Service     | 494,675.00   |
| Average Annual Debt Service     | 207,800.99   |
| Underwriter's Fees (per \$1000) |              |
| Average Takedown                |              |
| Other Fee                       | 20.000000    |
| Total Underwriter's Discount    | 20.000000    |
| Bid Price                       | 98.000000    |

| <i><b>Bond Component</b></i> | <i><b>Par<br/>Value</b></i> | <i><b>Price</b></i> | <i><b>Average<br/>Coupon</b></i> | <i><b>Average<br/>Life</b></i> |
|------------------------------|-----------------------------|---------------------|----------------------------------|--------------------------------|
| Term Bond due 2051           | 2,860,000.00                | 100.000             | 5.250%                           | 22.071                         |
|                              | 2,860,000.00                |                     |                                  | 22.071                         |

|                            | <i><b>TIC</b></i> | <i><b>All-In<br/>TIC</b></i> | <i><b>Arbitrage<br/>Yield</b></i> |
|----------------------------|-------------------|------------------------------|-----------------------------------|
| Par Value                  | 2,860,000.00      | 2,860,000.00                 | 2,860,000.00                      |
| + Accrued Interest         |                   |                              |                                   |
| + Premium (Discount)       |                   |                              |                                   |
| - Underwriter's Discount   | (57,200.00)       | (57,200.00)                  |                                   |
| - Cost of Issuance Expense |                   | (500,000.00)                 |                                   |
| - Other Amounts            |                   |                              |                                   |
| Target Value               | 2,802,800.00      | 2,302,800.00                 | 2,860,000.00                      |
| Target Date                | 03/15/2022        | 03/15/2022                   | 03/15/2022                        |
| Yield                      | 5.412143%         | 7.070346%                    | 5.250652%                         |

**NET DEBT SERVICE****LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (SINGLE-FAMILY)**

Larimer County, Colorado

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GENERAL OBLIGATION BONDS, SERIES 2022A

40.000 Debt Service Mills

Non-Rated, 1.30x, 30-yr. Maturity

<i>Period Ending</i>	<i>Principal</i>	<i>Coupon</i>	<i>Interest</i>	<i>Total Debt Service</i>	<i>Capitalized Interest Fund</i>	<i>Net Debt Service</i>
12/01/2022			106,773.33	106,773.33	106,773.33	
12/01/2023			150,150.00	150,150.00	150,150.00	
12/01/2024			150,150.00	150,150.00	150,150.00	
12/01/2025			150,150.00	150,150.00		150,150.00
12/01/2026			150,150.00	150,150.00		150,150.00
12/01/2027	30,000	5.250%	150,150.00	180,150.00		180,150.00
12/01/2028	40,000	5.250%	148,575.00	188,575.00		188,575.00
12/01/2029	40,000	5.250%	146,475.00	186,475.00		186,475.00
12/01/2030	45,000	5.250%	144,375.00	189,375.00		189,375.00
12/01/2031	50,000	5.250%	142,012.50	192,012.50		192,012.50
12/01/2032	55,000	5.250%	139,387.50	194,387.50		194,387.50
12/01/2033	60,000	5.250%	136,500.00	196,500.00		196,500.00
12/01/2034	65,000	5.250%	133,350.00	198,350.00		198,350.00
12/01/2035	70,000	5.250%	129,937.50	199,937.50		199,937.50
12/01/2036	75,000	5.250%	126,262.50	201,262.50		201,262.50
12/01/2037	80,000	5.250%	122,325.00	202,325.00		202,325.00
12/01/2038	90,000	5.250%	118,125.00	208,125.00		208,125.00
12/01/2039	95,000	5.250%	113,400.00	208,400.00		208,400.00
12/01/2040	100,000	5.250%	108,412.50	208,412.50		208,412.50
12/01/2041	105,000	5.250%	103,162.50	208,162.50		208,162.50
12/01/2042	115,000	5.250%	97,650.00	212,650.00		212,650.00
12/01/2043	125,000	5.250%	91,612.50	216,612.50		216,612.50
12/01/2044	135,000	5.250%	85,050.00	220,050.00		220,050.00
12/01/2045	140,000	5.250%	77,962.50	217,962.50		217,962.50
12/01/2046	155,000	5.250%	70,612.50	225,612.50		225,612.50
12/01/2047	160,000	5.250%	62,475.00	222,475.00		222,475.00
12/01/2048	175,000	5.250%	54,075.00	229,075.00		229,075.00
12/01/2049	185,000	5.250%	44,887.50	229,887.50		229,887.50
12/01/2050	200,000	5.250%	35,175.00	235,175.00		235,175.00
12/01/2051	470,000	5.250%	24,675.00	494,675.00		494,675.00
	2,860,000		3,313,998.33	6,173,998.33	407,073.33	5,766,925.00

BOND SOLUTION**LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT (SINGLE-FAMILY)**
Larimer County, Colorado**~~~**
GENERAL OBLIGATION BONDS, SERIES 2022A
40.000 Debt Service Mills
Non-Rated, 1.30x, 30-yr. Maturity

Period Ending	Proposed Principal	Proposed Debt Service	CAPI & DSRF Adjustments	Total Adj Debt Service	Revenue Constraints	Unused Revenues	Debt Serv Coverage
12/01/2022		106,773	(106,773)				
12/01/2023		150,150	(150,150)		16,767	16,767	
12/01/2024		150,150	(150,150)		76,538	76,538	
12/01/2025		150,150		150,150	137,504	(12,646)	91.57772%
12/01/2026		150,150		150,150	201,564	51,414	134.24168%
12/01/2027	30,000	180,150		180,150	240,324	60,174	133.40231%
12/01/2028	40,000	188,575		188,575	245,271	56,696	130.06536%
12/01/2029	40,000	186,475		186,475	245,271	58,796	131.53010%
12/01/2030	45,000	189,375		189,375	250,316	60,941	132.18015%
12/01/2031	50,000	192,013		192,013	250,316	58,304	130.36451%
12/01/2032	55,000	194,388		194,388	255,462	61,075	131.41919%
12/01/2033	60,000	196,500		196,500	255,462	58,962	130.00635%
12/01/2034	65,000	198,350		198,350	260,712	62,362	131.44025%
12/01/2035	70,000	199,938		199,938	260,712	60,774	130.39661%
12/01/2036	75,000	201,263		201,263	266,066	64,803	132.19848%
12/01/2037	80,000	202,325		202,325	266,066	63,741	131.50425%
12/01/2038	90,000	208,125		208,125	271,527	63,402	130.46356%
12/01/2039	95,000	208,400		208,400	271,527	63,127	130.29141%
12/01/2040	100,000	208,413		208,413	277,098	68,685	132.95643%
12/01/2041	105,000	208,163		208,163	277,098	68,935	133.11611%
12/01/2042	115,000	212,650		212,650	282,780	70,130	132.97897%
12/01/2043	125,000	216,613		216,613	282,780	66,167	130.54639%
12/01/2044	135,000	220,050		220,050	288,575	68,525	131.14083%
12/01/2045	140,000	217,963		217,963	288,575	70,613	132.39681%
12/01/2046	155,000	225,613		225,613	294,487	68,874	130.52774%
12/01/2047	160,000	222,475		222,475	294,487	72,012	132.36853%
12/01/2048	175,000	229,075		229,075	300,517	71,442	131.18700%
12/01/2049	185,000	229,888		229,888	300,517	70,629	130.72335%
12/01/2050	200,000	235,175		235,175	306,667	71,492	130.39947%
12/01/2051	470,000	494,675		494,675	306,667	(188,008)	61.99362%
	2,860,000	6,173,998	(407,073)	5,766,925	7,271,653	1,504,728	

EXHIBIT G

Form of District Disclosure Notice

EXHIBIT G
Disclosure Notice

SPECIAL DISTRICT PUBLIC DISCLOSURE

Pursuant to § 32-1-104.8 C.R.S.

Name of the District:	Ledge Rock Residential Metropolitan District No. 2 ("District")
Contact Information for the District:	Ledge Rock Residential Metropolitan District No. 2 c/o Pinnacle Consulting Group, Inc. 550 W. Eisenhower Blvd., Loveland, CO 80537
Powers of the District:	All powers authorized in § 32-1-1004, C.R.S., including, but not limited to, mosquito control, parks or recreational facilities or programs, traffic and safety controls, sanitation services, street improvements, and water services, subject to the limitations contained in the District's Service Plan regarding the exercise of such powers. The District's Service Plan specifically limits the District's authority to exercise the following powers without an intergovernmental agreement with the Town of Johnstown: fire protection, ambulance and emergency services, television relay and translator facilities, telecommunication and solid waste collection, and transportation services.
Service Plan:	The District's Service Plan, which may be amended from time to time, includes a description of the District's powers and authority. A copy of the District's Service Plan is available from the District and from the Division of Local Government.
Financial Powers of the District:	The District is authorized by Title 32 of the Colorado Revised Statutes to use a number of methods to raise revenues for capital needs and general operations costs. These methods, subject to the limitations imposed by Section 20 of Article X of the Colorado Constitution, include issuing debt, levying taxes, and imposing fees and charges. Information concerning directors, management, meetings, elections and current taxes are provided annually in the Notice to Electors described § 32-1-809(1), C.R.S., which may be found at the District's office, on the District's web site, on file at the Division of Local Government in the State Department of Local Affairs, or on file at the office of the clerk and recorder of each county in which the special district is located.
District Boundaries:	A map of the District's boundaries is attached hereto as <u>Exhibit A</u> . Please note that the District's boundaries may change from time to time. Please contact the District for the latest information.

District Taxes and Fees:	The District has authority to impose property taxes for the construction, operation, and maintenance of the improvements identified in the Service Plan. The District has the authority to issue debt and, in order to pay debt and for operations and maintenance costs, the District may impose a Debt Mill Levy and an Operations and Maintenance Mill Levy, and collect property taxes on properties within the District. The District may also establish a one-time Development Fee that may be imposed on a per-unit basis for residential property or a per-square foot basis for non-residential property, and may impose other fees and charges. The Service Plan establishes a Maximum Residential Debt Mill Levy, and a maximum Operations and Maintenance Mill Levy. The District has the authority to exceed these mill levy caps as provided in the Service Plan. The District's taxes are in addition to other property taxes imposed and collected by other governments such as the Town of Johnstown, Weld County, and other jurisdictions. Below are samples of potential property taxes of the District, based on assumed mill levies. Actual mill levies and property taxes in any year may be higher or lower.
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**LEDGE ROCK CENTER RESIDENTIAL
METROPOLITAN DISTRICT NO. 2
PROPERTY TAX ILLUSTRATION**

The following is a sample calculation of the property taxes that will be imposed by and paid solely to the District. This calculation does not include the property taxes that will be due and owing to other public taxing entities, such as to the Town of Johnstown, the Weld County Reorganized School District RE-5J or the Thompson School District R2-J and the Thompson Rivers Parks and Recreation District.

Sample Calculation of Property Tax for a Residential Property based on the Residential Mill Levy Cap:

Assumptions:

Market value of residence is \$400,000

Mill levy cap is 50 mills *

Calculation:

$\$400,000 \times .0715 = \$28,600$ (Assessed Valuation)

$\$28,600 \times .050 \text{ mills} = \text{\$1,440 per year in taxes owed solely to the District}$

* Per the Service Plan, the District is entitled to adjust the mill levy cap under certain circumstances, without a corresponding increase in the amount of taxes due and owing. For example, if the assessed valuation ratio for residential property is reduced below .0715, the District is entitled to increase the mill levy to recover the same amount of taxes that would have been paid based on the assessed valuation ratio on the date of approval of the Service Plan.

EXHIBIT H

Part I – Developer Indemnity Letter

EXHIBIT H
Part I – Developer Indemnity Letter

September 8, 2021

Town of Johnstown
450 S. Parish Avenue
Johnstown, CO 80534

RE: Ledge Rock Center Commercial Metropolitan District, Ledge Rock Center Residential Metropolitan District No. 1, Ledge Rock Center Residential Metropolitan District No. 2

To the Town Council:

This Indemnification Letter (the “Letter”) is delivered by the undersigned (the “Developer”) in connection with the review by the Town of Johnstown (the “Town”) of the Service Plan, including all amendments heretofore or hereafter made thereto (the “Service Plan”) for the Ledge Rock Center Commercial Metropolitan District (the “District”). Developer, for and on behalf of itself and its transferees, successors and assigns, represents, warrants, covenants and agrees to and for the benefit of the Town as follows:

1. Developer hereby waives and releases any present or future claims it might have against the Town or the Town’s elected or appointed officers, employees, agents, contractors or insurers (the “Released Persons”) in any manner related to or connected with the adoption of a Resolution of Approval regarding the Town’s approval of the District’s Service Plan or any action or omission with respect thereto. Developer further hereby agrees to indemnify and hold harmless the Released Persons from and against any and all liabilities costs and expenses (including reasonable attorneys’ fees and expenses and court costs) resulting from any and all claims, demands, suits, actions or other proceedings of whatsoever kind or nature made or brought by any end user, property owner or other person or third party which directly or indirectly or purportedly arise out of or are in any manner related to or connected with any of the following: (a) the Service Plan or any document or instrument contained or referred to therein; or (b) the formation of the District; or (c) any actions or omissions of the Developer or the District, or their agents, in connection with the District, including, without limitation, any actions or omissions of the Developer or District, or their agents, in relation to any bonds or other financial obligations of the District or any offering documents or other disclosures made in connection therewith.

2. This Letter has been duly authorized and executed on behalf of Developer.

Very truly yours,

DEVELOPER:
LEDGE ROCK CENTER, LLC

By: Michael S. Schuyler
Title: Member

Part II - District Indemnity Letter

Part II - District Indemnity Letter

{date – date of organizational meeting}

Town of Johnstown
450 S. Parish Avenue
Johnstown, CO 80534

RE: Ledge Rock Center Residential Metropolitan District No. 2

To the Town Council:

This Indemnification Letter (the “Letter”) is delivered by Ledge Rock Center Residential Metropolitan District No. __ (the “District”) in order to comply with the Service Plan, including all amendments heretofore or hereafter made thereto (the “Service Plan”) for the District. The District, for and on behalf of itself and its transferees, successors and assigns, covenant and agree to and for the benefit of the Town as follows:

1. The District hereby waive and release any present or future claims they might have against the Town or the Town’s elected or appointed officers, employees, agents, contractors or insurers (the “Released Persons”) in any manner related to or connected with the adoption of a Resolution of Approval of the Town of the District’s Service Plan or any action or omission with respect thereto. To the fullest extent permitted by law, the District hereby agree to indemnify and hold harmless the Released Persons from and against any and all liabilities costs and expenses (including reasonable attorneys’ fees and expenses and court costs) resulting from any and all claims, demands, suits, actions or other proceedings of whatsoever kind or nature made or brought by any end user, property owner or other person which directly or indirectly or purportedly arise out of or are in any manner related to or connected with any of the following: (a) the Service Plan or any document or instrument contained or referred to therein; or (b) the formation of the District; or (c) any actions or omissions of Ledge Rock Center, LLC (the “Developer”), or their agents, in connection with the formation and organization of the District, including, without limitation, any actions or omissions of the District or Developer, or their agents, in relation to any bonds or other financial obligations of the District or any offering documents or other disclosures made in connection therewith, including any claims disputing the validity of the Service Plan and said Resolution of Approval of the Town.

2. It is understood and agreed that neither the District nor the Town waive or intend to waive the monetary limits or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, § 24-10-101, *et seq.*, C.R.S., as from time to time amended, or any other defenses, immunities, or limitations of liability otherwise available to the Town, the District, its officers, or its employees by law.

3. This Letter has been duly authorized and executed on behalf of the District.

Very truly yours,

LEDGE ROCK CENTER RESIDENTIAL
METROPOLITAN DISTRICT NO. 2

By: _____
President

Attest:

Secretary



SpencerFane®

Memorandum

File No. 5501871

TO: Town of Johnstown

FROM: David S. O'Leary, Esq.

RE: Executive Summary for Proposed Ledge Rock Center Residential Metropolitan District No. 2 (Single-Family)

DATE: August 31, 2021

The proposed formation of the Ledge Rock Center Residential Metropolitan District No. 2 (the "District") encompasses the land generally located south of Highway 60/County Road 48 and east of Interstate I-25. The proposed service area includes approximately 61.336 acres of residential land in its proposed boundaries and is anticipated to include the single-family portion of the Ledge Rock Center project upon final development.

The service area is anticipated to include potential public infrastructure, improvements and amenities/uses upon acquisition and development. The improvements needed for the Ledge Rock Center Project include approximately 90 Park and Ride parking spaces to be included in the Project based upon a request of the Department of Transit and Rail of the Town, on-site and off-site public improvements that will be determined during the land use review process in accordance with the Town's ordinances, rules and regulations which include, among other potential improvements: (i) improvements to State Highway 60, as required by and in coordination with the Town and CDOT; (ii) improvements to High Plains Boulevard, as required by and in coordination with the Town and Weld County; (iii) improvements to the Home Supply Ditch, as required by and in coordination with the Town and Consolidated Home Supply Reservoir and Ditch Company; and (iv) undergrounding electric utilities adjacent to the Town Parcel, as required by the Town and in coordination with the Town and the electric utility provider.

The Ledge Rock Center Residential Metropolitan District No. 2 Service Plan is proposed to contain the single-family residential development within the Ledge Rock Center development. All property within the proposed boundaries has been annexed within the boundaries of the Town of Johnstown ("Town").

The primary purpose of the District is to provide public improvements consistent with Town-approved development plans that will be dedicated to the Town or dedicated to another public entity (or if permitted by IGA with the Town, retained by the District) for the use and benefit of the District's constituents, end users, the taxpayers, visitors and the public.

Considerable infrastructure will be constructed to provide the public improvements needed to support the development in and around the District. This Service Plan addresses the improvements to be provided by the District and demonstrates how the District proposed to serve the development will work together to provide the necessary public improvements.

Services and powers provided for metropolitan districts authorized by the Special District Act, pursuant to Title 32, C.R.S. and provided within similar districts within the Town, for consideration on the next possible public hearing of the Town Council in order to meet the requirements of a formation election in November 2021.



I. Major Service Plan Points for Ledge Rock Center Residential Metropolitan District No. 2.

- The owners of the property are proposed to be Ledge Rock Center, LLC and its affiliated entities.
- Developer of the property is Ledge Rock Center, LLC, and their affiliated entities (Michael Schlup and Allen Schlup are their consultants and their representatives)
- The Draft Financing Plan was provided by Piper Sandler & Company.
- Construction cost estimates were assembled by the Developer with consultation with the District Engineer, Point Consulting which has experience in the costing and construction of similar facilities.

II. The Project:

- 61.336 total acres of service area within the boundaries are anticipating. All acres of property in the proposed boundaries are annexed to and within the Town of Johnstown.
- Assumptions upon which this Service Plan is based are reflective of the anticipated initial zoning for the property within the proposed District, the cost estimates, and the Financing Plan are sufficiently flexible to enable the District to provide necessary services and facilities without the need for repeated amendments to the Service Plan.
- Modification of the proposed configuration of improvements, scheduling of construction of such improvements, as well as the locations and dimensions of various facilities and improvements shall be permitted to accommodate development needs consistent with zoning and future development approvals for the property, but consistent with approved development plans of the Town
- Anticipated single-family residential development is projected to begin in 2022 for a total of 175 single-family residences, absorbing at a rate of approximately 44 single-family units per year with pricing inflated as the development occurs. Absorption could occur more quickly depending upon approval of development plans and construction of public improvements needed for the project.
- An economic analysis and impact study will be done by the Town to discuss the use of a Town parcel, and for an incentive package where current sales tax revenue is proposed to be shared between the Town and the District for the purposes of financing the commercial public improvements and acquisition of land for public purposes as well as the economic impact of the residential development as well.
- Assuming development occurs as projected the residential assessed valuation at full buildout for collection year 2028 is expected to be \$6,094,674 for Ledge Rock Residential Metropolitan District No. 2. These values may differ based upon changes in assessed value of the property upon final completion of construction and development with additional assessed valuation possible depending upon final approved development plans with the Town.
- The estimated cost of the public improvements needed for the single-family residential property portion of the Ledge Rock Center project is currently estimated to be \$6,899,428 for onsite and offsite public improvements based upon current plans, but final values and costs will depend upon approved



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development plans which must be approved by the Town prior to construction and development of the single-family residential property.

- The proposed financing plan provides for a 40 mills for debt and 10 mills for operations purposes in accordance with current Town model service plan.
- The proposed and projected public improvements needed for the project will require additional financing to construct and complete. District financing is projected to pay for public improvements constructed through one or more bond issuances for the District. The total par amount of bonds estimated in 2022 is approximately \$3,232,000, which is anticipated to generate approximately \$1,997,567 in net proceeds provided full buildout occurs as anticipated using a 30 year amortization schedule.
- Debt is proposed to be issued in one or more series of bond issuances to allow for financing of constructed infrastructure and expedient completion of the Development.
- Requested Debt Authorization of \$3,900,000 allows for approximately 120% coverage (based upon the financing plan run at \$2,993,000 in capacity with revenue from the proposed ad valorem mill levies and operations and maintenance costs taken into consideration, the additional coverage would allow for contingencies and financing variations based upon changes to construction costs, development build out and absorption of the project. The net proceeds of the initial estimated bond issuances would be approximately \$1,997,567 for the single-family portion of the Ledge Rock Center Project. Current modeling has not been projected to provide any additional revenue other than property tax for the site initially. Additionally capacity may be available based upon what is ultimately constructed in the project based upon approved development plans and future assessed valuation for sales of the single-family residences. Public improvement costs not financed through the District would be funded through developer advances, private contributions or other financing contributions.
- Maximum voted interest rate of 8% simple interest, maximum underwriting discount of 4%. Interest on Developer Debt shall be limited to 8% simple interest.
- Metropolitan district powers allowed by the Special District Act and consistent with other Town of Johnstown metropolitan districts.
- Formation Election after approval of the Service Plan in November 2021.
- There are no current residents within the District and no debt or bonds have been issued.
- Mill levies, interest rate limitations and underwriting discounts will be consistent with the present Town imposed limitations with other service plans approved by the Town.
- Maximum term of any bond issue is 30 years for General Obligation Bonds.
- Intergovernmental Agreement with Town of Johnstown to implement Service Plan restrictions. No operations are currently authorized and future operations and maintenance of public improvements are subject to prior approval and authorization pursuant to intergovernmental agreement with the Town of Johnstown



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- Ledge Rock Center Residential Metropolitan District No. 2 shall develop and finance its own property.
- Ledge Rock Center, LLC is actively developing and meeting with the Town to complete both onsite and offsite public improvements for the commercial property, residential development and single-family and hotel/conference center property and park and recreation improvements for the residential property.

The Ledge Rock Center Residential Metropolitan District No. 2 Service Plan will serve the best interests of the taxpayers, property owners and development of the property within the Ledge Rock Center development, will maximize both development and absorption within the District and Town without delays in development. The formation of the District will allow for financing and development to pay for only those improvements and costs which are a direct benefit to the property within the District.

**TOWN OF JOHNSTOWN, COLORADO
RESOLUTION NO. 2021-30**

**RESOLUTION APPROVING THE SERVICE PLAN FOR
LEDGE ROCK CENTER RESIDENTIAL METROPOLITAN DISTRICT NO. 2**

WHEREAS, the Town of Johnstown, Colorado (“Town”) is a Colorado home rule municipality, duly organized and existing under the laws of the State of Colorado and the Town’s Home Rule Charter; and

WHEREAS, the Town Council of the Town (“Town Council”) is vested with authority to administer the affairs of the Town; and

WHEREAS, pursuant to Section 32-1-204.5, C.R.S., a Service Plan for the Ledge Rock Center Residential Metropolitan District No. 2 (“Service Plan”), a copy of which is attached hereto and incorporated herein by reference as Exhibit A, was submitted to the Town Council for approval; and

WHEREAS, Ledge Rock Center, LLC, a Kansas limited liability company (“Developer”), the purchaser of the real property within the initial proposed boundaries of the Ledge Rock Center Residential Metropolitan District No. 2 (“District”), with the consent of the owners of the real property, as evidenced in the Service Plan, has requested approval of the Service Plan; and

WHEREAS, pursuant to the provisions of Title 32, Article 1, Part 2, C.R.S., on September 8, 2021, the Town Council, following due notice, held a public hearing on the proposed Service Plan; and

WHEREAS, the Town Council considered the Service Plan and all other testimony and evidence presented at the hearing; and

WHEREAS, based upon the testimony and evidence presented at the hearing, the Town Council finds that the Service Plan should be approved, subject to the conditions set forth below, in accordance with Section 32-1-204.5(1)(c), C.R.S.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF JOHNSTOWN, COLORADO, THAT:

1. **Satisfaction of Statutory Requirements as to Filing and Notice.** The Town Council, as the governing body of the Town of Johnstown, Colorado, does hereby determine, based on representations made by and on behalf of the Developer and proponents of the formation of the District, that all of the requirements of Title 32, Article 1, Part 2, C.R.S., as amended, relating to the filing of the proposed Service Plan for the District have been fulfilled and that notice of the hearing was given in the time and manner as provided in Section 32-1-204, C.R.S.

2. **Jurisdiction.** Based on representations by and on behalf of the Developer and proponents of the formation of the District, the Town Council of the Town of Johnstown,

Colorado, has jurisdiction over the subject matter of the proposed Service Plan pursuant to Title 32, Article 1, Part 2, C.R.S., as amended.

3. **Findings.** That, pursuant to Section 32-1-204.5, C.R.S., Section 32-1-202(2), C.R.S., and Section 32-1-203(2), C.R.S., the Town Council does hereby find and determine, based on the Service Plan, the representations by and on behalf of the Developer and proponents of the formation of the District, and other evidence presented at the public hearing, that:

- (a) There is sufficient existing and projected need for organized service in the area to be serviced by the District;
- (b) The existing service in the area to be served by the District is inadequate for present and projected needs;
- (c) The District is capable of providing economical and sufficient service to the area within its proposed boundaries; and
- (d) The area to be included in the District has, or will have, the financial ability to discharge the proposed indebtedness on a reasonable basis.

4. **Service Plan Approved; Conditions and Limitations.** The Town Council hereby approves the Ledge Rock Center Residential Metropolitan District No. 2, attached as Exhibit A. This approval is given specifically subject to the following conditions and limitations pursuant to Section 32-1-204.5(1)(c), C.R.S.:

- (a) At its first meeting after the effective date of this Resolution and in no event later than sixty (60) days after the formation election of the District, the Board of Directors of the District shall execute the Intergovernmental Agreement with the Town ("IGA") and the District's Indemnity Letter in the forms set forth as exhibits to the Service Plan presented to the Town Council at its September 8, 2021, public hearing, or in forms otherwise acceptable to the Town Attorney, and shall deliver the fully executed originals of the IGA and Indemnity Letter to the Town within ten (10) days of the District's organizational meeting.
- (b) The Town's approval of the Service Plan shall not relieve the Developer or any other owner of property in the District of any requirement, under the annexation agreement pertaining to the property within the District's boundaries or otherwise, to provide financial guarantees for construction of, and dedicate to the Town, the required public improvements.
- (c) Once the District has been duly organized, any material modification of the Service Plan shall require an amendment to the Service Plan, which must be approved by Town Council.
- (d) The conditions set forth in this Resolution are not intended and shall not be construed to enlarge, diminish, or otherwise affect any of the requirements, limitations or other provisions of the Service Plan or IGA.

5. **Execution of Town IGA.** The IGA referred to in Section 4(a) above is hereby approved in essentially the same form as the copy of such IGA set forth as Exhibit D to the Service Plan, which was presented to the Town Council at the September 8, 2021, public hearing. The Mayor and Town Clerk are hereby authorized to execute the IGA on behalf of the Town provided the same has first been executed by the District.

6. **Filing of Resolution.** A certified copy of this Resolution shall be filed in the records of the Town and submitted to the Developer for the purpose of filing in the District Court of Weld County.

PASSED, SIGNED, APPROVED, AND ADOPTED this ____ day of _____, 2021.

ATTEST:

TOWN OF JOHNSTOWN, COLORADO

By: _____
Diana Seele, Town Clerk

By: _____
Gary Lebsack, Mayor



Town of Johnstown

TOWN COUNCIL AGENDA COMMUNICATIONS

AGENDA DATE: September 8, 2021

SUBJECT: Award design services for Water Treatment Plant

ACTION PROPOSED: Consider Awarding the Water Treatment Plant Design to Burns & McDonnell Engineering

ATTACHMENTS:

1. RFP
2. Contract/Scope of Services
3. Burns & McDonnell Proposal
4. Burns & McDonnell Updated Proposal
5. Aqua Proposal
6. Carollo Proposal
7. JVA Proposal

PRESENTED BY: Marco Carani, Public Works Director

AGENDA ITEM DESCRIPTION:

Enclosed for your review and consideration is a request to hire a design Engineer for the expansion of our Water Treatment Plant.

The Town currently operates the Water Treatment Plant located behind the Johnstown Cemetery. The Water Treatment Plant was built in 1966 as a mixed media filtration plant. It has gone through a few upgrades over the years, the biggest upgrade was in 2006. The Town upgraded the pretreatment side of the plant and built the new DAF building which removed the old clarifiers and replaced them with a Dissolve Air Flotation system (DAF).

Due to rapid growth in the Town of Johnstown the Water Treatment Plant has been experiencing higher daily flows leaving the plant. During the winter months we average 1.5 MGD of treated water. Starting in May of every year through mid-October, our plant is operating at 4.7 MGD with peak hour demand showing 9 to 11 MGD. Our current plant is permitted for 5 MGD and has the capability to produce 6 MGD. As we look at future growth in the Town of Johnstown the need to expand this plant from a 5 MGD plant to 12 MGD is imminent. Staff sent out RFP's through bidnetdirect and received four proposals from qualified engineering firms, Carollo, JVA, Aqua, and Burns & McDonnell.

The submittals were reviewed independently by the Public Works Director, Deputy Director of Public Works, Ramey Environmental Compliance, and the Town Manager. From the four applicants, the proposals were narrowed down to two (2) firms who we invited for formal interviews to discuss their proposals; explaining their experience, their approach to the project, and how they can best meet the needs of the Town. The RFP requested three different options.

The Community That Cares

www.TownofJohnstown.com

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141

Option 1.

Consider expansion of the existing filter building to house an additional set of filters to achieve a 10 to 12.4 MGD filtration construction in an adjacent building to house new filters. Filter media must match existing.

Option 2.

Construction of 3 to 4 racks of 3 MGD or greater to achieve 10 to 12.4 MGD treatment of pressurized membranes housed in a separate building constructed similar to a pole barn.

Option 3.

Other viable alternatives that the consultant may want to propose that helps to meet the Town's water demands that can be modular in nature to allow for future expansion of the Water Treatment Plant.

During our work session held on April 12, 2021. Staff along with Burns and McDonnell discussed options that the Town Council wanted to see moving forward for the residents of Johnstown to achieve improved water quality and the improvements to manage the Town's drinking water taste & odor issues. Council's direction for the short term was to install a Granular Activated Carbon (GAC) system, an Ultra Sonic Buoy for Town Lake, and improvements to our Powdered Activated Carbon system at Lone Tree Reservoir. To ensure a long-term solution, Council requested installation of an OZONE/Biologically Active Filtration (BAF) Water Treatment Plant. This would address the needs of the Town for many years.

Burns and McDonnell has been working with Staff to put together a plan on how this type of Plant would work with our current conditions. We have built a collaborative relationship with this company and feel moving forward with them would be in the best interest of the Town based on their proposal. Their proposal submitted was for a Membrane and Granular Activated Carbon (GAC) Plant. Cost for this design was \$814,022. After discussion with Town Council on June 14, 2021 work session, it was confirmed to proceed forward with the OZONE/BAF Water Treatment Plant and we requested they adjust their bid design to achieve this treatment process.

Burns and McDonnell gave the Town a design quote for \$2,059,442 for the Ozone /BAF. Staff considered bidding out the entire project again with this new direction, but is requesting we proceed with Burns and McDonnell for reasons that we have been working with then on this project and they have provided direction and a commitment to provide the Town of Johnstown with a project that will support the Town's needs for many years. Staff also feels delaying this any longer may impact future water needs. Staff believe their expertise and ability to meet the expectations of the Town outweighed the need to bid out this project again.

The total contract amount for the services is \$2,059,442. A budget amendment is not currently requested because based on the project schedule, we do not anticipate the project scope being fully completed this fiscal year. However, Council should consider the fact that this project cost is above what was initially anticipated. The original budget amount was \$450,000 to expand the current plant using the same filtration process. The total difference between the budgeted amount and the amount requested is \$1,609,442. This amount will be requested in the FY 2022 budget.

In addition to the design, pilot testing may be required by CDPHE. This will entail rental of Ozone testing equipment, Biologically Active Filter (BAF) test equipment and installation and monitoring. This also entails bench scale jar testing, data collection at the WTP to assess optimal chemical dosing options. The goal is to simulate peak taste and odor conditions. Cost for the pilot program that may be needed during the design phase and could cost up to \$831,280. This cost will be brought to Council for approval in the FY 2022 budget work sessions. Burns and McDonnell have asked CDPHE if they could use other pilot programs that have been completed in the last year. We are waiting for the response from CDPHE. A breakdown of pilot test cost attached in this packet.

LEGAL ADVICE:

The contract has been reviewed by the Town Attorney.

FINANCIAL ADVICE:

\$450,000 was budgeted in FY 2021. Funds are available to permit this project to move forward and if additional funds are necessary this fiscal year, they could be appropriated later in the calendar year.

RECOMMENDED ACTION: Approve the contract as presented.

SUGGESTED MOTIONS:

For Approval:

Staff Recommends to approve and award the Water treatment Plant Expansion Design to Burns and McDonnell in the amount not to exceed. \$2,059,442. \$450,000 to be spent as budgeted in FY 2021 and staff will present the remaining cost to Council in the FY2022 budget in the amount of \$1,609,442.

For Denial:

Staff recommends that we deny the award as presented and solicit formal bids again.

Reviewed and Approved for Presentation:



Town Manager

REQUEST FOR PROPOSAL



**450 South Parish Avenue
Johnstown CO, 80534
970-587-4664**

REQUEST FOR PROPOSALS
for
PROFESSIONAL ENGINEERING SERVICES
for
EXPANSION DESIGN
Of the
TOWN OF JOHNSTOWN WATER TREATMENT PLANT
EXPANSION FROM 5 MGD to 10

Issued on: December 30, 2020

Pre-Submittal Meeting: January 14, 2021 8 a.m. with Facility Tour

RFP Submittal/Due Date: February 5, 2021 at 1:00 p.m.

Tentative Town Council Approval: March 15, 2021

**COMPLETE PROPOSAL CAN BE FOUND ON
<https://johnstown.colorado.gov>**

GENERAL INFORMATION

The Town of Johnstown (herein referred to as the Town) is requesting proposals from qualified consultants for design services for the expansion of the Johnstown Water Treatment Plant from 5-MGD to 10 MGD (the Project) as described herein.

- A. The plant is located at 23205 WCR 13, Johnstown CO. 80534. The water plant was constructed and placed on-line in 1966. The facility which has been operated and maintained by the Town since its inception, was constructed as a mixed media plant with two clarifiers. In 2005, the two clarifiers were taken off line and a Dissolved Air Flotation (DAF) was installed. This pretreatment process will support a 10 MGD plant.
- B. This Request for Proposals (RFP) describes the project in general, the required scope of services, the selection process, and the minimum information that must be included with the proposal. Failure to submit information in accordance with the requirements and procedures listed herein may be cause for disqualification at the discretion of the Town.
- C. The information contained in this RFP is the Town's best understanding of the current needs and approach on how to address them, but the Town is open to creative and beneficial modifications to the scope of work described herein based on the consultant's professional expertise in these subject areas. If the consultant believes there is a better way to achieve the Town's goals, then that should be reflected in their proposal. The Town is open to a different delivery method I.e., CMAR/CMGC or Design/Build.
- D. Questions and Clarifications
 - 1. Any questions concerning this Request for Proposals should be directed to the person listed below. No interpretation or clarification of the meaning of the instructions or scope of services will be made orally except for general information that does not require a clarification. Every request for such interpretation should be in writing, submitted by e-mail and addressed to the individual shown below. To be given consideration, questions must be received at least seven (7) days prior (January 29) to the date fixed for the submission of proposals. All clarifications and any supplemental instructions will be posted on the Town of Johnstown website at the following address <https://johnstown.colorado.gov>. Firms should periodically check the website for updates and addenda to this Request for Proposal.
 - 2. Address requests to:
 Marco Carani
 Director of Public Works

Town of Johnstown
 450 S. Parish Avenue
 P.O. Box 609
 Johnstown, CO 80534
 Email: mcarani@townofjohnstown.com

I. PRE-SUBMITTAL CONFERENCE/MEETING

Due to COVID restrictions, all parties who plan to attend an onsite Pre-Submittal meeting must RSVP contact information and the number of representatives from the firm planning to attend by 1:00 pm January 7, 2021 to mcarani@townofjohnstown.com to confirm an onsite meeting. Masks must be worn and temperatures will be taken prior to entry into the facility. Individuals not complying or having a temperature over 100.4 degrees will be asked to leave.

A. An optional pre-submittal conference will be held on January 14, 2021 beginning at 8:00 a.m. at Johnstown Town Hall, 450 S. Parish, Johnstown CO 80534, followed by a site visit at the Water Treatment Plant. At this meeting, Town staff will discuss the scope of work, general contract issues and respond to questions from the attendees. While not required, firms interested in this Project should plan to attend the Pre-Submittal Conference. Town staff or Operations staff will not be available for meetings and will only respond to individual questions/inquiries received in writing regarding the project scope outside of this conference not later than seven (7) days (January 29, 2021) before the RFP due date. All questions raised and answers given outside of the pre-submittal conference/meeting, if any, will be documented and issued as an addendum to the RFP.

II. SCOPE OF SERVICES

A. Current plant is a Mixed Media Plant constructed in 1966. A plant improvement was constructed in 2005 to install a Dissolved Air Flotation unit for pretreatment. Current plant has 2 mixed media filters rated at 3.1 MGD for a total of 6.2 MGD. The pretreatment process has the capacity of 10 MGD.

Option 1.

The expansion of the existing filter building to house an additional set of filters to achieve a 10 to 12.4 MGD filtration. Construction of an adjacent building to house new filters. Filter media must match existing.

Option 2.

Construction of 3 to 4 racks of 3 MGD or greater for 10 to 12.4 MGD treatment of pressurized membranes housed in a separate building constructed similar to a pole barn.

Option 3.

Other viable alternatives that the consultant may want to propose that helps to meet the Town's water demands that can be modular in nature to allow for future expansion of the Water Treatment Plant.

To upgrade the plant from its existing condition to a 10 to 12.4 MGD, the items listed below would also need to be addressed along with other recommendations by the selected design engineer.

- Expand the existing Clearwell to meet needs.
- Construction of building to house Filter media cells or membranes racks.
- Access doors to allow media replacement or for future membrane installation.
- All internal and external plumbing, pumps and electrical which is required to operate the system.
- An HVAC unit for heating and cooling.
- Coordination with the Towns current SCADA contractor for monitoring of the new system.
- Design of additional raw water line from Towns raw water pump station to plant to be able to deliver an additional 5MGD
- Any and all safety devices needed to ensure safety to staff and the public for both operations, maintenance, access, and consumption of the treated water.

III. SUBMITTAL REQUIREMENTS/PROPOSAL FORMAT

- A. Due to COVID restrictions one email sent to mcarani@townofjohnstown.com is due by February 5, 2021 at 1:00 p.m. The email can either be through the Town's WeTransfer document transfer solution found at johnstownco.wetransfer.com OR can be an email that includes a link to a cloud-based application (FTP, Dropbox, Google Drive, etc.) that has been made available to the Town's representative. The Project name and Consultant's name should be shown on the subject line/message of the email. The Town will respond with an email that the submittal has been received as part of the February 5, 2021 submittal deadline.
- B. Three (3) hard copies, appropriately bound of the Proposal and one (1) electronic copy (pdf) on a flash drive must be received by close of business **on February 12, 2021 at the address shown below.** The Town cannot be responsible for the lack of receipt of proposals by the date and time specified. Mailed copies outside of the sealed envelope, addressed to and delivered to:

Town of Johnstown
 Marco Carani
 Director of Public Works.

450 S. Parish Avenue
P.O. Box 609
Johnstown, CO 80534

- C. Submittals will NOT be accepted or considered after the deadline.
- D. The Proposal must demonstrate specific expertise in the elements of work described herein. Proposals should be bound with the name of the Firm or firms and name of the Project visible on the outside cover. To allow the selection committee sufficient time to properly review all documents in their entirety, each proposal will be limited to 40 pages. The Title Page, Table of Contents, Letter of Transmittal, Section Dividers, and Resumes will not count against the page limits. The Proposal shall contain the following:
 - 1. SECTION 1 - IDENTIFICATION OF PROPOSER: The Proposal shall include the names, offices, addresses, email addresses and phone numbers for Consultant and subconsultant staff that are proposed to be involved in the design, The Proposal shall identify in which office(s) production will occur.
 - 2. SECTION 2 - PROJECT OVERVIEW AND APPROACH: The Proposal shall demonstrate the Consultant's understanding of the Project and include a statement acknowledging the Scope of Services. The Proposal shall also include a detailed description of the proposed approach to the Project. The description shall include details to implement the tasks described in the Scope of Services. The Consultant is encouraged to provide comments and enhancements to the scope provided in the RFP. The Proposal shall include a discussion regarding the Project's technical issues and the Consultant's approach to handling these issues. The Consultant shall also explain how technical memos, workshops, and/or design review meetings will be used, working with the framework of the Scope of Services, to achieve consensus in design details. Emphasis should be placed on how the Consultant's technical approach will promote the Project's success.
 - 3. SECTION 3 - MANAGEMENT APPROACH: The Proposal shall include a discussion regarding the Consultant's management approach, including coordination and monitoring of project schedule, cost, risk, scope, communications, quality, resources, and other management issues that the Consultant feels should be addressed. Emphasis should be placed on how the Consultant's management approach will promote the Project's success. The Consultant approach to quality control in the preparation of construction documents shall be clearly described in this section as well.

4. SECTION 4 - STAFF QUALIFICATIONS: The Proposal shall include a team member organizational chart and a listing and biography of key individuals proposed to be assigned to the project. Each individual's proposed position/responsibility shall be indicated. Special emphasis shall be provided on the individual's backgrounds, qualifications, certifications, experience on related and/or similar projects, and the location from where their work will be performed. The Proposal shall clearly indicate who will be in responsible charge of the project. At least three client references, including name, description of past working relationship, and current contact information, shall be listed for each key individual who is proposed in the organizational chart. The Proposal shall identify staff who will be assigned to the project for construction support, which will be negotiated later. Consultant/Subconsultant affiliation, and professional engineering licenses, including discipline and state of licensure, shall be designated for each individual. Full resumes, sorted first by firm, then by last name, shall be included as an appendix to the Proposal. Resumes shall be limited to two (2) pages each.
5. SECTION 5 - RELATED PROJECT EXPERIENCE: The Proposal shall include profiles of five (5) similar projects that the firm(s) and proposed team members have completed design in the last ten (10) years including project name, date, description and capacity of project, location, design and construction cost, and client reference including phone number. The firm's role in the project should also be described (preliminary design, design construction management, etc., and prime Consultant, subconsultant, etc.). For each project, indicate which proposed team members worked on the project and describe the role/work they performed and their levels of involvement.
6. SECTION 6 -PROJECT SCHEDULE: The Consultant shall prepare a schedule, showing all major project tasks, milestones, and deliverables required to complete all work.

IV. PROPOSED CONTRACT FEES

- A. **Submit one copy of your cost proposal with your uploaded proposal Proposals that do not provide costs may be considered non-responsive and subject to disqualification.** Proposed contract fees shall contain a schedule of the estimated man-hours required and broken down by type of personnel to be used for the proposed services. Breakdowns are to be shown separately for each item listed under "Scope of Work". Overhead factors and other multipliers shall be identified.

- B. The consultant shall be responsible for all required resources to include but not limited to computers, surveys, outside consultants, etc.
- C. The services described in the scope of work shall be compensated on a time and-expense basis.

V. EVALUATION PROCEDURE

- A. The Town of Johnstown will review and evaluate proposals based on the following factors:

1. Qualifications of Firm and Personnel
 - a. Firm's and personnel's experience on similar water treatment facilities projects with water treatment system processes, design, facility upgrades and retrofits to improve performance, permitting, system analysis, public information, construction management services during construction, start-up, and operations and maintenance to be provided.
 - b. Joint ventures or associations related to the services requested, as applicable.
 - c. Organizational chart with qualifications, experience, and responsibilities of the key project personnel (*i.e.*, Project Manager, Project Engineer, Process Engineer, Construction Manager, and QA/QC team) and sub-consultants/contractors.
 - d. Experience and successful project delivery history of the Project Manager responsible for delivery of project scope on similar projects.
2. Project Approach and Understanding
 - a. Suggested approach and understanding of the project.
 - b. Innovative suggestions and identifying challenges
 - c. Approach to communication with Town Staff and the public to facilitate successful delivery of the project within the proposed schedule.
 - d. Firm's description of their experience with and knowledge of all jurisdictional regulations that will be applicable to this project.
 - e. Internal QA/QC process on this project.
3. Capacity and Capability of Firm
 - a. Ability to meet technical design required by the scope. Please note, an emphasis will be placed on the firm's

demonstrated ability to meet schedule and budget requirements.

- b. Proposed schedule to perform the work with sufficient detail to understand the timing of the project deliverables.
 - c. Present and projected workloads
 - d. Potential to effectively replace key personnel, if necessary.
 - e. Management Control Program-Approach, cost control system used to track expenses and labor, method for project status reporting, and schedule control methodology
 - f. Past record of performance on contracts for delivery of work relevant to the project scope, including such factors as technical design, constructability, control of costs, quality of work, ability to meet schedules.
- 4. The cost for the work to be performed
 - a. Points will be awarded based on the cost for Basic Design Engineering and Bidding Services described in Section I of Attachment A.
- 5. Overall Quality of Proposal
 - a. The organization, structure and quality of the proposal will be factored into the award process
- D. Selection Process:
 - 1. Proposals will be evaluated based on the written response to selection criteria listed and the cost proposals provided. After receipt and review of proposals, the Town may elect to conduct interviews for some or all firms.
 - 2. It is anticipated that a contract for the prescribed services will be entered into with the consultant that in the opinion of the Town offers the most favorable combination of qualifications, approach, and pricing. Please note that the selection is a quality-based selection and the lowest cost proposal is not guaranteed to be the selected firm.
- E. Award of Contract
 - 1. The Town will recommend an award of this project to Town Council to consider and approve. Tentatively, we anticipate this to be awarded on Monday, **March 15, 2021**. The Town reserves the right to reject any and all proposals submitted, to waive any informalities in the proposals submitted, and to award a contract only when it appears to be in the best interest of the Town.

VI. SPECIAL CONDITIONS

- A. This RFP does not commit the Town to procure or award a contract for work or to compensate Proposers for proposal preparation expenses. All costs to prepare a response to this RFP shall be borne by the proposer.
- B. All information submitted in response to this RFP shall become the property of the Town, and as such, may be subject to public review as public record.
- C. The Town reserves the right to cancel, modify, supplement, add to, delete from or change any part or aspect of this project if it is believed to be in the best interest of the Town.
- D. The Town reserves the right to request additional data, information or clarification pertinent to this solicitation after the submittal date, provided that such information is germane to evaluation of the firm's qualifications from any or all members of submitting consultants. However, the Town shall not be required to request missing information from the submittal which may cause them to be considered non-responsive.
- E. The Town shall provide the release of all public information concerning the project, including selection announcements and contract awards. Those desiring to release information to the public must receive prior written approval through the Town.
- F. Members of the consultant teams, their agents, lobbyists, attorneys and others shall not contact members of the Town Council, any employee of the Town other than the contact person or any member of the Selection Committee regarding this project or process. Any such contact shall be grounds for automatic disqualification of the consultant team submittal.
- G. The Town, at its sole discretion, reserves the right to reject any and all submittals, waive any and all irregularities, and disregard any and all nonconforming or counter submittals.
- H. The Town may accept or reject any or all information submitted as part of the RFP.
- I. All proposals will be held in confidence until the scheduled agenda for the planned award of the project.

VII. EQUAL EMPLOYMENT OPPORTUNITY

- A. The Town of Johnstown is an equal employment opportunity employee. The City endeavors to do business with firms sharing the Town's commitment to equal opportunity and will not do business with any firm that discriminates on the basis of race, religion, color, ancestry, age, gender, sexual orientation, disability, medical condition or place of birth.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

AGREEMENT BETWEEN OWNER AND ENGINEER FOR PROFESSIONAL SERVICES

Prepared by



Issued and Published Jointly by



This Agreement has been prepared for use with EJCDC® C-700, Standard General Conditions of the Construction Contract, 2013 Edition. Their provisions are interrelated, and a change in one may necessitate a change in the other. For guidance on the completion and use of this Agreement, see EJCDC® E-001, Commentary on the EJCDC Engineering Services Agreements, 2013 Edition.

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AGREEMENT BETWEEN OWNER AND ENGINEER FOR PROFESSIONAL SERVICES

THIS IS AN AGREEMENT effective as of August 17, 2021 ("Effective Date") between
Town of Johnstown, a Colorado home rule municipal corporation ("Owner") and
Burns & McDonnell Engineering Company, Inc., a Missouri Corporation ("Engineer").

Owner's Project, of which Engineer's services under this Agreement are a part, is generally identified as follows:
Johnstown Water Treatment Plant Design

Other terms used in this Agreement are defined in Article 7.

Engineer's services under this Agreement are generally identified as follows:

Customary and basic planning, permitting assistance, design engineering to the Town of Johnstown Water Treatment Plant to increase the design capacity to 12.5 MGD ("Project"). This Agreement relates to the permitting assistance, engineering design related services related to the Project. Construction Phase Engineering Services will be negotiated during the final design phase of the project and be subject to an amendment to this Agreement or to a subsequent written agreement. The scope of this Agreement is more fully defined in Exhibit A.

Owner and Engineer further agree as follows:

ARTICLE 1 – SERVICES OF ENGINEER

1.01 *Scope*

- A. Engineer shall provide, or cause to be provided, the services set forth herein and in Exhibit A.
- B. Engineer shall perform its services in accordance with the Standard of Care for professional engineering. Engineer's scope of services shall be performed in accordance with the applicable regulations issued by the Colorado Department of Public Health and Environment ("CDPHE") regarding the design and permitting of drinking water facilities; specifically including Design Criteria for Potable Water Systems.

ARTICLE 2 – OWNER'S RESPONSIBILITIES

2.01 *General*

- A. Owner shall have the responsibilities set forth herein and in Exhibit B.
- B. Owner shall pay Engineer as set forth in Article 4 and Exhibit C.
- C. Owner shall be responsible for all requirements and instructions that it furnishes to Engineer pursuant to this Agreement, and for the accuracy and completeness of all programs,

reports, data, and other information furnished by Owner to Engineer pursuant to this Agreement. Engineer may use and rely upon such requirements, programs, instructions, reports, data, and information in performing or furnishing services under this Agreement, subject to any express limitations or reservations applicable to the furnished items.

- D. Owner shall endeavor to provide prompt written notice to Engineer whenever Owner observes or otherwise becomes aware of:
 - 1. any development that affects the scope or time of performance of Engineer's services.
 - 2. the presence at the Site of any Constituent of Concern that is not already known or discovered as described in Paragraph 6.10; or
 - 3. any relevant, material defect or nonconformance in: (a) Engineer's services, (b) the Work, (c) the performance of any Constructor to the extent such performance impacts the Engineer's obligations hereunder, or (d) Owner's performance of its responsibilities under this Agreement.

ARTICLE 3 – SCHEDULE FOR RENDERING SERVICES

3.01 Commencement

- A. Engineer is authorized to begin rendering services as of the Effective Date.

3.02 Time for Completion

- A. Engineer recognizes that time is material and shall complete its obligations set forth in this Agreement pursuant to the schedule set forth in Exhibit A, absent agreed-upon extensions of time.
- B. If, through no fault of Engineer, such periods of time or dates are changed, or the orderly and continuous progress of Engineer's services is impaired, or Engineer's services are delayed or suspended, then the time for completion of Engineer's services, and the rates and amounts of Engineer's compensation, shall be adjusted equitably if such delay results in additional cost to Engineer.
- C. If Owner authorizes changes in the project budget, scope, extent, or character of the Project or Engineer's services, then the time for completion of Engineer's services, and the rates and amounts of Engineer's compensation, shall be adjusted equitably, but shall only be increased if such change expands the scope, extent or character of the Project or Engineer's services.
- D. Owner shall make decisions and carry out its other responsibilities in a timely manner so as not to delay the Engineer's performance of its services.

ARTICLE 4 – INVOICES AND PAYMENTS

4.01 *Invoices*

- A. *Preparation and Submittal of Invoices:* Engineer shall prepare invoices in accordance with its standard invoicing practices and the terms of Exhibit C. Engineer shall submit its invoices to Owner on a monthly basis. Invoices are due and payable within 30 days of receipt.

4.02 *Payments*

- A. *Application to Interest and Principal:* Payment will be credited first to any interest owed to Engineer and then to principal.
- B. *Failure to Pay:* If Owner fails to make any payment due Engineer for services and expenses within 30 days after receipt of Engineer's invoice, then:
 1. amounts due Engineer will be increased at the rate of 1.0% per month (or the maximum rate of interest permitted by law, if less) from said thirtieth day; and
 2. Engineer may, after giving seven days written notice to Owner, suspend services under this Agreement until Owner has paid in full all amounts due for services, expenses, and other related charges, except that Engineer shall not suspend services for the Owner's failure to pay the portion of an invoice that is disputed. Owner waives any and all claims against Engineer for any such suspension.
- C. *Disputed Invoices:* If Owner disputes an invoice, either as to amount or entitlement, then Owner shall promptly advise Engineer in writing of the specific basis for doing so, may withhold only that portion so disputed, and must pay the undisputed portion subject to the terms of Paragraph 4.01.
- D. *Sales or Use Taxes:* If after the Effective Date any governmental entity takes a legislative action that imposes additional sales or use taxes on Engineer's services or compensation under this Agreement, then Engineer may invoice such additional sales or use taxes for reimbursement by Owner. Owner shall reimburse Engineer for the cost of such invoiced additional sales or use taxes; such reimbursement shall be in addition to the compensation to which Engineer is entitled under the terms of Exhibit C.

ARTICLE 5 – OPINIONS OF COST

5.01 *Opinions of Probable Construction Cost*

- A. Engineer's opinions (if any) of probable Construction Cost are to be made on the basis of Engineer's experience, qualifications, and general familiarity with the construction industry. However, because Engineer has no control over the cost of labor, materials, equipment, or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Engineer cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from opinions of probable Construction Cost prepared by Engineer. If Owner requires greater assurance as to probable Construction Cost, then Owner agrees to obtain an independent cost estimate.

5.02 *Opinions of Total Project Costs*

- A. The services, if any, of Engineer with respect to Total Project Costs shall be limited to assisting the Owner in tabulating the various categories that comprise Total Project Costs. Engineer assumes no responsibility for the accuracy of any opinions of Total Project Costs.

ARTICLE 6 – GENERAL CONSIDERATIONS

6.01 *Standards of Performance*

- A. *Standard of Care:* The standard of care for all professional engineering and related services performed or furnished by Engineer under this Agreement will be the care and skill ordinarily used by members of the subject profession practicing under similar circumstances at the same time and in the same locality.
- B. The foregoing representation of the standard of care shall not apply in connection with, and the Engineer shall have no responsibility for, any consequences from: (1) the Owner's failure to perform a responsibility under this Agreement, or (2) any of the following circumstances:
 - 1. The discovery, identification, presence, handling, disposal, or removal of, or exposure of a person to hazardous materials pre-existing that were not reasonably foreseeable or known at the Project, including but not limited to asbestos or asbestos products, lead-based paint, PCB, or other hazardous materials; or
 - 2. A modification to, or use of, any drawings, specifications or other documents furnished by the Owner, which modification or use is not contemplated by this Agreement.
- C. *Technical Accuracy:* Owner shall not be responsible for discovering deficiencies in the technical accuracy of Engineer's services. Engineer shall correct deficiencies in technical accuracy without additional compensation unless such corrective action is directly attributable to deficiencies in Owner-furnished information.
- D. *Consultants:* Engineer may retain such Consultants as Engineer deems necessary to assist in the performance or furnishing of the services, subject to reasonable, timely, and substantive objections by Owner. In its Proposal, Engineer designated Consultants to work on the Project, whose services are included in Basic Services described in Part 1 of Exhibit A and whose fees are included in Section C2.01 of Exhibit C, and Owner hereby agrees to retention of those designated Consultants. Prior to the retention of additional Consultants, Engineer shall provide written notice to Owner and allow Owner a reasonable period of time to object to the retention of, and expense related to, the additional Consultants.
- E. *Reliance on Others:* Subject to the standard of care set forth in Paragraph 6.01.A, Engineer and its Consultants may use or rely upon design elements and information ordinarily or customarily furnished by others, including, but not limited to, specialty contractors, manufacturers, suppliers, and the publishers of technical standards.
- F. *Compliance with Laws and Regulations, and Policies and Procedures:*
 - 1. Engineer and Owner shall comply with applicable Laws and Regulations in effect at the time the services are rendered.

2. Engineer shall comply with any and all policies, procedures, and instructions of Owner that are applicable to Engineer's performance of services under this Agreement and that Owner provides to Engineer in writing, subject to the standard of care set forth in Paragraph 6.01.A, and to the extent compliance is not inconsistent with professional practice requirements.
3. This Agreement is based on Laws and Regulations and Owner-provided written policies and procedures as of the Effective Date. The following may be the basis for modifications to Owner's responsibilities or to Engineer's scope of services, times of performance, or compensation:
 - a. changes after the Effective Date to Laws and Regulations.
 - b. the receipt by Engineer after the Effective Date of Owner-provided written policies and procedures.
 - c. changes after the Effective Date to Owner-provided written policies or procedures.
- G. Engineer shall not be required to sign any document, no matter by whom requested, that would result in the Engineer having to certify, guarantee, or warrant the existence of conditions whose existence the Engineer cannot ascertain. Owner agrees not to make resolution of any dispute with the Engineer or payment of any amount due to the Engineer in any way contingent upon the Engineer signing any such document.
- H. If the EJCDC forms are used for the Construction Contract, the general conditions for any construction contract documents prepared hereunder are to be EJCDC® C-700 "Standard General Conditions of the Construction Contract" (2013 Edition), prepared by the Engineers Joint Contract Documents Committee, as modified, upon agreement of the Contractor and as modified by Owner or Contractor, if at all. Any change to the Standard General Conditions of the Construction Contract which impact the Engineer must be reviewed and approved by the Engineer in writing.
- I. Engineer shall not at any time supervise, direct, control, or have authority over any Constructor's work, nor shall Engineer have authority over or be responsible for the means, methods, techniques, sequences, or procedures of construction selected or used by any Constructor, or the safety precautions and programs incident thereto, for security or safety at the Site, nor for any failure of a Constructor to comply with Laws and Regulations applicable to that Constructor's furnishing and performing of its work. Engineer shall not be responsible for the acts or omissions of any Constructor.
- J. Engineer neither guarantees the performance of any Constructor nor assumes responsibility for any Constructor's, failure to furnish and perform the Work in accordance with the Construction Contract Documents or any schedule for completion of the Work, except that Engineer shall be obligated, if retained in an amendment to this Agreement, to act as Owner's representative related to the Project and provide services mutually agreed to by the Parties, which may include but are not limited to, providing certain notifications regarding Constructor's work to Owner.

- K. Engineer shall not be responsible for any decision made regarding the Construction Contract Documents, or any application, interpretation, clarification, or modification of the Construction Contract Documents, other than those made by Engineer or its Consultants.
- L. Engineer is not required to provide and does not have any responsibility for surety bonding or insurance-related advice, recommendations, counseling, or research, or enforcement of construction insurance or surety bonding requirements.
- M. Engineer's services do not include providing legal advice or representation.
- N. Engineer's services do not include (1) serving as a "municipal advisor" for purposes of the registration requirements of Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) or the municipal advisor registration rules issued by the Securities and Exchange Commission, or (2) advising Owner, or any municipal entity or other person or entity, regarding municipal financial products or the issuance of municipal securities, including advice with respect to the structure, timing, terms, or other similar matters concerning such products or issuances.
- O. In addition to exercising the standard of care set forth in 6.01A, while at the Site, Engineer, its Consultants, and their employees and representatives shall comply with the applicable requirements of Contractor's and Owner's safety programs of which Engineer has been informed in writing.

6.02 *Use of Documents*

- A. All Documents are instruments of service, and Engineer shall retain an ownership and property interest therein (including the copyright and the right of reuse at the discretion of the Engineer) whether or not the Project is completed.
- B. If Engineer is required to prepare or furnish Drawings or Specifications under this Agreement, Engineer shall deliver to Owner at least one original printed record version of such Drawings and Specifications, signed and sealed according to applicable Laws and Regulations.
- C. Owner may make and retain copies of Documents for information and reference in connection with the use of the Documents on the Project. Engineer grants Owner a limited license to use the Documents on the Project, extensions of the Project, and for related uses of the Owner on related to or associated with this Project, subject to receipt by Engineer of full payment due and owing for all services relating to preparation of the Documents, and subject to the following limitations: (1) Owner acknowledges that such Documents are not intended or represented to be suitable for use on the Project unless completed by Engineer, or for use or reuse by Owner or others on extensions of the Project, on any other project, or for any other use or purpose, without written verification or adaptation by Engineer; (2) any such use or reuse, or any modification of the Documents, without written verification, completion, or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Owner's sole risk and without liability or legal exposure to Engineer or to its officers, directors, members, partners, agents, employees, and Consultants; (3) only to the extent permitted by law, as set forth in paragraph 8.09.A below, Owner shall indemnify and hold harmless Engineer and its officers, directors, members, partners, agents, employees, and Consultants from all claims, damages, losses, and expenses,

including attorneys' fees, arising out of or resulting from any use, reuse, or modification of the Documents without Engineer's written authorization and its verification, completion, or adaptation by Engineer; and (4) such limited license to Owner shall not create any rights in third parties.

- D. If Engineer at Owner's request verifies the suitability of the Documents, completes them, or adapts them for extensions of the Project or for any other purpose, then Owner shall compensate Engineer at rates or in an amount to be agreed upon by Owner and Engineer.
- E. Notwithstanding anything contained herein, the Parties recognize and agree that Owner is retaining Engineer pursuant to this Agreement to complete the Engineering Design Plans. Once completed, as long as Owner has made payments according to this Agreement, the Engineering Design Plans, along with any documents, drawings, specifications, and the like included therewith, shall be the Owner's property and Owner shall have the right to use the Engineering Design Plans as Owner desires and shall not be obligated to notify or obtain approval from Engineer for such use.

6.03 *Electronic Transmittals*

- A. Owner and Engineer may transmit, and shall accept, Project-related correspondence, Documents, text, data, drawings, information, and graphics, in electronic media or digital format, either directly, or through access to a secure Project website, in accordance with a mutually agreeable protocol.
- B. If this Agreement does not establish protocols for electronic or digital transmittals, then Owner and Engineer may jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

6.04 *Insurance*

- A. Engineer shall procure and maintain insurance as set forth in Exhibit G. Engineer shall cause Owner to be listed as an additional insured on the required applicable general liability insurance policy carried by Engineer. Engineer shall use commercially reasonable efforts to contractually require that Consultants procure and maintain insurance in appropriate limits and that Consultants list Owner as an additional insured on the required general liability insurance policy. Engineer shall not be required to carry insurance under this Agreement for the construction phase of the Project.
- B. Owner shall procure and maintain insurance. For purposes of this Agreement only, which does not cover the construction phase, and not for purposes of any subsequent agreement or work that may relate to the construction phase, Owner waives all claims against the Engineer that may be connected to construction phase administrative, engineering, or professional services except for those services that are expressly required of Engineer in Exhibit A.

- C. Owner shall require Contractor to purchase and maintain policies of insurance covering workers' compensation, general liability, motor vehicle damage and injuries, and other insurance necessary to protect Owner's and Engineer's interests in the Project and require Contractor to include Engineer as an additional insured on Contractor's policies of insurance for general liability and motor vehicle damage and injuries, as well as any excess/umbrella policies and waive rights of subrogation against Engineer for such policies as well.
- D. Owner and Engineer shall each deliver to the other certificates of insurance evidencing the coverages indicated in Exhibit G. Such certificates shall be furnished prior to commencement of Engineer's services and at renewals thereafter during the life of the Agreement.
- E. All policies of property insurance relating to the Project, including but not limited to any builder's risk policy, shall provide for waiver of subrogation rights, and contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insured thereunder or against Engineer or its Consultants. Owner and Engineer waive all rights against each other, Contractor, the Consultants, and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, to recover for losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by any builder's risk policy and any other property insurance relating to the Project. Owner and Engineer shall take appropriate measures in other Project-related contracts to secure waivers of rights consistent with those set forth in this paragraph.
- F. All policies of insurance shall contain a provision or endorsement that the coverage afforded will not be canceled, and that renewal will not be refused, until at least 10 days prior written notice has been given to the primary insured. Upon receipt of such notice, the receiving party shall promptly forward a copy of the notice to the other party to this Agreement.
- G. At any time, subsequent to the execution of this Agreement, Owner may request that Engineer or its Consultants, at Owner's sole expense, provide additional insurance coverage, If so requested by Owner, and if commercially available, Engineer shall obtain and shall require its Consultants to obtain such additional insurance coverage, for such periods of time as requested by Owner, and Exhibit G will be supplemented to incorporate these requirements.

6.05 *Suspension and Termination*

A. *Suspension:*

- 1. *By Owner:* In its sole discretion, Owner may suspend the Project for up to 90 days upon seven days written notice to Engineer.
- 2. *By Engineer:* Engineer may, after giving seven days written notice to Owner, suspend services under this Agreement if Owner has failed to pay Engineer for invoiced services and expenses, as set forth in Paragraph 4.02.B, or in response to the presence of Constituents of Concern at the Site, as set forth in Paragraph 6.10.D.

- B. *Termination:* The obligation to provide further services under this Agreement may be terminated:

1. For cause,
 - a. by either party upon 30 days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof through no fault of the terminating party.
 - b. by Engineer:
 - 1) upon seven days written notice if Owner demands that Engineer furnish or perform services contrary to Engineer's responsibilities as a licensed professional; or
 - 2) upon seven days written notice if the Engineer's services for the Project are delayed or suspended for more than 90 days for reasons beyond Engineer's control, or as the result of the presence at the Site of undisclosed or previously unknown Constituents of Concern, as set forth in Paragraph 6.10.
 - 3) Engineer shall have no liability to Owner on account of such termination.
 - c. Notwithstanding the foregoing, this Agreement will not terminate under Paragraph 6.06.B.1.a if the party receiving such notice begins, within seven days of receipt of such notice, to correct its substantial failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt thereof; provided, however, that if and to the extent such substantial failure cannot be reasonably cured within such 30 day period, and if such party has diligently attempted to cure the same and thereafter continues diligently to cure the same, then the cure period provided for herein shall extend up to, but in no case more than, 60 days after the date of receipt of the notice.
2. For convenience, by Owner effective upon Engineer's receipt of written notice from Owner.
- C. *Effective Date of Termination:* The terminating party under Paragraph 6.06.B may, in its discretion, set the effective date of termination at a time up to 30 days later than otherwise provided to allow Engineer to demobilize personnel and equipment from the Site, to complete tasks whose value would otherwise be lost, to prepare notes as to the status of completed and uncompleted tasks, and to assemble Project materials in orderly files.
- D. *Payments Upon Termination:*
 1. In the event of any termination under Paragraph 6.06, Engineer will be entitled to invoice Owner and to receive full payment for all services performed or furnished in accordance with this Agreement and all Reimbursable Expenses incurred through the effective date of termination. Upon making such payment, Owner shall have the limited right to the use of Documents, at Owner's sole risk, subject to the provisions of Paragraph 6.03.
 2. In the event of termination by Owner for convenience or by Engineer for cause, Engineer shall be entitled, in addition to invoicing for those items identified in Paragraph 6.06.D.1, to invoice Owner and receive payment of a reasonable amount for services and expenses directly attributable to termination, both before and after the effective date of

termination, such as reassignment of personnel, costs of terminating contracts with Engineer's Consultants, and other related close-out costs, using methods and rates for Additional Services as set forth in Exhibit C. Prior to invoicing, Engineer shall forward to Owner the proposed "reasonable amount" and Owner shall have ten days to review and, in its discretion, object to such amount, in which case the parties shall endeavor to agree upon the "reasonable amount" for such delineated services and expenses.

6.06 *Controlling Law*

This Agreement is to be governed by the Laws and Regulations of the State of Colorado. Venue for any action shall be in the County of Weld, State of Colorado.

6.07 *Successors, Assigns, and Beneficiaries*

- A. Neither Owner nor Engineer may assign, sublet, or transfer any rights under or interest (including, but without limitation, money that is due or may become due) in this Agreement without the written consent of the other party, except to the extent that any assignment, subletting, or transfer is mandated by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement. Nothing in this Paragraph prevents Engineer from subcontracting any portion of its services to consultants as provided in the Contract Documents.
- B. Contractor may engage temporary staffing agencies or obtain assistance from its affiliates and subsidiaries including, without limitation, Burns & McDonnell Canada Ltd., Burns & McDonnell International Inc., and Burns & McDonnell India Pvt. Ltd. ("Labor Sources") to fulfill Contractor's performance obligations under this Agreement. The parties agree that contracts, purchase orders, or similar agreements between Contractor and any Labor Sources are not subcontracts as that term is used in this Agreement, and personnel from such Labor Sources shall be billed according to the applicable rate sheet for the Scope of Work as if such personnel is a direct hire employee. Personnel from Labor Sources shall be considered agents of Contractor and able to act on behalf of Contractor within the scope of the authority granted such personnel according to job function and billing classification.
- C. Unless expressly provided otherwise in this Agreement:
 - 1. Nothing in this Agreement shall be construed to create, impose, or give rise to any duty owed by Owner or Engineer to any Contractor, Constructor, Subcontractor, lender or other third-party individual or entity, or to any surety or indemnity for or employee of any of them.
 - 2. All duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of Owner and Engineer and not for the benefit of any other party.
 - 3. At the time of negotiation of the Construction Contract Documents, upon written request of Engineer, Owner agrees to request that the substance of the provisions of this Paragraph 6.08.B appear in the Construction Contract Documents.

6.08 *Dispute Resolution*

- A. Owner and Engineer agree to negotiate all disputes between them in good faith for a period of 30 days from the date of notice prior to invoking the procedures of Exhibit H or other provisions of this Agreement or exercising their rights at law. Such negotiations shall include the designated representatives of each party identified in this Agreement and required by Paragraph 8.03.A.
- B. If the parties fail to resolve a dispute through negotiation under Paragraph 6.09.A, then either or both may invoke the procedures of Exhibit H. If Exhibit H is not included, or if no dispute resolution method is specified in Exhibit H, then the parties must first submit the dispute to mediation before a mediator jointly chosen in a location mutually agreed upon. If mediation is not successful, the parties may exercise their rights at law.

6.09 *Environmental Condition of Site*

- A. Owner represents to Engineer that as of the Effective Date to the best of Owner's knowledge no Constituents of Concern exist at or adjacent to the Site, other than those (i) disclosed in writing to Engineer, (ii) regularly occurring or existing at a water treatment site or (iii) discovered, or should have been discovered, by Engineer during the Engineer's requisite due diligence conducted prior to the execution of this Agreement.
- B. If Engineer encounters or learns of an undisclosed or unknown Constituent of Concern at the Site, then Engineer shall notify (1) Owner and (2) appropriate governmental officials if Engineer reasonably concludes that doing so is required by applicable Laws or Regulations.
- C. If Engineer or any other party encounters, uncovers, or reveals an undisclosed or unknown Constituent of Concern, then Owner shall promptly determine whether to retain a qualified expert to evaluate such condition or take any necessary corrective action.
- D. If investigative or remedial action, or other professional services, are necessary with respect to undisclosed Constituents of Concern, or if investigative or remedial action beyond that reasonably contemplated is needed to address a disclosed or known Constituent of Concern, then Engineer may, at its option and without liability for consequential or any other damages, suspend performance of services on the portion of the Project affected thereby until such portion of the Project is no longer affected.
- E. If the presence at the Site of undisclosed or unknown Constituents of Concern adversely affects the performance of Engineer's services under this Agreement, then the Engineer shall have the option of (1) accepting an equitable adjustment in its compensation or in the time of completion, or both; or (2) terminating this Agreement for cause on seven days' notice.
- F. Owner acknowledges that Engineer is performing professional services for Owner and that Engineer is not and shall not be required to become an "owner," "arranger," "operator," "generator," or "transporter" of hazardous substances, as defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, which are or may be encountered at or near the Site in connection with Engineer's activities under this Agreement.

6.10 Indemnification and Mutual Waiver

- A. *Indemnification by Engineer:* To the fullest extent permitted by Laws and Regulations, as allowed by parties to a contract, Engineer shall indemnify and hold harmless Owner, and Owner's officers, directors, members, partners, agents, consultants, and employees, from losses, damages, and judgments (including reasonable consultants' and attorneys' fees and expenses) arising from or relating to the Project, but only to the extent caused by any negligent and/or willful act or omission of Engineer or Engineer's officers, directors, members, partners, agents, employees, or Consultants.
- B. *Indemnification by Owner:* Only to the extent permitted by law, as set forth in paragraph 8.09.A below, Owner shall indemnify and hold harmless Engineer and its officers, directors, members, partners, agents, employees, and Consultants from losses, damages, and judgments (including reasonable consultants' and attorneys' fees and expenses) arising from third-party claims or actions relating to the Project, provided that any such losses, damages, or judgment are attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Owner or Owner's officers, directors, members, partners, agents, employees, or Contractors.
- C. *Environmental Indemnification:* Only to the extent permitted by law, as set forth in paragraph 8.09.A below, Owner shall defend, indemnify and hold harmless Engineer and its officers, directors, members, partners, agents, employees, and Consultants from all claims, costs, losses, damages, actions, and judgments (including reasonable consultants' and attorney's fees and expenses) caused by, arising out of, relating to, or resulting from a Constituent of Concern at, on, or under the Site, provided that (1) any such claim, cost, loss, damages, action, or judgment is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and (2) nothing in this paragraph shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own willful misconduct.
- D. *No Defense Obligation:* The indemnification commitment in this Agreement does not include a defense obligation by the indemnitor unless such obligation is expressly stated.
- E. *Percentage Share of Negligence:* To the fullest extent permitted by Laws and Regulations, a party's total liability to the other party and anyone claiming by, through, or under the other party for any cost, loss, or damages caused in part by the negligence of the party and in part by the negligence of the other party or any other negligent entity or individual, shall not exceed the percentage share that the party's negligence bears to the total negligence of Owner, Engineer, and all other negligent entities and individuals.
- F. *Mutual Waiver:* To the fullest extent permitted by Laws and Regulations, Owner and Engineer waive against each other, and the other's employees, officers, directors, members, agents, insurers, partners, and consultants, any and all claims for or entitlement to special, incidental, indirect, or consequential damages, which include but are not limited to, losses of use, income, anticipated profit, financing, business and reputation, damages to customers of Owner, lost sales and opportunities, arising out of, resulting from, or in any

way related to this Agreement or the Project, from any cause or causes, except to the extent the damages arise from Engineer's negligent or willful and wanton conduct.

6.11 *Records Retention*

- A. Engineer shall maintain on file in legible form, for a period of five years following completion or termination of its services, all Documents, records (including cost records), and design calculations related to Engineer's services or pertinent to Engineer's performance under this Agreement. Upon Owner's request, Engineer shall provide a copy of any such item to Owner at cost.
- B. Engineer recognizes and agrees that Owner is a public entity subject to the provisions of the Colorado Open Records Act, C.R.S. §§ 24-72-200.1, *et seq.* ("CORA"), and that Owner may be required to disclose Documents, records, and design calculations pursuant to CORA.

6.12 *Miscellaneous Provisions*

- A. *Notices:* Any notice required under this Agreement will be in writing, addressed to the appropriate party at its address on the signature page and given personally, by registered or certified mail postage prepaid, or by a commercial courier service. All notices shall be effective upon the date of receipt. Notwithstanding the foregoing, notice may be provided by electronic mail ("E-mail") on the condition that the receiving party acknowledges receipt of the E-mail and does not, upon such acknowledgment, object to the form of notice.
- B. *Survival:* All express representations, waivers, indemnifications, and limitations of liability included in this Agreement will survive its completion or termination for any reason.
- C. *Severability:* Any provision or part of the Agreement held to be void or unenforceable under any Laws or Regulations shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Engineer, which agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- D. *Waiver:* A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Agreement.

ARTICLE 7 – DEFINITIONS

7.01 *Defined Terms*

- A. Wherever used in this Agreement (including the Exhibits hereto) terms (including the singular and plural forms) printed with initial capital letters have the meanings indicated in the text above, in the exhibits, or in the following definitions:
 - 1. *Addenda*—Written or graphic instruments issued prior to the opening of bids which clarify, correct, or change the bidding requirements or the proposed Construction Contract Documents.

2. *Additional Services*—The services to be performed for or furnished to Owner by Engineer in accordance with Part 2 of Exhibit A of this Agreement.
3. *Agreement*—This written contract for professional services between Owner and Engineer, including all exhibits identified in Paragraph 8.01 and any duly executed amendments.
4. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Construction Contract.
5. *Basic Services*—The services to be performed for or furnished to Owner by Engineer in accordance with Part 1 of Exhibit A of this Agreement.
6. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Construction Contract Price or the Construction Contract Times, or other revision to the Construction Contract, issued on or after the effective date of the Construction Contract.
7. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth in the Construction Contract, seeking an adjustment in Construction Contract Price or Construction Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Construction Contract Documents or the acceptability of Work under the Construction Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Construction Contract.
8. *Constituent of Concern*—Asbestos, petroleum, radioactive material, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, State, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
9. *Construction Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
10. *Construction Contract Documents*—Those items designated as “Contract Documents” in the Construction Contract, and which together comprise the Construction Contract.
11. *Construction Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Construction Contract Documents.

12. *Construction Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve milestones, if any, in the Construction Contract; (b) achieve Substantial Completion; and (c) complete the Work.
13. *Construction Cost*—The cost to Owner of the construction of those portions of the entire Project designed or specified by or for Engineer under this Agreement, including construction labor, services, materials, equipment, insurance, and bonding costs, and allowances for contingencies. Construction Cost does not include costs of services of Engineer or other design professionals and consultants; cost of land or rights-of-way, or compensation for damages to property; Owner's costs for legal, accounting, insurance counseling, or auditing services; interest or financing charges incurred in connection with the Project; or the cost of other services to be provided by others to Owner. Construction Cost is one of the items comprising Total Project Costs.
14. *Constructor*—Any person or entity (not including the Engineer, its employees, agents, representatives, and Consultants), performing or supporting construction activities relating to the Project, including but not limited to Contractors, Subcontractors, Suppliers, Owner's work forces, utility companies, other contractors, construction managers, testing firms, shippers, and truckers, and the employees, agents, and representatives of any or all of them.
15. *Consultants*—Individuals or entities having a contract with Engineer to furnish services with respect to this Project as Engineer's independent professional associates and consultants; subcontractors; or vendors.
16. *Contractor*—The entity or individual with which Owner enters into a Construction Contract.
17. *Documents*—Data, reports, Drawings, Specifications, Record Drawings, building information models, civil integrated management models, and other deliverables, whether in printed or electronic format, provided or furnished in appropriate phases by Engineer to Owner pursuant to this Agreement.
18. *Drawings*—That part of the Construction Contract Documents that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date*—The date indicated in this Agreement on which it becomes effective, but if no such date is indicated, the date on which this Agreement is signed and delivered by the last of the parties to sign and deliver.
20. *Engineer*—The individual or entity named as such in this Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Construction Contract Price or the Construction Contract Times.
22. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

23. *Owner*—The individual or entity named as such in this Agreement and for which Engineer's services are to be performed. Unless indicated otherwise, this is the same individual or entity that will enter into any Construction Contracts concerning the Project.
24. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the services to be performed or furnished by Engineer under this Agreement are a part.
25. *Record Drawings*—Drawings depicting the completed Project, or a specific portion of the completed Project, based on Contractor's record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications, as delivered to Engineer and annotated by Contractor to show changes made during construction.
26. *Reimbursable Expenses*—The expenses incurred directly by Engineer in connection with the performing or furnishing of Basic Services and Additional Services for the Project.
27. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site during the Construction Phase. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative. The duties and responsibilities of the Resident Project Representative, if any, are as set forth in Exhibit D.
28. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
29. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Construction Contract Documents.
30. *Site*—Lands or areas to be indicated in the Construction Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
31. *Specifications*—The part of the Construction Contract Documents that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
32. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
33. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Construction Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes

for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

34. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
 35. *Total Project Costs*—The total cost of planning, studying, designing, constructing, testing, commissioning, and start-up of the Project, including Construction Cost and all other Project labor, services, materials, equipment, insurance, and bonding costs, allowances for contingencies, and the total costs of services of Engineer or other design professionals and consultants, together with such other Project-related costs that Owner furnishes for inclusion, including but not limited to cost of land, rights-of-way, compensation for damages to properties, Owner’s costs for legal, accounting, insurance counseling, and auditing services, interest and financing charges incurred in connection with the Project, and the cost of other services to be provided by others to Owner.
 36. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Construction Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Construction Contract Documents.
 37. *Work Change Directive*—A written directive to Contractor issued on or after the effective date of the Construction Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.
- B. *Day*:
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

ARTICLE 8 – EXHIBITS AND SPECIAL PROVISIONS

8.01 *Exhibits Included*:

- A. Exhibit A, Engineer’s Services.
- B. Exhibit B, Owner’s Responsibilities.
- C. Exhibit C, Payments to Engineer for Services and Reimbursable Expenses.
- D. ~~Exhibit D, Duties, Responsibilities and Limitations of Authority of Resident Project Representative.~~ (NOT USED)
- E. ~~Exhibit E, Notice of Acceptability of Work.~~ (NOT USED)
- F. ~~Exhibit F, Construction Cost Limit.~~ (NOT USED)
- G. Exhibit G, Insurance.

- H. Exhibit H, Dispute Resolution.
- I. Exhibit I, Limitations of Liability.
- J. ~~Exhibit J, Special Provisions.~~ (NOT USED)
- K. Exhibit K, Form of Amendment to Owner-Engineer Agreement.

8.02 *Total Agreement*

- A. This Agreement, together with the exhibits included above, constitutes the entire agreement between Owner and Engineer and supersedes all prior written or oral understandings. This Agreement may only be amended, supplemented, modified, or canceled by a written instrument duly executed by both parties. Amendments should be based whenever possible on the format of Exhibit K to this Agreement.

8.03 *Designated Representatives*

- A. With the execution of this Agreement, Engineer and Owner shall designate specific individuals to act as Engineer's and Owner's representatives with respect to the services to be performed or furnished by Engineer and responsibilities of Owner under this Agreement. Such an individual shall have authority to transmit instructions, receive information, and render decisions relative to this Agreement on behalf of the respective party whom the individual represents. The Owner recognizes that that Engineer's designated representative is subject to change due to vacations, sick leave, occasional firm commitments to other clients or projects and that when the designated representative is not available, the Engineer shall identify in writing another suitable person as a replacement.

8.04 *Engineer's Certifications*

- A. Engineer certifies that it has not engaged in corrupt, fraudulent, or coercive practices in competing for or in executing the Agreement. For the purposes of this Paragraph 8.04:
 1. "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the selection process or in the Agreement execution.
 2. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the selection process or the execution of the Agreement to the detriment of Owner, or (b) to deprive Owner of the benefits of free and open competition.
 3. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the selection process or affect the execution of the Agreement.

8.05 *Governmental Immunity*

- A. Nothing contained in this Agreement shall be construed as a waiver of the limitations on damages or any of the privileges, immunities or defenses provided to, or enjoyed by, Owner under common law or pursuant to statute, including but not limited to the Colorado

Governmental Immunity Act, §§ 24-10-101 *et seq.*, C.R.S., as may be amended from time to time.

8.06 *Appropriation of Funds*

- A. Pursuant to C.R.S. § 24-91-103.6, as may be amended from time to time, Owner has appropriated the money necessary to fund this Project and compensate the Engineer as set forth herein. No change order or other form of directive shall be issued by Owner requiring additional compensable work to be performed by Engineer, which causes the aggregate amount payable under this Agreement to exceed the amount appropriated for the original contract amount, unless the Engineer is given written assurance by Owner that lawful appropriations have been made by Owner to cover the cost of the additional work or unless such work is covered under the remedy-granting provisions of this Agreement.
- B. Pursuant to C.R.S. § 29-1-110, as may be amended from time to time, financial obligations of Owner payable as set forth herein, after the current fiscal year, are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available. This Agreement shall be terminated effective January 1 of the first fiscal year for which funds are not appropriated.

8.07 *Costs and Attorney's Fees*

- A. In the event of litigation enforcing or interpreting the terms of the Agreement, the prevailing party shall be entitled an award of reasonable attorney fees and all costs of suit, including expert witness fees, court reporter fees and similar litigation expenses, except that Owner shall only be required to pay such fees to the extent permitted by law considering the limitations set forth in the Colorado Constitution, the Johnstown Home Rule Charter and Colorado statutes, including, but not limited to, those relating to budgeting and appropriations.

8.08 *Illegal Aliens*

- A. Engineer certifies, warrants, and agrees that it shall not knowingly employ or contract with an illegal alien to perform work under this contract and shall confirm the employment eligibility of all employees who are newly hired for employment in the United States to perform work under this contract, through participation in the E-Verify Program or the Department of Labor and Employment program. Engineer shall not knowingly employ or contract with an illegal alien to perform work under this contract or enter into a contract with a sub-consultant that fails to certify to Engineer that the sub-consultant shall not knowingly employ or contract with an illegal alien to perform work under this contract. Engineer (a) shall not use E-Verify Program or Department of Labor and Employment program procedures to undertake pre-employment screening of job applicants while this contract is being performed, (b) shall notify the sub-consultant and Owner within three days if Engineer has actual knowledge that a sub-consultant is employing or contracting with an illegal alien for work under this contract, (c) shall terminate the subcontract if a sub-consultant does not stop employing or contracting with the illegal alien within three days of receiving the notice, and (d) shall comply with reasonable requests made in the course of an investigation, undertaken pursuant to C.R.S. § 8-17.5-102(5), by the Colorado Department of Labor and Employment. If Engineer fails to comply with any requirement of this provision or C.R.S. § 8-17.5-101 *et seq.*, Owner may terminate this contract for breach

and, if so terminated, Engineer shall be liable for actual and, notwithstanding provisions to the contrary in this Agreement, consequential damages.

8.09 *Owner's Indemnification Obligations*

- A. Owner represents that it is prohibited by the Colorado Constitution, the Johnstown Home Rule Charter, the Johnstown Municipal Code, and state law from entering into indemnification obligations without appropriations in its budget which it has not made for this Agreement. Accordingly, notwithstanding anything herein to the contrary, Owner's indemnification obligations set forth in this Agreement are provided only to the extent permitted by law.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, the Effective Date of which is indicated on page 1.

Owner: []

Engineer: Burns & McDonnell Engineering Company, Inc.

By: _____

Print name: Gary Lebsack

Title: Mayor

Date Signed: []

By: _____

Print name: Dan Korinek

Title: Vice President

Date Signed: _____

ATTEST:

Engineer License or Firm's Certificate No. (if required):
Firm registration not required in Colorado.

Diana Seele, Town Clerk

State of: _____

Address for Owner's receipt of notices:

Town of Johnstown

450 S. Parish Avenue

Johnstown, CO 80534

Address for Engineer's receipt of notices:

Burns & McDonnell Engineering Company, Inc.

9785 Maroon Circle, Suite 400

Centennial, CO 80112

Designated Representative (Paragraph 8.03.A):

Matt LeCerf []

Title: Town Manager []

Phone Number: 970-587-4664 []

E-Mail Address: mlecerf@townofjohnstown.co
m

Designated Representative (Paragraph 8.03.A):

Dan Korinek

Title: Vice President

Phone Number: 303-474-2224

E-Mail Address: dkorinek@burnsmcd.com

STATE OF COLORADO)

) ss

COUNTY OF _____)

SUBSCRIBED AND SWORN to before me this ____ day of _____, 2021, by xxxxxxxx as

WITNESS my hand and official seal.

My commission expires: _____

Notary Public

This is **EXHIBIT A**, consisting of 29 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

Engineer's Services

Article 1 of the Agreement is supplemented to include the following agreement of the parties.

Engineer shall provide Basic and Additional Services as set forth in the attached Table.

PART 1 – BASIC SERVICES

A1.01 *Scope of Services Table*

Engineer shall provide the following services as summarized below and described in detail below:

1. Project Initiation & Coordination
2. Review of Existing Data & Basis of Design
3. Preliminary Design 30%
4. Detailed Design 60%
5. Optimize Operations
6. Final Design
7. CMAR Selection
8. Equipment Procurement

Scope of Services – Part 1, Basic Services

The Scope of Services proposed includes design services for an expansion of the existing 6.2 million gallons per day (MGD) capacity water treatment plant (WTP) to 12.5 MGD. The WTP expansion includes:

- Modification of the existing pretreatment system to saturated air flotation (SAF).
- New ozone system for taste and odor control.
- New biologically active filtration (BAF) and associated chemical systems.
- New disinfection contact basin with separate backwash supply tank.
- New distribution pump station.
- New backwash waste tank.
- New recycle pump station.
- Associated yard piping and related structures.
- New chemical storage and dosing systems.
- Related electrical and control system upgrades.
- All Work on the existing WTP property and the adjacent property immediately to the south (Weld County Parcel 106101400047).

Finished water will tie into the existing transmission mains on the WTP property. Backwash waste will be directed to a new storage tank. Recycled water will be sent to the existing raw water tank for blending with the existing incoming raw water. Thickened backwash will be directed to the existing sanitary sewer.

The following items are excluded from the scope:

- Modifications to the Lone Tree Reservoir pump station or powdered activated carbon (PAC) system.
- Addition of a second raw water transmission main from the Lone Tree Reservoir.
-
- Modification of the two existing ground storage tanks.
- Treatment of thickened backwash waste. Solids will be directed to the existing sanitary sewer.
- Changes to the site access roadway.

Task Series 100 – Project Initiation & Collaboration

Task 101 – Project Kickoff Meeting:

Engineer shall coordinate and lead a Project Kickoff Meeting at the WTP. During the Project Kickoff meeting the collective project team shall regroup the team on the project goals, coordinate activities, discuss project requirements, establish a project schedule, identify key project issues/concerns, identify key personnel who are to provide input on the project, and get initial input on design items. A site walk with the Owner will occur immediately after the Kickoff Meeting.

Task 102 – Weekly Progress Meetings:

The Engineer's project manager will prepare for, attend, and conduct weekly progress meetings. It is currently anticipated that half of the meetings will be in person and half will be virtual. Regular workshop attendees will include the project manager and a process engineer. Other resources will participate as part of a virtual meeting. The Engineer will provide meeting minutes with a decision log and a list of action items. Meeting minutes will be distributed via e-mail. When workshops or review meeting coincide with weekly progress meetings the meetings will be combined. Assumes 12 months of meetings during the design phase. This task also includes internal progress meetings.

Task 103 – Project, Risk and Resource Management, Schedule, and Budget Controls:

Engineer shall provide project management services for the design phase includes all project coordination between the Owner and the team members. The Engineer will monitor project status, monitor project schedule, monitor project deliverables, and coordinate resources including sub-Engineers. The Engineer will prepare a risk register and a decision log at project initiation and maintain throughout the course of the design phase. The Engineer will utilize our internal accounting systems to track budget and manage project scope.

Task Series 200 – Review Existing Data & Basis of Design

Task 201 – Review Existing Documents:

Engineer shall prepare a document request for the Owner existing data, including record drawings, operational records, and. The Engineer will summarize the data in the basis of design report (BODR) and identify any gaps for the Owner to collect.

Task 202 – Develop Permitting Matrix:

Engineer shall assist with necessary permitting as identified in the BODR and listed in the Table A-1 below. Engineer shall prepare a permitting matrix to identify potential permit requirements for the project. The permitting matrix will identify local, state, and federal authorities, permit requirements, likelihood of needing a permit, responsible party for submitting permit and estimated duration for submittal review and negotiation. We currently do not include fee to perform the services for all of these permits. We have included fees to perform all permits coordinated by the Engineer that are certain (100%) required. The Engineer will determine which other permits are required and any additional permitting work required will be included in additional services. Other permits may be required by the Contractor. Engineer has assumed that the Owner will pay all permit application and review fees.

Table A 1 - Preliminary Permitting Matrix

Permit/Compliance		Permit/Compliance	Administering Agency	Requirement	Trigger	Probability of Need	Estimated Duration to Acquire Authorization	Permit Coordinator and Submitter
Federal	Clean Water Act, Section 404	Clean Water Act, Section 404	U.S. Army Corp of Engineers (USACE), Omaha District	Permanent wetland impacts greater than 0.50 acre require an Individual Permit, including mitigation and public involvement. If permanent wetland impacts range from 0.10 to 0.50 acre, USACE notification and application is required to obtain a nationwide permit (NWP); if less than 0.1 acre, no USACE notification is required.	Temporary and/or permanent impacts on wetlands and/or jurisdictional features.	Low (25%) Depends on whether wetlands and streams onsite can be avoided in siting facilities.	If present, coordination with USACE could take 2-6 months. Submit after BODR. Assumes wetland areas less than 0.5 acres.	Engineer
	Endangered Species Act (ESA) Section 7 and 10 Consultation	Endangered Species Act (ESA) Section 7 and 10 Consultation	USFWS	The ESA § 7 directs all Federal agencies to work to conserve federally listed threatened, endangered, candidate and proposed (TECP) species and to use authorities to further the purposes of the ESA. Section 7 and 10 of the ESA is the mechanism by which Federal agencies and private citizens ensure actions, including those they fund or authorize, do not jeopardize the existence of TECP species.	Presence of protected species within or adjacent to areas affected by the Project	Low (25%). Not likely present	If present, coordination with USFWS would take about 1 year. If not present, 60 days. Submit after BODR.	Engineer
	Migratory Bird Treaty Act (MBTA)	Migratory Bird Treaty Act (MBTA)	USFWS	Avian studies and nest surveys could be required by the USFWS to demonstrate compliance with the ESA, MBTA, and the Bald and Golden Eagle Protection Act (BGEPA).	Breeding habitat clearing during nesting season	Moderate (50%). Depends on nesting species in the area and construction schedule.	If nesting habitat clearing can occur outside of nesting season, efforts would be minor.	Engineer
	Bald and Golden Eagle Protection Act	Bald and Golden Eagle Protection Act	USFWS	The BGEPA (16 U.S.C. 668-668c) prohibits anyone, without a permit, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ..., alive or dead, or any part, nest, or egg thereof."	Surface occupancy within 0.25-mile or construction activities within 0.5 mile of bald or golden eagle nests or bald eagle winter roost sites (see CPW recommended buffer distances in section 3.1.4)	Low (25%). Although a bald eagle was observed, we do not believe an incidental take permit (ITP) will be necessary.	If buffer zones and seasonal restrictions can be implemented, efforts would be minor.	Engineer
	Notice of Proposed Construction or Alteration Determination of No Hazard to Air Navigation	Notice of Proposed Construction or Alteration Determination of No Hazard to Air Navigation	Federal Aviation Administration (FAA)	The requirements for filing with the FAA for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.	Structure is above 200 ft, proximity to an airport, potential glare impacts for solar sites within 2 miles of an airport.	Very low (<10%)	Must be filed 45 days prior to construction.	Engineer
	Spill Prevention, Control, and Countermeasures (SPCC); 40 CFR Part 112, or 40 CFR Part 300.	Spill Prevention, Control, and Countermeasures (SPCC); 40 CFR Part 112, or 40 CFR Part 300.	Environmental Protection Agency (EPA), Region 8	SPCC plan.	Transformers with a 55-gallon capacity or greater	Moderate (50%). If a transformer will be located on site, a SPCC will be required.	Final Design/ Construction No pre-approval required. Must be kept onsite and reviewed every 5 years or if there is a change in the site.	Contractor
State	CPW Coordination	CPW Coordination	CPW, State-protected species	Colorado law states wildlife and their environment are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. CPW routinely reviews development project proposals and makes recommendations for areas where state-protected plant and animal species are known to occur. CPW recommends conducting raptor surveys during the breeding season and implementing nest buffers (nesting season is year-round depending on the raptor species) and season restrictions (150 feet to 0.5 miles, depending on the raptor species; CPW 2008)	Presence of protected species within or adjacent to areas affected by the Project	Moderate (50%). Coordination is likely.	If present, coordination with USFWS and CPW would take 30-90 days.	Engineer
	National Pollutant Discharge Elimination System (NPDES) Permit; Stormwater Management Plan (SWMP)	National Pollutant Discharge Elimination System (NPDES) Permit; Stormwater Management Plan (SWMP)	Colorado Department of Public Health and Environment (CDPHE); Stormwater protection	If more than 1 acre of disturbance will occur, a SWMP would be developed during final design of the Project and would incorporate an Erosion and Sediment Control Plan.	Greater than 1 acre of disturbance	100%	30 days	Contractor
	General Construction Permit Air Pollutant Emission Notice (APEN)	General Construction Permit Air Pollutant Emission Notice (APEN)	CDPHE: Air Pollution Control Division	Land development refers to all land clearing activities, including but not limited to land preparation such as excavating or grading, for residential, commercial, or industrial development.	Land development and the operation of emitting equipment	High (90%); construction equipment	30 days	Contractor
	National Historic Preservation Act (NHPA), Section 106 Consultation	National Historic Preservation Act (NHPA), Section 106 Consultation	Colorado Office of Archeology and Historic Preservation (OAHP)	Section 106 of the NHPA requires Federal agencies to consider the effects that their federally funded activities and programs have on significant historic properties. "Significant historic properties" are those properties that are included in, or eligible for, the National Register of Historic Places. Section 106 compliance would be required for USACE permits, etc.	Involvement of Federal actions (lands, permits, funding, etc.).	Moderate (50%). If USACE permitting is needed, NHPA compliance will be required.	90 days	Engineer
	State Highway Access Permit	State Highway Access Permit	Colorado Department of Transportation (CDOT)	To obtain permission to construct, modify, relocate, or close a vehicular access, where such work will be within highway right-of-way (ROW), a state highway access permit is required. To obtain permission, a complete application must be submitted to the issuing authority and a permit issued. Construction may not begin until a Notice to Proceed is approved. Application packages may be obtained from the issuing authority. To investigate. If required, responsibility of contractor.	Digging or excavating within the state ROW	Low (25%). Based on remaining on existing WTP property. High if additional property acquired.	Final Design/ Construction The statewide encroachment permit turnaround performance target is 72 hours.	Engineer or Contractor
	Oversize/ Overweight Permits	Oversize/ Overweight Permits	CDOT	Permit required to move oversize or overweight loads on State roads (85,000 pounds gross maximum, 20,000 pounds per axle maximum) To investigate. If required, responsibility of vendor.	Oversize/overweight loads	Moderate (50%)	30 days	Contractor
	Water quality division	Water quality division	CDPHE	Review and approve facility design	Modification or expansion of existing WTP process	Certain (100%)	90 days	Engineer
Local	Floodplain Development	Floodplain Development	Town of Johnstown	Verify location of works not within floodplain	New construction	Certain (100%)	30 days	Engineer
	Site Development Plan	Site Development Plan	Town of Johnstown	New construction or development within town boundaries	New development	Certain (100%)	120 days	Engineer
	Building Permit	Building Permit	Town of Johnstown	New construction within town boundaries	New construction	Certain (100%)	60 days	Engineer

Task 203 – Desktop Analysis:

Engineer shall review data provided by Owner (record drawings, operating records). Conduct field visual assessment of existing assets to determine if assets suitable to integrate in the expanded WTP. Prepare technical memorandum (TM) to document the condition of existing assets. Develop up

Exhibit A – Engineer’s Services

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to three (3) potential process trains, and initial sizing calculations. Identify site conditions, includes review of existing soils report, potential for presence of environmental or cultural resources, identify site utilities (water, sanitary sewer, storm, electricity, data, communications, natural gas). Identify integration points with the existing WTP and potential impacts to the existing WTP operations.

The Owner shall be given at least one week to review all design deliverables prior to holding a review meeting or workshop.

Task 204 - Workshop 1 – Overall Treatment Train Options

Prepare agenda and facilitate an Overall Treatment Train Options Selection Workshop at the WTP to evaluate potential candidate treatment trains. Candidate trains include membrane filtration with granular activated carbon (GAC) and ozone and BAF. The preferred conceptual design will be selected using costs and non-monetary factors. The selection matrix will be provided to allow all parties to become familiar prior to the meeting. Engineer will lead a paired-comparison evaluation during the workshop. The workshop will identify the preferred option while noting the advantages and disadvantages to each option. Provide summary notes to document the decisions made during the Selection Workshop.

Task 205 - Water Characterization

Owner to provide population projections as basis for future water demand calculations. Engineer shall use the existing water quality data and conduct additional field analysis to characterize water quality. Engineer shall summarize water quality data in a TM. This task includes an allowance up to \$20,000 for laboratory analytical costs for parameters not included within Owner's available data.

Task 206 - Pretreatment Capacity Analysis

Engineer shall analyze the conversion of the existing dissolved air flotation (DAF) to saturated air flotation (SAF). Includes sending sample water to SAF vendor for jar testing at their facility. Identify process modifications to implement SAF and sequence of construction to minimize impact to operations.

Task 207 - Prepare 2 Layout Options for Selected Treatment Train

Engineer shall prepare two (2) schematic layout options for the expanded WTP. Includes preliminary sizing of process units and proposed structures.

Owner to indicate if the adjacent property will be acquired for the WTP expansion prior to Engineer starting Task 207 to avoid additional Engineer effort to redesign schematic layouts.

Task 208 - Taste & Odor Control Option Selection

Engineer shall prepare comparison of taste and odor control options including granular activated carbon (GAC), ozone, biologically active filtration (BAF). Task will include available operating data from the 2021 GAC demonstration project. Summarize taste and odor control options in a TM.

Task 209 - Workshop 2 - Taste & Odor Control Option Selection

Prepare agenda and facilitate a Taste & Odor Options Selection Workshop to evaluate potential an overall taste and odor control toolbox. Discuss treatment options from source management, blending ratios, PAC at Lone Tree, ozone, BAF and GAC. The workshop will identify the preferred option while noting the advantages and disadvantages to each option. Provide summary notes to document the decisions made during the Workshop.

Task 210 - Disinfection & Distribution Pump Station Options Development

Engineer shall complete disinfection, distribution storage and pumping analysis, including design of new disinfection contact basin. Coordinate capacity of pump station with Owner for other planned distribution system improvements. Investigate options for reuse of existing ground storage tanks. Improvements to the ground storage tanks are excluded. Prepare design for a separate backwash supply cell to use un-chlorinated water for BAF backwash. Perform desktop analysis on corrosion impact to distribution system. Summarize findings in a TM.

Task 211 - Workshop 3 - Alternative Design Comparison

Engineer shall host an interactive workshop at the Owner's facilities to discuss design documents prepared to date, including all TM and analytical data. Workshop shall discuss anticipated raw water quality, treatment goals, taste and odor options, disinfection contact basin and distribution pump station design. Solicit Owner feedback to make collaborative decisions on the preferred process train for conceptual design.

Task 212 - Prepare Conceptual Design

Engineer shall advance the conceptual design, based on Owner feedback during Workshop 3. Conceptual design includes design drawings to show the selected treatment train layout, structure sizing, utilities, proposed structures and initial process & instrumentation diagrams. Conceptual design package to represent 15% complete design. Engineer to develop opinion of probable construction and annual operating costs, construction schedule and phases.

Based on the 15% design documents, Engineer shall prepare an AACE Class 4 engineer's opinion of probable cost for the project. This cost opinion will be submitted along with the design documents for review and comment by the Owner. The cost opinion will be based on recent bid tabulation information, historical cost data, and discussions with local suppliers and contractors. Assumptions will be included for reference. Conceptual drawings to be submitted in PDF format. Summarize cost and schedule in a TM.

Task 213 - Prepare WTP Siting Options, Construction & Prioritization Phases

Engineer shall prepare phasing plans to show the sequence of construction on the existing WTP property. Engineer shall prepare up to three (3) on the adjacent property. Phasing plan to indicate critical tie-ins that may impact the WTP operations, estimated durations and contingency plans. Work sequence shall identify construction tasks that should be performed during seasonal low demand periods. Summary in TM.

Task 214 - Basis of Design Report

Engineer shall prepare a Basis of Design Report (BODR) to document decisions made, design standards, design criteria, layout, estimated costs and schedule, based on feedback at Workshop.

Task 215 - Workshop 4 - Review Conceptual Design

Engineer shall host an interactive workshop at the Owner's facilities to discuss the conceptual design drawings and TM submitted to date. Solicit Owner feedback to make collaborative decisions on the selected conceptual design. Finalize conceptual design to carry forward into preliminary design. Provide summary notes to document the decisions made during the Workshop.

Task Series 300 – Preliminary Design (30%)

Task 301 - Develop Preliminary Design:

The Engineer will develop a set of schematic (30%) plans for the scope listed above. The 30% plans will consist of civil, architectural, structural, process, mechanical, electrical, and pipeline drawings necessary to convey the intended scope of improvements to potential Construction Manager At-Risk (CMAR) firms. Engineer will provide a PDF of the 30% plans (11"x17"). The plans will be prepared in accordance with Engineer's and/or sub-consultant's drafting standards.

This task includes the development of table of contents for the anticipated specifications for the expanded WTP scope. The Engineer shall finalize the process flow diagram for the WTP. The process flow diagram shall indicate the overall process flow but shall not include most valves or the number of equipment items. The Engineer will finalize the unit process sizing and include the information in a process design sheet in the 30% drawings.

The Engineer will finalize the hydraulics for the expanded WTP, including raw water, settled water, filtered water, treated water and backwash waste. The Engineer will coordinate with the Owner to finalize the hydraulics and coordinate tie-ins to raw or treated water.

Task 302 - Topographic Survey:

Conduct topographic survey requirements, as required by Engineer, to facilitate the detailed design of the expanded WTP on the existing 4.5 acres WTP property. Includes land survey plat, private utility located and title binder for one parcel. This work will be subcontracted.

Task 303 - Geotechnical Investigations:

Conduct geotechnical investigation of the existing WTP property, based on seven (7) boreholes, to develop foundation and pavement design recommendations. This work will be subcontracted.

Task 304 - Preliminary Design Report:

Engineer shall update the BODR with decisions made during the preliminary design phase in a preliminary design report (PDR). Engineer shall collaborate with the CMAR. CMAR will develop the estimated schedules and construction costs for the PDR.

Task 305 – Review Meeting 1 – Preliminary Design and Phasing:

Engineer shall host a Review Meeting 1 at the Owner's facilities to discuss the 30% design documents. The purpose of this meeting is to provide the Owner and Engineer an opportunity to clarify Owner comments on the documents. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email. Decision log and risk register will be updated.

Task Series 400 – Detailed Design (60%)

401 - Prepare 60% Design:

Engineer shall provide drawings at the 60% design level. The 60% drawings shall include drawings included in the 30% design package, brought to 60%, and additional detail drawings that are needed for final design. The plans will be prepared in accordance with Engineer's and/or subconsultant's drafting standards. The Engineer will develop a set of 60% specifications, consisting of draft specifications from all required engineering disciplines. Engineer will provide a PDF of the 60% plans (11"x17") and specifications.

The CMAR shall prepare estimated construction cost, schedule, and sequencing at the 60% and 90% deliverables. It is assumed that there is one work package (no early work packages, such as excavation or foundation packages).

402 - Utility Locates & Test Holes:

Engineer shall sub-contract for utility locates and test holes after site layout confirmed in preliminary design. Prepare utility report compatible with ASCE Class B. Allowance for up to ten (10) test holes. This work will be subcontracted.

403 - Review Meeting 2 - 60% Design:

After the Owner has had an opportunity to review the 60% design documents, Engineer will conduct a 60% design review meeting. The purpose of this meeting is to provide the Owner and Engineer an opportunity to clarify Owner comments on the documents. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email. Decision log and risk register will be updated.

404 - Initial Permitting Support:

Engineer shall prepare initial applications and supporting documents for approval submittals to CDPHE Water Quality Division, Owner Planning and Building Permit. This task includes initial coordination calls with the above entities, including, pre-application meetings, where applicable.

Task Series 500 – Final Design (90%)

501 - Prepare 90% Design:

Engineer shall provide plans at the 90% design level. The 90% drawings shall include 60% drawings, brought to 90%, and additional detail drawings that are needed for final design. Engineer will provide a PDF of the 90% plans (11"x17"). The plans will be prepared in accordance with BMcD's and/or subconsultant's drafting standards. Engineer shall develop a set of 90% specifications, consisting of specifications from required engineering disciplines. Engineer will provide a PDF of the 90% specifications.

502 - Review Meeting 3 - 90% Design:

After the Owner has had an opportunity to review the 90% design documents, Engineer will conduct a 90% design review meeting. The purpose of this meeting is to provide the Owner and Engineer an opportunity to clarify Owner comments on the documents. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email. Decision log and risk register will be updated.

503 - Final Permitting Support:

Engineer shall coordinate with authorities having jurisdiction, including response to comments on the initial submittals, submit updated documentation for final issue of permits.

504 - Prepare Construction Documents:

Engineer will incorporate any comments from the 90% design documents from the Owner, CMAR and reviewing authorities into the Issued for Construction documents. The issued for construction documents shall be signed and sealed by a professional engineer in the state of Colorado.

505 - Review Meeting 4 – Construction Documents:

Engineer will conduct a final review meeting with the Owner and CMAR to discuss the construction documents. The purpose of this meeting is to provide the Owner and Engineer an opportunity to clarify Owner and CMAR comments on the documents. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email. Decision log and risk register will be updated.

Task Series 600 – CMAR Selection & Collaboration

601 – Project Delivery Workshop

Engineer will host a collaborate Workshop within 30 days of project initiation with the Owner to discuss project delivery options. Options include Design-Bid-Build, Design-Build and Construction Management At-Risk (CMAR). The preferred delivery method will be selected using costs and non-monetary factors. The selection matrix will be provided to allow all parties to become familiar prior to the meeting. The workshop will identify the appropriate form of agreement between the Owner and contractor.

It is assumed for this scope of services that the selected delivery method will be CMAR.

602 – CMAR Execution Workshop

Engineer will host a collaborate Workshop with the Owner to discuss how to execute the project with CMAR delivery. Engineer shall provide a proposed sequence of tasks to the Owner prior to the meeting for their review. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email. Decision log and risk register will be updated.

603 – Prepare Request for Qualifications (RFQ) Documents:

Engineer shall prepare a RFQ document to issue to local construction contractors. The goal of the RFQ is to develop a short list of qualified contractors to invite to the proposal phase. The RFQ shall request contractor qualifications, including proposed staffing, recent project experience and references.

Owner shall provide their preferred CMAR forms of agreement for use. Owner shall manage the advertising of the RFQ.

It is assumed that the RFQ documents are issued with a description of the scope of work. This approach starts the CMAR selection process early in the design process to benefit of the CMAR contributions.

604 - Review Meeting 5 - CMAR RFQ Documents:

Engineer will conduct a review meeting with the Owner to discuss the CMAR RFQ documents. Owner shall provide comments for the Engineer to review and incorporate, where applicable. Engineer shall update the RFQ documents based on the review meeting comments. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email. Decision log and risk register will be updated.

605 - Evaluation of Received Qualification Packages & Development of Short List:

Engineer shall assist the Owner with evaluation of the received RFQ packages and facilitate a discussion on the shortlisted firms. Only firms on the shortlist will be invited to the proposal stage.

606 - Preparation of Request for Proposals (RFP):

Engineer shall prepare an RFP document to issue to the shortlisted firms. CMAR firms will propose on their project approach, schedules, comments on the proposed form of agreement, Phase 1 (pre-construction services) and CMAR fee (% fee on the cost of work). Owner shall manage the advertising of the RFP and related questions. It is assumed that the RFP documents are issued with the conceptual design (15%) package.

607 - Review Meeting 6 - CMAR RFP Documents:

Engineer will conduct a review meeting with the Owner to discuss the CMAR RFP documents. Owner shall provide comments for the Engineer to review and incorporate, where applicable. Engineer shall update the RFP documents based on the review meeting comments. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email.

608 - RFP Period Support:

Engineer shall support the Owner by responding in writing to questions received from CMAR firms.

609 - Evaluation of CMAR Proposals & Contractor Negotiation:

Engineer shall assist the Owner with evaluation of the received RFP packages and facilitate a selection of the preferred CMAR firm. Task includes participating in interviews with three (3) proponents.

610 - Review of Cost Estimates, Schedules, Value Engineering & Constructability Issues:

Engineer will work with the selected CMAR contractor to identify portions of the work that are candidates for early work packages, identify cost-saving or value engineering opportunities, identify long lead time equipment packages, and prioritize the design of these items accordingly. It is assumed that the Owner's building department will allow partial building permits and that early construction packages are possible.

CMAR to develop estimated construction costs and schedules at the 30%, 60%, 90% and final design milestones. Engineer shall review all estimates prepared by the CMAR, including the Guaranteed Maximum Price development and breakdown for completeness, contract compliance and conformity with the scope of work and the Owner's goals and expectations.

Task Series 700 – Equipment Procurement

701 - Prepare Documents for Early Procurement Packages:

Engineer shall collaborate with the Owner to identify early procurement packages. This scope of work assumes the following early procurement packages:

- SAF equipment
- Ozone system equipment
- BAF system equipment, including chemical dosing systems
- Pumping units (backwash supply, filtered water, distribution pumps, recycle pumps)
- Diesel generator

Engineer shall prepare technical specifications and layout drawings for the above packages.

702 - Prepare Procurement Request for Proposal Packages:

Engineer shall prepare issued for bid documents for the above equipment packages. Owner shall provide front-end procurement documents in their preferred format and facilitate the solicitation and receipt of proposals.

703 - Review Meeting 7 - Procurement Documents:

Engineer will conduct a review meeting with the Owner to discuss the procurement documents. Owner shall provide comments for the Engineer to review and incorporate, where applicable. Engineer shall update the procurement documents based on the review meeting comments. Engineer will provide meeting minutes with a decision log and list of action items. Meeting minutes will be distributed via email.

704 - Procurement Period Support:

Engineer shall support the Owner by responding in writing to questions received from equipment vendors.

705 - Evaluation & Negotiation of Procurement Packages:

Engineer shall assist the Owner with evaluation of the received equipment package bids. Engineer shall facilitate a selection of the preferred equipment supplier, based on monetary and non-monetary criteria.

This scope of work assumes that the CMAR contractor will assume responsibility for procurement of the equipment packages after selection by the Owner and Engineer.

706 - Submittal Review

Engineer shall review compliance submittals from equipment suppliers. Includes initial submittal review, coordination meetings and resubmittal review.

707- Coordination with Installing Contractor

Engineer shall coordinate with CMAR contractor on the scope, technical criteria, schedule, and CMAR-contracts of the equipment packages.

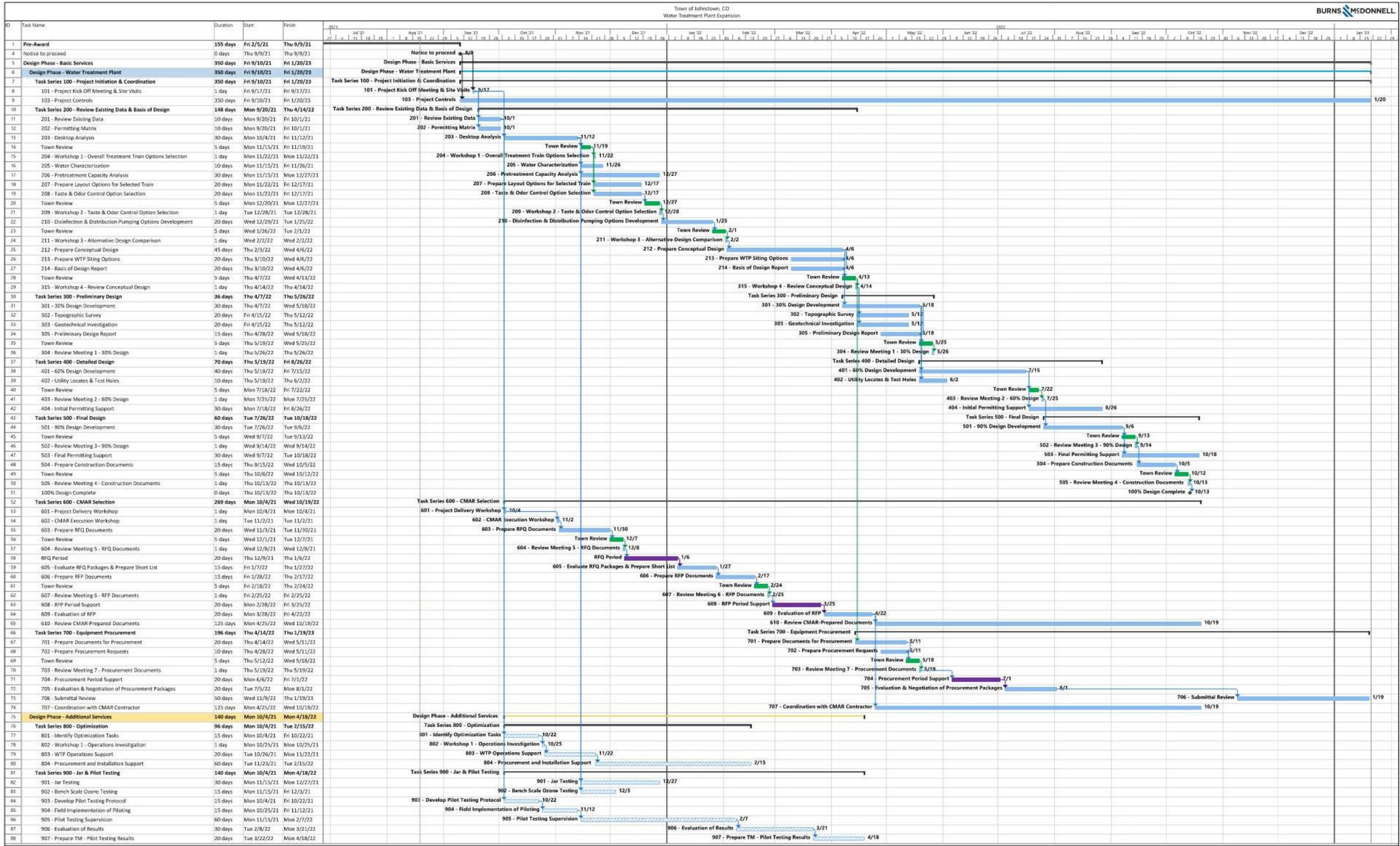


Figure A- 1 - Design Schedule

PART 2 – ADDITIONAL SERVICES

A2.01 *Additional Services Requiring Owner's Written Authorization*

- A. If authorized in writing by Owner, Engineer shall provide Additional Services of the types listed below. These services are not included as part of Basic Services and will be paid for by Owner as indicated in Exhibit C. The Parties recognize and agree that many of the listed Additional Services do not apply to this initial phase of the Project, developing the Engineering Design Plans, but may be applicable to subsequent phases of the Project. Pursuant to an amendment to this Agreement, certain of the Additional Services listed herein may become a Basic Service during such subsequent phases of the Project.

Task Series 800 – Optimize Operations

801 - Identify Optimization Tasks

Engineer shall prepare a questionnaire for WTP operators. Operators will be asked to complete the questionnaire and return it prior to our first operators' workshop. This will help gather a broad opinion of current concerns, challenges, and opportunities. Engineer will ask for each operator's level of comfort with particular technologies to seek their input on improving existing operations and safety. Engineer to conduct a site visit with Owner staff to investigate the current operations. Engineer to develop a list of potential optimization tasks based on operator input and the Engineer's site visit. The goal of the 500 Task Series is to provide Owner staff will relief during periods of high water demand until the expanded WTP is online.

802 - Workshop 5 - Operations Investigation

Engineer shall prepare agenda and facilitate a Workshop with Owner operations staff. The Workshop will identify the current bottlenecks and operating procedures that impact the Owner's ability to meet maximum day demands and water quality goals. Provide summary notes to develop action list of optimization tasks, including, but not limited to operational, maintenance, mechanical, electrical or control improvements that can be fast tracked.

803 - WTP Operations Support

Engineer shall provide support to WTP operations. Attend site on weekly basis, review Owner-supplied data and make recommendations to current O&M practices.

804 - Procurement & Installation Support

Engineer shall provide analysis and technical support to identified optimization tasks that are not immediately addressed by O&M practices. Includes on-site bench top testing, laboratory analysis (this work will be subcontracted), consulting with CDPHE. Engineer shall provide technical support for procurement, installation and start-up of equipment identified as an optimization tasks.

Task Series 900 – Jar & Pilot Testing

Task 901 - Jar Testing:

Engineer shall conduct bench scale jar testing and data collection at the WTP to assess optimal chemical dosing options for select constituent removals. The Owner will assist the collection of water supply samples and basic laboratory testing on the raw water that can be conducted onsite during testing (turbidity,

temperature, color, UVT, pH, hardness, and alkalinity). The Engineer assumes that the cost for all lab equipment, consumables and outside water quality laboratory work would be paid by the Owner. This work will be subcontracted.

Engineer shall provide a TM to include the testing results. Owner comments from the draft TM will be incorporated into the final TM.

Task 902 - Bench Scale Ozone Testing:

Engineer shall conduct bench scale testing to determine if raw or intermediate ozone preferred. Engineer shall determine bromate interaction and disinfection byproduct formation potential, using Engineer-supplied ozone generator and laboratory analysis. Feed water will be spiked with organic compounds to simulate peak taste and odor conditions. This work may be subcontracted.

Task 903 - Develop Testing Protocol:

The treatment process that will be analyzed during the pilot test is ozone and granular media filtration. Detailed protocols will be provided by Engineer for each unit process included in the pilot test prior to the initiation of pilot testing. CDPHE will be contacted prior to performing a pilot test and approved by CDPHE if we plan on utilizing the pilot to provide justification for straying from the CDPHE design guidelines.

Task 904 - Field Implementation of Pilot Testing:

Pilot testing will take place onsite at the Johnstown WTP. Effluent from the existing DAF units will be the raw water supply to the pilot units. A small submersible pump may be required for the unit. It is assumed that the Owner would supply the submersible pump with design information from the Engineer.

Task 905 - Pilot Testing Supervision:

Owner staff will oversee the daily (Monday through Friday) operation of the pilot system for its 8 week duration. If the system goes down over the weekend, Owner staff will maintain it on Monday. Daily operation tasks will involve collecting and analyzing water quality samples, maintaining target flowrates and chemical dosing rates, measuring flowrates at specified locations and frequencies, recording visual observations, and noting any issues that occur with the pilot testing components.

Task 906 - Evaluation of Results:

Pilot-Scale testing progress meetings will be held bi-weekly (every two weeks). These meetings will either be held at Johnstown's offices or by phone conference / Microsoft LiveMeeting. The goal of these meetings is to present data collected and summarize results from the previous two weeks of pilot testing. This will be a time to discuss testing progress, any issues with the system, and preview any modifications that will be made to the system (adjust process loading rates, dosing rates, etc.). Engineer (with the cooperation of Johnstown personnel working on the pilot) will prepare an Agenda and compile a summary of results prior to each meeting. Engineer will provide meeting minutes with a decision log and list of action items.

Task 907 - TM7 - Pilot Testing Results:

Engineer will prepare a technical memorandum documenting findings identified during pilot-testing. The technical memorandum will summarize the effectiveness of treatments tested during the pilot test and will culminate in recommended loading rates and dosing rates for each unit process and chemical for the startup and operation of the Water Treatment Plant under various water quality and temperature conditions. The technical memorandum will also describe any perceived weakness in the treatment system and methods that can be utilized (design and operation) to overcome.

Task Series 1000 – Owner Costs for Piloting by Engineer

The following items will be procured and paid for by the Owner: chemicals, chemical feed pumps, electricity, electricity installation, unloading of the pilot units with a crane, chemical consumption, maintenance consumables, daily operation, collection of grab samples, water quality testing and performing pilot system repairs.

Task 1001 – Ozone Pilot Rental

The Engineer or the Owner can lease an ozone pilot system. The most applicable party to lease this equipment will be determined early in the project. It is assumed the pilot will come with a storage container due to the limited building space onsite. This work will be subcontracted.

Task 1002 – BAF Pilot Rental

The Engineer or the Owner can lease a granular media filtration pilot system. The most applicable party to lease this equipment will be determined early in the project. It is assumed the pilot will come with a shipping container due to the limited building space onsite. This work will be subcontracted.

Task 1003 – Pilot Site Implementation

The Engineer will assist with the installation and implementation of the pilot. The Engineer will hire a contractor to install the unit.

1. Preparation of applications and supporting documents (in addition to those furnished under Basic Services) for private or governmental grants, loans, or advances in connection with the Project; preparation or review of environmental assessments and impact statements; review and evaluation of the effects on the design requirements for the Project of any such statements and documents prepared by others; and assistance in obtaining approvals of authorities having jurisdiction over the anticipated environmental impact of the Project.
2. Services to make measured drawings of existing conditions or facilities, to conduct tests or investigations of existing conditions or facilities, or to verify the accuracy of drawings or other information furnished by Owner or others.
3. Services resulting from significant changes in the scope, extent, or character of the portions of the Project designed or specified by Engineer, or the Project's design requirements, including, but not limited to, changes in size, complexity, Owner's schedule, character of construction, or method of financing; and revising previously accepted studies, reports, Drawings, Specifications, or Construction Contract Documents when such revisions are required by changes in Laws and Regulations enacted subsequent to the Effective Date or are due to any other causes beyond Engineer's control.
4. Services resulting from Owner's request to evaluate additional alternative solutions beyond those agreed to in Paragraph A1.01.
5. Services required as a result of Owner's providing incomplete or incorrect Project information to Engineer.

6. Services related to the acquisition of property related to the Work, beyond the exhibits, drawings and definitions included as part of Basic Services.
7. Providing renderings or models for Owner's use, including services in support of building information modeling or civil integrated management.
8. Undertaking investigations and studies including, but not limited to:
 - a. detailed consideration of operations, maintenance, and overhead expenses.
 - b. the preparation of feasibility studies (such as those that include projections of output capacity, utility project rates, project market demand, or project revenues) and cash flow analyses, provided that such services are based on the engineering and technical aspects of the Project, and do not include rendering advice regarding municipal financial products or the issuance of municipal securities.
 - c. preparation of appraisals.
 - d. evaluating processes available for licensing and assisting Owner in obtaining process licensing.
 - e. detailed quantity surveys of materials, equipment, and labor; and
 - f. audits or inventories required in connection with construction performed or furnished by Owner.
9. Furnishing services of Consultants for other than Basic Services.
10. Providing data or services of the types described in Exhibit B, when Owner retains Engineer to provide such data or services instead of Owner furnishing the same.
11. Providing the following services:
 - a. Services attributable to more prime construction contracts than specified in Paragraph A1.03.D.
 - b. Services to arrange for performance of construction services for Owner by contractors other than the principal prime Contractor and administering Owner's contract for such services.
12. Services during out-of-town travel required of Engineer, other than for visits to the Site, Owner's office or CDPHE's offices as required in Basic Services (Part 1 of Exhibit A).
13. Preparing for, coordinating with, participating in and responding to structured independent review processes, including, but not limited to, construction management, cost estimating, project peer review, value engineering, and constructability review requested by Owner; and performing or furnishing services required to revise studies, reports, Drawings, Specifications, or other documents as a result of such review processes.

14. Preparing additional bidding-related documents (or requests for proposals or other construction procurement documents) or Construction Contract Documents for alternate bids or cost estimates requested by Owner for the Work or a portion thereof.
15. Assistance in connection with bid protests, rebidding, or renegotiating contracts for construction, materials, equipment, or services.
16. Preparing conformed Construction Contract Documents that incorporate and integrate the content of all Addenda and any amendments negotiated by Owner and Contractor.
17. Providing Construction Phase services beyond the original date for completion and readiness for final payment of Contractor, but only if such services increase the total quantity of services to be performed in the Construction Phase, rather than merely shifting performance of such services to a later date.
18. Preparing Record Drawings, and furnishing such Record Drawings to Owner.
19. Supplementing Record Drawings with information regarding the completed Project, Site, and immediately adjacent areas obtained from field observations, Owner, utility companies, and other reliable sources.
20. Conducting surveys, investigations, and field measurements to verify the accuracy of Record Drawing content obtained from Contractor, Owner, utility companies, and other sources; revise and supplement Record Drawings as needed.
21. Preparation of operation, maintenance, and staffing manuals.
22. Protracted or extensive assistance in refining and adjusting of Project equipment and systems (such as initial startup, testing, and balancing).
23. Assistance to Owner in training Owner's staff to operate and maintain Project equipment and systems.
24. Assistance to Owner in developing systems and procedures for (a) control of the operation and maintenance of Project equipment and systems, and (b) related recordkeeping.
25. Preparing to serve or serving as a consultant or witness for Owner in any litigation, arbitration, lien or bond claim, or other legal or administrative proceeding involving the Project.
26. Overtime work requiring higher than regular rates, but only upon Owner's prior written approval.
27. Providing construction surveys and staking to enable Contractor to perform its work other than as required under Paragraph A1.05.A.8; any type of property surveys or related engineering services needed for the transfer of interests in real property; and providing other special field surveys.
28. Providing more extensive services required to enable Engineer to issue notices or certifications requested by Owner.

Exhibit A – Engineer's Services

EJCDC® E-500, Agreement Between Owner and Engineer for Professional Services.

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29. Extensive services required during any correction period, or with respect to monitoring Contractor's compliance with warranties and guarantees called for in the Construction Contract (except as agreed to under Basic Services).
30. Other additional services performed or furnished by Engineer not otherwise provided for in this Agreement.

A2.02 Additional Services Not Requiring Owner's Written Authorization

- A. Engineer shall advise Owner that Engineer is commencing to perform or furnish the Additional Services of the types listed below. For such Additional Services, Engineer shall request and obtain specific advance written authorization from Owner. Engineer shall cease performing or furnishing such Additional Services upon receipt of written notice to cease from Owner.
 1. Services in connection with Work Change Directives and Change Orders to reflect changes requested by Owner.
 2. Services in making revisions to Drawings and Specifications occasioned by the acceptance of substitute materials or equipment other than "or equal" items; services after the award of the Construction Contract in evaluating and determining the acceptability of a proposed "or equal" or substitution which is found to be inappropriate for the Project; evaluation and determination of an excessive number of proposed "or equals" or substitutions, whether proposed before or after award of the Construction Contract.
 3. Services resulting from significant delays, changes, or price increases occurring as a direct or indirect result of materials, equipment, or energy shortages.
 4. Additional or extended services arising from (a) the presence at the Site of any Constituent of Concern or items of historical or cultural significance, (b) emergencies or acts of God endangering the Work, (c) damage to the Work by fire or other causes during construction, (d) a significant amount of defective, neglected, or delayed Work, (e) acceleration of the progress schedule involving services beyond normal working hours, or (f) default by Contractor.
 5. Services (other than Basic Services during the Post-Construction Phase) in connection with any partial utilization of the Work by Owner prior to Substantial Completion.
 6. Evaluating unreasonable or frivolous requests for interpretation or information (RFIs), Change Proposals, or other demands from Contractor or others in connection with the Work, or an excessive number of RFIs, Change Proposals, or demands.
 7. Reviewing a Shop Drawing or other Contractor submittal more than three times, as a result of repeated inadequate submissions by Contractor.
 8. While at the Site, compliance by Engineer and its staff with those terms of Owner's or Contractor's safety program provided to Engineer subsequent to the Effective Date that exceed those normally required of engineering personnel by federal, State, or local safety authorities for similar construction sites.

This is **EXHIBIT B**, consisting of 3 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

Owner's Responsibilities

Article 2 of the Agreement is supplemented to include the following agreement of the parties.

B2.01 In addition to other responsibilities of Owner as set forth in this Agreement, Owner shall at its expense:

- A. Provide Engineer with all criteria and full information as to Owner's requirements for the Project, including design objectives and constraints, space, capacity and performance requirements, flexibility, and expandability, and any budgetary limitations.
- B. If Engineer is retained to provide bidding assistance, provide Engineer with Owner's bidding requirements.
- C. Furnish to Engineer any other available information pertinent to the Project including reports and data relative to previous designs, construction, or investigation at or adjacent to the Site.
- D. Following Engineer's assessment of initially-available Project information and data and upon Engineer's request, obtain, furnish, or otherwise make available (if necessary, through title searches, or retention of specialists or consultants) such additional Project-related information and data as is reasonably required to enable Engineer to complete its Basic and Additional Services. Engineer and its Consultants shall be entitled to rely on the completeness and accuracy of such Owner-furnished information. Such additional information or data would generally include the following:
 - 1. Property descriptions.
 - 2. Zoning, deed, and other land use restrictions.
 - 3. Utility and topographic mapping and surveys.
 - 4. Property, boundary, easement, right-of-way, and other special surveys or data, including establishing relevant reference points.
 - 5. Explorations and tests of subsurface conditions at or adjacent to the Site; geotechnical reports and investigations; drawings of physical conditions relating to existing surface or subsurface structures at the Site; hydrographic surveys, laboratory tests and inspections of samples, materials, and equipment; with appropriate professional interpretation of such information or data.
 - 6. Environmental assessments, audits, investigations, and impact statements, and other relevant environmental, historical, or cultural studies relevant to the Project, the Site, and adjacent areas.

7. Data or consultations as required for the Project but not otherwise identified in this Agreement.
- E. Arrange for safe access to and make all provisions for Engineer to enter upon public property as required for Engineer to perform services under the Agreement.
- F. Recognizing and acknowledging that Engineer's services and expertise do not include the following services, provide, as required for the Project:
 1. Accounting, bond and financial advisory (including, if applicable, "municipal advisor" services as described in Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) and the municipal advisor registration rules issued by the Securities and Exchange Commission), independent cost estimating, and insurance counseling services.
 2. Legal services with regard to issues pertaining to the Project as Owner requires, Contractor raises, or Engineer reasonably requests.
 3. Such auditing services as Owner requires to ascertain how or for what purpose Contractor has used the money paid.
- G. Provide the services of an independent testing laboratory to perform all inspections, tests, and approvals of samples, materials, and equipment required by the Construction Contract Documents (other than those required to be furnished or arranged by Contractor), or to evaluate the performance of materials, equipment, and facilities of Owner, prior to their incorporation into the Work with appropriate professional interpretation thereof. If requested, provide Engineer with the findings and reports generated by testing laboratories, including findings and reports obtained from or through Contractor.
- H. Provide reviews, approvals, and permits from all governmental authorities having jurisdiction to approve all phases of the Project designed or specified by Engineer and such reviews, approvals, and consents from others as may be necessary for completion of each phase of the Project.
- I. Upon request, advise Engineer of the identity and scope of services of any independent consultants employed by Owner to perform or furnish services in regard to the Project, including, but not limited to, cost estimating, project peer review, value engineering, and constructability review.
- J. If Owner designates a construction manager or an individual or entity other than, or in addition to, Engineer to represent Owner at the Site, the parties may define and set forth as an attachment to this Exhibit B the duties, responsibilities, and limitations of authority of such other party and the relation thereof to the duties, responsibilities, and authority of Engineer.
- K. If more than one prime contract is to be awarded for the Work designed or specified by Engineer, then designate a person or entity to have authority and responsibility for coordinating the activities among the various prime Contractors, and define and set forth the duties, responsibilities, and limitations of authority of such individual or entity and the relation thereof to the duties, responsibilities, and authority of Engineer as an attachment to this Exhibit

B that is to be mutually agreed upon and made a part of this Agreement before such services begin.

- L. Inform Engineer in writing of any specific requirements of safety or security programs that are applicable to Engineer, as a visitor to the Site.
- M. Examine all alternative solutions, studies, reports, sketches, Drawings, Specifications, proposals, and other documents presented by Engineer (including obtaining advice of an attorney, risk manager, insurance counselor, financial/municipal advisor, and other advisors or consultants as Owner deems appropriate with respect to such examination) and render in writing timely decisions pertaining thereto.
- N. Inform Engineer regarding any need for assistance in evaluating the possible use of Project Strategies, Technologies, and Techniques, as defined in Exhibit A.
- O. Advise Engineer as to whether Engineer's assistance is requested in identifying opportunities for enhancing the sustainability of the Project.
- P. Place and pay for advertisement for Bids in appropriate publications.
- Q. Furnish to Engineer data as to Owner's anticipated costs for services to be provided by others (including, but not limited to, accounting, bond and financial, independent cost estimating, insurance counseling, and legal advice) for Owner so that Engineer may assist Owner in collating the various cost categories which comprise Total Project Costs.
- R. Attend and participate in the pre-bid conference, bid opening, pre-construction conferences, construction progress and other job-related meetings, and Site visits to determine Substantial Completion and readiness of the completed Work for final payment.
- S. Authorize Engineer to provide Additional Services as set forth in Part 2 of Exhibit A of the Agreement, as required.
- T. The Owner shall, at the written request of the Engineer, prior to the commencement of Engineer's services and thereafter, furnish to the Engineer reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under this Agreement. When requested, furnishing of such evidence shall be a condition precedent to the commencement or continuation of the Engineer's services. After such evidence has been furnished, the Owner shall not materially vary such financial arrangements without appropriation.
- U. If the Owner requires that any assembly, system, product item of material, or design be included in the Project without (or against) the Engineer's recommendation, or if the Owner selects a contractor, subcontractor, or material fabricator, or any assembly, system, product or item of material, without (or against) the Engineer's recommendation, the Engineer shall have no responsibility for such decision by the Owner or for the performance of such owner-specified items or persons, nor shall the Engineer be required to issue any opinion or certificate with respect to such items or the work of such persons.

This is **EXHIBIT C**, consisting of 5 pages, referred to in and part of the Agreement between Owner and Engineer for Professional Services dated August 17, 2021.

Payments to Engineer for Services and Reimbursable Expenses
COMPENSATION PACKET BC-1: Basic Services – Lump Sum

Article 2 of the Agreement is supplemented to include the following agreement of the parties:

ARTICLE 2 – OWNER’S RESPONSIBILITIES

C2.01 Compensation for Basic Services (other than Resident Project Representative) – Lump Sum Method of Payment

- A. Owner shall pay Engineer for Basic Services set forth in Exhibit A as follows:
1. Design Phase Services for WTP: A Lump Sum, not to exceed, amount of \$ 2,059,442 based on the following estimated distribution of compensation:
 2. Engineer may alter the distribution of compensation between individual phases noted herein to be consistent with services actually rendered, but shall not exceed the total Lump Sum amount unless approved in writing by the Owner.
 3. The Lump Sum includes compensation for Engineer’s services and services of Engineer’s Consultants, if any. Appropriate amounts have been incorporated in the Lump Sum to account for labor costs, overhead, profit, expenses (other than any expressly allowed Reimbursable Expenses), and Consultant charges.
 4. The portion of the Lump Sum amount billed for Engineer’s services will be based upon Engineer’s estimate of the percentage of the total services actually completed during the billing period. If any Reimbursable Expenses are expressly allowed, Engineer may also bill for any such Reimbursable Expenses incurred during the billing period as an additional amount to the stipulated lump sum.
- B. *Period of Service:* The compensation amount stipulated in Compensation Packet BC-1 is conditioned on a period of service not exceeding 16 months. If such period of service is extended, the compensation amount for Engineer's services may, by written agreement, be adjusted.

C2.02 *Compensation for Additional Services as a Reimbursable Expenses*

- A. In addition to the Lump Sum, Engineer is also entitled to reimbursement from Owner for the Reimbursable Expenses.
- B. For budgeting purposes only, the additional services are estimated to be \$831,280. This is for the Design Phase only.
- C. Owner shall pay Engineer for all Reimbursable Expenses at the rates set forth in Appendix 1 to this Exhibit C. To the extent the Reimbursable Expenses are not expressly set forth in Appendix 1, Engineer shall only invoice Owner for such expenses to the extent reasonable.
- D. Reimbursable Expenses include the following, to the extent reasonable: transportation (including mileage), lodging, and subsistence incidental thereto; upon the prior written consent of Owner, providing and maintaining field office facilities including furnishings and utilities; toll telephone calls, mobile phone charges, and courier charges; reproduction of reports, Drawings, Specifications, bidding-related or other procurement documents, Construction Contract Documents, and similar Project-related items; and Consultants' charges. In addition, if authorized in advance by Owner, Reimbursable Expenses will also include expenses incurred for the use of highly specialized equipment.
- E. The amounts payable to Engineer for Reimbursable Expenses will be the Project-related internal expenses actually incurred or allocated by Engineer, plus all invoiced external Reimbursable Expenses allocable to the Project, the latter multiplied by a factor of 1.1.

C2.03 *Other Provisions Concerning Payment*

- A. Whenever Engineer is entitled to compensation for the charges of Engineer's Consultants, those charges shall be the amounts billed by Engineer's Consultants to Engineer times a factor of 1.1, except that Engineer's Consultant's charges are already included in C2.01. If additional Consultants are retained, Engineer shall obtain the prior written consent of Owner.
- B. *Factors:* The external Reimbursable Expenses and Engineer's Consultants' factors include Engineer's overhead and profit associated with Engineer's responsibility for the administration of such services and costs.
- C. To the extent necessary to verify Engineer's charges and upon Owner's timely request, Engineer shall make copies of such records available to Owner at cost.

This is **EXHIBIT C.01**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

[Omitted]

Additional Services – Standard Hourly Rates

Article 2 of the Agreement is supplemented to include the following agreement of the parties:

C2.04 Compensation for Additional Services – Standard Hourly Rates Method of Payment

A. Owner shall pay Engineer for Additional Services, if any, as follows:

1. *General:* For services of Engineer's personnel engaged directly on the Project pursuant to Paragraph A2.01 or A2.02 of Exhibit A, except for services as a consultant or witness under Paragraph A2.01.A.20, (which if needed shall be separately negotiated based on the nature of the required consultation or testimony) an amount equal to the cumulative hours charged to the Project by each class of Engineer's personnel times Standard Hourly Rates for each applicable billing class for all Additional Services performed on the Project, plus related Reimbursable Expenses and Engineer's Consultant's charges, if any.
2. *Standard Hourly Rates are as set forth in Appendix 1 to this Exhibit C.*

B. *Compensation For Reimbursable Expenses:*

1. For those Reimbursable Expenses that are not accounted for in the compensation for Basic Services under Paragraph C2.01 and are directly related to the provision of Additional Services, Owner shall pay Engineer at the rates set forth in Appendix 1 to this Exhibit C.
2. Reimbursable Expenses may include the expenses identified in Appendix 1 and the following categories, to the extent reasonable: transportation (including mileage), lodging, and subsistence incidental thereto; providing and maintaining field office facilities including furnishings and utilities; toll telephone calls, mobile phone charges, and courier charges; reproduction of reports, Drawings, Specifications, bidding-related or other procurement documents, Construction Contract Documents, and similar Project-related items; and Consultants' charges. In addition, if authorized in advance by Owner, Reimbursable Expenses will also include expenses incurred for the use of highly specialized equipment.
3. The amounts payable to Engineer for Reimbursable Expenses, if any, will be the Additional Services-related internal expenses actually incurred or allocated by Engineer, plus all invoiced external Reimbursable Expenses allocable to such Additional Services, the latter multiplied by a factor of 1.1.
4. The Reimbursable Expenses Schedule may be adjusted annually (as of January 1) to reflect equitable changes in the compensation payable to Engineer on the condition that such Schedule is provided to Owner at least thirty (30) days in advance of the proposed increase.

C. *Other Provisions Concerning Payment for Additional Services:*

1. Whenever Engineer is entitled to compensation for the charges of Engineer's Consultants, those charges shall be the amounts billed by Engineer's Consultants to Engineer times a factor of 1.1
2. *Factors:* The external Reimbursable Expenses and Engineer's Consultant's Factors include Engineer's overhead and profit associated with Engineer's responsibility for the administration of such services and costs.
3. To the extent necessary to verify Engineer's charges and upon Owner's timely request, Engineer shall make copies of such records available to Owner at cost.

This is **Appendix 1 to EXHIBIT C**, consisting of 5 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

Reimbursable Expenses Schedule

A. *Standard Hourly Rates:*

1. The Standard Hourly Rates apply only as specified in Article C2.

Schedule of Hourly Professional Service Billing Rates

Position Classification	Classification Level	Hourly Billing Rate
General Office *	5	\$65.00
Technician *	6	\$82.00
Assistant *	7	\$98.00
	8	\$131.00
	9	\$157.00
Staff *	10	\$179.00
	11	\$198.00
Senior	12	\$219.00
	13	\$240.00
Associate	14	\$252.00
	15	\$254.00
	16	\$257.00
	17	\$259.00

NOTES:

1. Position classifications listed above refer to the firm's internal classification system for employee compensation. For example, "Associate", "Senior", etc., refer to such positions as "Associate Engineer", "Senior Architect", etc.
2. For any nonexempt personnel in positions marked with an asterisk (*), overtime will be billed at 1.5 times the hourly labor billing rates shown.
3. For outside expenses incurred by Burns & McDonnell, such as authorized travel and subsistence, and for services rendered by others such as subcontractors, the client shall pay the cost to Burns & McDonnell plus 10%.
4. Monthly invoices will be submitted for payment covering services and expenses during the preceding month. Invoices are due upon receipt. A late payment charge of 1.5% per month will be added to all amounts not paid within 30 days of the invoice date.
5. The services of contract/agency and/or any personnel of a Burns & McDonnell subsidiary or affiliate shall be billed to Owner according to the rate sheet as if such personnel is a direct employee of Burns & McDonnell.
6. The rates shown above are effective for services through December 31, 2021, and are subject to revision thereafter.

Company Print Services Billing Schedule

Effective Date
January 1, 2021

PHOTOCOPY

The photocopy process is used for either black and white or color copies/prints up to 12x18. Stock used can be from 20 lb. bond to 100 lb. cover weight, including index tabs. This process is best utilized by:

- Book printing
- Letters and memos
- Line drawings
- Manuals
- Specification covers
- Report covers
- Specifications
- Addendums
- All preliminary documents
- Newsletters
- Booklets
- Forms
- Meeting handouts

PHOTOCOPY – Imaging/Printing on 20 lb. bond

B/W Copies/Prints

8½x11 to 8½x14.....	\$0.06
11x17.....	\$0.14
12x18.....	\$0.24

Color Copies/Prints

8½x11 to 8½x14.....	\$0.38
11x17.....	\$0.80
12x18.....	\$1.30

Central Print Services Only (B/W Volume Discounts - per page)

	8½x11/ 8½x14	11x17	12x18
1 – 2,500.....	\$0.06.....	\$0.14.....	\$0.24
2,501 – 7,500.....	\$0.05.....	\$0.12.....	\$0.22
7,501 – 15,000.....	\$0.04.....	\$0.10.....	\$0.20
15,001 – up.....	\$0.03.....	\$0.08.....	\$0.18

Central Print Services Only (Color Volume Discounts - per page)

	8½x11/ 8½x14	11x17	12x18
1 – 1,500.....	\$0.38.....	\$0.80.....	\$1.30
1,501 – 4,500.....	\$0.33.....	\$0.70.....	\$1.20
4,501 – 7,500.....	\$0.28.....	\$0.60.....	\$1.10
7,501 – up.....	\$0.23.....	\$0.50.....	\$1.00

* Larger than 12 x 18 - See Large Photocopy

Handwork: Labor-charge \$36.00 per hour.

Overtime work will be billed at \$54.00 per hour.

Minimum overtime charge is one hour.

Binding/Finishing

Up to 12x18

3 Hole Drill.....	Per 3 Hole.....	\$0.75
Folding (machine).....	Per Page.....	\$0.04
Folding (by hand).....	Per Page.....	\$0.10
Staple (machine).....	Per Staple.....	\$0.03
Staple (by hand).....	Per Staple.....	\$0.08
Edge Bind.....	Per Book.....	\$1.75
Standard Bind.....	Per Book.....	\$3.00
GBC Plastic Bind.....	Per Book.....	\$3.00
Plastic Coil Bind.....	Per Book.....	\$3.00
Wire Bind.....	Per Book.....	\$3.30
Screw Post Bind.....	Per Post.....	\$2.00
Hand Inserting.....	Per Page.....	\$0.15

Laminating

Double Sided

Up to 11x17.....	\$2.50 Per Page
Larger Than 11x17.....	\$2.00 Per. Sq. Ft.

The rates shown above are effective for services through December 31, 2021, and are subject to revision thereafter.

LARGE FORMAT PHOTOCOPY/PRINTING/PLOTTING

Black & White & Color copy/prints up to 36" wide are available on the HP PageWide 8000. All plots will be on bond, Mylar/Film at client's request. This process is best utilized by:

- Approval sets
- Draft sets
- Preliminary sets

WHQ Copy Center Unit Price
B/W = \$0.24 sf Color = \$3.00 sf
(L/C - Line Color = \$1.99 SF)

	B/W	L/C	Color
12x18.....	\$0.48.....	\$3.98.....	\$6.00
15x21.....	\$0.72.....	\$5.97.....	\$9.00
18x24.....	\$0.72.....	\$5.97.....	\$9.00
22x34.....	\$1.44.....	\$11.94.....	\$18.00
24x36.....	\$1.44.....	\$11.94.....	\$18.00
28x40.....	\$1.92.....	\$15.92.....	\$24.00
30x42.....	\$2.16.....	\$17.71.....	\$27.00
34x44.....	\$2.64.....	\$21.87.....	\$30.00
36x48.....	\$2.88.....	\$23.88.....	\$36.00

Larger than 12 sq. ft.:

Actual square footage x \$0.26 per sq. ft. B/W
Actual square footage x \$3.00 per sq. ft. Color

For mylar, add \$0.85 per sq. ft.

DISCOUNT TABLE/CENTRAL PRINT SERVICES

Square footage rounds up

	<u>Over 3,000 Sq. Ft. Per Order</u>		<u>Unit Price</u>
	B/W	L/C	Color
12x18.....	\$0.41.....	\$3.83.....	\$5.02
15x21.....	\$0.54.....	\$5.25.....	\$6.75
18x24.....	\$0.54.....	\$5.25.....	\$6.75
22x34.....	\$1.08.....	\$10.50.....	\$13.50
24x36.....	\$1.08.....	\$10.50.....	\$13.50
28x40.....	\$1.44.....	\$14.00.....	\$18.00
30x42.....	\$1.62.....	\$15.75.....	\$20.25
34x44.....	\$1.98.....	\$19.75.....	\$24.75
36x48.....	\$2.16.....	\$21.00.....	\$27.00

Finishing

Folding (by machine).....	per page.....	\$0.75
Staple.....	per Staple.....	\$0.10
Staple with edge binder.....	per Set.....	\$2.50
Post bind.....	per Post.....	\$2.00
Hole Drilling.....	per Hole.....	\$0.25

Handwork will be charged if total time needed to complete is more than 15 minutes.

Labor charge is \$36.00 per hour.

Overtime will be billed at \$54.00 per hour.

Minimum overtime charge is one hour.

Company Vehicle

Billing Schedule

Effective Date
January 1, 2021

	Type of Vehicle	Base Rate			Mileage Charge
		Daily	Weekly	Monthly	
Burns & McDonnell fleet vehicle use is charged using an assigned time component and miles traveled component. The assigned time component provides for daily, weekly and monthly durations. The miles traveled component relates to variable costs such as fuel, lubrication, tires, maintenance, routine cleaning, etc.	Sedan, 4 door	\$60	\$300	\$1,195	\$0.27
	Van	\$67	\$335	\$1,335	\$0.32
	Van, 12-15 Passenger	\$125	\$625	\$2,175	\$0.34
The daily charge applies when a vehicle is assigned for 7 days or less. The daily charge is for each 24-hour period or fraction thereof. The weekly charge applies when a vehicle is assigned for more than 7 consecutive days and less than 6 continuous weeks. For fractions of a week over 7 consecutive days, the weekly rate will be prorated by the number of days and fractional days the vehicle is assigned (one-seventh per calendar day).	Truck - 2WD Pickup, ½ Ton Regular Cab	\$ 52	\$260	\$1,035	\$0.30
	Truck - 2WD Pickup, ½ Ton Extended Cab	\$57	\$285	\$1,135	\$0.30
	Truck - 2WD Pickup, ½ Ton Crew Cab	\$62	\$310	\$1,235	\$0.30
The monthly charge applies when a vehicle is assigned for more than 6 continuous weeks. For fractions of a month over 6 continuous weeks, the monthly rate will be prorated by the number of months and fractional months the vehicle is assigned (one thirtieth per calendar day).	Truck - 4WD Pickup, ½ Ton Regular Cab	\$62	\$310	\$1,235	\$0.33
	Truck - 4WD Pickup, ½ Ton Extended Cab	\$66	\$330	\$1,305	\$0.33
	Truck - 4WD Pickup, ½ Ton Crew Cab	\$70	\$350	\$1,385	\$0.33
Employee-owned vehicles are charged at the per mile amount allowed by the Internal Revenue Service for business miles. Vehicles rented at destinations as part of short duration travel, such as airports, are charged per the receipt amount from the Rental Company, plus fuel, insurance, and other directly applicable amounts such as extra cleaning.	Truck - 4WD Pickup, ¾ Ton Extended Cab	\$78	\$395	\$1,575	\$0.34
	Truck - 4WD Pickup -¾ Ton Crew Cab	\$90	\$450	\$1,750	\$0.34
	Truck - 2WD Pickup, 1Ton Regular Cab	\$70	\$350	\$1,395	\$0.33
The base rate table displays Burns & McDonnell fleet vehicle charges that, in addition to providing the vehicle, provides all fuel, maintenance, repairs, fleet care, scheduling and liability insurance required by statute. For project needs involving any vehicle types that do not appear in the following table, charges will be established from prevailing market prices for the vehicle, miles traveled, and insurance premiums. For situations requiring higher insurance limits than required by statute, a vehicle high insurance limits charge can be prepared.	Truck - 4WD Pickup, 1Ton	\$90	\$450	\$1,795	\$0.34
	Compact SUV (Terrain, Equinox or similar)	\$67	\$335	\$1,335	\$0.33
	Mid-Size SUV (Acadia, Traverse or similar)	\$77	\$385	\$1,535	\$0.33
	Full Size SUV (Yukon, Tahoe or Similar 6+ Passenger)	\$89	\$520	\$1,995	\$0.34

The rates shown above are effective for services through December 31, 2021 and are subject to revision thereafter.

FLEET21

This is **EXHIBIT D**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

[Omitted.]

This is **EXHIBIT E**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

[Omitted.]

This is **EXHIBIT G**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

Insurance

Paragraph 6.05 of the Agreement is supplemented to include the following agreement of the parties:

G6.05 Insurance

- A. The limits of liability for the insurance required by Paragraph 6.05.A and 6.05.B of the Agreement are as follows:

1. By Engineer:

- a. Workers' Compensation: Statutory
- b. Employer's Liability --
 - 1) Bodily injury, each accident: \$[1,000,000]
 - 2) Bodily injury by disease, each employee: \$[1,000,000]
 - 3) Bodily injury/disease, aggregate: \$[1,000,000]
- c. General Liability --
 - 1) Each Occurrence (Bodily Injury and Property Damage): \$[1,000,000]
 - 2) General Aggregate: \$[2,000,000]
- d. Excess or Umbrella Liability --
 - 1) Per Occurrence: \$[2,000,000]
 - 2) General Aggregate: \$[2,000,000]
- e. Automobile Liability --Combined Single Limit (Bodily Injury and Property Damage):

\$[1,000,000]
- f. Professional Liability –
 - 1) Each Claim Made \$[2,000,000]
 - 2) Annual Aggregate \$[2,000,000]
- g. Other (specify): \$[]

2. The Owner shall be listed on Engineer's general liability policy as provided in Paragraph 6.05.A.

Exhibit G – Insurance.

This is **EXHIBIT H**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

Dispute Resolution

Paragraph 6.09 of the Agreement is supplemented to include the following agreement of the parties:

H6.09 *Dispute Resolution*

A. *Mediation*: Owner and Engineer agree that they shall first submit any and all unsettled claims, counterclaims, disputes, and other matters in question between them arising out of or relating to this Agreement or the breach thereof ("Disputes") to mediation by, unless the parties otherwise agree, the Judicial Arbiter Group in Denver, Colorado. Owner and Engineer agree to participate in the mediation process in good faith. The process shall be conducted on a confidential basis and shall be completed within 120 days. Owner and Engineer shall share equally in the cost of the mediation. If such mediation is unsuccessful in resolving a Dispute, then (1) the parties may mutually agree to a dispute resolution of their choice, or (2) either party may seek to have the Dispute resolved by a court of competent jurisdiction.

This is **EXHIBIT I**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

Limitations of Liability

Paragraph 6.11 of the Agreement is supplemented to include the following agreement of the parties:

Limitation of Engineer's Liability

- A. *Engineer's Liability Limited to Compensation under Agreement:* Notwithstanding any other provision of this Agreement, and to the fullest extent permitted by Laws and Regulations, the total liability, in the aggregate, of Engineer and Engineer's officers, directors, members, partners, agents, employees, and Consultants to Owner and anyone claiming by, through, or under Owner for any and all claims, losses, costs, or damages whatsoever arising out of, resulting from, or in any way related to the Project or the Agreement from any cause or causes, including but not limited to the negligence, professional errors or omissions, strict liability, breach of contract, indemnity obligations, or warranty express or implied, of Engineer or Engineer's officers, directors, members, partners, agents, employees, or Consultants (hereafter "Owner's Claims"), shall not exceed the total compensation to be paid under this Agreement.

This is **EXHIBIT J**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

[Omitted.]

This is **EXHIBIT K**, consisting of 2 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated August 17, 2021.

AMENDMENT TO OWNER-ENGINEER AGREEMENT
Amendment No. _____

The Effective Date of this Amendment is: _____.

Background Data

Effective Date of Owner-Engineer Agreement:

Owner:

Engineer:

Project:

Nature of Amendment: [Check those that are applicable and delete those that are inapplicable.]

- _____ Additional Services to be performed by Engineer
- _____ Modifications to services of Engineer
- _____ Modifications to responsibilities of Owner
- _____ Modifications of payment to Engineer
- _____ Modifications to time(s) for rendering services
- _____ Modifications to other terms and conditions of the Agreement

Description of Modifications:

Here describe the modifications, in as much specificity and detail as needed. Use an attachment if necessary.

Agreement Summary:

Original agreement amount:	\$ _____
Net change for prior amendments:	\$ _____
This amendment amount:	\$ _____
Adjusted Agreement amount:	\$ _____

Change in time for services (days or date, as applicable): _____

The foregoing Agreement Summary is for reference only and does not alter the terms of the Agreement, including those set forth in Exhibit C.

Owner and Engineer hereby agree to modify the above-referenced Agreement as set forth in this Amendment. All provisions of the Agreement not modified by this, or previous Amendments remain in effect.

OWNER:

ENGINEER:

 By: _____
 Print _____
 name: _____

 Title: _____

 Date Signed: _____

 By: _____
 Print _____
 name: _____

 Title: _____

 Date Signed: _____

Cost Proposal

Three project fees are included herein for your consideration, based on the options described in our proposal and summarized below.

Option 3 includes added items that were identified in our multiple site visits and discussions with the Town but were not requested in the RFP. The additional elements in Option 3 are important to the operation and expansion of the WTP. Option 3 develops a clear expansion and replacement program that is flexible based on growth and budget constraints. ***Additional items listed in Option 3 may be removed from the scope if they are determined not necessary to meet the Town's goals.***

Option 3 also includes an optional parallel series of tasks to help give your operators some breathing room for the peak demand season of 2021.

Basis of Fee Summary			
Approach	Option 1	Option 2	Option 3
Process Unit	Granular Media Filtration Expansion	Membrane Filtration Expansion	Comprehensive Site Master Plan
Lonetree Pump Station & Pipeline	Remain as is		
Town Lake Pump Station	Remain as is		
Raw Water Tank	Remain as is		
Chemical Storage	Remain in existing location	Add storage to the new Membrane Building	
Pretreatment Capacity	Existing DAF 10 MGD		Convert to SAF 12.5 MGD
Filtration	Expand existing Filter Building with 3 new GMF	Add new Membrane Building with 3 trains	
Taste & Odor Control	Maintain existing PAC system. Town implement upgrades at Lonetree and Town Lake outside WTP expansion project.		Implement multi-phase approach. Lease to own GAC contactors in Membrane Building. Optimize T&O removal with SAF conversion. Future flexibility for T&O control.
Disinfection Compliance	Modify existing GST with baffles		Add new Disinfection Contact Basin sized for ultimate flows.
Treated Water Storage	Use existing GST		Convert GST to distribution storage
Distribution Pump Station	Add new below ground pump station with 3 pumps.		New at-grade pump station with vertical turbine pumps above a new DCB
Backwash Supply	Gravity from existing GST	Backwash from distribution system	
Backwash Waste	Modify existing pond footprint and recycle	No change	

	pump station for Filter Building expansion	
Electrical System	Use existing electrical service. Upgrade site lighting and security.	New electrical service for Membrane Building, DCB and DPS. Add second diesel generator. Upgrade site lighting and security
SCADA System	Scale existing system for GMF and DPS expansion by Town's existing SCADA contractor	Add control system nodes for Membrane Building, T&O system, DCB and new DPS.
Best Value Project Our initial analysis indicates that Options 1 and 2 result in similar estimated construction costs but limit the future flexibility and operational robustness provided by Option 3.		

Town of Johnstown

Water Treatment Plant Expansion from 5 to 10 mgd

Work Breakdown Structure and Fee Schedule - Option 1 GMF Expansion

Activity	Project Manager	Quality Control	Lead Process	Process	Structural	Architectural	Civil	Mechanical	Electrical, Instrumentation & Controls	Construction	CAD / Designer	BMcD Total Labor		Expenses	Sub- Consultants	Total Cost
	Pugh	Schaefer	Kinser	Rachelson Huth	Kienholz	Lang Dalglish	Tessitore	Olsen	Johnson Patwari	Herrington Other	Ellis					
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Direct	Cost	
TASK SERIES 100 - Project Initiation & Coordination																
101 - Project Kick Off Meeting	4		4									8	2024	\$80		\$ 2,104
102 - Bi-Weekly Review Meetings	26											26	\$6,552	\$260		\$ 6,812
103 - Project, Risk and Resource Management, Schedule and Budget Controls	110												\$27,720	\$1,110		\$ 28,830
Sub-Total Series 100	140	0	4	0	0	0	0	0	0	0	0	34	\$36,296	\$1,450	\$0	\$37,746
TASK SERIES 200 - Review Existing Data & Basis of Design																
201 - Review Existing Records	2		4	8								14	\$3,234	\$130		\$ 3,364
202 - Develop Permitting Matrix	2			4								6	\$1,361	\$50		\$ 1,411
203 - Desktop Analysis ¹	2	1	2	12	2				2		16	37	\$6,296	\$250		\$ 6,546
204 - Workshop 1 - Filter Options Selection	4		4									8	\$2,024	\$80		\$ 2,104
205 - Water Characterization ²	2		4	8								14	\$3,234	\$130		\$ 3,364
206 - Pretreatment Capacity Analysis ³												0	\$0	\$0		\$ -
207 - Prepare 2 Layout Options for Selected Filter Type	2		4	12							16	34	\$5,658	\$230		\$ 5,888
208 - Taste & Odor Control Option Selection ⁴												0	\$0	\$0		\$ -
209 - Workshop 2 - Alternative Design Comparison ⁵	4		4									8	\$2,024	\$80		\$ 2,104
210 - Prepare Conceptual Design ⁶	4		8	30	8	6	12	2	20		40	130	\$23,245	\$930		\$ 24,175
211 - Workshop 3 - Review Conceptual Design	2		2	2								6	\$1,440	\$60		\$ 1,500
212 - Basis of Design Report ⁷	4	2	4	40	4	4	8	4	8	4	8	90	\$18,630	\$750		\$ 19,380
Sub-Total Series 200	28	3	36	116	14	10	20	6	30	4	80	347	\$67,145	\$2,690	\$0	\$69,835
TASK SERIES 300 - Preliminary Design 30%																
301 - Develop Preliminary Design 30%	16	2	24	90	60	40	32	16	40		60	380	\$75,950	\$3,040		\$ 78,990
302 - Topographic Survey							8					8	\$1,408	\$60	\$11,385	\$ 12,853
303 - Geotechnical Investigations					8							8	\$1,920	\$80	\$6,567	\$ 8,567
304 - Workshop 4 - Review Preliminary Design and Phasing	2		2						2			6	\$1,426	\$60		\$ 1,486
305 - Workshop 5 - Delivery Option Determination	2	2								2		6	\$1,516	\$60		\$ 1,576
Sub-Total Series 300	20	4	26	90	68	40	40	16	42	2	60	408	\$82,220	\$3,300	\$17,952	\$103,472
TASK SERIES 400 - Detailed Design 60%																
401 - Prepare 60% Design	16	2	32	140	90	48	40	32	80	8	120	608	\$118,658	\$4,750		\$ 123,408
402 - Utility Locates & Test Holes ⁸				8								8	\$1,714	\$70	\$10,000	\$ 11,784
403 - Review Meeting 1 - 60% Design	2		2						2			6	\$1,426	\$60		\$ 1,486
404 - Initial Permitting Support ⁹	12	2	4	24	4	4	24	2	4		8	88	\$17,753	\$710		\$ 18,463
Sub-Total Series 400	30	4	38	172	94	52	64	34	86	8	128	710	\$139,551	\$5,590	\$10,000	\$155,141
TASK SERIES 500 - Optimize Operations																
501 - Identify Optimization Tasks												0	\$0	\$0		\$ -
502 - Workshop 6 - Operations Investigation												0	\$0	\$0		\$ -
503 - WTP Operations Support												0	\$0	\$0		\$ -
504 - Procurement & Installation Support												0	\$0	\$0		\$ -
Sub-Total Series 500	0	0	0	0	0	0	0	0	0	0	0	0	\$0	\$0	\$0	\$0
Project Subtotals - Design Development to 60%	218	11	104	378	176	102	124	56	158	14	268	1499	\$325,212	\$13,030	\$27,952	\$366,194
TASK SERIES 600 - Final Design																
601 - Prepare 90% Design	20	2	32	120	80	32	40	20	100	8	120	574	\$111,150	\$4,450		\$ 115,600
602 - Review Meeting 2 - 90% Design	2		2									4	\$1,012	\$40		\$ 1,052
603 - Final Permitting Support	8			16		24						48	\$10,454	\$420		\$ 10,874
604 - Prepare Bid Documents	2	2	4	20	16	8	12	8	32		40	144	\$26,220	\$1,050		\$ 27,270
605 - Review Meeting 3 - Bid Documents	2		2									4	\$1,012	\$40		\$ 1,052
Sub-Total Series 600	34	4	40	156	96	64	52	28	132	8	160	774	\$149,848	\$6,000	\$0	\$155,848
TASK SERIES 700 - Bid Phase Support																
701 - Pre-Bid Meeting	2											2	\$504	\$20		\$ 524
702 - Bid Phase Support	4			30	2	4	2	2	6			50	\$10,780	\$430		\$ 11,210
703 - Review Bids	4											4	\$1,008	\$40		\$ 1,048
Sub-Total Series 700	10	0	0	30	2	4	2	2	6	0	0	56	\$12,292	\$490	\$0	\$12,782
Project Subtotals - Final Design & Bid Phase Support	44	4	40	186	98	68	54	30	138	8	160	830	\$162,140	\$6,490	\$0	\$168,630
Project Subtotals	262	15	144	564	274	170	178	86	296	22	428	2329	\$487,352	\$19,520	\$27,952	\$534,824
Project Total																\$534,824

Notes:

1. Review data provided by Town (record drawings, operating records). Conduct field visual assessment of existing assets to determine if assets suitable to integrate in expanded WTP.

2. Town to provide population projections as basis for future water demand calculations. Use existing water quality data.

3. Maintain current pretreatment capacity of 10 MGD. Perform desktop analysis to confirm anticipated removal percentages.

4. Maintain existing PAC system, add ultrasonic buoy to Town Lake. No new T&O control process.

5. Select process train for conceptual design.

6. Resolve layout on existing WTP site, estimate construction cost, schedule and phases.

7. Document decisions and design criteria, based on feedback at Workshop 3.

8. Includes allowance for 10 utility test holes at \$1,000 each.

9. Prepare initial submittals to CDPHE Water Quality Division, Town Planning and Building Permit, Weld County.

Town of Johnstown
Water Treatment Plant Expansion from 5 to 10 mgd

Work Breakdown Structure and Fee Schedule - Option 2 Membrane Filtration

Activity	Project Manager	Quality Control	Lead Process	Process	Structural	Architectural	Civil	Mechanical	Electrical, Instrumentation & Controls	Construction	CAD / Designer	BMcD Total Labor		Expenses	Sub- Consultants	Total Cost
	Pugh	Schaefer	Kinser	Rachelson Huth	Kienholz	Lang Dalglish	Tessitore	Olsen	Johnson Patwari	Herrington Other	Ellis					
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Direct	Cost	
TASK SERIES 100 - Project Initiation & Coordination																
101 - Project Kick Off Meeting	4		4									8	2024	\$80		\$ 2,104
102 - Bi-Weekly Review Meetings	24											24	\$6,048	\$240		\$ 6,288
103 - Project, Risk and Resource Management, Schedule and Budget Controls	100												\$25,200	\$1,010		\$ 26,210
Sub-Total Series 100	128	0	4	0	0	0	0	0	0	0	0	32	\$33,272	\$1,330	\$0	\$34,602
TASK SERIES 200 - Review Existing Data & Basis of Design																
201 - Review Existing Records	2		4	8								14	\$3,234	\$130		\$ 3,364
202 - Develop Permitting Matrix	2			4								6	\$1,361	\$50		\$ 1,411
203 - Desktop Analysis ¹	2	1	2	12	2				2		16	37	\$6,296	\$250		\$ 6,546
204 - Workshop 1 - Filter Options Selection	4		4									8	\$2,024	\$80		\$ 2,104
205 - Water Characterization ²	2		4	8								14	\$3,234	\$130		\$ 3,364
206 - Pretreatment Capacity Analysis ³												0	\$0	\$0		\$ -
207 - Prepare 2 Layout Options for Selected Filter Type	2		4	12							16	34	\$5,658	\$230		\$ 5,888
208 - Taste & Odor Control Option Selection ⁴												0	\$0	\$0		\$ -
209 - Workshop 2 - Alternative Design Comparison ⁵	4		4									8	\$2,024	\$80		\$ 2,104
210 - Prepare Conceptual Design ⁶	4		8	20	8	6	12	2	24		40	124	\$21,930	\$880		\$ 22,810
211 - Workshop 3 - Review Conceptual Design	2		2	2								6	\$1,440	\$60		\$ 1,500
212 - Basis of Design Report ⁷	4	2	4	40	4	4	8	4	8	4	8	90	\$18,630	\$750		\$ 19,380
Sub-Total Series 200	28	3	36	106	14	10	20	6	34	4	80	341	\$65,830	\$2,640	\$0	\$68,470
TASK SERIES 300 - Preliminary Design 30%																
301 - Develop Preliminary Design	12	2	20	70	40	40	32	12	40		40	308	\$62,006	\$2,480		\$ 64,486
302 - Topographic Survey							8					8	\$1,408	\$60	\$11,385	\$ 12,853
303 - Geotechnical Investigations					8							8	\$1,920	\$80	\$6,567	\$ 8,567
304 - Workshop 4 - Review Preliminary Design and Phasing	2		2						2			6	\$1,426	\$60		\$ 1,486
305 - Workshop 5 - Delivery Option Determination	2	2								2		6	\$1,516	\$60		\$ 1,576
Sub-Total Series 300	16	4	22	70	48	40	40	12	42	2	40	336	\$68,276	\$2,740	\$17,952	\$88,968
TASK SERIES 400 - Detailed Design 60%																
401 - Prepare 60% Design	16	2	24	120	80	40	32	32	60	8	100	514	\$100,768	\$4,030		\$ 104,798
402 - Utility Locates & Test Holes ⁸				8								8	\$1,714	\$70	\$10,000	\$ 11,784
403 - Review Meeting 1 - 60% Design	2		2						2			6	\$1,426	\$60		\$ 1,486
404 - Initial Permitting Support ⁹	12	2	4	24	4	24	4	2	4		8	88	\$18,409	\$740		\$ 19,149
Sub-Total Series 400	30	4	30	152	84	64	36	34	66	8	108	616	\$122,316	\$4,900	\$10,000	\$137,216
TASK SERIES 500 - Optimize Operations																
501 - Identify Optimization Tasks												0	\$0	\$0		\$ -
502 - Workshop 6 - Operations Investigation												0	\$0	\$0		\$ -
503 - WTP Operations Support												0	\$0	\$0		\$ -
504 - Procurement & Installation Support												0	\$0	\$0		\$ -
Sub-Total Series 500	0	0	0	0	0	0	0	0	0	0	0	0	\$0	\$0	\$0	\$0
Project Subtotals - Design Development to 60%	202	11	92	328	146	114	96	52	142	14	228	1325	\$289,694	\$11,610	\$27,952	\$329,256
TASK SERIES 600 - Final Design																
601 - Prepare 90% Design	16	2	24	90	60	24	54	36	120	8	100	534	\$103,357	\$4,130		\$ 107,487
602 - Review Meeting 2 - 90% Design	2		2									4	\$1,012	\$40		\$ 1,052
603 - Final Permitting Support	8			16		24						48	\$10,454	\$420		\$ 10,874
604 - Prepare Bid Documents	2	2	4	20	16	8	12	8	32		40	144	\$26,220	\$1,050		\$ 27,270
605 - Review Meeting 3 - Bid Documents	2		2									4	\$1,012	\$40		\$ 1,052
Sub-Total Series 600	30	4	32	126	76	56	66	44	152	8	140	734	\$142,056	\$5,680	\$0	\$147,736
TASK SERIES 700 - Bid Phase Support																
701 - Pre-Bid Meeting	2											2	\$504	\$20		\$ 524
702 - Bid Phase Support	4			30	2	4	2	2	6			50	\$10,780	\$430		\$ 11,210
703 - Review Bids	4											4	\$1,008	\$40		\$ 1,048
Sub-Total Series 700	10	0	0	30	2	4	2	2	6	0	0	56	\$12,292	\$490	\$0	\$12,782
Project Subtotals - Final Design & Bid Phase Support	40	4	32	156	78	60	68	46	158	8	140	790	\$154,348	\$6,170	\$0	\$160,518
Project Subtotals	242	15	124	484	224	174	164	98	300	22	368	2115	\$444,042	\$17,780	\$27,952	\$489,774
Project Total																\$489,774

Notes:

1. Review data provided by Town (record drawings, operating records). Conduct field visual assessment of existing assets to determine if assets suitable to integrate in expanded WTP.

2. Town to provide population projections as basis for future water demand calculations. Use existing water quality data.

3. Maintain current pretreatment capacity of 10 MGD. Perform desktop analysis to confirm anticipated removal percentages.

4. Maintain existing PAC system, add ultrasonic buoy to Town Lake. No new T&O control process.

5. Select process train for conceptual design.

6. Resolve layout on existing WTP site, estimate construction cost, schedule and phases.

7. Document decisions and design criteria, based on feedback at Workshop 3.

8. Includes allowance for 10 utility test holes at \$1,000 each.

9. Prepare initial submittals to CDPHE Water Quality Division, Town Planning and Building Permit, Weld County.

Town of Johnstown

Water Treatment Plant Expansion from 5 to 10 mgd

Work Breakdown Structure and Fee Schedule - Option 3 Comprehensive Site Mater Plan

Activity	Project Manager	Quality Control	Lead Process	Process	Structural	Architectural	Civil	Mechanical	Electrical, Instrumentation & Controls	Construction	CAD / Designer	BMcD Total Labor		Expenses	Sub- Consultants	Total Cost
	Pugh	Schaefer	Kinser	Rachelson Huth	Kienholz	Lang Dalglish	Tessitore	Olsen	Johnson Patwari	Herrington Other	Ellis					
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Direct	Cost	
TASK SERIES 100 - Project Initiation & Coordination																
101 - Project Kick Off Meeting	4		4									8	2024	\$80		\$ 2,104
102 - Bi-Weekly Review Meetings	30											30	\$7,560	\$300		\$ 7,860
103 - Project, Risk and Resource Management, Schedule and Budget Controls	120											120	\$30,240	\$1,210		\$ 31,450
Sub-Total Series 100	154	0	4	0	0	0	0	0	0	0	0	158	\$39,824	\$1,590	\$0	\$41,414
TASK SERIES 200 - Review Existing Data & Basis of Design																
201 - Review Existing Records	4		8	16								28	\$6,467	\$260		\$ 6,727
202 - Develop Permitting Matrix	2			4								6	\$1,361	\$50		\$ 1,411
203 - Desktop Analysis ¹	4	1	8	24	4				4		16	61	\$11,788	\$470		\$ 12,258
204 - Workshop 1 - Filter Options Selection	4		4									8	\$2,024	\$80		\$ 2,104
205 - Water Characterization ²	4		12	16								32	\$7,483	\$300	\$10,000	\$ 17,783
206 - Pretreatment Capacity Analysis ³	4		24	40								68	\$15,672	\$630		\$ 16,302
207 - Prepare 2 Layout Options for Selected Filter Type	4		4	24							16	48	\$8,733	\$350		\$ 9,083
208 - Taste & Odor Control Option Selection ⁴	12		16	32								60	\$13,942	\$560		\$ 14,502
209 - Workshop 3 - Taste & Odor Control Option Selection	4		4	4								12	\$2,881	\$120		\$ 3,001
210 - Disinfection & Distribution Pump Station Options Development ⁵	12		24	40	8				8			92	\$21,262	\$850		\$ 22,112
211 - Workshop 4 - Alternative Design Comparison ⁶	4		4									8	\$2,024	\$80		\$ 2,104
212 - Prepare Conceptual Design ⁷	8		16	60	16	8	32	4	40		40	224	\$43,142	\$1,730		\$ 44,872
213 - Prepare WTP Siting Options, Construction & Prioritization Phases ⁸	4		8	24	4				4	8		52	\$12,000	\$480		\$ 12,480
214 - Workshop 5 - Review Conceptual Design	4		4	4								12	\$2,881	\$120		\$ 3,001
212 - Basis of Design Report ⁹	4	2	4	40	4	4	8	4	8	4	8	90	\$18,630	\$750		\$ 19,380
Sub-Total Series 200	78	3	140	328	36	12	40	8	64	12	80	801	\$170,290	\$6,830	\$10,000	\$187,120
TASK SERIES 300 - Preliminary Design 30%																
301 - Develop Preliminary Design	32	2	40	180	80	40	24	32	80		120	630	\$124,372	\$4,970		\$ 129,342
302 - Topographic Survey							8					8	\$1,408	\$60	\$11,385	\$ 12,853
303 - Geotechnical Investigations					8							8	\$1,920	\$80	\$6,567	\$ 8,567
304 - Workshop 4 - Review Preliminary Design and Phasing	4		4						2			10	\$2,438	\$100		\$ 2,538
305 - Workshop 5 - Delivery Option Determination	2	2								2		6	\$1,516	\$60		\$ 1,576
306 - Preliminary Design Report	4	2	16	60	8	8	12	4	8	8		130	\$28,693	\$1,150		\$ 29,843
Sub-Total Series 300	42	6	60	240	96	48	44	36	90	10	120	792	\$160,346	\$6,420	\$17,952	\$184,718
TASK SERIES 400 - Detailed Design 60%																
401 - Prepare 60% Design	32	2	40	180	120	60	40	40	100	8	160	782	\$152,804	\$6,110		\$ 158,914
402 - Utility Locates & Test Holes ¹⁰				2								2	\$428	\$20	\$20,000	\$ 20,448
403 - Review Meeting 1 - 60% Design	2		2						2			6	\$1,426	\$60		\$ 1,486
404 - Initial Permitting Support ¹¹	12	2	4	24	4	4	4	2	4		8	68	\$14,233	\$570		\$ 14,803
Sub-Total Series 400	46	4	46	206	124	64	44	42	106	8	168	858	\$168,891	\$6,760	\$20,000	\$195,651
TASK SERIES 500 - Optimize Operations																
501 - Identify Optimization Tasks	8	2	8	24					4			46	\$10,520	\$420		\$ 10,940
502 - Workshop 6 - Operations Investigation	4		4	4								12	\$2,881	\$120		\$ 3,001
503 - WTP Operations Support	4		32	40								76	\$17,704	\$710		\$ 18,414
504 - Procurement & Installation Support	4		8	24	16			8	32			92	\$20,390	\$820		\$ 21,210
Sub-Total Series 500	20	2	52	92	16	0	0	8	36	0	0	226	\$51,495	\$2,070	\$0	\$53,565
Project Subtotals - Design Development to 60%	340	15	302	866	272	124	128	94	296	30	368	2835	\$590,847	\$23,670	\$47,952	\$662,469
TASK SERIES 600 - Final Design																
601 - Prepare 90% Design	24	2	32	140	100	40	32	24	80	8	160	642	\$122,164	\$4,890		\$ 127,054
602 - Review Meeting 2 - 90% Design	2		2									4	\$1,012	\$40		\$ 1,052
603 - Final Permitting Support	8			16		24						48	\$10,454	\$420		\$ 10,874
604 - Prepare Bid Documents	4	2	8	30	16	8	12	8	32		40	160	\$29,882	\$1,200		\$ 31,082
605 - Review Meeting 3 - Bid Documents	2		2									4	\$1,012	\$40		\$ 1,052
Sub-Total Series 600	40	4	44	186	116	72	44	32	112	8	200	858	\$164,524	\$6,590	\$0	\$171,114
TASK SERIES 700 - Bid Phase Support																
701 - Pre-Bid Meeting	2											2	\$504	\$20		\$ 524
702 - Bid Phase Support	4			30	2	4	2	2	6			50	\$10,780	\$430		\$ 11,210
703 - Review Bids	4											4	\$1,008	\$40		\$ 1,048
Sub-Total Series 700	10	0	0	30	2	4	2	2	6	0	0	56	\$12,292	\$490	\$0	\$12,782
Project Subtotals - Final Design & Bid Phase Support	50	4	44	216	118	76	46	34	118	8	200	914	\$176,816	\$7,080	\$0	\$183,896
Project Subtotals	390	19	346	1082	390	200	174	128	414	38	568	3749	\$767,664	\$30,750	\$47,952	\$846,366
Project Total																\$846,366

Notes:

- Review data provided by Town (record drawings, operating records). Conduct field visual assessment of existing assets to determine if assets suitable to integrate in expanded WTP.
- Town to provide population projections as basis for future water demand calculations. Use existing water quality data and conduct additional lab analysis to characterize water quality. Includes \$10,000 allowance for laboratory costs.
- Convert existing DAF to SAF. Send sample water to SAF vendor for jar testing.
- Prepare comparison of T&O options including GAC, Ozone, BAF. Prepare conceptual design for GAC system, leased to own system to incorporate in WTP expansion.
- Develop disinfection, distribution storage and pumping analysis, including design of new disinfection contact basin. Perform desktop analysis on corrosion impact to distribution system.
- Select process train for conceptual design.
- Resolve treatment train, layout on existing WTP site, estimate construction cost, schedule and phases.
- Prepare 3 concepts for WTP layout on the existing property and two additional properties.
- Document decisions and design criteria, based on feedback at Workshop. Select WTP site.
- Includes allowance for 10 utility test holes at \$1,000 each.
- Prepare initial submittals to CDPHE Water Quality Division, Town Planning and Building Permit, Weld County.



Professional Engineering Services for

Expansion Design of the Town of Johnstown Water Treatment Plant: Expansion from 5 MGD to 10 MGD

RFP # 430-10681 | February 5, 2021

Submitted to:
Town of Johnstown

February 5, 2021

Town of Johnstown
Attn: Marco Carani, Director of Public Works
450 South Parish Avenue
Johnstown CO, 80534

RE: Proposal for Professional Engineering Services for Expansion Design of the Town of Johnstown Water Treatment Plant: Expansion from 5 MGD to 10 MGD

Dear Mr. Carani:

The Town of Johnstown (the Town) is looking for a collaborative engineering team to design an expansion to the Town's drinking water facility, increasing its capacity from 5 MGD to 10 MGD plus redundancy. Burns & McDonnell has more than 30 years of experience working in Colorado and along the front range on brownfield WTP expansions, utilizing each plant's existing assets and developing designs that meet challenging cost, schedule, and technical goals.

Why Burns & McDonnell?



Deep Bench of Resources. As a multi-discipline design team with more than 40 people exclusively dedicated to water and wastewater projects, our proposed project team works on projects just like yours across the front range. We have a deep enough bench to deliver multiple projects at once, without sacrificing quality, and to provide the specialized experience you need in each design discipline.



Solve Your Taste & Odor Challenges. Having recently completed two large WTP projects with taste & odor challenges for the City of Thornton and Town of Erie, we have a variety of tools and methods to address taste and odor concerns effectively and economically.



More Local WTP Retrofits & Major Expansion Experience than Any Other Team. With a local water treatment portfolio spanning the last three decades, we know the Colorado market extremely well. In 2020, we completed four major water treatment projects in the Denver Metro area alone, three of which were large scale retrofits. We excel in making the most of your existing infrastructure, positioning you for compliance with future regulations, and making your facility operator friendly.



Flexible Approach with Design-Build Option, to Expedite Schedule and Reduce Costs. We have assembled a design team to deliver an approach which meets the needs of the RFP as stated, with the option to seamlessly transition into a design-build team, which would benefit the project in terms of cost, schedule, and simplified execution. Our design-build option team is led by Burns & McDonnell, with a construction manager and construction team provided by Garney Construction. Regardless of which delivery method the Town selects, we will position you for compliance with future regulations, and partner with you to address issues in the watershed and solve taste and odor challenges.

If you have any questions, please reach out to Brett by phone at (303) 583-0335 or via email at bdpugh@burnsmcd.com. We are looking forward to helping you make your project a complete success.

Best regards,

Brett Pugh, PE
Project Manager

Daniel Korinek, PE
Vice President

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Section 1. Identification of Proposer

Making Our Clients Successful

Burns & McDonnell is a fully integrated engineering and consulting firm with a multidiscipline staff. We are 100% employee owned, which means we are relationship-focused and dedicated to making our clients successful. We have a 90 percent repeat-business rate and client partnerships that span multiple decades.

Consultant Name/Office/Address

Name | Burns & McDonnell Engineering Company, Inc.

Address | 9785 Maroon Circle, Suite 400 | Centennial, CO 80112

Phone | (303) 583-0335 **Email** | pdpugh@burnsmcd.com

Subconsultants

Name | Kumar & Associates, Inc. (geotechnical)

Address | 10302 South Progress Way,
Parker, CO 80134

Name | Flatirons Surveying, Inc. (survey)

Address | 4501 Logan Street,
Denver, Colorado 80216

Construction Partner for Design-Build Option

Name | Garney Construction, Inc. (contractor)

Address | 7911 Shaffer Parkway, Littleton, CO 80127

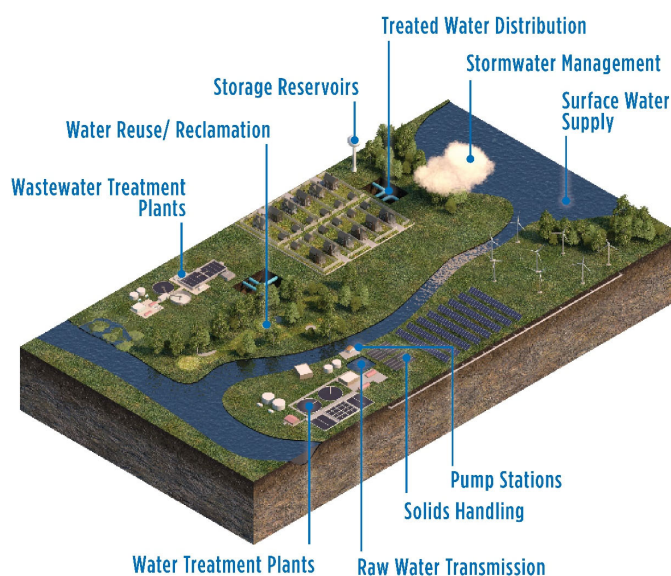
Office in Which Production will Occur

We will provide design services from our Centennial, CO office location. This office is home to 275 design, construction, and environmental resources, more than 40 of which are dedicated exclusively to water and wastewater projects. Our key personnel live here, work here, and are committed to making your project the very best it can be. We don't just work on a few projects here and there in Colorado; most of our team's experience is right here in Colorado along the Front Range.



Industry Rankings

Honored with numerous awards for excellence by professional organizations, government agencies and the armed forces, Burns & McDonnell has a reputation for providing high-quality service and innovative solutions to clients. *Engineering News-Record* ranks Burns & McDonnell #9 in the top 500 U.S. design firms and the top one-third of the leading program management firms, design-build firms, construction management-for-fee firms, green design firms, and construction management-at-risk firms. We are ranked #9 nationwide in water treatment.



Section 2. Project Overview & Approach

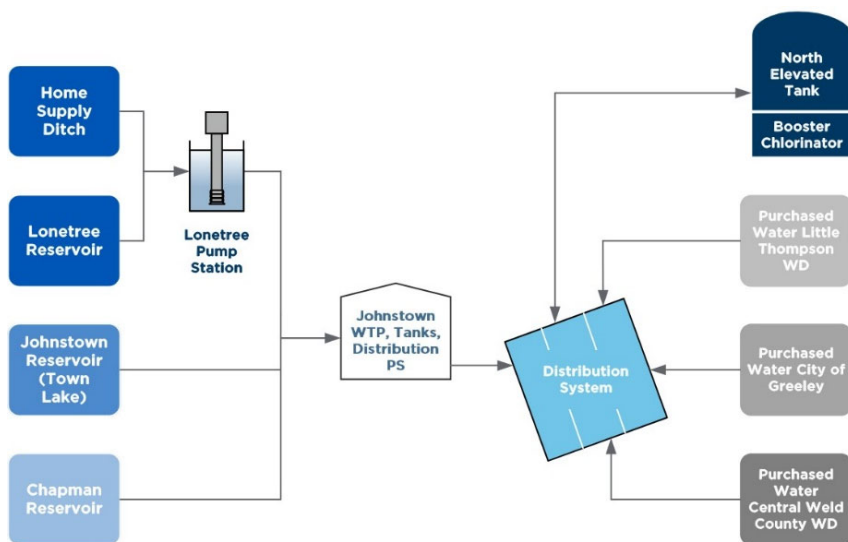
Project Understanding

The Town is experiencing high growth in its service area due to recent annexations and subdivisions and needs to expand the capacity of its water treatment. Aging infrastructure creates challenges for operations during high demand periods. The Town also experiences seasonal taste and odor issues related to algae growth in its water supply.

The Town water supply is sourced from the Big Thompson River, with water conveyed through the Home Supply Ditch to the Lonetree and Town Lake Reservoirs. The Lonetree Reservoir, near Berthoud, CO, is filled from the Big Thompson through two upstream reservoirs, Boedecker Lake and Lon Hagler Reservoir. A pump station at Lonetree Reservoir delivers water to the water treatment plant (WTP) through a 10.6 mile, 16-inch pipeline. The Home Supply Ditch can be diverted to the Lonetree Pump Station only when water levels in the reservoir are less than 17-feet. The Home Supply Ditch continues towards Johnstown and flows through the Town Lake before continuing on to downstream irrigation customers. The Town also has interconnects with Little Thompson Water District, the City of Greeley, and the Central Weld County Water District.

Key Project Considerations

- Rapid increase in water demand
- Increase filter capacity
- Aging infrastructure
- Taste & odor control



Taste and odor (T&O) issues in the Lonetree Reservoir are attributed to algae growth, leading to the seasonal presence of Geosmin and Methyl-Isoborneol (MIB). Geosmin and MIB are also present in the Town Lake, but at lower levels than Lonetree Reservoir. Powdered activated carbon (PAC) is dosed at the Lonetree Reservoir to absorb taste and odor compounds. Raw water from Lonetree and Town Lake is blended at the WTP in an above ground steel tank before it flows to the pretreatment building.

Figure 2-1. Johnstown's Water Supply System

Figure 2-2 on the next page is the current process flow diagram for the WTP. Pretreatment consists of alum injection, rapid mix, two-stage flocculation followed by dissolved air flotation (DAF). The Town is currently switching to a polymer-added coagulant to improve the pretreatment performance (solids, turbidity, and total organic carbon (TOC) removal).

Settled water flows by gravity to two granular media filters (GMF), each rated for 3.1 MGD. Filtered water enters a small clearwell below the filter gallery and is pumped to two ground storage tanks (GST). The GST's provide disinfection contact time, as well as backwash supply and distribution system storage. The distribution pump station is a below-grade structure that pumps finished water to the east and west pressure zones, respectively. The distribution system includes an existing 0.75 MG elevated storage tank, and a new 2 MG storage is proposed for the southeast part of the distribution system.

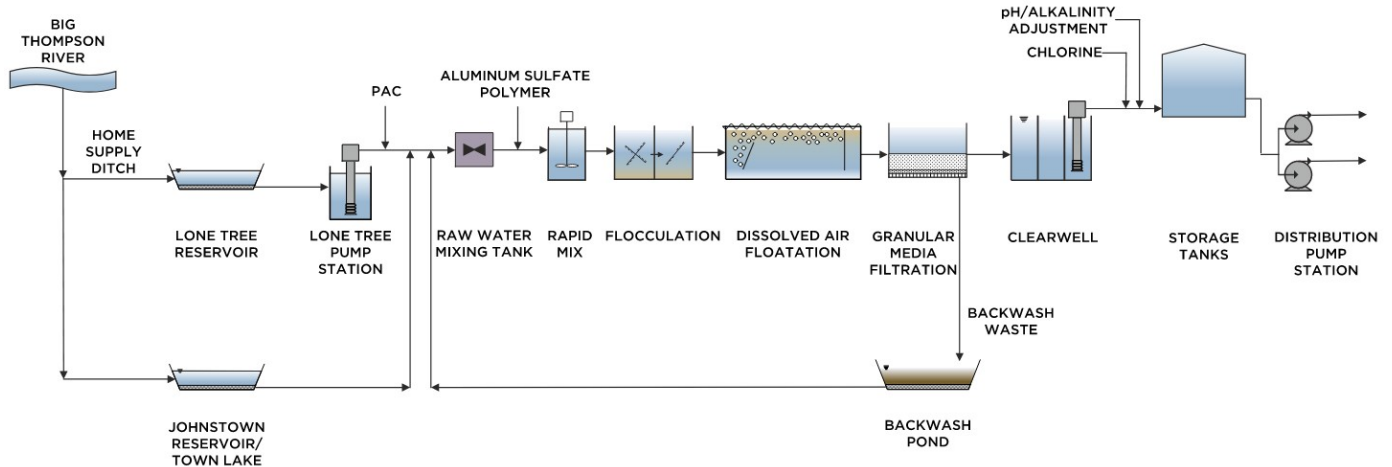


Figure 2-2. Johnstown WTP Existing Process Flow Diagram

The Town is facing many challenges due to growing water demands, aging infrastructure, and customer satisfaction. The existing WTP is limited by its filtration capacity, which creates challenges to maintain the necessary water levels in the GST to meet disinfection requirements. The two filters provide a total capacity of 6.2 MGD with both in service, which does not offer redundancy if one filter is offline. The existing DAF pretreatment system is rated for 10 MGD. Peak flows out of the storage tanks approach 11 MGD in summer months.

Approach Overview

The Town has identified two options for filter expansion (Options 1 and 2), while Option 3 includes other elements of importance to the WTP operation and expansion. Our overall approach is explained in Table 2-1 where we describe additional elements identified through multiple site visits and discussions with the Town. Option 3 includes added improvements not identified in Options 1 and 2. Table 2-1. provides this information at a glance, with more detail on each option in the subsequent sections. Our Management Approach provides detail on our proposed execution of the project. We want to address your preference for filter expansion first (Options 1 and 2), in parallel with planning for the future with issues through Option 3.

Table 2-1: Three Options to the Johnstown WTP Expansion

Consideration	1 Granular Media Filtration Expansion	2 Membrane Filtration Expansion	3 Comprehensive Site Master Plan
Summary	Expand Filter Building	Add membranes in parallel with existing GMF	Increase pretreatment capacity, address T&O issues, add membrane filtration, improve disinfection and distribution pumping
Meet Water Demands	Yes, future phases more challenging	Yes, scalable for future phases	Flexible and adaptable to changing demands
Aging Infrastructure	Rely on existing 60-year-old filter building and GST	Existing 40- and 60-year-old GST remain in service	Extends the investment in your WTP and provides long term plan to reach ultimate goals
T&O Issues	Multiple options applicable	Options limited	Multi-phased, holistic approach from source management to treatment
Disinfection Compliance	Direct water to the existing clearwell and rely on existing GST's	Pump direct from membranes into the existing GST's	Consider long term approach with dedicated

			contact basin and pump station
Distribution Pump Station	Expand existing vault and pumps	Expand existing vault and pumps	Evaluate best-value of new, dedicated distribution and backwash pumps
Within Your Budget	Most expensive first phase, more expensive later phases	Least expensive for more capacity, but limits T&O adaptability in future	Tailored to your current budget and rates; adapt as funding becomes available
Future Water Quality Concerns	No	No	Adaptable for future concerns (T&O, drought, wildfire, PFAS)

Value Added Service - Optimize Operations

We developed a value-added service to identify short term fixes to provide your operators relief heading into the peak demand season of 2021. These services are described following Option 3.

Option 1 – Granular Media Filtration Expansion

The existing filter building was put into service in 1966. It contains two granular media filters, each rated for 3.1 MGD. The media and air scour system were replaced in 2020, but the existing Wheeler ball underdrain system was not upgraded. Backwash draws from the two on-site GST and discharges to the on-site pond. Backwash is recycled to the front of the WTP and solids are discharged to the sanitary sewer and sent to the Central Wastewater Treatment Plant. Issues such as solids break through, air locking in the filtered water header, and cavitation on the filtered water pumps due to the shallow clearwell limit the filtration capacity.

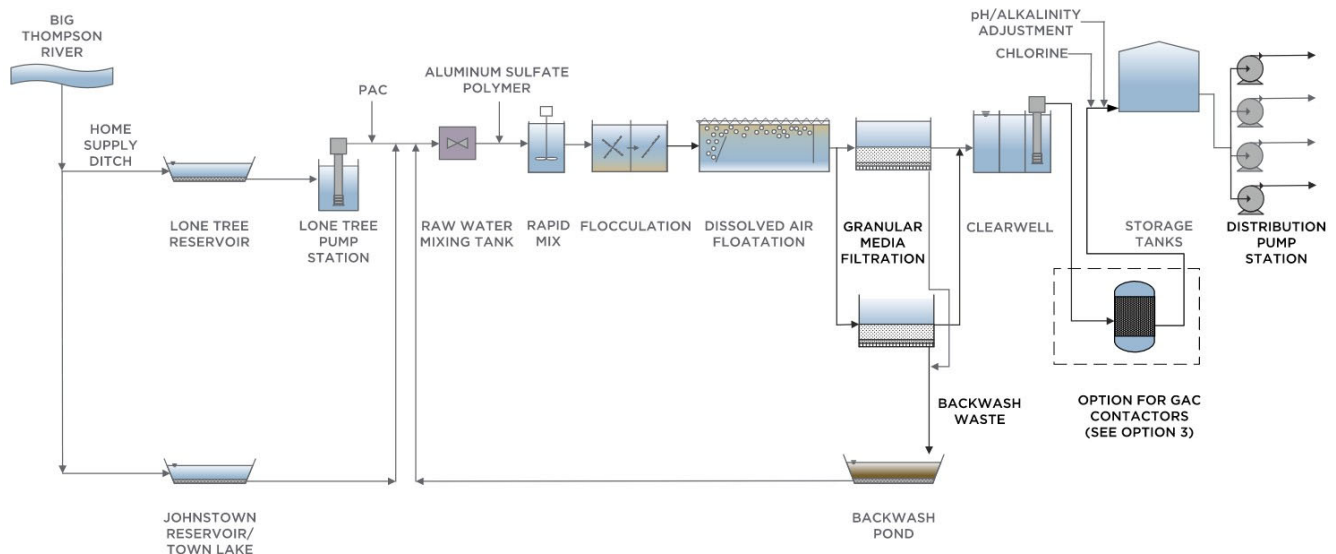


Figure 3-4. Process Flow Diagram for Option 1 (Grey is existing, black is proposed).

Additional capacity will be achieved by expanding the existing filter building to include new filters of the same size and configuration. Similar sized filters provide flexibility and simplify operations by avoiding complicated flow splitting. Adding two additional GMFs provides 12.4 MGD of installed filtration capacity. However, this results in a new rated capacity of only 9.3 MGD to meet the CDPHE criteria with the largest filter being offline. Three new GMFs provide a filtration capacity of 12.4 MGD but a WTP rated for the



Figure 2-3. Existing Filter Gallery

10 MGD capacity of the DAF pretreatment system. Depending upon budget constraints, the addition of 4 GMFs, or space for a fourth filter, may be better suited to provide redundancy, operational symmetry, and offer excess capacity to defer the next filter expansion. New filtered water pumps will transfer water into the existing GST's. The Distribution Pump Station (DPS) will be expanded in a new concrete vault.

Significant structural, mechanical, and electrical work is required to expand the existing filter building to both gain additional capacity, but also address the condition of the pipe gallery. Further improvements will be required to bring the filter building to current building codes, particularly around the existing chemical storage areas, electrical and control rooms. Care must be taken if expanding the existing building or consider a stand-alone building. Scaling the GMF system for future phases is more involved than a membrane option because of the structural costs. Expansion of the GMF to the southwest will impede on the existing backwash pond and recycle pump station, leading to additional modifications. Staying with the GMF preserves options for T&O control with GAC caps, ozone, or biologically active filtration (BAF). GAC caps or BAF are not applicable to a membrane-based solution.

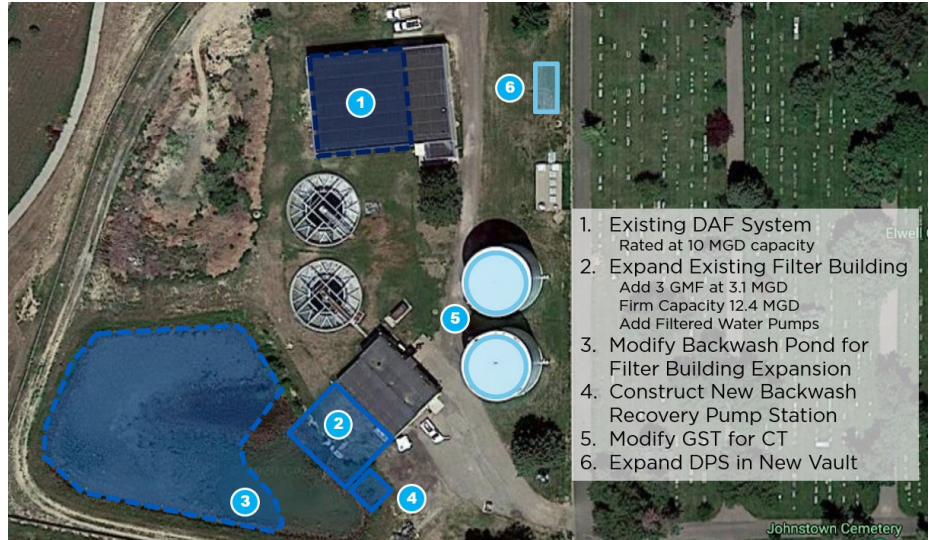


Figure 2-5. Option 1 GMF Expansion

Option 2 – Pressurized Membrane Filtration Addition

Option 2 consists of utilizing membrane filtration in place of the GMF and the existing DAF pretreatment system capacity of 10 MGD. There are a number of membrane filtration sub-options, we will evaluate with the Town:

- ▶ Add 6.4 MGD pressure membrane filtration system, expandable to 12.4 MGD; utilize the existing GMF filters until their end of life and expand the membrane system at that time
- ▶ Add 12.4 MGD of pressure membrane filtration and retire the existing media filters
- ▶ Install 10 MGD submerged membrane gravity filters (MGF) in existing filter basins

There are generally two options for constructing membranes at the WTP, pressure and submerged systems. Pressure systems are less expensive as a new build system versus submerged systems unless the filter basins can be reused. The existing filter basins are shallow, with very little room in the gallery to accommodate the extensive pipework required in a typical submerged membrane system. Therefore, the only real option is a submerged MGF system by Suez. Suez' MGF system operates in a similar mode as the existing GMF based on the existing hydraulic profile with no additional pumping. The two existing GMF could be converted to four MGF each rated at 3.33 MGD (10 MGD total capacity). Suez indicates that in the installations they have so far that backwashing is only needed twice per day and cleaning is only needed to limit bio-growth. However, we do not consider this option feasible since it does not provide full capacity, is only offered by one manufacturer and has not been proven for more than the past few years on a small number of installations. Cleaning systems are recommended for all membrane systems in the event of fouling, regardless of the low filter loading rate of a MGF system.

Site Visits

Site Visits to installations of the potential membrane manufacturers is included for the Town to understand differences and features to incorporate into the design.

The pressure system options for the WTP are diverse and include Dupont, Pall, Suez, and H2O Innovations, among others. The listed manufacturers all have installations in Colorado. Each of these manufacturers have distinct differences in services they offer, types of membrane fiber construction, flexibility to retrofit alternative modules with a universal rack, to name a few. All are proven manufacturers with extensive installations globally.

If membranes were selected, a new membrane system will be installed in an at-grade pre-engineered metal building with climate controls for equipment operation, supplied by a new settled water pump station at the pipe gallery level of the existing pretreatment building. The new settled water pumps will be sized with enough backpressure to pass through the membranes and feed the existing GST. This bypasses the existing filtered water pump station in the filter building gallery and avoids re-pumping. A pressure membrane system is easily scalable to meet the town's growing water demand. Expansion phases can be achieved by adding new modules to installed trains or adding new treatment trains. The new membrane filtration building can be sized for the initial phase only, be designed for a future expansion or built for the ultimate build-out floor space with equipment added later as needed. A new membrane building sized for the current phase has been assumed.

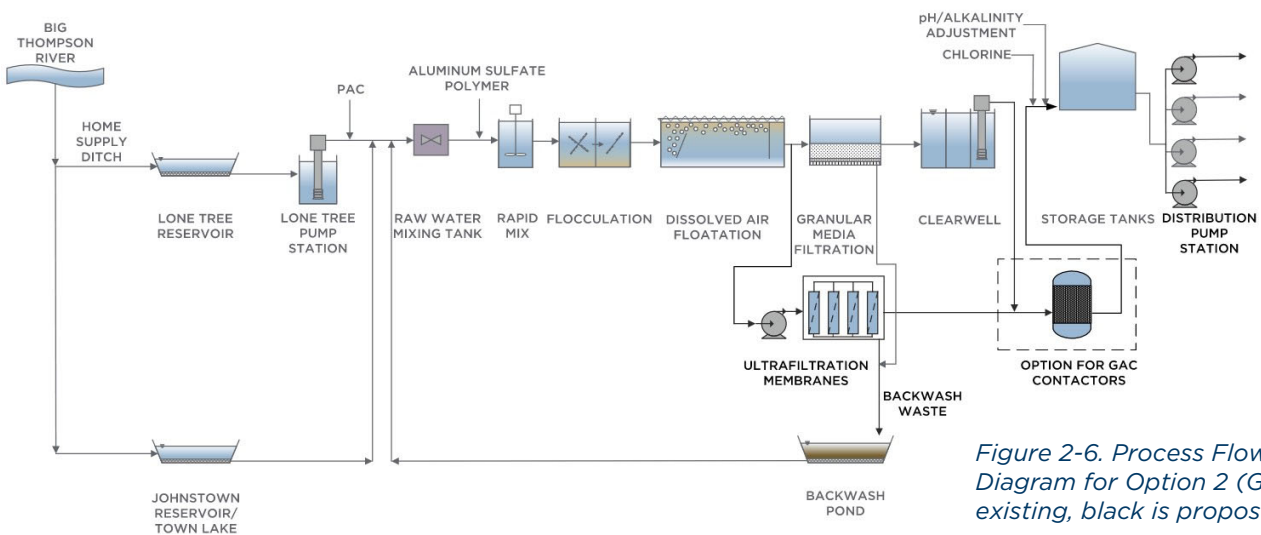


Figure 2-6. Process Flow Diagram for Option 2 (Grey is existing, black is proposed).

An early filtration Workshop will be used to determine Option 1 or 2 is the most-cost effective solution to meet the forecasted water demand. The GMF expansion introduces risk because of the age and condition of the filter building. GMF expansion also adds complications associated with demolition, modification of the existing clarifiers, backwash pond and recycle pump station.

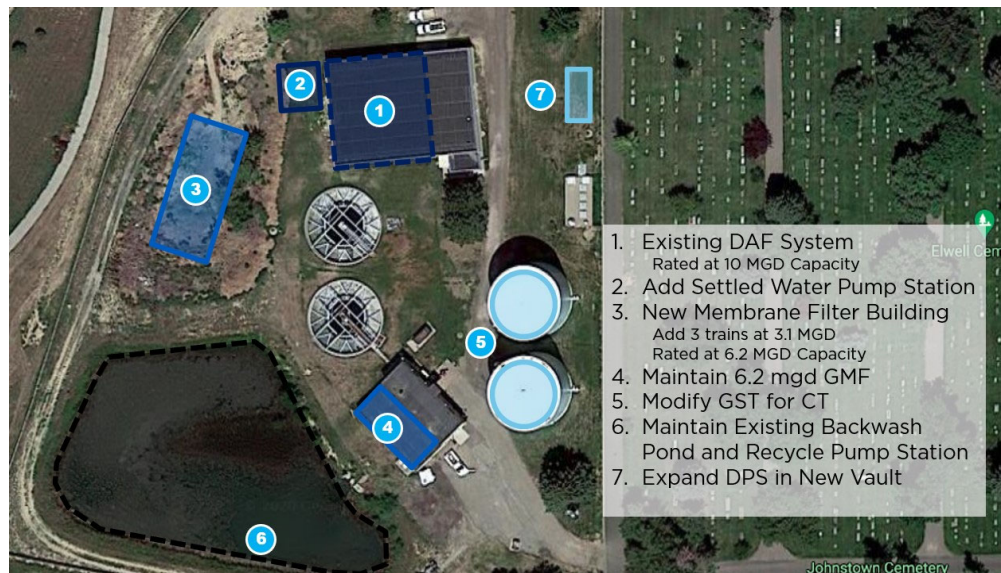


Figure 2-7. Option 2 - Membrane Filtration Addition

Table 2-2 provides a comparison of these sub-options versus Option 1 where the existing GMF are expanded.

Table 2-2: Filtration Comparison			
Option 1	Expand GMF	▶ Gravity flow fits into existing hydraulic profile ▶ Recent media only 1 year old ▶ Potential to add GAC caps, BAF for additional T&O control ▶ Uses existing assets and recent media replacement	▶ Higher backwash volumes ▶ More challenging for the next expansion ▶ Risk of filter breakthrough at high rates ▶ Recommend air scour over surface wash ▶ Existing underdrains near end of life
Option 2A	Add 6.2 MGD of Pressure Membranes, Keep GMF	▶ Uses existing assets and recent media replacement ▶ Defers cost of full membrane installation ▶ Smaller footprint ▶ Higher recovery ▶ Competitive cost ▶ Straightforward expansion in a new building	▶ Add pumping station to supply membrane system ▶ Must install GAC polishing downstream, cannot tolerate PAC on membranes ▶ Operators must manage two separate treatment systems ▶ Typical 10-year module replacement ▶ Existing underdrains near end of life, deferment may be short
Option 2B	Add 12.4 MGD of Pressure Membranes, Retire GMF	▶ Retire and abandon existing GMF and Filter Building ▶ Standardizes on one technology ▶ Straightforward expansion in a new building ▶ Scalable for future expansions	▶ Add pumping station to supply membrane system ▶ Must install GAC polishing downstream ▶ More advanced operation and maintenance than GMF
Option 2C	10 MGD of Submerged MGF in Existing Filter Basins	▶ Retire and abandon existing GMF ▶ Repurpose filter basins for submerged gravity membranes ▶ Fit higher capacity within the existing filter basins ▶ Low energy and chemical costs for a membrane system	▶ Requires re-pumping after filtration ▶ Rely on single GMF during winter conversion to MGF ▶ Limited cleaning system, may limit ability to recovery from a water quality event ▶ Must install separate T&O step ▶ Less than 10 installations worldwide

Disinfection credits for the additional capacity under Option 2 will be achieved modifying the existing GST to include better mixing or baffling to reduce the overall contact time (CT) requirements. Disinfection log inactivation credits vary between GMF and membranes, which will contribute to lower CT requirements with a membrane system. T&O control is discussed in Option 3. Membrane filtration does not provide T&O removal. The Distribution Pump Station will be expanded in a new concrete vault, similar to Option 1.

It is anticipated that the pressurized membrane filtration is most-cost effective solution to meet the initial forecasted water demand and offers a straightforward path for expansion. The GMF expansion introduces risk because of the age and condition of the Filter Building. GMF expansion also adds complications associated with demolition, modification of the existing clarifiers, backwash pond and recycle pump station.

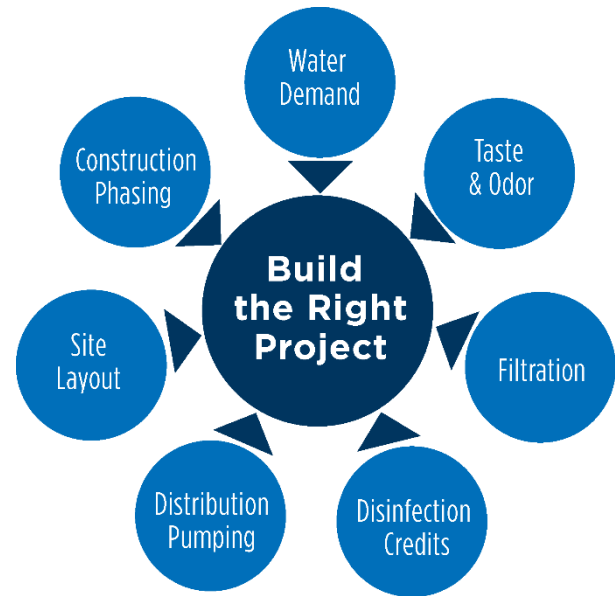
Option 3 – Comprehensive Site Master Plan

Our Option 3 approach is structured around collaboration and investigation into **seven key issues** to select the right project that fits your budget. Each issue is investigated separately and deliberately to form the Basis of Design.

This approach builds consensus on solutions for the big questions in a sequential and timely manner such that design can progress efficiently. Our goal is to design a facility that is robust for the anticipated water quality and future regulations, be flexible for operations, organized, clean, is easily scalable and is set up for years to come.

Advantages of a Comprehensive Plan

- Robust treatment for current and future water quality concerns (T&O, drought, wildfire)
- Scalable to allow strategic construction sequencing
- Tailored to your budget, for Phase I and subsequent Phases



Question 1 – Water Demand Projections

Johnstown's annexations of surrounding land created opportunities for large subdivisions, leading to high growth rate and corresponding water demand. The median growth rate between 2021 and 2019 was 7.3%. This growth is expected to continue through 2041, with a build-out population near 50,000. The sizing of the WTP expansion must address this high growth rate, and not be undersized and result in the need for another expansion in a handful of years. Our team will use the Town's planning and growth projections to confirm the anticipated future water demands and set reasonable WTP expansion phases.

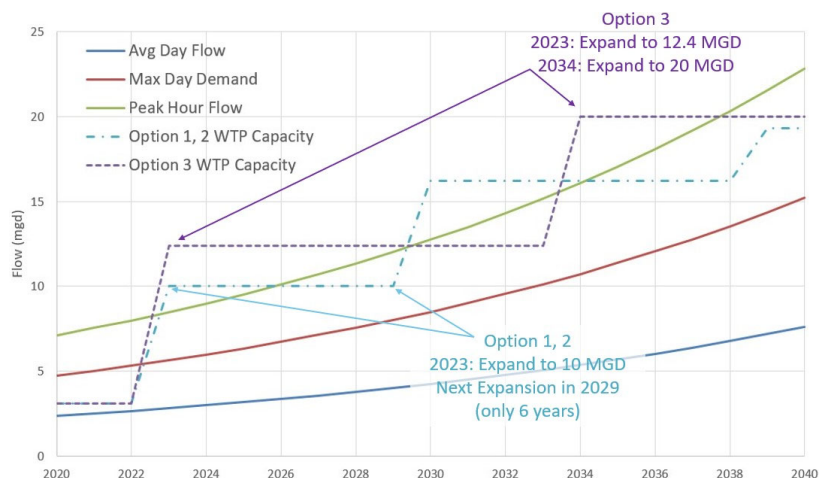


Figure 2-8. Projected Water Demand vs Potential WTP Phasing Scenario

Figure 2-8 shows the average day flow (ADF), maximum day demand (MDD) and peak hour flow (PHF) anticipated in Johnstown over the next 20 years. The WTP must provide MDD, with the differences in PHF made up by distribution storage. We will work with the Town to determine an efficient, stepped- approach to expand the WTP, while maximizing the value of the existing infrastructure. An initial expansion that does not address pretreatment capacity will require a second expansion completed within six years.

Therefore, we propose a conversion of the existing DAF system to Suspended Air Flotation (SAF). ***SAF provides a higher hydraulic through-put and solids capture rate within the same basins.*** The existing high-pressure air-saturator and recycle pumps are replaced with a surfactant-based foaming agent and mixer. The resulting anionic bubble improves removal rates by both attracting and lifting suspended solids. This approach provides the opportunity to re-rate pretreatment up to 12.5 MGD or higher, upon additional testing, verification, and acceptance by CDPHE. This SAF approach is anticipated to improve performance at lower operating costs, remove more suspended solids, TOC, Geosmin and MIB and increase the filter run time. ***Improving the percent TOC removed is an operational goal*** to meet the Town's permit requirements.

Convert DAF & Re-Rate Capacity

- Remove saturators, air compressors, recycle pumps
- Add surfactant foaming agent generator
- Add emulsion mixer to pump gallery
- Potential to double solids capture and through-put

A phased approach has the benefits of being flexible, to right-size the WTP to changing demand patterns, address critical concerns early, and allows the Town to level out the capital spending. This approach offers time to identify and secure funding or financing, as needed, and reduce the strain on the Town's capital budgets. We will work with the town to establish a practical and flexible expansion plan that has a clear program to meet the next 10 to 20 years of growth.

Maximize Water Resources

Raw water is sent to the WTP from the Lonetree and Town Lake Pump Stations, with current firm capacities of approximately 4.7 and 5 MGD, respectively. Expansion of the Lonetree Pump Station and its associated pipeline are necessary for the increased WTP capacity but were excluded from the scope by Addendum 1.

The Town owns the water rights to the ***Chapman Reservoir***, but currently has no way to access that water. Chapman Reservoir is susceptible to nutrient loading from agricultural run-off. Even though Chapman Reservoir is not a near term water source, our approach will evaluate suitable treatment trains for your current sources as well as the Chapman Reservoir. This may include provisions to combine with the new pipeline from Lonetree, as well as selecting a WTP robust treatment train that is suited to the high nitrates, TOC, and T&O compounds from Chapman Reservoir. This new source will help the Town ***improve their resiliency*** for water quality events by adding a third source, prepare for drought conditions, and climate change.



Figure 2-9. Potential Pipeline from Chapman Reservoir

Question 2 - Taste & Odor Control

A major objective of the project is to address seasonal T&O issues related to algae growth. Our team is currently working with the Town to identify short-term solutions to address T&O issues for the summer of 2021. However, T&O must be looked at from a long-term, multi-phased approach, to establish a WTP that is robust, resilient, and able to adapt to changing water quality. Burns & McDonnell identified a ***T&O Toolbox*** in collaboration with the Town as part of our on-going study. The toolbox includes multiple options that each contribute toward removal of TOC and T&O odor compounds.

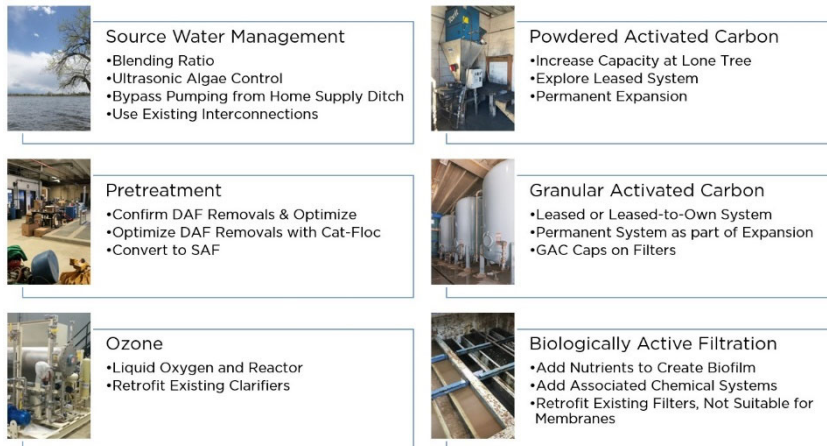


Figure 2-10. Taste & Odor Control Toolbox

incorporated into the WTP expansion. No single technology will do it all, so we will provide a flexible system to make it easy for the operators. Our team will perform desktop analysis and jar tests to verify the effectiveness of a given T&O control strategy prior to implementation.

Question 3 – Filtration Options

Filtration options are discussed above. The selection of the filtration options must consider how the overall WTP will operate as a whole in response to changing water quality, redundancy, ease of operations and life cycle cost. The preferred filtration option will be selected in a collaborative workshop. The basis of our Option 3 approach is a new pressurized membrane system operating in parallel with the existing GMF.

Questions 4 & 5 – Disinfection & Distribution Pumping

The GST are used for distribution storage, backwash storage and disinfection CT. Operators are challenged to maintain the minimum water levels for CT in the GST during periods of high demand. There is no baffling in the tanks, results in a large volume required to meet disinfection requirements. The GST are 65 and 45 years old and need repairs. The DPS is an underground vault with pumps sending water to the East and West pressure zones. Variable speed drives were installed recently, which has helped better match pumping to the system demand.

The WTP expansion is a great opportunity to reexamine how disinfection, distribution storage and pumping is performed for the long-term instead piecing together a short-term solution that depends on existing infrastructure. Several concepts are presented in the text box.

CT & DPS Considerations

- Convert to chloramines to reduce disinfection by-products
- Expand DPS – In Vault or Above Grade
- Rehabilitate aged GST
- Add new DCB with high baffling factor and dedicated backwash volume
- Convert GST's to distribution storage to defer the construction of a new storage tank
- Combine expanded DPS with a dedicated backwash pump station
- Optimize post-treatment chemicals for corrosion control

A new disinfection contact basin (DCB) is an economical way to add CT when a higher baffling factor is used to reduce overall volume. A new DCB creates opportunities to convert the two GST's to distribution storage to meet peak hour demands and **defer new storage in the distribution system**. A new DCB can be designed for the current CT requirements (GMF- giardia) but be sized for future requirements (membranes – virus). The DCB structure can be sized for ultimate flows with a new at-grade pump station installed above with vertical turbine pumps. Pumps are added, as needed, for future phases. A dedicated backwash wash volume will reduce the

height required in the GST for CT compliance. A dedicated DCB, and improved TOC removals from the upgraded pretreatment system, will help the town reduce the chlorine residual entering the distribution system and contribute to lowering disinfection by-products.

The potential upgrades will increase the initial construction costs but will be easier to operate and improve disinfection compliance. However, examining the disinfection and distribution pumping systems for the long-term may prove this to be the best-value and set the town up for the future. The benefits and challenges of modifications to the GST, DCB and DPS will be discussed in a dedicated Workshop. This task will also examine the finished water quality to determine the corrosion potential in the distribution system and identify the preferred corrosion control solution.

Question 5 - WTP Siting and Layout

With all the decisions made above, the attention shifts to identifying the preferred location for the WTP expansion and how to optimize the existing site. The existing WTP property has footprint available for the initial expansion, but that may leave little choices for future phases. It may be more economical to expand on an adjacent site (Figure 2-11). Our approach will result in a site master plan that prevents scenarios that are boxed in by the existing site constraints.

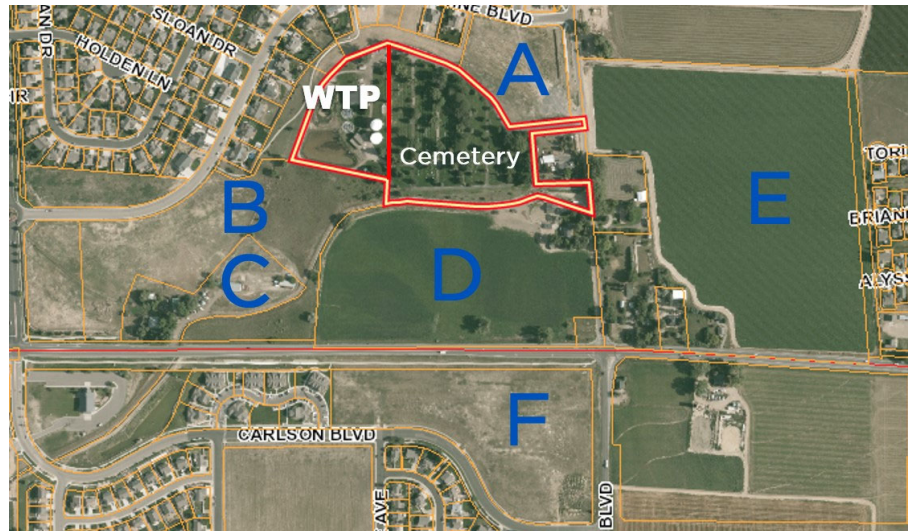


Figure 2-11. WTP Expansion Property Options

Question 6 – Construction Phasing

Our design approach is based on developing a phased sequence of work that meets water demand and water quality issues and prioritizes critical upgrades, while extending the useful life of your existing assets and is a facility that you can afford. Figure 2-12 presents a proposed phasing as an example of a potential solution. The Town must capitalize on recent infrastructure improvements at the Lonetree pump station and filter media. We are also aware of aging structures such as the Filter Building and steel GST that are approaching the end of their useful life. There will likely be more surprises and higher costs trying to reconfigure the Filter Building for a new application while maintaining service. A phased approach creates time to decide if it is worth spending funds to improve an old structure or if it is time to start fresh with a new building. Our comprehensive site master plan approach will form the Basis of Design with a flexible plan to pivot towards your priorities.

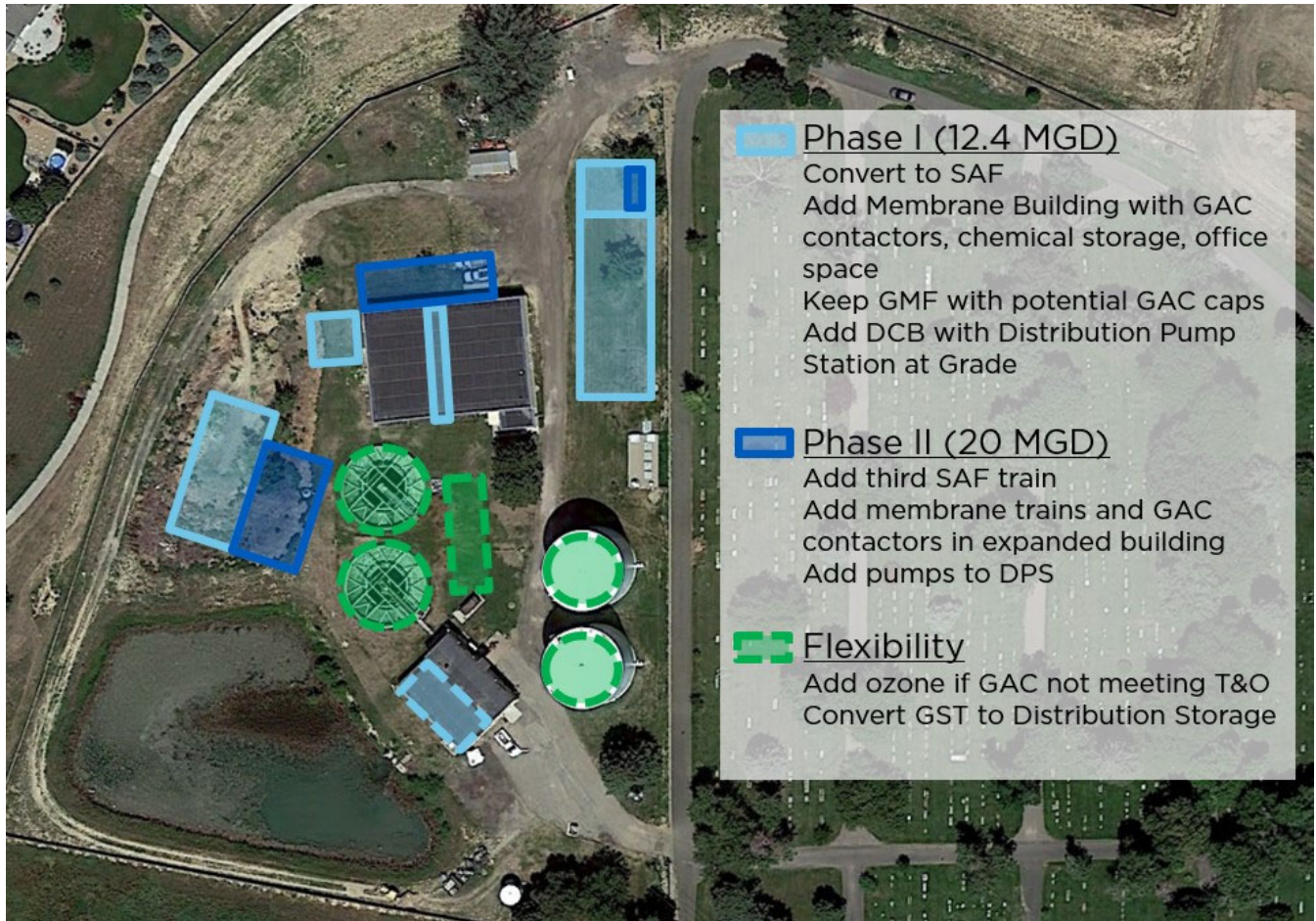


Figure 2-12. Potential Phasing Plan

Plan for Service Interruptions

Construction phasing will be developed as the comprehensive site plan is determined. Construction phasing will also identify when critical work has to happen and identify that WTP service interruptions will occur during periods of low demand. Construction phasing will help to place priority work, such as T&O control, earlier in the sequence such that the Town can benefit during the season they are most needed.

The Town will need to investigate the use of the existing interconnections with Little Thompson Water District, Greeley, and Central Weld County Water District. The Greeley interconnection is only available when the Boyd Lake WTP is running in the summer months as a peaking plant and only available at lower pressure. The Central Weld County Water District interconnection is available at higher pressure but may not have the capacity to meet the town's peak demands. Our construction schedule will identify critical interruptions that may occur in the summer months so the Town can plan ahead. Exercising the interconnections or water rights help with overall system resiliency, being able to react to an event with your backup supplies tested and ready to go, agreements in place.

Value Added Option: Short Term Relief by Optimizing Operations

The individuals that operate your water facilities will provide critical input to the decisions made during the conceptual design. We will distribute a questionnaire to the operators at the start of the project. Operators will be asked to complete the questionnaire and return it prior to our first operators’ workshop. This will help gather a broad opinion of current concerns, challenges, and opportunities. We will ask for each operator’s level of comfort with particular technologies to seek their input on improving existing operations and safety.

We offer an *Operations Optimization task* series that will start from the project outset, in a parallel with the design progression, to give your staff relief ahead of summer demands of 2021. Our team will focus immediately *partnering with your operations staff* to address your current issues that are creating bottlenecks and challenging the operator’s ability to meet maximum day demands.

There are many challenges that the operators face in meeting maximum day demands during the irrigation season. This task series includes engaging the operators to identify, develop and implement improvements to better prepare for summer demands. This will be done in parallel with, but also inform, the WTP expansion design for long term needs. Our process technology lead engineer, Karla Kinser, will host *Workshop 2 – Operations Investigations* to identify current issues and potential ways to improve them. This workshop is designed to create an itemized list of operational, maintenance, mechanical, electrical or control improvements that can be fast tracked.

Many of these items may be achieved by modifying the current O&M practices. However, some will require additional engineering support, analysis through testing, or consultation with approving authorities to be successfully implemented. Our scope and fee include time to support the Town and its operators with this critical task, through the engineering and assistance with procurement, installation support and start-up consulting.

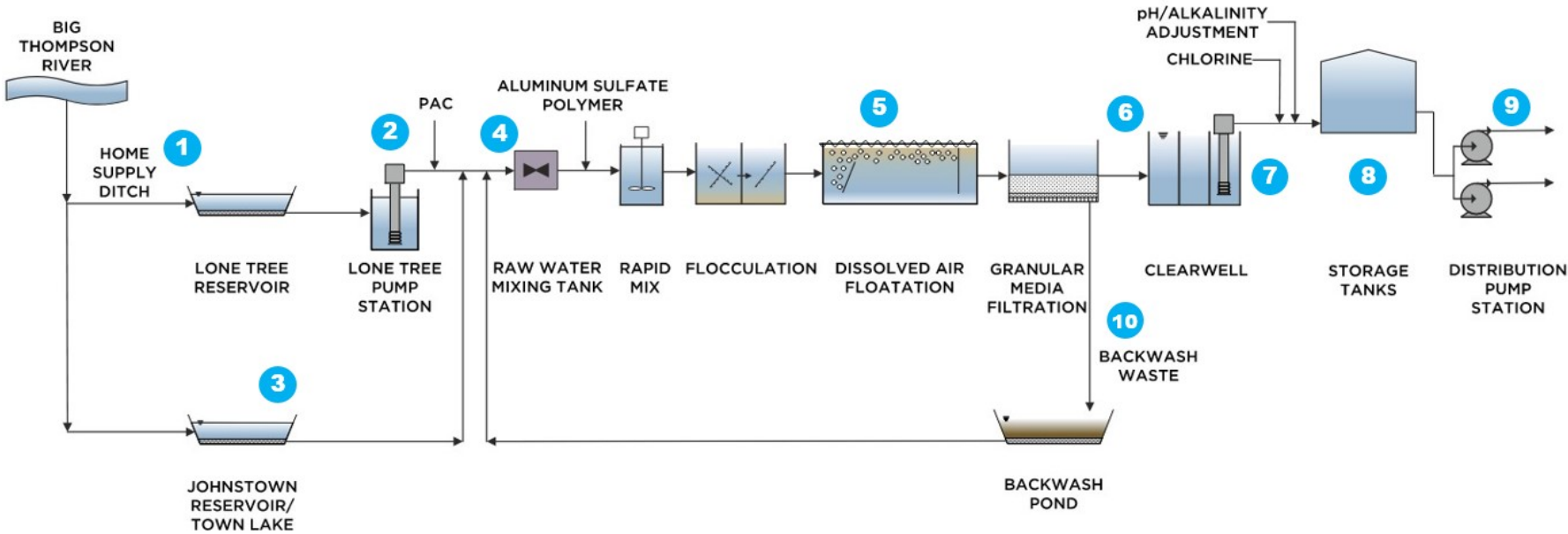


Figure 2-13. Suggested Remedies for Current Operational Bottlenecks

Table 2-3: Short Term Operations Fixes		
1	Bypass Pumping at Home Supply Ditch	Add temporary pumps in the Ditch to bypass Lonetree Reservoir during T&O events. Send Ditch water to the Lonetree Pump Station even when water levels are high.
2	PAC	Increase auger capacity at Lonetree for improved T&O control
3	Town Lake	Install ultrasonic buoy system in Town Lake to limit algae growth
4	Coagulant	Convert to cationic-polymer based coagulant from alum
5	Optimize DAF	Conduct testing to optimize TOC and algae removal in the existing DAF, increase solids capture to increase filter run times and reduce backwash water volumes
6	Filtered Water Header	Add air release valves to prevent air locking
7	Filtered Water Pumps	Rebuild pumps to increase capacity and avoid cavitation during high flows or replace in a deeper well below the clearwell
8	Log Removal Credits	Investigate use of baffles in GST to improve baffling and reduce the storage height required, study potential of alternative log removal credits to reduce the contact time required.
9	Distribution Pumping	Adjust operating setpoints to keep the 0.75 MG storage tank full and buffer peak hour flows out of GST
10	Backwash	Adjust the time of day for backwashes to where there is lower demand to maintain operating levels in the GST

Section 3. Management Approach

Components of Our Proactive Management Approach to Promote Project Success



Project Approach

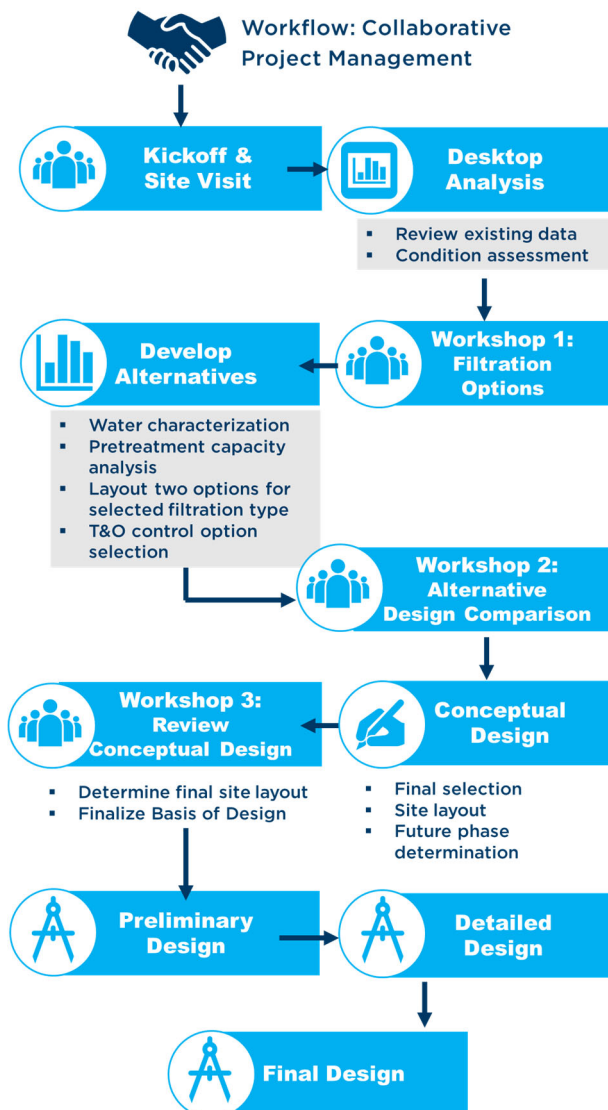
The Burns & McDonnell team has the right experience to plan and design this project for the Town of Johnstown (Town). Making the project successful starts with understanding your specific operational preferences. **Our team's approach is client centric.** We will use an interactive design process that involves your stakeholders every step of the way, making sure that project objectives and expectations are understood and addressed. This ongoing dialogue will be especially important during the early stages of the design process when critical decisions are being made.

Design Approach

Our approach to design is simple – have the right people available when they are needed. Since we have all design disciplines under one roof in our local office, managing our internal resources is a matter of good planning practices. Our project teams maintain a resource planning database and calendar to forecast our discipline engineers. We use these tools to improve efficiency, manage workloads, and make sure we can meet the deadlines we promise.

Key personnel such as the project manager, design manager, and critical discipline leads typically stay involved with projects continuously during their execution. Discipline engineers may have time gaps between when they are needed to complete tasks. In all cases, our engineers stay with projects from planning through construction so that the engineer who specified a piece of equipment will be reviewing the shop drawing prior to installation.

During the project design phase, our project manager will participate in **biweekly project meetings** with the Town. We use these meetings to discuss design elements, project schedule, future milestones, and current progress. We also hold project workshops, as detailed below, at critical design points to discuss alternatives and obtain project feedback.



Use of 3D Modeling

Our design team uses Autodesk Revit to generate plan sets. It is a great tool for all new treatment facility projects as well as many retrofits depending on the complexity of the project. Some of the benefits of using a 3D model include schedule coordination, conveying the design to the owner, and making conflicts easy to spot. For those who do not regularly look at plan sets, we can create a preliminary model that shows walls, pumps, equipment, and the spacing in the area.

We can also easily create models for a “walk through” to show what the final product will look like, including virtual reality models. It is easy to modify the preliminary model based on the owner’s desired changes. This allows us to home in on the final product prior to completing the costlier final engineering calculations.

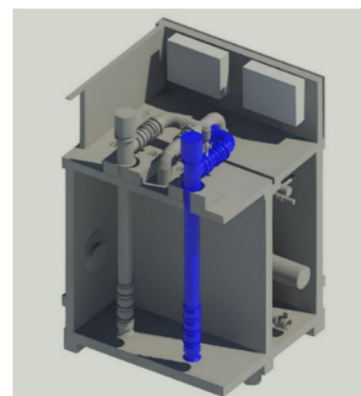


Figure 3-1. 3-D models showing new pump station at a WTP expansion

Focus on Permitting

Understanding that the schedule is often controlled by outside agencies, our team makes **submittals our priority**. We will provide guidance on the regulatory requirements with Town and/or Weld County building inspection, Town building department, fire department, CDPHE and other agencies to develop a Permitting Matrix. This table will identify key project submittal milestones during detailed design and review timelines to avoid unforeseen delays later in the project.

Preliminary, Detailed and Final Design

Upon determining the Basis of Design, per the Collaborative Workflow shown above, we will advance with detailed design, with submittals at 30%, 60 and 90% and final design (bid-ready documents). The following tables describe the design deliverables by milestone, to show their degree of completeness as the project progresses.

Table 3-1: Engineering Discipline Percent Complete by Project Milestone

Design Milestone: Criteria	30%	60%	90%	Final
Treatment Process Layout & Design	60	90	100	100
Process & Instrumentation Diagrams (P&ID)	50	90	100	100
Site Civil (Grading, Yard Piping)	40	70	100	100
Structural	20	70	90	100
Architectural	40	80	90	100
Mechanical (Plumbing, heating, ventilation)	20	60	90	100
Electrical	10	60	80	100
Instrumentation & SCADA	20	40	60	100
Phasing and Demolition	30	70	90	100

Table 3-2: Design Milestone Comparison

Design Milestone: Deliverable	30%	60%	90%	Final
Specifications	Table of Contents	Draft specs	Div. 00 contracting documents, final technical specs	Sealed by PE

Table 3-2: Design Milestone Comparison

Design Milestone: Deliverable	30%	60%	90%	Final
Drawings	Sheet Index, preliminary drawings	Plans, sections, details for all buildings and processes. Submit to CDPHE	Complete drawing set, update based on CDPHE feedback	Sealed, suitable for final construction
Process Flow Diagrams	Schematic for process units	Final	Complete	Complete
P&ID	Draft	Near final	Final	Complete
Equipment list	Initial list	Final list with data packages	Equipment specifications finalized	Complete
Hydraulic Profile	Draft	Final	Complete	Complete
Site Plan	Structure location and yard piping, surface improvements	Grading, erosion control, survey control	Final surface improvements	Complete
Buildings	Approximate size and floor plans, code requirements, elevations	Floor plans and sections with piping,	Final details	Complete
Opinion of Probable Construction Costs	Class 4 (-30 to +50%)	Class 2 (-15 to +20%) Or by CMAR	Class 1 (-10 to +15%) Or by CMAR	Class 1 Or updated by CMAR, for any changes post 90%
Constraints	Key design/ construction constraints identified (floodplain, Geotech, phasing)		Described in Div. 00	
Electrical	Equipment layout, one-line diagram for power distribution	Draft process control narrative (PCN) describing automation, monitoring strategies	Final PCN	Complete
Schedule	Estimated construction duration, initial sequencing plan	Updated duration, sequencing	Complete	Per bidding

Project Schedule & Cost Management

The Burns & McDonnell team uses a portfolio of proven tools and processes to look at both near- and long-term project drivers to determine how they can, should, and will fit into the project to meet both budget and schedule parameters.

We use a well-developed accounting system, EcoSys, to track labor costs, expenses, and billing. Brett Pugh will be responsible for setting and controlling the budgets for your project. As part of the billing process, he will review billed hours, expenses, and costs monthly. He will also use additional tools to track progress and forecast expenditures through the end of the project. As labor hours and costs are recorded through our weekly time sheet process and expense management system, the data becomes available to him through a cloud-based system to analyze current and projected costs for the project.

While the financial systems track costs, the ***most important part of cost control is managing the team.***

We take a focused approach to design, in which our key discipline engineers complete the conceptual design to clearly understand our path forward before we involve the expanded team to complete the final design. This helps us keep each design discipline focused and moving the project forward through managing the sequence of deliverables.

All invoices will include a one-page status report that identifies work accomplished during the invoiced period, and work planned for the upcoming invoice period and a recap of fund expended/funds remaining for project.

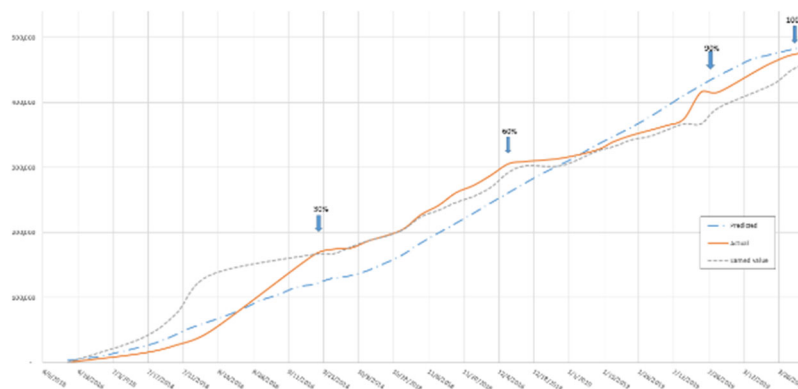


Figure 3-2. Example design project S-Curve comparing forecast, actual and earned value.

Opinions of Probable Cost

Our team is committed to providing you with biddable/constructible design documents and opinions of probable cost throughout design that you can rely on. Because of our vast history of water plant design and in-house construction experience, we have a library of recent constructed projects and bid prices which will inform the opinions for this project.

We understand that the Town has a target capital cost planned for the upgrades. We will focus on designing the upgrades required at this time, while keeping an overall plan for the facility in mind and making sure those upgrades fit into the overall plan.

Maintaining updated cost opinions and life cycle costs is as important as monitoring project financials or updating drawings. As detailed design progresses, concepts are changed, design workshops are held, etc., all impacting the facility cost. Our approach is to prepare updated cost opinions and life cycle costs following milestone completions, such as preliminary design, 60% design, 90% design, and 100% design.

Value Added

Our team does not rely on cost tools or models available on the market to estimate costs for water treatment plants; *we use ground up estimates informed by local market data.*

We also plan to leverage either our internal construction staff or our construction partner, Garney Construction, provide a second check on our estimates and to contribute a larger set of construction cost data.

Our estimates will help the Town plan out the capital works that work within your budgets. This defensible approach helps support water rate increases and help the Town set appropriate rates for tap fees.

Assistance with Funding Sources

Funding the construction of the expansion of the WTP may require a combination of rate increases, bonds, grants, and loans. Loans are available through the State Revolving Fund (SRF) administered through the CDPHE. There also may be other existing federal grants or new loans available due to the change in the federal administration, for example through other avenues such as the Clean Water Fund. Burns & McDonnell has extensive experience assisting our clients in determining all avenues available to obtain grants and loans. We routinely aid in filing applications and administration of the CDPHE SRF. We have included an optional task to assist the Town in obtaining funding for the project once a cost estimate has been prepared and a budget understood.

Life Cycle Optimization Tool

An understanding of all costs associated with any option considered for the WTP is critical. For example, while the capital cost of a GMF expansion utilizing the existing filters may appear less than a 12.4 MGD expansion using membranes, there may be significant differences in the overall life cycle once a 20 or 50-year life horizon of replacement, maintenance, and all operating costs such as PAC or GAC replacement are considered. Our approach is to present construction (or capital) costs along with chemical, electrical, and estimated labor costs for each option, and any impacts to other facilities in the plant for the predetermined life horizon presented as a net present value so the Town may evaluate each option completely. These costs are utilized in conjunction with non-cost criteria for a formal evaluation of all alternatives so that a best-value selection may be made for the WTP. ***Our life cycle tool is invaluable when considering value engineering options because a deduction in capital costs can result in a large increase in operating costs.***

Schedule

We will develop a schedule in Microsoft Project at the start of the project with your input incorporated. We will use the schedule to forecast resources, plan the overall project execution, and help define proposed deliverables. The schedule is a living document and will be updated as the project progresses. Typically, it will be updated each month as part of the invoicing cycle and compared against the baseline schedule as the project progresses. Internal accounting software will generate up to date spending reports for Brett to compare against the forecasted spending to monitor and track the project progress.

Risk Management

Our approach to risk management starts with experienced team leadership. Before responding to an RFP, we determine the correct leadership team to review the agreement, complete the work, and provide quality control. If we do not have the right team for the job, then we will not go after a project.

A large portion of the projects our proposed team works on are executed using alternative delivery methods, such as design-build, construction manager at risk (CMAR), and engineer-procure-construct (EPC). All of these projects go through an in-depth risk review process to confirm design risk, cost risk, construction risk, external risks, schedule risk, etc. This experience improves our ability to identify pitfalls in project alternatives and designs at the earliest stages of planning. While we are not delivering this project through an alternative delivery model, we are already aware of the key project risk and will address risk items in our internal project execution plan. Risk management is enhanced in DB by the integrated project team managing together all components throughout the project delivery (design to construction).

We are already aware of many of the current operational risks and have incorporated those into our Operations Optimization task series described above.

Table 3-3: Preliminary Risk Matrix

Risk or Opportunity Description	Consequence	Mitigation Measure(s)
Obtaining CDPHE construction approval	▶ Delayed schedule	▶ Burns & McDonnell has an excellent relationship with CDPHE ▶ Coordinate early in the design phase
Continued taste & odor issues during design and construction.	▶ Unsatisfied customers	▶ Apply multi-phased approach ▶ Investigate proven technologies ▶ Share plan with customers
Code compliance for existing structures	▶ Add scope late in construction ▶ Delayed schedule	▶ Complete condition assessment at project initiation to identify upgrades
Challenges with connections to existing buried pipelines	▶ Size conflicts ▶ Location conflicts ▶ Material conflicts	▶ Extensive locates and test holes during design phase
Keeping the existing plant operational and treating water within regulatory standards during construction	▶ WTP shut down and unable to treat water ▶ WTP unable to meet standards	▶ Prepare to use available interconnections ▶ Develop worst case scenario contingency plans
Maintain water levels in GST for disinfection compliance	▶ Fail to comply with operating permit	▶ Adjust flow set points to smooth plant flows ▶ Address mechanical issues with filtered water pumps at project outset ▶ Optimize pretreatment to reduce loading on filters
Operating the Lonetree PAC system	▶ Recurring T&O complaints	▶ Upsize existing PAC system capacity ▶ Increase staffing presence

Communications

Burns & McDonnell has been in business for 123 years and recognizes the importance of coordination and communication between your staff and our project team. This begins at the initial coordination/ kickoff meeting where direct lines of communication, project requirements, project scope, public concerns, design criteria, and critical project issues are established.

Table 3-4: Typical Kickoff Meeting Discussion Topics:

▶ Project background and overview	▶ Project Schedule
▶ Team introductions	▶ Key action item needs
▶ Subconsultants and their roles (if any)	▶ Existing data exchange
▶ Chain of command	▶ Permitting
▶ Project goals and objectives	▶ Project meeting schedule
▶ Owner preferences and concerns	▶ Delivery model
▶ Existing asset condition	▶ Filtration option preference

Our project management approach stresses communication up front so that we understand the Town's needs and goals prior to fully submerging all staff members into the project. The approach includes a process of keeping you informed about progress of the work and keeping you involved in making key decisions through focused and scheduled meetings.

The goal is to balance the needs and goals of the Town with the project cost and schedule. Our approach to design is centered on understanding the problem to be solved and incorporating the preferences of the Town into that solution. We understand that there are often many ways to complete a design, but ultimately, it will not be successful unless your staff and operators are in support of the design.



Figure 3-3. Our straightforward approach to design and approach to project management will result in a smoothly executed project.

Quality

A major benefit of having all disciplines in the same office and dedicated to specific design services, such as municipal water, is that our work teams are coordinated and consistent. Our team's QA/QC program is mandatory on all projects. We use it to develop project documents that adhere to project requirements. Its purpose is to minimize inconsistencies, gaps, and interferences in the documents.

Specific quality control tasks, shown in figure 3-4, will be budgeted into the project. Our timekeeping and manpower system monitors specific task activities. The process implemented on your project could include up to six distinct quality control review subtasks from the beginning of the project to its completion, as shown in the figure.

As the project manager, Brett Pugh will be responsible for organizing all aspects of your project's quality control activities including:

- ▶ Scheduling QA/QC reviews
- ▶ Assembling review teams
- ▶ Overseeing in-house quality reviews
- ▶ Coordinating with the Town on QA/QC requirements

Brett will also coordinate with the project team so that the quality control functions are smoothly incorporated into the overall scope.



Figure 3-4. Quality Management Plan Steps.

Resources

Our team routinely completes multiple projects simultaneously, which is how we are able to support so many in-house engineering disciplines. On a project like yours, discipline engineers complete their part of the design in a sequence that meets the submittal schedule. They do not need to be involved throughout the entire duration of

the design, only when their part of the project is active. Discipline leads will remain available for coordination purposes on an as-needed basis throughout the duration of the project. We use this approach to plan resources and make sure we can meet your desired schedule.

This approach offers efficiencies to our local team, who are often collaborating on multiple projects at any given time. The synergies created by working on multiple projects for a single client will create savings by having a single point of contact, reducing the number of site visits, and discuss multiple issues at once spanning both projects. The natural collaboration of our integrated teams saves time and eliminates the need coordinate with a third party. Executing multiple projects puts our team in the best position to understand priorities and where the money needs to be spent the most between the two projects.

275 Resources
In Centennial, CO
42 Local Staff
Dedicated to Water Projects

Bid Phase Support & Project Delivery Option

The Town indicated that they anticipate that the project will be delivered by conventional Design-Bid-Build (DBB) but are interested in Construction Management at Risk (CMAR). Both CMAR and progressive Design-Build (DB) may benefit the project by reducing the overall duration, better controlling costs, and managing/sharing risk.

Our approach can be implemented for any of the delivery methods. An open, collaborative discussion will occur during the preliminary design to determine the optimal solution for the Town. Important considerations include schedule, cost, future phasing, collaboration with the watermain design team, and the Town's comfort level with alternative delivery.

Table 3-5: Project Delivery Method Options

Delivery Model	Benefits	Drawbacks
DBB – Design Bid Build	▶ Traditional method ▶ Owner familiarity ▶ Typically award on lowest bid ▶ Established price	▶ Cost unknown until bid (high bids) ▶ Must fully define project before bidding ▶ Separate contracts for designer and contractor
DB – Design Build	▶ Collaboration ▶ Early bid packages ▶ Open book accounting ▶ Reduce schedule by early start of construction ▶ Single contract for design-builder ▶ Additional value engineering and risk management opportunities.	▶ Learning curve for some owners ▶ Joint venture or prime/sub arrangement between designer and contractor
CMAR – Construction Manager at Risk	▶ Collaboration with contractor during design ▶ Early bid packages ▶ Open book accounting ▶ Additional value engineering and risk management opportunities	▶ Quality based selection, not competitively bid on price alone ▶ Separate contracts for designer and contractor

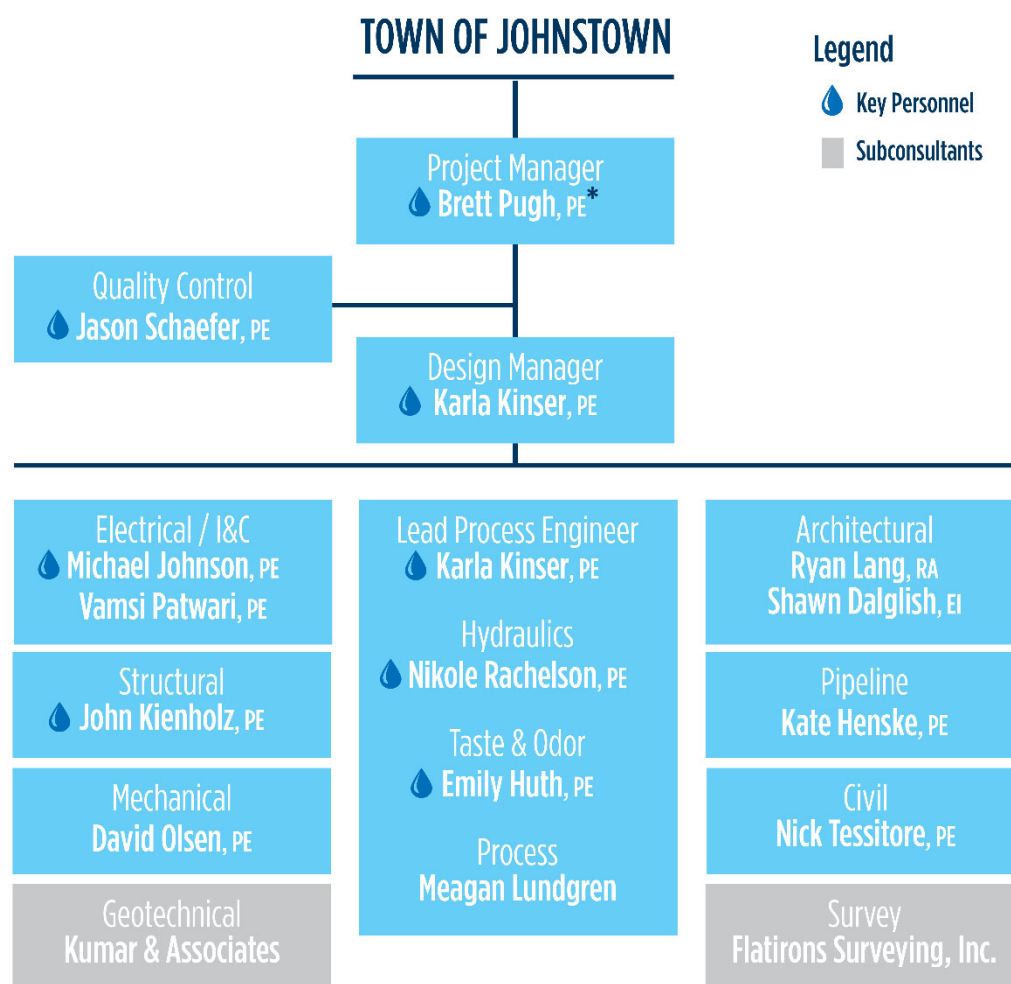
Please refer to Section 7 in this proposal for more information about delivering this project with a design-build delivery model.

Section 4. Staff Qualifications

Organization Chart

Our design team is 100% located in Centennial, Colorado, providing you with readily available in-person interface and allowing our team members to be on site quickly. Brett Pugh, project manager, will be your primary point of contact, partnering with the Town and managing the project's scope, schedule, budget, and quality objectives. Resumes are provided in Attachment A.

The project manager, project engineer, quality reviewer, and key discipline leads will remain engaged with the project throughout construction, providing the Town with seamless support. Our project team organization is set up to seamlessly transition from design only to design-build delivery, should the Town elect to pursue that option.



* There are many opportunities for synergy between the water treatment and wastewater treatment projects. If the same team executes both projects, there would be efficiencies gained from having the project manager be involved in both projects. We would like to discuss the possibilities with the Town. In addition to shared leadership, there would be benefits in terms of shared meetings, reporting, scheduling, and invoicing, which would further promote cost savings and streamline communications across both projects. Likewise, If the Town selects a design-build delivery model, we could also implement a consistent design-build manager across both projects.

Key Team Member Bios & Client References

All key staff will continue to be involved through the construction phase.



Brett Pugh, PE | Project Manager & Point of Contact in Responsible Charge of Project

License | Professional Engineer: CO (Civil) **Location** | Centennial, CO

23 years of experience in both water and wastewater treatment facility design, construction, and commissioning, which includes dissolved air flotation, membrane filtration, and granular media filtration optimization. Has been actively involved with collaborative project delivery (DB, progressive DB, CMAR) for more than 20 years. Partners with clients to understand their key project drivers to develop realistic and cost-effective solutions.

REFERENCES

- | | |
|---|--|
| 1 | Project Lynn R. Morgan Water Treatment Plant Expansion (2021) \$10.7M
Role on Project Project Manager
Owner & Contact Town of Erie, CO
Todd Fessenden (303) 926-2895, tfessenden@erieco.gov |
| 2 | Project Boxelder WWTP Expansion (2021) \$32M
Role on Project Project Manager
Owner & Contact Boxelder Sanitation District
Brian Zick: (970) 498-0604, brianz@boxeldersanitation.org |
| 3 | Project Dodd WTP Hydroelectric Project (2020) \$3M
Role on Project Project Manager
Owner & Contact Left Hand Water District
Chris Smith (303) 530-4200, chrissmith@lefthandwater.org |



Jason Schaefer, PE | Quality Control/Assurance

License | Professional Engineer: CO (Civil) **Location** | Centennial, CO

13 years of experience as a senior process design engineer, project manager, and quality reviewer for major water treatment facility retrofits and new plants, using both traditional and collaborative project delivery methods. Extensive experience in pretreatment, treatment process selection, plant optimization, and design-build delivery. Will provide knowledgeable guidance in both project scope development and engineering solutions.

REFERENCES

- | | |
|---|--|
| 1 | Project Dodd WTP Upgrades (2016) \$28M
Role on Project Project Manager / Project Engineer
Owner & Contact Left Hand Water District
Chris Smith, District Manager: (303) 530-4200 chrissmith@lefthandwater.org |
| 2 | Project Thornton WTP Replacement (2020) \$100M
Role on Project Project Manager
Owner & Contact City of Thornton
Dennis Laurita: (303) 538-7649 dennis.laurita@thorntoncolorado.gov |
| 3 | Project Advanced Treatment at Plum Creek Water Purification Facility (2021) \$29M
Role on Project Project Manager
Owner & Contact Town of Castle Rock
Tim Friday: (720) 733-6030 tfriday@crgov.com |



Karla Kinser, PE | Design Manager/ Lead Process Engineer

License | Professional Engineer: CO (Civil) **Location** | Centennial, CO

26 years of experience in water treatment, serving as a project engineer, lead process engineer, and filtration specialist. Globally recognized subject matter specialist in membrane treatment. Has led the multi-discipline design effort for large water treatment plant expansions and retrofits nationwide.

REFERENCES

1

Project | TDS Reduction at Cherokee Water Reclamation Facility (2021) \$42M
 Role on Project | Lead Process Engineer
 Owner & Contact | Cherokee Metropolitan District
 Jeff Munger: (719) 597-5080 ext. 115 | jmunger@cherokeemetro.org

2

Project | Wes Brown WTP Membrane Analysis and Pilot, Train 8 Mods (2021) \$1.2M
 Role on Project | Lead Process Engineer
 Owner & Contact | City of Thornton
 Stacy Roberts: (720) 977-6252 | Stacy.Roberts@thorntoncolorado.gov

3

Project | Lynn R. Morgan Water Treatment Plant Expansion (2021) \$10.7M
 Role on Project | Membranes Specialist
 Owner & Contact | Town of Erie, CO
 Todd Fessenden (303) 926-2895, tfessenden@erieco.gov



Nikole Rachelson, PE | Process Engineer (Hydraulics)

License | Professional Engineer: CO (Civil) **Location** | Centennial, CO

14 years of experience with both water treatment plant and pump station hydraulics at facilities ranging from 1 to 215 MGD. Experience includes design and analysis of hydraulics to optimize functionality, determine hydraulic capacity, accommodate complicated retrofits without impacting upstream processes, and maximize efficiency.

REFERENCES

1

Project | Interim Compliance at Fountain Valley Authority WTP (2017) \$1.1M
 Role on Project | Project Manager
 Owner & Contact | Colorado Springs Utilities
 Jerad Barnett: (719) 688-4546 | jbarnett@csu.org

2

Project | Eaton Pump Station Relocation (2018) \$1.8M
 Role on Project | Project Manager / Hydraulics Lead
 Owner & Contact | City of Westminster
 Julie Koehler: (303) 658-2178 | jkoehler@cityofwestminster.us

3

Project | Highlands Booster Pump Station (2016) \$700K
 Role on Project | Project Manager / Hydraulics Lead
 Owner & Contact | Cottonwood Water & Sanitation District
 Ron Lambert, Owner's Engineer, Mulhern: (303) 649-9857 | ron@mulhernemre.com



Emily Huth, PE | Process Engineer (Taste & Odor)

License | Professional Engineer: WY (Civil) **Location** | Centennial, CO

Six years of experience as a process design engineer and project engineer on water treatment facility projects. Experience includes piloting of filter loading rates, pretreatment, and filtration; and process designs that address taste and odor concerns in variable water sources.

REFERENCES

1

Project | Thornton WTP Replacement (2020) \$100M
 Role on Project | Project Engineer
 Owner & Contact | City of Thornton
 Dennis Laurita: (303) 538-7649 | dennis.laurita@thorntoncolorado.gov

2

Project | Wes Brown WTP Membrane Analysis and Pilot, Train 8 Mods (2021) \$1.2M
 Role on Project | Assistant Project Manager, Process Engineer
 Owner & Contact | City of Thornton
 Stacy Roberts: (720) 977-6252 | Stacy.Roberts@thorntoncolorado.gov

3

Project | Gregory Hill Pump Station (Part of Pressure Zone 3 Expansion)
 Role on Project | Project Engineer
 Owner & Contact | City of Westminster
 Julie Koehler: (303) 658-2178 | jkoehler@cityofwestminster.us



John Kienholz, PE | Structural Engineer

License | Professional Engineer: CO (Civil) **Location** | Centennial, CO

17 years of experience focused in the water industry, designing steel, concrete, and masonry structures and substructures. Has served as the lead structural engineer on some of the largest water treatment and wastewater treatment projects in the Denver Metro area. Also serves as a building information model (BIM) coordinator for these projects, coordinating the design effort across multiple disciplines.

REFERENCES

1

Project | Advanced Treatment at Plum Creek Water Purification Facility (2021) \$29M
 Role on Project | Lead Structural Engineer
 Owner & Contact | Town of Castle Rock
 Tim Friday: (720) 733-6030 | tfriday@crgov.com

2

Project | Thornton WTP Replacement (2020) \$100M
 Role on Project | Structural Engineer
 Owner & Contact | City of Thornton
 Dennis Laurita: (303) 538-7649 | dennis.laurita@thorntoncolorado.gov

3

Project | TDS Reduction at Cherokee Water Reclamation Facility (2021) \$42M
 Role on Project | Lead Structural Engineer
 Owner & Contact | Cherokee Metropolitan District
 Jeff Munger: (719) 597-5080 ext. 115 | jmunger@cherokeemetro.org



Michael Johnson, PE | Electrical/I&C Engineer

License | Professional Engineer: CO (Electrical) **Location** | Centennial, CO

20 years as an electrical and controls engineer, with experience in the water industry spanning treatment facility expansions, new treatment facilities, and pump stations.

REFERENCES

1

Project | Lynn R. Morgan Water Treatment Plant Expansion (2021) \$10.7M
 Role on Project | Electrical Engineer
 Owner & Contact | Town of Erie, CO
 Todd Fessenden (303) 926-2895, tfessenden@erieco.gov

2

Project | Broomfield WTF Expansion (2020) \$16M
 Role on Project | Electrical Engineer
 Owner & Contact | City and County of Broomfield
 Ronda Jo Ackerman Alford: (303) 464-5807 | ralford@broomfield.org

3

Project | First Creek Lift Station Capacity Improvements (2021) \$407K
 Role on Project | Electrical Engineer
 Owner & Contact | City of Aurora
 Andrea Long: (720) 859-4346 | along@auroragov.org

Additional Design-Build Resources

If the Town is interested in design-build, Jason Schaefer will serve as the design-build manager, and Garney Construction will serve as the construction manager.



Matt Wampler, DBIA | Construction Manager

Garney Construction **Location** | Littleton, CO

20 years of construction experience in the water industry with a strong background in design-build. Role includes day to day field operations, client interface, material procurement and approvals, and subcontractor management. Recent experience working with Burns & McDonnell on two large treatment facilities in Colorado using design-build delivery. Select recent experience includes:

- ▶ Construction manager, City of Thornton, Thornton WTP Replacement (20 MGD, \$100M) (Progressive Design-Build with Burns & McDonnell)
- ▶ Construction manager, Cherokee Metropolitan District, TDS Reduction at Cherokee Water Reclamation Facility (\$42M) (Progressive Design-Build with Burns & McDonnell)
- ▶ Senior project manager, Metro Wastewater Reclamation District, PAR 1088 Northern Treatment Plant (\$98M) (Progressive Design-Build)
- ▶ Senior project manager, City of Loveland, Wastewater Treatment Plant Improvements (\$35M)

Subconsultants

We often subcontract with topographical surveying and geotechnical firms with local knowledge and relationships. Our team has successfully worked with the firms below on water projects across the Front Range.

- ▶ **Kumar & Associates** provides geotechnical engineering services, environmental sciences, engineering geology, construction observation, and material testing. Their more than 80 professional engineers and geologists, environmental scientists, and engineering technicians have recent water project experience.
- ▶ **Flatirons Surveying, Inc.** has served the Front Range since 1981 as a premier provider of surveying services that include a wide variety of construction surveying and construction layout services. Flatirons has a staff of 50 professionals that includes six licensed surveyors, 10+ field crews, and a complete drafting department.

Section 5. Related Project Experience

Our project team has extensive experience along the Front Range and into Wyoming and Montana. We selected the following projects with the most relevance to the Town. Details on each project immediately follow.

Featured Projects <i>Detailed descriptions are provided on pages 28-32.</i>	Colorado Project	WTP Retrofit / Expansion	Pretreatment	Granular Media Filtration	Membrane Filtration	Taste & Odor Control	DOVE Compliance	Pumping	Plant Size (MGD)	Year Complete
Lynn R. Morgan WTF Expansion		•	•		•	•	•	•	16	2020
Plum Creek WPF Advanced Trmt.		•	•	•	•	•	•	•	6	2021
Dodd WTP Upgrades		•	•		•	•	•	•	16	2016
Broomfield WTF Expansion		•	•	•			•	•	26	2020
Thornton WTP Replacement			•	•		•	•	•	20	2020

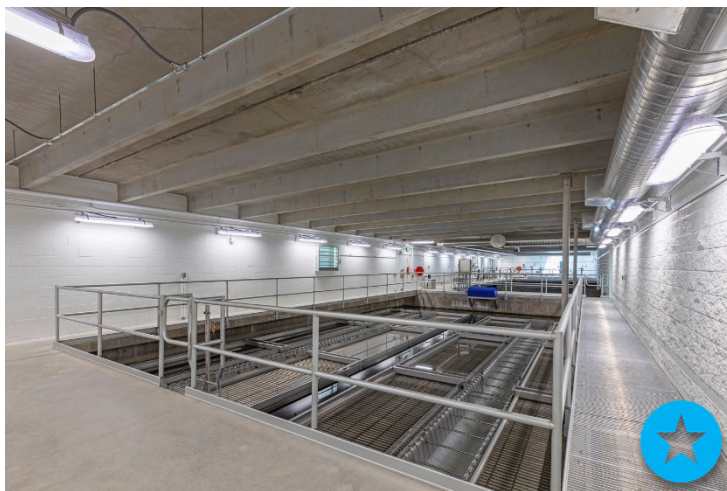
Consistent Project Team

Our project team has worked together on numerous, similar projects in recent years, all in this region. This shared success will benefit the Town by building off our team's relevant local knowledge and we can hit the ground running. Our consistent team will lead to consistent results.

Consistent Team = Consistent Results Owner Project	Brett Pugh	Karla Kinser	Jason Schaefer	Nikole Rachelson	Emily Huth	Meagan Lundgren	Michael Johnson	Nick Tessitore	John Kienholz	David Olsen
City of Thornton Thornton WTP Replacement	•	•	•		•	•	•	•	•	•
Left Hand Water District Dodd WTP Upgrades			•	•	•			•	•	
Town of Erie Lynn R. Morgan WTF Expansion	•	•	•	•			•	•	•	•
Town of Castle Rock Plum Creek WPF Advanced Treatment	•	•	•	•	•	•	•	•	•	•
City and County of Broomfield Broomfield WTF Expansion	•		•	•			•	•	•	•
City of Westminster Pressure Zone 3 Expansion		•	•	•	•		•	•	•	•
Colorado Springs Utilities Rechlorination at Research & Roxbury Pump Stations		•	•	•			•	•	•	•
Denver Water Moffat WTP Modifications (DP#7)	•	•	•	•					•	•
Left Hand Water District Dodd Hydroelectric Facility	•		•	•			•	•	•	•
Mt Carbon Metro District Morrison WTP Expansion	•	•	•	•				•	•	•

Featured Projects

Lynn R. Morgan WTF Expansion | Erie, CO



The Town of Erie required an expansion of the Lynn R. Morgan WTF to meet the needs of a growing customer base. Our team provided design and construction phase services to expand the WTF from 9.9 to 16.6 MGD. The expansion includes a micro-turbine facility for hydroelectric generation on their Carter Lake Reservoir supply from the Northern Colorado Water Conservancy District, yard piping modifications, a new pretreatment train consisting of 4-stage flocculation and inclined plate settlers, three new 2.25 MGD submerged membrane trains, a new 4,500 gpm high service pump and a new 30-inch finished water transmission main.

The existing submerged membrane systems included six submerged membrane cells with only three trains populated. The expansion added membrane modules, permeate pumps, piping, valves, and associated instrumentation to the three vacant cells. The entire submerged membrane control system was updated to replace discontinued hardware. The existing ancillary equipment will be maintained to reduce the overall project cost.

The Town of Erie receives its raw water from a blend of Carter Lake, the Boulder Feeder Canal, Erie Lake, and the Thompson Reservoir. The Town was experiencing taste and odor issues attributed to the presence of geosmin in the raw water supply. Burns & McDonnell completed jar testing and prepared a study to identify alternatives to broadcasting an algaecide to its reservoirs. Powdered activated carbon injection, granular activated carbon absorption, ozone, and biologically active filtration were evaluated, with PAC selected as the most cost effective for the anticipated geosmin levels and blending ratios.

The project included a characterization of the raw water sources to identify operational savings based on seasonal variations and combinations of sources. Operations data from both the submerged and pressurized membrane plants were analyzed to identify seasonal trends, assess the efficacy of the current cleaning protocols, and flag opportunities for optimization.

Construction was phased to avoid impacts on operations, with the submerged membrane installation occurring during a seasonal outage during low demand periods. Our team worked with Garney Construction, using a CMAR collaborative delivery method, to procure long-lead equipment early, reducing the overall construction duration by 10 weeks.



Collaborative Delivery Project with
Garney Construction

CLIENT & REFERENCE

- ▶ Town of Erie, Colorado
Todd Fessenden, Public Works
Director - Utilities
(303) 926-2895
tfessenden@erieco.gov

PLANT SIZE

- ▶ 16 MGD

COMPLETION DATES & VALUE

- ▶ Design Complete: February 2019
- ▶ Construction Complete: 2020
- ▶ Design Fee: \$1.5 million
- ▶ Constructed Value: \$12.8 million

FIRM'S ROLE & SERVICES

- ▶ Prime Consultant
- ▶ Preliminary Design, Final Design,
Construction Phase Support

KEY STAFF

- ▶ Brett Pugh, Project Manager
- ▶ Karla Kinser, Membrane Specialist
- ▶ Jason Schaefer, Quality Control
- ▶ Nick Tessitore, Civil
- ▶ David Olsen, Mechanical
- ▶ John Kienholz, Structural QC
- ▶ Michael Johnson, Electrical

Thornton Water Treatment Plant Replacement | Thornton, CO



The new Thornton Water Treatment Plant (TWTP) was implemented to replace the existing Thornton Treatment Plant (originally constructed in 1955), which was near the end of its useful life. The new TWTP has a firm capacity of 20 MGD and works in concert with the Wes Brown WTP to serve the City's water needs.

Our team performed a six-month pilot that included pre-oxidation, pretreatment, intermediate ozone, and biofiltration. This led to the process train selection of raw water oxidation, pumped rapid mix, flocculation, sedimentation with plate settlers, advanced oxidation with ozone and hydrogen peroxide, biologically active filtration, and chlorine disinfection. The TWTP includes advanced treatment train is designed to accommodate 99.9% taste and odor removal.

Though the existing plant met all current regulatory standards for water quality, the new TWTP is a much more flexible plant that can adjust to treat several source water conditions and exceed existing water treatment standards. In addition, it was designed with hydraulic capacity for emergency treatment during high-flow periods. The pilot-tested and CDPHE-approved high filter loading rates allows for sustained peak flows during high demands systems. However, the TWTP will be operated at a more conservative filter loading rate.

The TWTP treats water from Thornton's two primary existing surface water sources: Standley Lake and the South Platte River. Water from Standley Lake presents few quality issues, though seasonal fluctuations sometimes create reduced volumes of water available from that source. Water obtained from the South Platte presents chronic challenges with taste and odor, a problem stemming primarily from the presence of organic matter, algae blooms, and other constituents. TWTP can isolate treatment of the respective water sources coming into the plant. This gives operators the flexibility to isolate or blend the two raw water sources as needed, optimizing chemical use, and potentially saving costs. The inclusion of multiple chemical injection points throughout the treatment train also aids in operational flexibility. This feature, combined with strategically placed instrumentation, allows the city to quickly respond to significant variations in water source quality.



You guys are just fantastic. Great partners... a hell of a team. It is a pleasure to work on projects with you and this project was outstanding. Thanks for all you do.

- Dennis Laurita, City of Thornton

CLIENT & REFERENCE

- ▶ City of Thornton, Colorado
Dennis Laurita
Contract Administrator
(303) 538-7649
dennis.laurita@thorntonco.gov

PLANT SIZE

- ▶ 20 MGD

COMPLETION DATES & VALUE

- ▶ Design Complete: 2018
- ▶ Construction Complete: 2020
- ▶ Design Fee: \$5,079,130
- ▶ Constructed Value: \$100 million

FIRM'S ROLE & SERVICES

- ▶ Subconsultant to Contractor
- ▶ Piloting, Preliminary Design, Final Design, Construction Phase Support

KEY STAFF

- ▶ Jason Schaefer, Project Manager
- ▶ Brett Pugh, Quality Control
- ▶ Karla Kinser, Quality Control
- ▶ Emily Huth, Project Engineer
- ▶ John Kienholz, Structural
- ▶ Nick Tessitore, Civil
- ▶ David Olsen, Mechanical
- ▶ Michael Johnson, Electrical

Dodd WTP Upgrades | Niwot, CO



Burns & McDonnell worked as part of a design-build team with Garney Construction to upgrade to the Dodd Water Treatment Plant (DWTP) in Niwot, Colorado. Burns & McDonnell permitted and designed and the upgrades to the DWTP. The DWTP includes conventional pretreatment with high-rate inclined plate settlers, MF/UF membranes, clearwell, and high service pumping to increase capacity from an 8 MGD to 10 MGD with the capability to expand to 16 MGD.

Additional facility components include an administration spaces including a laboratory, control center; chemical storage and feed for a coagulant, sodium permanganate, sodium hypochlorite, hydrochloric acid, hydrofluorosilicic acid, citric acid, powder activated carbon, caustic soda, and sodium bisulfite; and full site development including solids holding ponds, storm drainage, and raw water pipes.

The existing Dodd WTP utilized a soda ash feed system for finished water pH and alkalinity adjustment. The District's preference was to change to a sodium hydroxide feed system, both for consistency with the membrane cleaning chemicals used, as well as reducing their reliance on a dry chemical feed system. To make the transition from soda ash to caustic soda, Burns & McDonnell developed a desktop water quality model to identify the stability of the finished water. This model calculated water quality indices such as the Ryznar index, calcium carbonate precipitation potential, dissolved inorganic carbon, aggressiveness index, and Langelier saturation index to determine if changing pH adjustment methods would affect the stability of the water. The desktop model generated the design criteria for the chemical dosing systems, pretreatment with inclined plate settlers in front of the Pall Corporation ultrafiltration membrane system. Our team verified the desktop model chemical dosing rates with a series of jar tests.

The existing disinfection contact basin was abandoned and replaced with a larger basin. Our team worked with CDPHE to develop acceptable CT design criteria at the beginning of the DOVE initiative and was one of the first facilities in the state to meet the criteria.

CLIENT

- ▶ Left Hand Water District, Colorado
Chris Smith
(303) 530-4200
chrissmith@lefthandwater.org

COMPLETION DATES & VALUE

- ▶ Design Complete: 2015
- ▶ Construction Complete: 2016
- ▶ Design Fee: \$2,040,000
- ▶ Constructed Value: \$28.8 million

FIRM'S ROLE & SERVICES

- ▶ Design-Build Joint Venture with Garney Construction
- ▶ Preliminary Design, Final Design, Construction Phase Support

KEY STAFF

- ▶ Jason Schaefer, Project Manager & Lead Process Engineer
- ▶ Nikole Rachelson, Process
- ▶ Emily Huth, Process
- ▶ Nick Tessitore, Civil
- ▶ John Kienholz, Structural



We have no doubt that few teams could have met all of our objectives within such a compressed design and construction timeline. And you did it!

- Christopher Smith, General Manager, Left Hand Water District

Advanced Treatment at Plum Creek WPF | Castle Rock, CO



Castle Rock Water is taking a proactive approach to developing a sustainable, long-term water supply for its customers. Part of this approach includes developing a raw water supply and treatment system capable of meeting demands using 75% renewable sources. As the original designer of the Plum Creek Water Purification Facility (WPF), Burns & McDonnell planned for the addition of advanced treatment systems to the facility that will help the Town meet its renewable source goals.

The Town's strategy to meet these goals includes both planned indirect and direct potable reuse sources from the water reclamation facility. The Advanced Treatment Project includes the addition of additional systems to provide additional removal of giardia, viruses, and cryptosporium, while also targeting reductions in contaminants of emerging concern.

Our team provided piloting, design, and full-time construction observation services for the addition of raw water blending, biological filtration, advanced oxidation, UV, granular activated carbon, and residuals handling to the WPF. The facility is currently rated for 6 MGD but has been designed to expand to 12 MGD in the future.

The granular activated carbon system includes eight adsorption vessels, each filled with 40,000 pounds of direct activated GAC. The system targets emerging contaminants such as pharmaceuticals/ personal care products, as well providing a polishing step for total organic carbon.

The project is being completed using the same Guaranteed Maximum Price Construction Management delivery method that was used for the design and construction of the original facility. Like the original facility, the construction of the project has been divided into multiple work packages to expedite the schedule.

CLIENT & REFERENCE

- ▶ Town of Castle Rock, Colorado
Tim Friday, Engineering Manager
P: (720) 733-6030
E: tfriday@crgov.com

PLANT SIZE

- ▶ 6 MGD

COMPLETION DATES & VALUE

- ▶ Design Complete: 2018
- ▶ Construction Complete: 2021
- ▶ Design Fee: \$1,528,086
- ▶ Constructed Value: \$29 million

FIRM'S ROLE & SERVICES

- ▶ Design-Build Joint Venture with Garney Construction
- ▶ Piloting, Preliminary Design, Final Design, Construction Phase Support

KEY STAFF

- ▶ Jason Schaefer, Project Manager
- ▶ Emily Huth, Project Engineer
- ▶ Karla Kinser, Quality Control
- ▶ John Kienholz, Structural
- ▶ Nick Tessitore, Civil
- ▶ David Olsen, Mechanical

Broomfield WTF Expansion | Broomfield, CO



Burns & McDonnell provided design services to expand the Broomfield WTF's capacity from 20 MGD to 26 MGD, replace existing equipment at the end of its useful life, and bring the WTF into compliance with certain design criteria that have evolved since its original construction. In many cases the improvements also provide ease of future expansion to the WTF to reach its ultimate build out capacity of 32 MGD.

In addition to preparing construction plans and specifications, our team assisted Broomfield in evaluating potential contractors for CMGC services at the 30% design milestone. We prepared the necessary documentation to obtain all pre-construction related permits including CDPHE permit to construct, City and County of Broomfield (CCoB) building permit, CCoB PUD update, and '20-day letter' environmental clearance.

Improvements included expanding the raw water metering and chemical injection vault, replacing the existing rapid mix equipment, replacing existing vertical flocculators, adding a third stage of flocculation, replacing the existing PVC tube settlers with SST lamella plate settlers, adding three filter cells, and improving the existing solids handling and chemical storage/feed facilities.

The project team developed an early equipment procurement package and the filter building foundation to provide the CMGC contractor the ability to start these elements of the work early and meet CCoB's desired timeline. The existing WTF can only be taken offline for a few days at a time and only during low demand season, so coordinating design and construction activities was critical to the project's success.

The solids handling improvements eliminated a significant maintenance issue with an existing circular (hosed) solids collection system with minor piping improvements and equipment improvements and avoiding costly basin modifications, or addition. The chemical system improvements relocated existing pre-treatment chemicals into a new building, closer to the point of application, provide a permanent home for new PAC feed equipment, and provide space for a future chemical of choice. A new soda ash storage and feed building was added much closer to its injection point, reducing the maintenance previously associated with a long run of feed piping. The existing Aqua Ammonia storage and feed system was replaced by liquid ammonium sulfate, reducing safety concerns for WTF staff. The chemical systems remaining in the existing facility were re-partitioned and their feed equipment separated to further enhance working conditions for WTF staff.

CLIENT & REFERENCE

- ▶ City & County of Broomfield, Colorado
Ronda Jo Ackerman Alford
P: (303) 464-5807
E: ralford@broomfield.org

PLANT SIZE

- ▶ 26 MGD

COMPLETION DATES & VALUE

- ▶ Design Complete: 2018
- ▶ Construction Complete: 2020
- ▶ Design Fee: \$1,012,884
- ▶ Constructed Value: \$16 million

FIRM'S ROLE & SERVICES

- ▶ Prime Consultant
- ▶ Preliminary Design, Final Design, Construction Phase Support

KEY STAFF

- ▶ Jason Schaefer, Project Manager
- ▶ Brett Pugh, Quality Control
- ▶ John Kienholz, Structural
- ▶ Nick Tessitore, Civil
- ▶ David Olsen, Mechanical

More Local WTP Expansions & Retrofits Than Any Other Team

The projects shown in the table below presented a wide variety of design and construction challenges as well as extensive permitting requirements. You can be confident that we will mitigate your project's challenges because we have consistently done so on similar projects for local clients. Our approach to design is centered on working with your stakeholders and operators to maximize your budget, and ultimately deliver a facility that will be easy and safe to operate for many years.

 New Water Treatment Facility Designs & Major Expansions <i>DB = Design-Build</i> <i>CMAR = Construction Manager at Risk</i> <i>EPC = Engineer-Procure-Construct</i>	Construction Complete (Year)	Size (MGD)	Delivery Method	Constructed Value (Approx. \$)	Colorado Project	New Facility	Expansion or Retrofit	Inclined Plate Settler Sedimentation	Membrane Filtration
Thornton Water Treatment Plant Replacement	2020	20	DB	\$100M					
Westminster Northwest WTP	2002	15	DB	\$18M					
Westminster Northwest WTP Expansion	2011	20	DB	\$3M					
Westminster Semper WTP Plate Settler Addition	2006	44	DB	\$2M					
TCMWC Maple Grove WTP Residuals Handling	2020	15.6	EPC	\$8.1M					
Castle Rock Plum Creek WPF Advanced Treatment	2020	6	CMAR	\$29M					
Castle Rock Plum Creek WPF	2013	6	CMAR	\$17M					
Left Hand Water District Dodd WTP Upgrades	2016	16	DB	\$29M					
Broomfield WTP Expansion	2020	26	CMAR	\$16M					
Mt. Carbon Metro. Dist. Morrison WTP Expansion	2022	1	EPC	\$13M					
Cherokee Metro. Dist. WRF TDS Reduction	2023	4.8	DB	\$42M					
Erie Lynn R. Morgan WTP Exp. (2)	2020	16	CMAR	\$12.8M					
Erie Lynn R. Morgan WTP Exp. (1)	2010	9.9	DB	\$13.1M					
Erie Lynn R. Morgan WTP Pressure Membrane Expansion	2014	9.9	EPC	\$340K					
Clifton Charles A. Strain WTP Pretreatment Imp.	2009	16	DB	\$6M					
Thornton Wes Brown WTP Exp.	2006	50	CMAR	\$57M					
Colo. Springs Util. FVA WTP TOC Removal	2017	18	DB	\$1M					
Denver Water Moffat WTP Repurposing	2022	150	DBB	\$12M					
Denver Water North Complex EI&C Upgrades	2017	-	EPC	\$6.4M					
Rapid City, SD Jackson Springs WTP	2013	8	DBB	\$20M					
Gillette, WY Pine Ridge Disinfection Facility	2016	10	DBB	\$5.75M					
Billings, MT West End WTP	2024	20	DBB	\$60M					

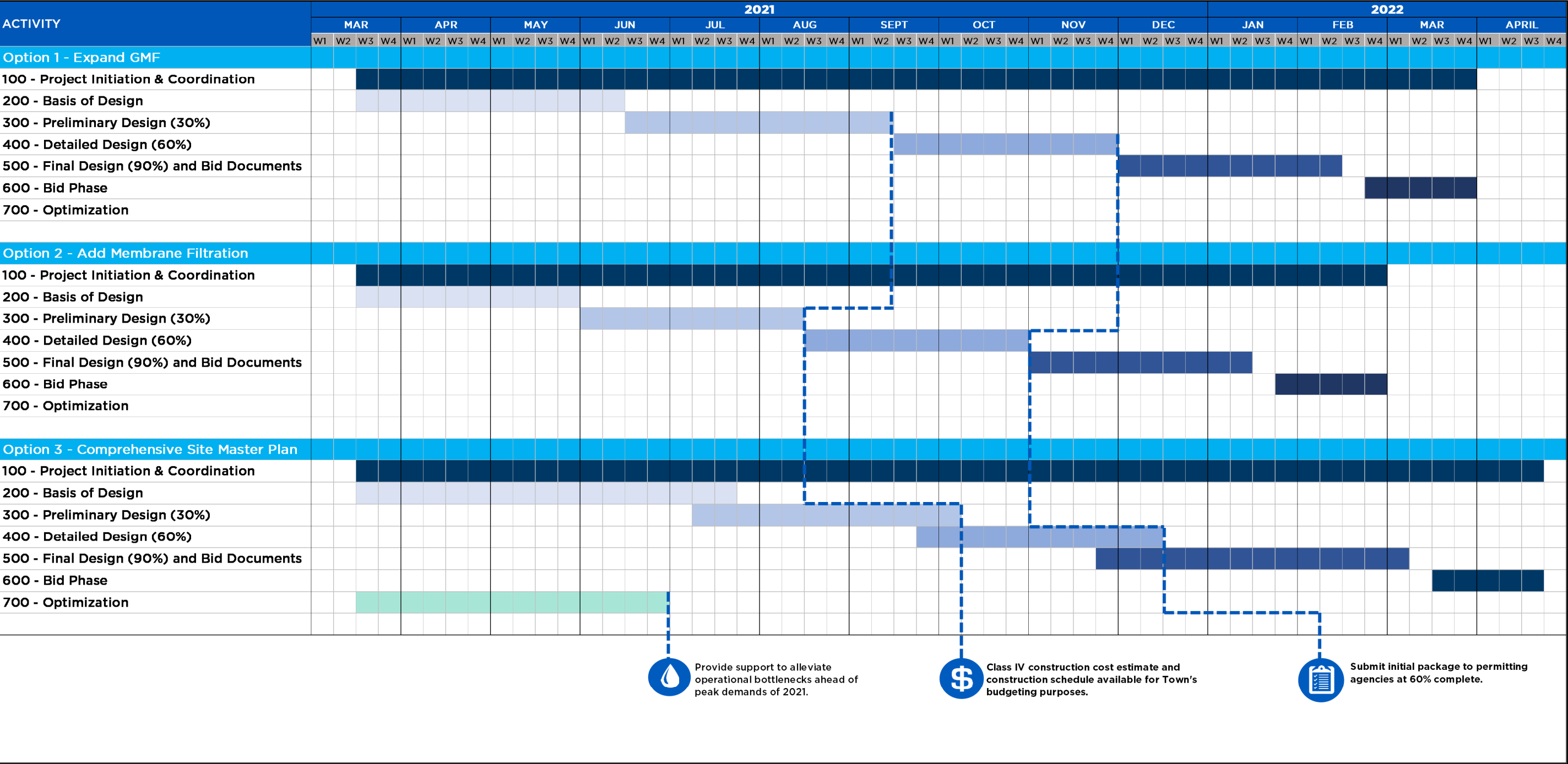
Section 6. Project Schedule

Three project schedules are included herein for your consideration, based on the options described in Section 4, and summarized below. The level of effort and duration varies based on the scope of each option. Our goal is to complete the basis of design and have a preliminary cost estimate to the Town for the late summer of 2021 for your budgeting purposes. The schedules below compare the duration of the major task series. Initial permitting submittals will occur with the 60% complete design packages. Permitting submittal review and approvals periods will vary by agency (Town, Weld County, CDPHE). Option 3 includes a parallel series of tasks to help give your operators some breathing room for the peak demand season of 2021.

Table 6.1: Basis of Schedule and Fee Summary

Approach	Option 1	Option 2	Option 3
Process Unit	Granular Media Filtration Expansion	Membrane Filtration Expansion	Comprehensive Site Master Plan
Lonetree Pump Station & Pipeline	Remain as is		
Town Lake Pump Station	Remain as is		
Raw Water Tank	Remain as is		
Chemical Storage	Remain in existing location	Add storage to the new Membrane Building	
Pretreatment Capacity	Existing DAF 10 MGD		Convert to SAF 12.5 MGD
Filtration	Expand existing Filter Building with 3 new GMF	Add new Membrane Building with 3 trains	
Taste & Odor Control	Maintain existing PAC system		Implement multi-phase approach. Lease to own GAC contactors in Membrane Building. Upgrades at Lonetree, Town Lake, and pretreatment. Future flexibility for T&O control.
Disinfection Compliance	Modify existing GST with baffles		Add new Disinfection Contact Basin sized for ultimate flows.
Treated Water Storage	Use existing GST		Convert GST to distribution storage
Distribution Pump Station	Add new below ground pump station with 3 pumps.		New at-grade pump station with vertical turbine pumps above a new DCB
Backwash Supply	Gravity from existing GST	Backwash from distribution system	
Backwash Waste	Modify existing pond footprint and recycle pump station for Filter Building expansion	No change	
Best Value Project Our initial analysis indicates that Options 1 and 2 result in similar estimated construction costs but limit the future flexibility and operational robustness provided by Option 3.			

Summary Schedule: Options 1, 2, and 3



Section 7. Alternative Delivery Option

Our fee and scope of work for Options 1, 2, and 3 assume that this project will be executed using traditional design-bid-build delivery. We would like to continue our previous discussions of an integrated Design-Build (DB) delivery with our construction partner, Garney Construction.

Burns & McDonnell executes a large percentage of our projects using DB and other integrated delivery methods because it brings great benefits to projects. We continuously work with local clients looking to meet tight deadlines while realizing cost savings on water projects.

An integrated delivery model is the most logical for this project because of the schedule savings it offers. This type of delivery also offers the benefit of efficient collaboration by directly aligning the design and construction team in project understanding and expectations.

Design-Build Team

As stated previously, our proposal is based on design-bid-build approach, as requested by the Town. **However, we are in a unique position to be able to offer the Town a complete DB proposal at the 60% design milestone.**

If the Town elects to pursue a design-build delivery model, we will complete the project with Garney as our construction partner. Burns & McDonnell will complete the engineering and permitting work with in-house staff, while Garney will act as the general contractor, self-performing critical work and managing subcontracted construction trades.

Our specialty in fast-track, integrated delivery projects is driven by strong project management capabilities and a collaborative approach of working with our client, subcontractors, and contractor from the very beginning, to develop an economical, constructible solution.

The Town will benefit from the added value of having both engineering and construction team members working together from the onset of the design. We gain alignment in purpose and understanding, and together, we work toward meeting the Town's goals. Additionally, we are able to achieve earlier price certainty, reduce costs, and expedite the schedule.

Benefits to the Town: Design-Build Delivery

1

One Point of Contact & One Contract

Streamlined project execution - everyone on the team works toward the project goals

2

Collaborative Approach

Design and construction team members work together to solve problems and look for value engineering opportunities

3

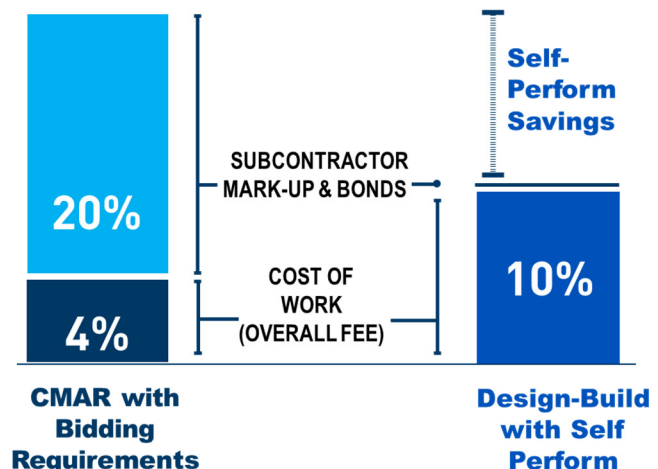
Earlier Price Certainty

Obtain a Guaranteed Maximum Price (GMP) before the design is complete

4

Accelerated Schedule

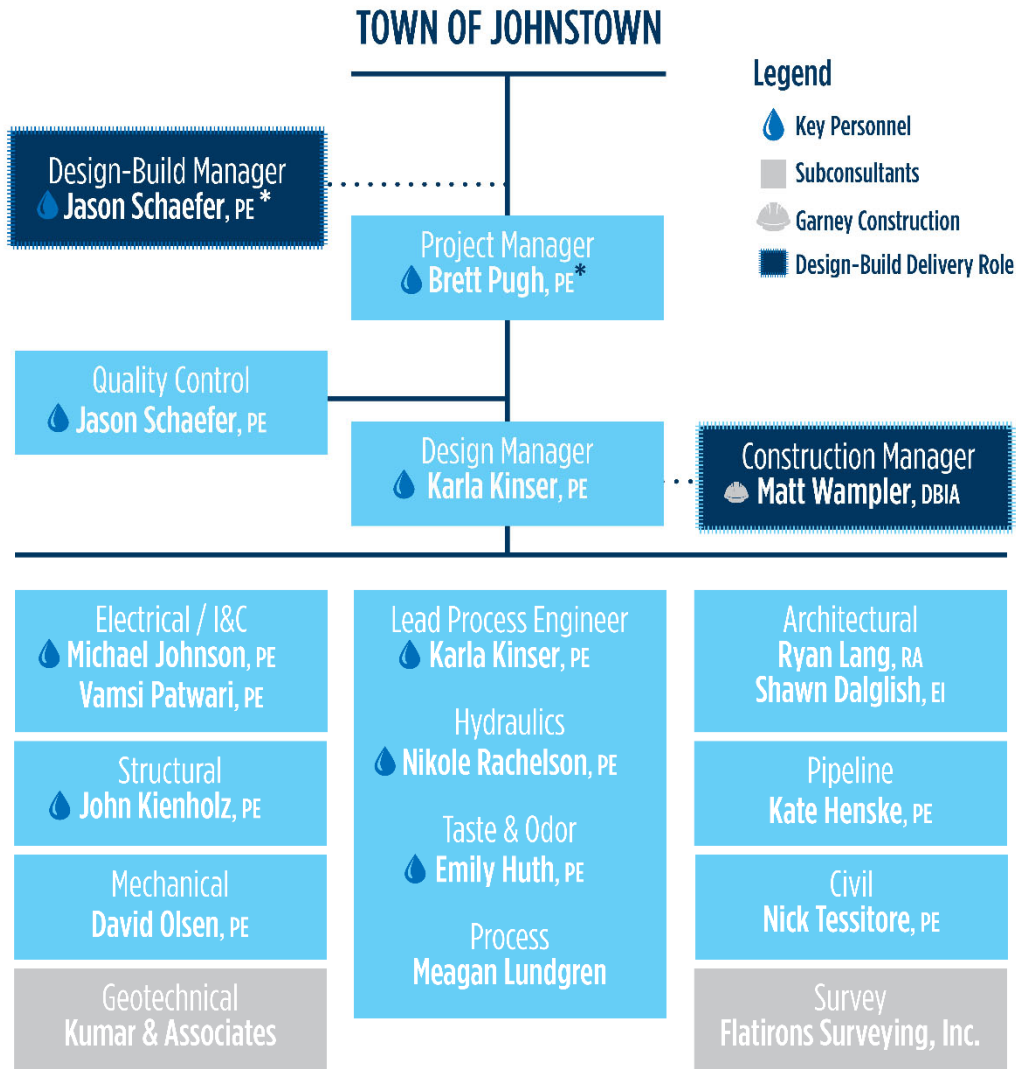
Use early work packages and procure long-lead time items before design is complete



Design-Build Organization

If the Town selects the design-build delivery model, we will transition seamlessly from design into construction, maintaining a consistent staffing structure and adding a design-build manager and construction resources.

You will have a consistent, single point of contact from the beginning of your project through commissioning. We will have one overall design-build manager for the project, a design manager for technical coordination, and a construction manager. We look forward to discussing the specifics and your preferences.



* There are many opportunities for synergy between the water treatment and wastewater treatment projects. If the same team executes both projects, there would be efficiencies gained from having the project manager be involved in both projects. We would like to discuss the possibilities with the Town. In addition to shared leadership, there would be benefits in terms of shared meetings, reporting, scheduling, and invoicing, which would further promote cost savings and streamline communications across both projects. Likewise, If the Town selects a design-build delivery model, we could also implement a consistent design-build manager across both projects.

Selecting a Delivery Method for Your Project

Our team will host a collaborative discussion with the Town during preliminary design to review project delivery options. The discussion will provide a summary of the benefits and challenges of each delivery method to determine the optimal solution for the Town. Important considerations include schedule, cost, seasonal water demands, and the Town's comfort level with integrated delivery.



BMcD / Garney Team Experience Summary

The Town will have the opportunity at the 60% milestone, with the GMP in hand, to select the integrated design-build proposal or just proceed with design and bid the project at final design. If integrated design-build delivery is selected as the path forward, the GMP will include the remaining engineering services and engineering construction services. Our team will be in a strong position to place purchase orders on long-lead time items that were recently bid during the development of the GMP, which will save time.

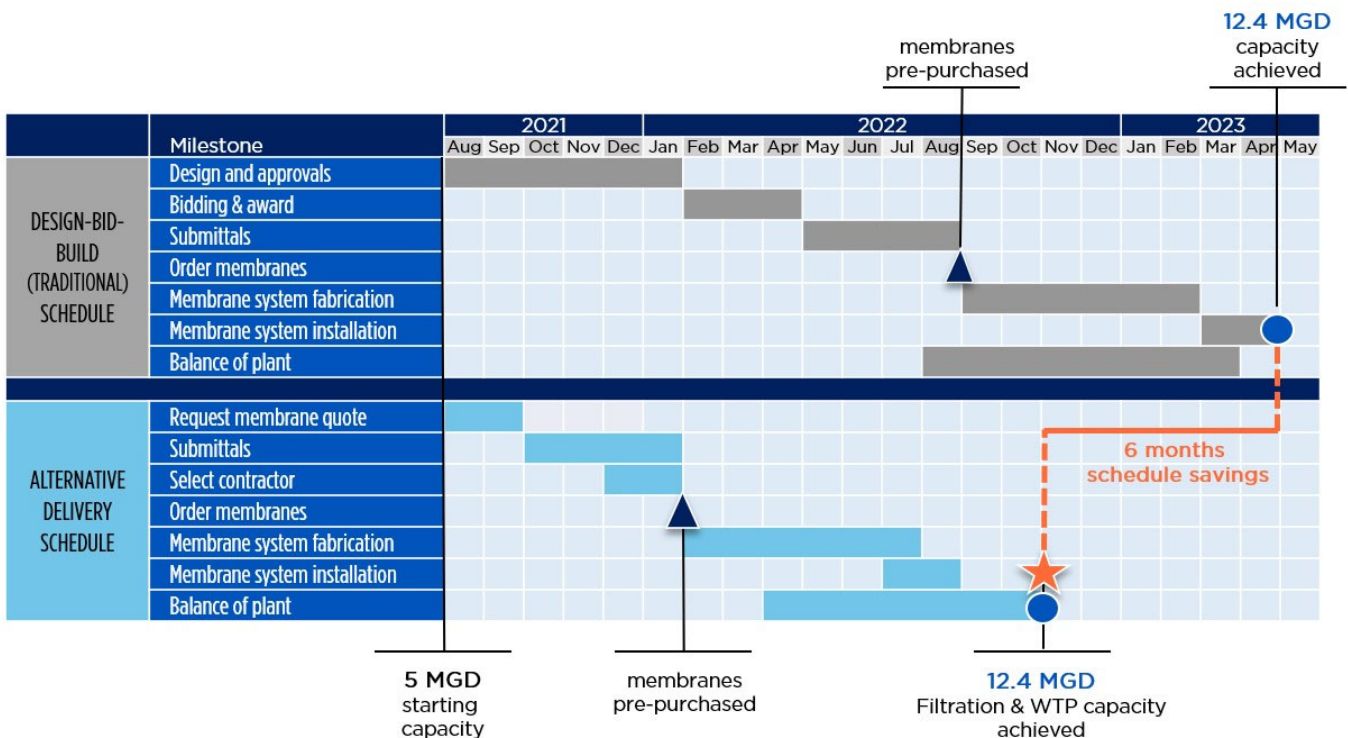


Figure 7-1. Potential Schedule Savings Resulting from Early Purchase of Long Lead Time Equipment in an Integrated Delivery Model

Our design-bid-build fee includes engineering services through to the bidding of construction contractors. An integrated design-build delivery fee does not require 90%, final documents or bid phase services.

The following table outlines the progression of the engineer's (Burns & McDonnell) activities from conceptual design to the bid phase, based on delivery method (DBB, Design-Build, and CMAR).

Table 7-1: Engineer's Role by Delivery Model			
Approach	Design-Bid-Build	Integrated Design-Build	Construction Management at Risk
Conceptual Design 15%	Prepare basis of design with Town input.	Evaluate and select best-value delivery model.	Issue request for qualifications (RFQ) for construction firms through public notification.
Preliminary Design 30%	Select preferred concept with Town. Engineer prepares estimates of construction schedule and costs with available resources.	Contractor engaged to provide pre-construction services - early input on constructability, sequencing, and costs.	Issue request for proposals (RFP) for shortlisted construction firms. Include 30% design for contractors to develop approach, schedule, cost estimate and their fee.
Detailed Design 60%	Advance design to 60%. Submit initial permitting documents. Update construction cost and schedule estimates.	Provide guaranteed maximum price (GMP) proposal to complete design and construction. Price certainty. <i>Engineer's fee does not exceed that listed for 60% design.</i>	Contractor engaged to provide constructability input, cost estimating, scheduling, alternative evaluation. Request quotes for trades and long-lead time equipment.
Final Design 90%	Respond to permitting agency comments. Advance design to best and final format. Prepare pre-bid estimate with project fully defined.	Place order long-lead time equipment to reduce schedule. Start early work package. Update GMP, as necessary, for changes between 60% and 90%.	Finalize supplier quotes and place orders
Bid Phase	Host pre-bid meeting. Respond to first questions from contractors. Comment on received bids. Revise scope or design if bids exceed budget.	Not required.	Not required.

ATTACHMENT A RESUMES

BRETT PUGH, PE

Project Manager



Brett is a senior project manager and professional civil engineer with more than 23 years of experience in project management, design, and construction, collaborative project delivery, and process commissioning. His design experience includes water treatment, wastewater treatment, distribution, and collection. Brett's surface water treatment facility design experience includes new

facilities and expansions using a variety of pretreatment and treatment technologies, including (but not limited to) dissolved air floatation, plate settlers, pressure membranes, and submerged membranes. He works with clients to holistically evaluate options for facility expansions based on their water quality goals, taste and odor concerns, redundancy needs, budget, ease of future expansion, and ease of operations/ maintenance.

EDUCATION

- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, TX)

3 YEARS WITH BURNS & MCDONNELL

23 YEARS OF EXPERIENCE

Taste & Odor Project | Town of Johnstown

Johnstown, Colorado

Project manager for study to evaluate taste and odor control performance of the town's existing powdered activated carbon system at the Lone Tree Reservoir. Conducted jar testing to quantify Geosmin and MIB removals. Compared the PAC system performance with the strategies at other nearby water systems. Developed recommendations for multi-phase approach to taste and odor control at Lonetree Reservoir, Town Lake and at the WTP. Support the town with implementing short-term granular activated carbon system in preparation for summer 2021.

Lynn R. Morgan WTP Expansion | Town of Erie

Erie, Colorado

Project manager for the expansion of the evaluation and design of a 10 MGD WTP upgrade to increase the plant capacity to 17 MGD. The upgrade includes a pretreatment with flocculation and lamella plate sedimentation followed by submerged membrane filtration and a high service pump station expansion. The project included a feasibility study and detailed design of a 80 kW micro-turbine on the existing Northern Colorado Water's SWSP pipeline. Burns & McDonnell assisted the town with securing grant for the feasibility study as well as a matching grant for construction through the Renewable and Clean Energy Challenge program with the Colorado Department of Local Affairs. The project is being executed as a CMAR to expedite the construction and allow for contractor input during design. Construction was completed in July 2020.

Boxelder WWTP Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Project manager for the expansion of the Boxelder WWTP. The District has seen significant development in their service area which has driven the need for expansion. The project doubles the phased isolation biological nutrient removal BNR secondary treatment process trains and brings the facility capacity to 4.6 MGD and 10,000 lbs of influent organic capacity. The project also includes upgrades to the headworks/grit systems, a new UV disinfection system, and aerobic digestion with slow-speed dewatering. The project is currently in construction using a CMAR delivery model and will be complete in August 2021.

BRETT PUGH, PE

(continued)

Dodd WTP Hydroelectric Project | Left Hand Water District

Niwot, Colorado

Project manager for the detailed design and construction administration of a 200 kW micro-turbine addition at the existing 16 MGD Dodd Water Treatment Plant. Left Hand Water District will receive a new raw water supply from Northern Colorado Water's SWSPII pipeline in early 2020. The high pressure in the pipeline made the addition of a micro-turbine feasibility. The generated power will be used at the Dodd WTP to reduce their annual energy bill by providing sustainable energy generation on site. The construction was completed in June 2020.

Morrison CO WTP Expansion | Mount Carbon Metropolitan District

Morrison, Colorado

Project manager. Mount Carbon Metropolitan District is a special district, responsible for supplying water and wastewater services to the Red Rocks Ranch development from the Town of Morrison's WTP. Raw water is sourced from a blend of Bear Creek and the Cooley Reservoir. The proposed design includes an expansion to the exiting pretreatment building. New pretreatment basins and chemical facilities will be installed. Two additional pressurized membrane trains will be installed for additional capacity and redundancy. The existing chlorine contact basin will remain in service with a new high service pump installed. Project tasks include water modeling, jar testing for iron, manganese and uranium removal and cost estimating.

Meyer Ranch Water Reuse Facility* | Randolph Todd Company

Near New Braunfels, Comal County, Texas

Design engineer for a 0.39 MGD wastewater treatment plant using a **membrane bioreactor** and UV disinfection. TCEQ requires a high-quality effluent because the wastewater facility is in the sensitive Edwards Aquifer Recharge Zone. Included a membrane bioreactor, UV disinfection and storage and distribution of Type I reclaimed water for irrigation. The equalization tank was sized to minimize peak hour and maximum daily flow rates to the MBR system to remain in compliance with TCEQ filtration rates.

Pottle Lake Water Treatment Plant* | Cape Breton Regional Municipality

North Sydney, Nova Scotia, Canada

Project manager for a \$12 million, 8 MGD surface water treatment plant using membrane filtration. The new facility is located next to the existing intake and high service pump station, which were maintained in the new system to reduce overall project cost. A two-stage, **submerged membrane system** was used to achieve 99 percent recovery of the raw water, thereby reducing the process wash water load on the nearby capacity limited sanitary sewer.

Longford Water Treatment Plant* | Northern Midlands Council

Longford, Tasmania, Australia

Project manager for the design-build of a \$5M surface water treatment plant for the Town of Longford, Tasmania. The Town of Longford received chlorinated water from a rapidly changing river water supply. Served as the project manager, design lead, and resident construction superintendent on the project. The facility utilizes enhanced coagulation, **dissolved air flotation** and gravity filtration. The building exterior includes architectural features to comply with the local historic town, built in the early 1800s.

* Denotes experience prior to Burns & McDonnell

JASON SCHAEFER, PE, ENV SP

Quality Control



Jason is a senior process engineer, project manager, and quality reviewer with experience managing, planning, optimizing, troubleshooting, designing, and constructing conventional and advanced water treatment facilities. He has 13 years of experience focused on major water treatment facility retrofits and new plants, using both traditional and collaborative project delivery

methods. He has extensive experience in pretreatment, treatment process selection, plant optimization, and design-build. Jason will provide knowledgeable guidance for taste and odor solutions, project scope development, and project delivery options.

Dodd Water Treatment Plant Upgrade | Left Hand Water District

Niwot, Colorado

Project manager and lead process engineer. BMcD worked as part of a design-build team with Garney Construction to upgrade to the Dodd Water Treatment Plant (DWTP) in Niwot, Colorado. BMcD permitted and designed and the upgrades to the DWTP. The DWTP includes conventional pretreatment with high-rate inclined plate settlers, MF/UF membranes, clearwell, and high service pumping to increase capacity from an 8 MGD to 10 MGD with the capability to expand to 16 MGD. Responsible for client interface and managing budget, design, inter-discipline coordination and construction phase services. Worked closely with operators to develop the design and to provide training.

Plum Creek WPF Advanced Treatment Project | Town of Castle Rock

Castle Rock, Colorado

Project manager. Responsible for client interface and managing budget, piloting, detailed design, inter-discipline coordination and construction phase services for this \$30M project, which is adding new treatment processes to the existing Plum Creek facility, also designed by our team. This project is being executed using a construction management at risk (CMAR) delivery method. The project includes the addition of multiple treatment processes, including pre-ozone, biofiltration, advanced oxidation with ozone, GAC adsorption, and UV disinfection.

Broomfield Water Treatment Plant Expansion | City and County of Broomfield

Broomfield, Colorado

Project manager . Worked on the detailed design to expand Broomfield's water treatment plant from 20 to 26 MGD, with hydraulic capacity for up to 32 MGD. The project includes modifications to the existing pre-treatment system, new chemical feed building, three new filters, solids stream modifications and chemical system upgrades. The project is being delivered using construction management at-risk to facilitate early project completion. The process evaluation included hydraulic profile, process flow diagram, equipment selection, sizing and layout, pipe sizing, chemical dosing, yard piping and operational review.

Thornton Water Treatment Plant Replacement Project | City of Thornton

Thornton, Colorado

Project manager. Responsible for daily client interface and managing budget, piloting, process design criteria development and confirmation, detailed design, inter-discipline coordination and construction phase services for this \$100M project. The

EDUCATION

- ▶ MS, Environmental and Civil Engineering
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Envision SP: Professional Engineer (CO, MT, OK, WY, ID)

13 YEARS WITH BURNS & MCDONNELL

13 YEARS OF EXPERIENCE

JASON SCHAEFER, PE, ENV SP

(continued)

project is being executed as a joint venture with Garney Construction, using a design-build delivery method. The water treatment plant will have an initial capacity of 20 MGD using conventional treatment processes, as well as the ability to treat two water sources, Standley Lake and South Platte River, with provisions for a third source. The process design includes traditional pretreatment, ozone, biofiltration, and disinfection.

Northwest Water Treatment Facility Expansion | City of Westminster

Westminster, Colorado

Project engineer. Responsible for the ultrafiltration membrane expansion for the City of Westminster's Northwest Water Treatment Facility. The project included the design and construction services for three new membrane filtration trains totaling 5.6 MGD additional capacity. As the process engineer, responsible for process design, periodic construction inspection, and regulatory approval. The project also included replacement of existing filtration piping, addition of filter-to-waste piping and HVAC improvements.

Plum Creek Water Purification Facility | Town of Castle Rock

Castle Rock, Colorado

Co-project manager and project engineer. Worked on the Town of Castle Rock's new 4.0 MGD Plum Creek Water Purification Facility (PCWPF). This project was completed utilizing a Construction Manager at Risk (CMAR) delivery method. The PCWPF includes aeration, conventional pretreatment with high-rate inclined plate settlers, greensand filtration, MF/UF membranes, chloramine disinfection, clearwell, and high service pumping. The PCWPF's raw water is GWUDI with provisions for future use of a surface water supply. The groundwater source contains high levels of iron and manganese thereby requiring the use of aeration and greensand filtration. Additional facility components include an administration building complete with a laboratory, control center, conference area, and maintenance area; chemical storage and feed; and full site development. Worked closely with operators to develop the design and to provide training.

Lynn R. Morgan Water Treatment Plant Expansion | Town of Erie

Erie, Colorado

Quality reviewer. Worked on the detailed design to expand the Lynn R. Water Treatment Plant from 9.9 MGD to 17 MGD. The upgrade includes a pretreatment with flocculation and lamella plate sedimentation followed by membrane filtration. The project is being executed as a CMAR to expedite the construction and allow for contractor input during design.

Wes Brown Water Treatment Plant Taste & Odor Conceptual Study | City of Thornton

Thornton, Colorado

Project manager and engineer. Worked on the optimization of Thornton's existing facility and an evaluation of potential new treatment options for the reduction of taste and odor causing Geosmin and 2-Methylisoborneol. Conducted a series of jar tests to evaluate the effectiveness of current process in reducing taste and odor compounds. The following chemicals were jar tested for taste and odor optimization: chlorine, three types of powder activated carbon, hydrochloric acid, and five types of coagulants. The potential new technologies evaluated included ozone, UV/hydrogen peroxide, and granular activated carbon.

Lynn R. Morgan Water Treatment Facility Taste & Odor Conceptual Study | Town of Erie

Erie, Colorado

Project manager and engineer. The project included the investigation of taste and odor reduction methods for implementation at the water treatment plant. The technologies evaluated included chlorine, ozone, potassium permanganate, chlorine dioxide, granular activated carbon, powder activated carbon, and UV/hydrogen peroxide. As a result of this study the Town installed a powder activated carbon feed system to reduce taste and odor compounds of their raw water.

KARLA KINSER, PE

Design Manager & Lead Process Engineer



Karla has 26 years of experience in water treatment, serving as a project engineer, lead process engineer, and filtration specialist. She has led the multi-discipline design effort for large water treatment plant expansions and retrofits nationwide. Karla specializes in water treatment and reuse with an extensive focus in membrane processes. Her project experience includes bench-

and pilot testing, process design, detailed design, startup, to troubleshooting operating plants for low-pressure (MF, UF, MBR) and high-pressure (NF, RO) membranes. She has been a global leader for membranes at three firms and worked for two low pressure membrane companies which has afforded her a unique understanding of operations of facilities and negotiation of warranties.

EDUCATION

- ▶ MS, Engineering
- ▶ BS, Civil Engineering
- ▶ BS, Natural Resource Management

REGISTRATIONS

- ▶ Professional Engineer: CO, TX

2 YEARS WITH BURNS & MCDONNELL

26 YEARS OF EXPERIENCE

Thornton WTP Replacement | City of Thornton

Thornton, Colorado

Quality Reviewer. This 20 MGD water treatment plant project is being executed as a design-build in partnership with Garney. The water treatment plant will have an initial capacity of 20 MGD using conventional treatment processes, as well as the ability to treat two water sources, Standley Lake and South Platte River, with provisions for a third source. The process design includes pretreatment with lamella plate settlers, ozone, biofiltration, and disinfection.

Plum Creek Water Purification Facility Advanced Treatment | Town of Castle Rock

Castle Rock, Colorado

Quality Reviewer. Provided quality review for the detailed design for this project, which is adding new treatment processes to the existing Plum Creek facility, also designed by our team. This project is being executed using a construction management at risk (CMAR) delivery method. The project includes the addition of multiple treatment processes, including pre-ozonation, biofiltration, advanced oxidation with ozone, GAC adsorption, and UV disinfection.

Lynn R. Morgan WTP Expansion | Town of Erie

Erie, Colorado

Treatment Specialist. This project included the evaluation and design of a 10 MGD WTP upgrade to increase the plant's treatment capacity to 16 MGD. The design of the plant includes a pretreatment with flocculation and lamella plate sedimentation followed by membrane filtration. The project is being executed as a CMAR to expedite the construction and allow for contractor input during design. Construction of the WTP expansion is 60% complete. The project included a financial analysis and study of installing a micro-turbine for their Northern Water Supply. The Town decided to move forward with the turbine design, which is currently at 60% complete.

Wes Brown WTP Train 8 Modifications | City of Thornton

Thornton, Colorado

Project Engineer. This project includes the conversion of a backwash recovery filtration train to a full process filter equivalent to Trains 1 through 7. Design, specifications, cost estimates, and a CDPHE permit application were prepared for

KARLA KINSER, PE

(continued)

the project. The project involved an increase to a filtrate pump, redesign of stainless-steel piping, reconnecting and modification of air scour piping, and electrical modification associated with these changes. The project utilized a shortened milestone delivery method to meet a fast-track schedule. Demolition and new design drawings were utilized to convey the modification to the contractor.

Council Bluff WTP Expansion* | Council Bluff Water Works

Iowa

Project engineer. This facility treats water from ground water wells near the Missouri River in western Iowa. The original plant was designed to produce 5 MGD, and the building design included space to increase the plant capacity to 10 MGD through the addition of new membrane trains. Due to increases in industrial demands, the capacity was increased in incremental phases to the ultimate 10 MGD capacity. Karla led the procurement and performed a detailed water quality analysis on the pretreatment system to optimize the permanganate addition upstream of the ultrafiltration.

Ridenour WTP Pilot Study and Plant Design* | City of Jacksonville

Jacksonville, Florida

Process Engineer. Responsible for the pilot testing and process design for the 20 MGD new water treatment plant. As part of the pilot test, multiple treatment trains were evaluated to treat a combination of groundwater and surface water. Processes considered included: ozone, air stripping, lime softening, multiple coagulants with flocculation/sedimentation, dual and mono-media filtration. The pilot was operated for approximately 9 months and led directly into preliminary and final design.

Claude Dyal Water Treatment Plant* | City of Cocoa

Cocoa, Florida

Project Engineer. Responsible for the pilot testing and subsequent process design of the new 48 MGD water treatment plant treating Taylor Creek Reservoir augmented by groundwater wells. Led the design of the pilot site, operated the pilot plant, and conducted multiple taste/odor tests for City staff. Processes piloted included lime softening, coagulation, floc/sed, dual media filters, ozone, and ultraviolet disinfection. The final design of the plant consisted of coagulation with lime, floc/sed, dual media filtration, and ozone.

Stevens WTP Plant Optimization* | Corpus Christi Public Utilities

Texas

Technical Leader. This project's objective was to optimize and evaluate multiple conventional processes for the water treatment plant, as well as the impacts on the distribution system water quality. The project involved a year-long pilot study evaluating flocculation, sedimentation, and filtration along with modeling and coupon testing of multiple locations in the distribution system for corrosion control.

North RO Water Treatment Plant (D-B)* | City of Cape Coral

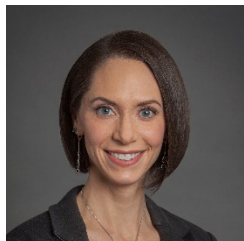
Florida

Project Technical Lead. Design-Build of a 12 MGD, expandable to 24 MGD water treatment plant. Led 20 engineers on a cross-functional team for preliminary and final design. Provided quality control and technical oversight during construction, final installation, and start-up. Project was completed in three years. Design of facility included well-field raw water supply, sand separators, cartridge filters, reverse osmosis, degasification, high service pumps, cleaning and chemical systems, brine injection wells, and an enhanced SCADA system to integrate with the original water treatment plant.

*Denotes experience prior to joining Burns & McDonnell

NIKOLE RACHELSON, PE

Hydraulics



Nikole is a senior process design engineer with experience in design and construction for a variety of water projects. Her design experience includes conventional treatment process design, pump station design, treatment plant hydraulics modeling and design, distribution system modeling, and other miscellaneous process components at water plants. Nikole has extensive experience with both water treatment plant and pump station hydraulics at facilities ranging from 1 to 215 MGD. Her experience includes design and analysis of hydraulics to optimize functionality, determine hydraulic capacity, accommodate complicated retrofits without impacting upstream processes, and maximize efficiency.

Moffat Rebuild Ralston Evaluation* | Denver Water

Denver, Colorado

Process design lead for [assessment of existing treatment plant hydraulics capacity](#). Responsible for creating a model of the existing treatment plant, performing a model calibration, determining the treatment plant's ultimate capacity, and suggesting areas for hydraulic improvements. Significant client interaction required, including multiple design progress presentations, and a hydraulics modeling/calibration learning session with treatment plant operations staff.

Soldier Canyon Filter Plant Conditions Assessment* | Soldier Canyon

Fort Collins, Colorado

Process design lead for [hydraulics analysis](#) of existing 45 MGD water treatment plant. Created a model of the existing infrastructure and utilized model output to identify the cause of plant flow distribution and capacity issues. Analyzed model output to predict the hydraulic behavior of the plant at increasing flows. Significant client interaction required during model development.

Moffat Water Treatment Plant Modifications | Denver Water

Lakewood, Colorado

Hydraulics. Moffat improvements include retrofitting the existing headworks facility to reduce incoming pressure and adjust pH and direct NTP supply to clearwells for storage. Moffat's NTP-related improvements are be designed to facilitate construction during scheduled operational outages to minimize the impact on the distribution system. The project included a new sleeve valve, carbon dioxide dosing systems, 1,500 feet of 48-inch yard piping and structural modifications. Nikole performed [detailed hydraulic analyses to model the finished water piping performance during a range of operating conditions](#).

CSWTP Improvements* | Colorado City Metropolitan District

Colorado City, Colorado

Process design lead responsible for [hydraulics modeling and design](#), as part of detailed design for upgrades to an existing water treatment plant, including raw water pump station, finished water pump station, packaged membranes, RO and clear well disinfection.

North Complex Electrical, Instrumentation and Controls Upgrade | Denver Water

Denver, Colorado

Process engineer for an engineer-procure-construct (EPC) scope of work to interconnect five existing raw water reservoirs and the South Platte River at the DRWSP North Complex. The project includes a 32 MGD pump station preliminary design,

EDUCATION

- ▶ MS, Civil and Environmental Engineering
- ▶ BS, Environmental Engineering

REGISTRATIONS

- ▶ Licensed Professional Engineer (CO, AZ)
- ▶ Certified Construction Documents Technologist (CDT)

4 YEARS WITH BURNS & MCDONNELL

14 YEARS OF EXPERIENCE

NIKOLE RACHELSON, PE

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an extensive hydraulic analysis to develop and confirm operational scenarios and control strategies for the North Complex system, and various electrical/instrumentation/mechanical upgrades to existing infrastructure. [Completed the pump station preliminary design and the hydraulic evaluation.](#)

Price Park Improvements | City of Longmont

Longmont, Colorado

Project manager. The Price Park Improvements Project carries the 2016 study recommendations (also done by BMcD) into design. Phase 1 includes a tank sizing and operation study, which compares the 5 MG tank and pump station recommendations from the study to a larger eight (8) MG tank and upgraded pump station. [Hydraulic modeling](#) will determine the operational requirements of the new pump station. The two design alternatives will be evaluated from a design, constructability, and cost perspective to determine the design direction moving forward. Once the storage and pump station requirements are determined, Phase 1 will also include preliminary design. Phase 2 of the project will include detailed design based on the design decisions made in Phase 1.

Eaton Pump Station | City of Westminster

Thornton, Colorado

Project manager for a design-build pump station and waterline project. Project work included relocating a 5.5 MGD pump station, installing new waterline piping to reconnect pump station suction and discharge to the distribution system, and installing new waterline piping to feed the City's upcoming downtown redevelopment. The project also included a [hydraulic analysis of the pump station and surrounding infrastructure](#) to determine its capabilities during various normal and emergency operational scenarios.

Hydroelectric Project, Lynn R. Morgan WTP | Town of Erie

Erie, Colorado

Hydraulics and QC for the feasibility study, detailed design, and construction administration of an 80 kW micro-turbine addition at the existing 17 MGD Lynn R. Morgan Water Treatment Facility. Erie has received raw water from Northern Colorado Water's SWSP pipeline for nearly 20 years. The potential energy in this pipeline was dissipated through an existing buried sleeve valve vault. The addition of a hydroelectric generator proved feasibility after a study compared applicable turbine technologies, potential installation locations and several financial scenarios.

Cooley East Pump Station | City of Thornton

Thornton, Colorado

Lead process engineer for the pump station portion of the project, which includes a 9 MGD raw water pump station, approximately 3 miles of 36-inch raw waterline, 3 miles of 42-inch potable waterline, transmission, 1 mile of 8-inch potable and irrigation waterlines, 770 feet of 15-inch sewer relocation and 770 feet of 36-inch storm drain.

Pump Station Improvements and Irrigation System Master Plan* | Town of Superior

Superior, Colorado

Project manager and process design lead for the [hydraulic evaluation](#) of the Superior irrigation system, design of pump station upgrades, and construction following a design/build format. [Evaluation included hydraulic modeling and pump performance assessment, followed by recommended pump station upgrades to meet current and future capacity demands.](#) Pump station improvements included design of new high duty and booster pump stations.

*Denotes experience prior to joining Burns & McDonnell

EMILY HUTH, PE

Process Engineer: Taste & Odor



Emily is a process design engineer with six years of experience focused on water treatment facility projects. Her experience includes piloting of filter loading rates, pretreatment, and filtration; and process designs that address taste and odor concerns in variable water sources. Emily's role on projects frequently includes inter-discipline design coordination, direct interface with the

client, and collaboration with the contractor. She has recent design-build experience on the Thornton WTP Replacement.

EDUCATION

- ▶ MS, Environmental Engineering,
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (WY)

5 YEARS WITH BURNS & MCDONNELL

6 YEARS OF EXPERIENCE

Thornton Water Treatment Plant Replacement Project | City of Thornton

Thornton, Colorado

Process design lead. Responsible for discipline coordination and assisting in the design of chemical feed systems, ozone system, pretreatment, biological filtration, and process piping. In addition, assisted with data interpretation and experimental planning of a six-month pilot. The project is being executed as a design-build in partnership with Garney. The water treatment plant will have an initial capacity of 20 MGD using conventional treatment processes, as well as the ability to treat two water sources, Standley Lake and South Platte River, with provisions for a third source. The process design includes traditional pretreatment, ozone, biofiltration, and disinfection.

Dodd Water Treatment Plant Upgrade | Left Hand Water District

Niwot, Colorado

Process engineer. Burns & McDonnell worked as part of a design-build team with Garney Construction to upgrade to the Dodd Water Treatment Plant (DWTP). Designed conventional pre-treatment with a mechanical rapid mixer, horizontal paddle flocculators, high-rate inclined plate settlers, MF/UF membranes, clearwell and high service pumping to increase capacity from an 8 MGD to 10 MGD with the capability to expand to 16 MGD. Additional facility components included administration spaces such as a laboratory, control center; chemical storage and feed; and full site development for solids holding ponds, storm drainage, and raw water pipes. Construction phase service responsibilities included managing and reviewing submittals and RFIs, preparing operator Training materials, and assisting in the design of additional scope items. Start-up responsibilities included performing jar tests and generation of the start-up plan.

Pressure Zone 3 Expansion: Gregory Hill Pump Station and Tanks | City of Westminster

Westminster, Colorado

Project engineer. Responsible for the design of the Gregory Hill Pump Station and two 3 MG above ground storage tanks. The facility is part of a large pressure zone expansion project that will increase water storage capacity and water pressure within Zone 3 of the City of Westminster's water distribution system. The pump station includes five new VFD controlled pumps to achieve flowrates from 0.5 MGD to 13.8 MGD (with the capability of future expansion to 15.6 MGD) that will allow the City to meet the system's high flow demands and desired low flow outputs. The pump station building includes a separate electrical room, restroom, and the two storage tanks which include hydrodynamic mixing systems. Process design

EMILY HUTH, PE

(continued)

responsibilities included assistance in the design pump sizing, all pump station, storage tank, and yard process piping and accessories, general pump station and tank sizing, and preparation of drawings and specifications.

Wes Brown Water Treatment Plant Train 8 Modifications | City of Thornton

Thornton, Colorado

Process engineer who designed modifications to an existing membrane train at the Wes Brown Water Treatment Plant for the City of Thornton. The design converted Train 8 from a secondary recovery train to a forward flow operating train to match the other seven trains in the facility. Design responsibilities included discipline coordination, design of process components (new pump with variable frequency drive, stainless steel pump and blower piping modifications, instrumentation), and preparation of drawings and specifications.

Alternative Membrane Analysis and Pilot | City of Thornton

Thornton, Colorado

Process engineer who assisted with the evaluation of alternative membrane manufacturers for the Wes Brown Water Treatment Plant. An evaluation of alternative membrane manufacturers was performed to allow competitive bidding and replacement in the future was performed. Our team performed the evaluation, recommended an alternate manufacturer, developed technical specifications and assisted with procurement of membranes from the alternative manufacturer. A full-scale pilot evaluating the new membrane manufacturer with the existing is being performed.

East Gravel Lakes Pump Station Chemical Upgrades | City of Thornton

Thornton, Colorado

Assistant project manager who designed a sodium permanganate feed system at the East Gravel Lakes #4 Pump Station for the City of Thornton. The existing dry-feed potassium permanganate system was removed and converted to a liquid-feed sodium permanganate system including two chemical storage tanks, chemical metering pumps and accessories, new chemical feed piping and fill station, and an emergency eyewash with water heater. Construction phase service responsibilities included managing and reviewing submittals and RFIs.

Spurgeon WTP Chlorine Conversion | Left Hand Water District

Niwot, Colorado

Process engineer who designed a safe, cost effective, bulk sodium hypochlorite system to replace the existing chlorine gas system at the Spurgeon Water Treatment Plant. Our design utilized the District's existing chlorine gas building and piping, which reduced project costs and construction duration. The team designed two bulk sodium hypochlorite FRP tanks, which were installed in a newly constructed containment area within the existing chlorine gas room. Design responsibilities included preparing the Preliminary Engineering Report. Construction phase service responsibilities included managing and reviewing submittals and RFIs.

Wes Brown Water Treatment Plant High Service Pump Station Actuator Replacement | City of Thornton

Thornton, Colorado

Assistant project manager for replacement of valve actuators in the high service pump station in the Wes Brown Water Treatment Plant. The existing hydraulic valve actuators were removed and replaced with electric actuators powered by a separate uninterruptible power supply cabinet. Construction phase responsibilities include managing and reviewing submittals and RFIs.

MEAGAN LUNDGREN, EI

Process Engineer



Meagan is an assistant environmental engineer with experience in drinking water and wastewater unit operations design and analysis. Her areas of study have included water quality analysis and testing, field assessment and data collection, environmental chemistry, and contaminant fate and transport. Her role on projects includes assisting in the design of water and wastewater treatment and conveyance systems for municipal

applications. Her role includes system design, specification development, creating cost opinions, submittal review and interdisciplinary coordination.

EDUCATION

- ▶ BS, Environmental Engineering

REGISTRATIONS

- ▶ Engineer in Training: CO

1.5 YEARS WITH BURNS & MCDONNELL

1.5 YEARS OF EXPERIENCE

Taste & Odor Project | Town of Johnstown

Johnstown, Colorado

Process engineer for study to evaluate taste and odor control performance of the town's existing powdered activated carbon system at the Lone Tree Reservoir. Conducted jar testing to quantify Geosmin and MIB removals. Compared the PAC system performance with the strategies at other nearby water systems. Developed recommendations for multi-phase approach to taste and odor control at Lonetree Reservoir, Town Lake and at the WTP. Support the town with implementing short-term granular activated carbon system in preparation for summer 2021.

Plum Creek WPF Advanced Treatment Project | Town of Castle Rock, Colorado

Castle Rock, Colorado

Assistant process engineer. Worked on construction phase services on the renovation of the Plum Creek Water Purification Facility (WPF) Advanced Treatment Project. The project includes the addition of multiple treatment processes, including pre-ozonation, biofiltration, advanced oxidation with ozone, GAC adsorption, and UV disinfection for use in treatment of direct potable reuse. The facility is currently rated for 6 MGD but has been designed to expand to 12 MGD. The responsibilities during the construction phase of the project include interdisciplinary coordination and submittal review.

Lynn R. Morgan Water Treatment Plant Expansion | Town of Erie, Colorado

Erie, Colorado

Assistant process engineer. Worked on the evaluation of the current performance of the Lynn R. Morgan Water Treatment Facility as well as the evaluation of the facility's source waters. Responsibilities included reviewing performance and operations data to make recommendations on increased efficiency and performance at the plant.

Thornton Water Treatment Plant Replacement [Design-Build] | City of Thornton

Thornton, Colorado

Assistant process engineer for the replacement of the Thornton Treatment Plant (TTP). The project includes the design and construction of a new 20 MGD treatment plant including traditional pretreatment, ozone, biofiltration, and disinfection. Her responsibilities during the construction phase of this project included submittal review and compilation of a comprehensive operations and maintenance manual for the entire plant.

Wes Brown Water Treatment Plant Membrane Evaluation | City of Thornton

Thornton, Colorado

Assistant process engineer for the evaluation of the membrane system currently in place at the Wes Brown Treatment Plant. Responsibilities included reviewing performance and operations data to make recommendations on increased efficiency and performance at the plant.

KATE HENSKE, PE

Pipeline



Kate is a senior pipeline engineer with the demonstrated ability to not only ask the right questions, but to listen to stakeholders in order to communicate more clearly and concisely, which results in more collaborative, transparent, and successful projects – from start to finish. She has successfully managed a variety of water and wastewater pipeline projects and tasks throughout

the Rocky Mountain Region. Kate's water system experience includes design of major water distribution facilities including pipelines from 6 through 54-inches in diameter, pressure reducing valves, control valves, air release valves and master water meters; design of booster and well pump stations; site grading and piping for water storage tanks; and master planning, water alignments, and facility studies for residential and commercial areas including storage tank sizing.

EDUCATION

- ▶ BS, Civil and Environmental Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, WY, CA, TX)

15 YEARS WITH BURNS & MCDONNELL

32 YEARS OF EXPERIENCE

Pressure Zone 3 Expansion: 88th and 104th Waterline Replacements | City of Westminster

Westminster, Colorado

Pipeline lead. Worked on the conversion of a section of Pressure Zone 1 to Pressure Zone 3 in the vicinity of the Westminster Mall which is being revitalized into the downtown area for the City of Westminster. This work includes the design of multiple waterlines through the Westminster system including 1.5 miles of 16-inch waterline, 1.3 miles of 30-inch waterline, 1.2 miles of 20-inch waterline, and 0.3 miles of fiber optics cable. The waterlines are being replaced due to the higher pressures when the area converts to Pressure Zone 3. The controls are being moved from a tank that is scheduled to be demolished to an existing tank between which the fiber is required. The waterlines and fiber will be placed within existing ROW, through private property and under US 36. Coordination will be required with the City of Westminster, Adams County, Jefferson County and WYDOT. The work included planning, design, alignment selection and evaluation, public relations, material evaluations, and permitting.

Airport Road to Baron Court Waterline | Town of Erie

Erie, Colorado

Project manager. Worked on approximately 3,000 linear feet of 16 and 12-inch waterline. This waterline replaces the existing aging waterline and provides replacement prior to the streets being resurfaced as a result of a sanitary sewer project along the same alignment. The waterline will be placed within an existing casing, within existing ROW and through an acquired easement. There will be multiple surface reactivations, new fire hydrant installation and existing fire hydrant connections.

Union Boulevard Water Main Replacement Project | Colorado Springs Utilities

Colorado Springs, Colorado

Project manager. Worked on the design of approximately 8,300 linear feet of 8, 12 and 24-inch waterline in Union Boulevard from Academy Boulevard to Deliverance Drive, fire hydrant replacements, lateral replacement and service reconnections as part of CSU's Water Main Replacement Ahead of Paving Program in conjunction with the City of Colorado Springs' 2C pavement replacement initiative. Union Boulevard is a very busy road which is also congested with many utilities. Design permitting was required from the City of Colorado Springs for traffic control and potholing which took place at night. In addition to the design plans; potholing and erosion control plans were developed.

KATE HENSKE, PE

(continued)

Colorado Springs Utilities | Mesa Road Waterline

Colorado Springs, Colorado

Project manager. Managed the design of the replacement of 4,900 linear feet of 18-inch cast iron waterline with 12-inch PVC waterline, fire hydrant replacements, lateral connections, and service connections as part of CSU's Water Main Replacement Ahead of Paving Program in conjunction with the City of Colorado Springs' 2C pavement replacement initiative. This is a quick paced project and construction will be completed through the Construction Manager / General Contractor (CMGC) process for which coordination and assistance with Colorado Springs Utilities and the General Contractor will be required to establishing a guaranteed maximum price. The project also included developing a paired comparison analysis for connection options which include, adding to pressure reducing valves in the existing system, or connecting into the existing 42-inch PCCP main.

Raw Water Pump Station and Pipeline | Town of Erie

Erie, Colorado

Project engineer. Worked on over 7.5 miles of 30-inch water transmission piping in Boulder County from the Boulder Creek Supply Canal to Erie Lake. The waterline is placed in street right-of-way and there are numerous bores under the roads. The project also has a crossing with the Union Pacific Railroad. The tracks are not being used so it was agreed that the tracks could be removed and replaced during water line installation. Coordination was required with Boulder County, City of Boulder Open Space, CDOT, numerous ditch companies, and Union Pacific Railroad. Alignment was dictated by the Boulder County 1041 process.

WISE Local Infrastructure Project | Town of Castle Rock

Castle Rock, Colorado

Pipeline lead. Worked on over 5.3 miles of 30 and 36-inch water transmission piping in the Town of Castle Rock and Douglas County. The WISE Local Infrastructure delivers WISE water from Parker's Reuter Hess Reservoir to the Town of Castle Rock's water distribution system. The 5.3-mile pipeline provides a sustainable long-term water supply of the Town and other WISE providers (Dominion Water & Sanitation District). The project alignment is mostly within an existing Xcel energy power line easement, through private property and within Town of Castle Rock property. Special precautions were incorporated into the contract documents due to construction taking place near a high voltage power line. The waterline was designed for steel, ductile iron and PVC to allow for competition during the bidding phase. Coordination was required with the Town of Castle Rock, Xcel Energy, Douglas County, and CDPHE.

Broomfield Water Treatment Plant Expansion | City and County of Broomfield

Broomfield, Colorado

Project manager. Worked on design and permitting for approximately 1,970 linear feet of 24-inch potable waterline within the City and County of Broomfield. This project provided domestic waterline looping from the treatment plant to an existing 24-inch waterline. The project also included design for a 36-inch bored steel casing under the Farmer Irrigation Company which required extensive permitting.

Cooley East Pump Station & Pipeline | City of Thornton

Thornton, Colorado

Project manager for the 5 MGD firm capacity pump station and an 18-inch water conveyance pipeline, approximately 2,000 linear feet in length, with discharge structures at the Cooley West Reservoir and the South Platte River. There is a gravity discharge which consists of an overflow structure in the Cooley East Reservoir, 3 -24-inch discharge lines and a discharge structure at the South Platte River.

NICK TESSITORE, PE, LEED AP BD+C, ENV SP

Civil Engineer



With almost two decades of civil engineering experience, Nick specializes in site development, pavement design, drainage and stormwater design, project management, master planning, and construction inspection. He excels in preparing development site plans, utility routing, drainage development, and working with municipalities for zoning

development and all permitting.

Dodd Water Treatment Plant Upgrade | Left Hand Water District Niwot, Colorado

Lead civil engineer for the design and construction of the upgrades to the water treatment plant. The project provided upgrades to increase the WTP to a 10 MGD capacity, so the facility can reduce overall operations and maintenance requirements by improving treatment processes. The design consisted of access roads, fencing, grading, drainage, soil evaluation, permitting, erosion control measures, and site mobility. Major earthwork design involved raising and expanding the existing backwash ponds to an elevation above the current groundwater table and installing a geosynthetic clay liner. Other design activities include earthwork, utility coordination, survey, building and foundation placement, and drainage design.

Plum Creek Water Advanced Treatment Project | Town of Castle Rock Castle Rock, Colorado

Lead Civil Engineer for the design and construction services for the addition of advanced treatment processes to the existing Plum Creek Water Purification Facility (PCWPF). This project utilized the design/contract-build contracting method to select a general contractor to participate in a collaborative project delivery environment. Design activities required full site development including raw water piping, finished water, electric, natural gas, fiber optic communications, site access, and storm water mitigation. Other design consisted of grading, drainage, pavement design, soil evaluation, erosion control measures, yard piping, utility coordination, survey, and foundation placement.

Water Treatment Plant Replacement | City of Thornton Thornton, Colorado

Lead Civil Engineer for the design and construction for the new \$90M design-build water treatment facility project. The treatment plant will have an initial capacity of 20 MGD using conventional treatment processes, as well as the ability to treat two water sources, Stanley Lake and South Platte River. The process design includes raw water ozone, rapid mix, flocculation, sedimentation and biologically active filtration. Design activities required full site development including raw water piping, finished water, electric, natural gas, fiber optic communications, site access, yard piping, and storm water mitigation. Other design consisted of grading, drainage, pavement design, soil evaluation, erosion control measures, yard piping, utility coordination, survey, traffic maneuvering, security fencing, landscaping, and foundation placement.

Plum Creek Water Purification Facility | Town of Castle Rock Castle Rock, Colorado

Civil Engineer for the design and construction services for the new 4-MGD Plum Creek Water Purification Facility (PCWPF). This project utilized the design/contract-build contracting method to select a general contractor to participate in a

EDUCATION

- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, KY, WY, UT, NM, KS, NV, OR, WA, MT, OK, PA, AL, TX, AZ, MO)
- ▶ LEED AP BD+C
- ▶ ENV SP

13 YEARS WITH BURNS & MCDONNELL

19 YEARS OF EXPERIENCE

NICK TESSITORE, PE, LEED AP BD+C, ENV SP

(continued)

collaborative project delivery environment. Design activities required full site development including raw water piping, finished water, electric, natural gas, fiber optic communications, site access, and storm water mitigation. Other design consisted of grading, drainage, pavement design, soil evaluation, erosion control measures, yard piping, utility coordination, survey, and foundation placement.

North Water Reclamation Facility Capacity Improvements | Town of Erie

Erie, Colorado

Lead Civil Engineer for the improvements to the NWRf plant to include a solids load out system truck containment, a new sulfuric acid tank building, and expansion of the splitter box. Overall design consisted of pavement, grading, drainage, soil evaluation, permitting, erosion control measures, and site mobility. Other design activities include earthwork, utility coordination, building and foundation placement, and storm drainage.

Stonegate Wastewater Facility Upgrades | Stonegate Village Metropolitan District

Parker, Colorado

Project Civil Engineer for the design of the upgrades to the wastewater treatment plant. The project provided upgrades to handle a 6.5 MGD capacity, so the facility can reliably meet the current permit limits and reduce overall operations and maintenance requirements by improving treatment processes. The design consisted of new access roads, fencing, grading, drainage, soil evaluation, permitting, erosion control measures, and site mobility. Other design activities include earthwork, utility coordination, survey, building and foundation placement, and drainage design.

Jackson Springs Water Treatment Plant | City of Rapid City

Rapid City, South Dakota

Project Civil Engineer for the construction phase of a new membrane filtration water treatment plant. The project provided a new treatment facility with 8 MGD capacity, a new surface water intake from Rapid Creek, a new raw water pumping station located outside the floodway, rapid mix, flocculation, sedimentation, membrane filtration, clearwell, high service station, and raw and finished water piping. Responsibilities during construction included submittal evaluation, quantity tracking, field coordination, and overall safety operations.

Wastewater Treatment Plant | Boxelder Sanitation District

Fort Collins, Colorado

Lead Civil Engineer for the design and construction services for the new 3-MGD mechanical wastewater treatment plant. This project utilized the design/contract-build contracting method to select a general contractor to participate in a collaborative project delivery environment. Design activities required full site development including yard piping, electric, natural gas, fiber optic communications, site access, and storm water mitigation. Other design consisted of grading, drainage, pavement design, soil evaluation, erosion control measures, yard piping, utility coordination, survey, and foundation placement.

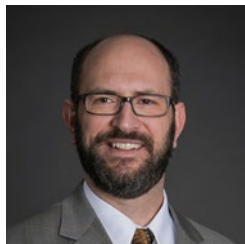
Research and Roxbury Pump Station Rechlorination Project | Colorado Springs Utilities

Colorado Springs, Colorado

Lead civil engineer. Worked on the design and retrofit of two new pump stations, one is located at the Research facility and the other is located at the Roxbury location in Colorado Springs, Colorado. Design tasks included the overall site design, grading, chemical truck access, structure excavation and backfill, stormwater design, and underground utility routing. Other design includes soil evaluation, erosion control measures, utility coordination, survey, and building and foundation placement.

MICHAEL JOHNSON, PE

Lead Electrical / I&C Engineer



Michael is a senior electrical and controls engineer. He has worked as a field engineer assisting in startup commissioning and system integration of control systems for industrial facilities and as a consulting engineer to develop conceptual designs, detailed designs, and specifications for electrical & control systems for municipal facilities.

EDUCATION

- ▶ BS, Electrical Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, KS, SD, WY)

20 YEARS WITH BURNS & MCDONNELL

20 YEARS OF EXPERIENCE

Maple Grove WTP Solids Handling Project | The Consolidated Mutual Water Company

Lakewood, Colorado

Lead electrical/I&C engineer responsible for the conceptual design, specifications and detailed design of the 480 VAC 3-phase electrical system including panels and cables for the lighting, mixing tanks, feed pumps, polymer skids and dewatering press skids power distribution. The overall scope of this project is solids handling improvements to an existing water treatment plant based on recommendations our team made during the previous solids study. The solids study included a detailed solids production evaluation, bench scale dewatering testing, pilot testing, and development of design alternatives for converting the existing system from drying beds to mechanical dewatering. Our team designed the plant improvements based on this study and is currently constructing the improvements.

Ft Lupton WWTP Upgrades | City of Fort Lupton, Colorado

Fort Lupton, Colorado

Electrical/I&C engineer. Provided detailed electrical design documents and construction EPC specifications and construction sequence planning for the upgrade of a single train wastewater facility to add an additional train and include future planning for a third train.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre

Pierre, South Dakota

Electrical/I&C engineer. Coordinated multiple engineers for the design of Construction Contract documents and specifications for the electrical control system for a wastewater facility. Coordinated the new design to integrate with the existing plant infrastructure.

Wastewater Treatment Facility Expansion | City of Green River

Green River, Wyoming

Electrical/I&C engineer. Coordinated multiple engineers for the design of Construction Contract documents and specifications for the electrical control system for a wastewater facility. Reviewed the department standard specifications for suitability for the type of contract., Reviewed the department standard specifications for suitability for the type of contract.

Actuator Replacement at Wes Brown WTP | City of Thornton

Thornton, Colorado

Electrical/I&C engineer. Provided work packages for the replacement of hydraulic actuators to a construction partner. Provided minimal design with sufficient instruction to contractor for critical components to minimize engineering expenses.

MICHAEL JOHNSON, PE

(continued)

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Electrical/I&C engineer. Provided project support to the construction contractor for a wastewater treatment facility designed by Burns and McDonnell Water Department. Reviewed and revised the project cable schedule and electrical drawings, responded to Contractor RFI's, worked with Utility and Client to resolve compliance items. While at the same time learning Water Wastewater design criteria and design requirements.

Dodd WTP Hydroelectric Project | Left Hand Water District

Niwot, Colorado

Electrical/I&C engineer. Revised the electrical design of a hydro turbine located at the base the front range, to meet utility company requirements and performed compliance submittal reviews.

First Creek Lift Station Improvements | City of Aurora

Denver, Colorado

Electrical/I&C engineer. The First Creek Lift Station will be abandoned once a new interceptor to a new Metro North WWTP is completed. Until that time, the lift station will pump both the Second and First Creek flows to the existing Aurora WWTP. This project increases the capacity of the FCLS to 3.0 MGD to handle the flows from both service areas. This project retrofitted the existing submersible lift station with large pumps, updated controls, new flow meter, and a bypass vault connection. The project also added a new 50' antenna mast and SCADA monitoring that communicates to the City's main monitoring system. Electrical detailed design specifications and drawings, Contract submittal reviews and construction support, answered RFI's, Attended Client Workshop & Factory Acceptance Testing. We were able to create an updated standard set of Burns and McDonnell contract drawings to meet City of Auroras preferred methods and procedures. We were able to incorporate SCADA Design manual and to meet very specific product interface and product testing requirements.

Skyline Pump Station Interconnect | City of Longmont

Longmont, Colorado

Electrical/I&C engineer. In order to meet emergency indoor water demands, the City of Longmont accepts intermittent water supplies from surrounding districts via interconnects in their system. In order to move this emergency interconnect water throughout their water distribution system, Burns & McDonnell designed an emergency interconnect in an existing pump station consisting of an end suction pump, piping, and associated updates to electrical and HVAC. The Burns & McDonnell team has also assisted the City with construction observations and inspections. Provided construction work package for the City to self perform the work. Addition of a zone to zone variable frequency drive transfer pump. Provided minimal design requirement, with sufficient critical design components.

Rock Creek Lift Station Odor Control Improvements | City and County of Broomfield, Colorado

Englewood, Colorado

Electrical/I&C engineer. Provide a Construction Contract specifications and detailed design drawings to replace the pump station pumps, MCC and to add odor control equipment. Specifically outlined a Construction sequence for the pump station to stay online while performing the work.

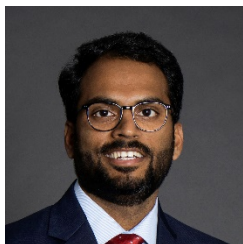
Cooley East Pump Station | City of Thornton, Colorado

Thornton, Colorado

Electrical/I&C engineer. Revised a pump station design, provided control narrative, specifications and drawing revisions. Answered Construction RFIs, and participated in factory acceptance test, site visits and walkdown.

VAMSI PATWARI, PE

Electrical / I&C Engineer



Vamsi is an electrical engineer with six years of experience in electrical design, analysis, and project coordination. He has specialized experience in industrial power and control systems.

Zenon PLC Upgrades at Wes Brown WTP | City of Thornton

Thornton, Colorado

Electrical engineer that provided engineering support for the replacement of one of the City's major PLC systems. This project is a conversion of the Zenon PLC at the Wes Brown Water Treatment Plant, including migration of software packages. Developed a design package for the PLC conversion, and coordinated between Suez, system integrator and City. Burns & McDonnell developed record documents after installation and startup of the upgraded PLC was completed.

Wastewater Treatment Plant Inspection and Engineering | City of Longmont, Colorado

Longmont, Colorado

Electrical engineer. Consulted with the Longmont WWTP regarding service water pressure, modifications to the biological treatment system, and pump design/replacement. Vamsi worked on a study to evaluate the existing emergency generators at both the Nelson Flanders Water Treatment Plant and the Longmont Wastewater Treatment Plant. The evaluation includes increasing the existing generator run times, new ATS/MTS, sectionalizer, and fuel storage. The study involved developing options for emergency power, evaluating each with monetary and non-monetary criteria, recommendations, and developing the design.

Green River Wastewater Treatment Plant Expansion | City of Green River

Green River, Wyoming

Electrical engineer and instrumentation/controls for expansion to the existing Green River Wastewater Treatment Plant. The project includes the replacement of the existing lagoon system with a 1.5 MGD BNR mechanical plant. The new facility includes a complete treatment process with headworks/grit, BNR secondary process, UV disinfection and aerobic digestion.

Plum Creek Water Reclamation Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Electrical engineer that performed the evaluation and design of the closed transition emergency power system. This project includes the capacity expansion of the Plum Creek WWTP from 6.4 to 9.5 MGD. The primary purpose of the project is the capacity expansion and replacement of the solids stabilization system with an Autothermal Thermophilic Aerobic Digestion process (ATAD) process to create Class A biosolids.

Dodd WTP Hydroelectric Project | Left Hand Water District

Niwot, Colorado

Electrical engineer. Vamsi worked on a construction phase for a new Hydroelectric Facility. Reviewed shop drawings and design for the construction phase of this project. The overall scope of work included detailed design of a 200 kW micro-turbine at the 10 MGD Dodd Water Treatment Plant. The Dodd WTP receives raw water from Northern Colorado Water Conservation District's Boulder Feeder Canal as well as the new SWSPH. The Dodd micro turbine will take an average of 9

EDUCATION

- ▶ MS, Electrical Engineering (Industrial Electrical & Control Systems)
- ▶ Bachelor of Technology, Electrical and Electronics Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, TX)

1 YEAR WITH BURNS & MCDONNELL

6 YEARS OF EXPERIENCE

VAMSI PATWARI, PE

(continued)

cubic feet per second (cfs) of raw water from SWSPII at a pressure range between 85 and 195 psi. The financial analysis provided by BMCD indicates a viable payback for the micro turbine project. An alternative delivery model was selected to reduce the overall project schedule by pre-purchasing long lead time equipment at 30% design.

Vac Pump Improvements at Wes Brown WTP | City of Thornton

Thornton, Colorado

Electrical engineer for the addition of vacuum pumps to serve the membranes in the Wes Brown Water Treatment Plant. Two 15 horsepower vacuum pumps will be installed to maintain water surface levels in the air/water separation vessels and maintain prime on the membrane permeate pumps. Vacuum pumps will be provided with integral variable frequency drives and controls.

South Water Reclamation Plant* | Albuquerque Bernalillo County Water Authority

Albuquerque, New Mexico

Electrical lead engineer for electrical medium voltage loop A&B design project. Reconfigured the existing two medium voltage loops throughout the facility to improve safety, reliability, and ease of maintenance by eliminating taps to connect downstream transformers. The two medium voltage loops are connected to existing 15-kV metal enclosed load interrupter switchgears (main-tier-main) via new 15-kV pad mount switchgears (S&C PME style) at various points throughout the facility. The downstream transformers are reconnected to be fed from individual fused switches by retrofitting the existing 15-kV metal enclosed load interrupter switchgears. All the medium voltage switches are configured with kirk keys to prevent from both loops being paralleled. Demolition of a 50 year old existing outdoor 15-kV service entrance switchgear and replacing with a 15-kV arc resistant service entrance switchgear in a new building along with providing medium voltage breaker controls, coordinating interconnection with the power utility for parallel operation and provide recommended relay settings in accordance with IEEE 1547. The design also included describing detailed construction sequence to minimize the outages through the facility while transferring the power to the new configuration.

West Gravel Lakes Pump Station Electrical Upgrade* | City of Thornton

Thornton, Colorado

Electrical engineer for the replacement of the electrical distribution equipment at the West Gravel Lakes pump station. The existing electrical equipment (indoor and outdoor MCC, disconnect switch and ATS, HP-3 panelboard in KMNO4 building) was identified to be replaced based on the previous arc flash study analysis report. Along with replacing this equipment, the design focused on simplifying the distribution scheme by adding a service entrance switchboard (SWBD-WGL). This also helped in reducing the arc flash energy levels at the MCCs. The design also focused on cost effective solutions in reconnecting HP-1 (Panelboard in PAC building) and HP-3 (Panelboard in KMNO4 building) to generator backup source (MCC-WGL-B).

Zone 3/4 Pump Station MCC and VFD Upgrades | City of Thornton

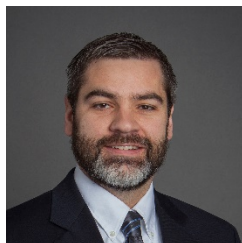
Thornton, Colorado

Project manager and electrical engineer that developed the design and specifications for the replacement of two motor control center (MCC) switchboards and the installation of two new variable frequency drives (VFDs) at two existing pumps in the Zone 3/4 Pump Station. The MCCs to be replaced include the existing north Square D MCC and the existing south Cutler Hammer MCC. New VFDs will be installed on pumps 3-2 and 3-3 at the pump station, which do not currently have VFDs.

*denotes experience prior to joining Burns & McDonnell

JOHN KIENHOLZ, PE

Structural Engineer



John is a senior structural engineer with more than 17 years of structural design experience for municipal, commercial, military, power generation, power distribution and industrial clients. His primary responsibilities include the design of steel, concrete, and masonry structures and substructures.

EDUCATION

- ▶ BS, Civil Engineering
- ▶ MS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer: CO

14 YEARS WITH BURNS & MCDONNELL

17 YEARS OF EXPERIENCE

Advanced Treatment at Plum Creek PWF | Town of Castle Rock

Castle Rock, Colorado

Lead structural engineer for housing equipment responsible for advanced drinking water treatment equipment, capable of treating ground water, surface water, and wastewater treatment plant effluent for drinking water. Largest element consists of a masonry building with precast roof elements crating a 30-ft interior clear height for housing large granular activated carbon tanks. Project consists of a cast-in-place concrete buried vault and a partially buried solids storage tank.

Lynn R. Morgan Water Treatment Plant Expansion | Town of Erie, Colorado

Erie, Colorado

Quality review. Reviewed the structural design for the expansion of a 10 MGD WTP to increase the plant capacity to 17 MGD. The upgrade includes a pretreatment with flocculation and lamella plate sedimentation followed by membrane filtration and a high service pump station expansion. The project is being executed as a CMAR to expedite the construction and allow for contractor input during design. Construction was completed in July 2020.

Plum Creek Water Purification Facility | Town of Castle Rock

Castle Rock, Colorado

Structural engineer for new treatment facility housing pretreatment, membrane filtration and chemical storage processes and office space. Plum Creek is a complex building comprised of several wings, four different roof elevations and five structural systems (concrete, masonry, precast, metal joists and wood timbers.)

Jackson Springs Water Treatment Plant | City of Rapid City

Rapid City, South Dakota

Structural engineer that designed masonry superstructure and precast concrete roof for 113 feet by 226 feet treatment plant. Roof levels varied with bearing heights up to 25 feet and parapets up to 8 feet tall.

Wastewater Treatment Plant Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Structural engineer that designed the concrete grit basin, anaerobic selector basin, oxidation ditches as well as the masonry building housing several pumps.

JOHN KIENHOLZ, PE

(continued)

Wastewater Treatment Plant Expansion | City of Green River

Green River, Wyoming

Lead structural engineer responsible for developing structural drawings and specifications for a new wastewater treatment facility. Structures include administration building, headworks/process building housing, grit separator structure, anaerobic selector basin, oxidation ditches, splitter structure, clarifiers, solids handling building, and UV treatment building.

North Water Reclamation Facility | Town of Erie

Erie, Colorado

Structural engineer that designed the UV/Dewatering facility for the treatment plant. Design consisted of a masonry building with precast double-tee roof. Concrete foundation was on drilled shafts with basins for the UV process and a structural slab for the dewatering equipment. This project was awarded the 2011 Rocky Mountain Design-Build Institute of America Water/Wastewater Project of the Year. It also received a 2013 ACEC-CO Honor Award (Waste and Storm Water Category).

Wastewater Treatment Facility | Fairplay Sanitation District

Fairplay, Colorado

Structural engineer that designed masonry building housing blower room, electrical room, and headworks for the new wastewater treatment facility. Operations started in January 2009 and the project was awarded the National Design-Build Institute of America's 2010 Water/Wastewater Project of the Year (<\$25M).

Tucson-Rogers Pump Station | City of Thornton, Colorado

Thornton, Colorado

OnSite resident engineer and representative. Worked on the City of Thornton on an eighteen month, six million-dollar (construction cost) project. Observed contractor activities and construction methods to verify the product delivered to the client met the contract drawings and specifications developed by the Engineer of Record (in this case, not Burns & McDonnell). The project was a pump station that could transfer water in either direction between the South Platte River and the reservoir.

Moffat WTP Decommissioning (Design Package 7) | Denver Water

Denver, Colorado

Structural support for work towards decommissioning the Moffat Water Treatment Plant and repurposing the finished water clear wells to become water storage tanks in their distribution system. Performed multiple tank inspections and co-authored the evaluation and Basis of Design report.

West Side Pump Stations [Countryside and Zone 5] | City of Westminster

Westminster, Colorado

Lead structural engineer. Worked on horizontal split-case pump house. Building consisted of a concrete foundation on drilled shafts, masonry walls with architectural elements, and hot-rolled steel roof trusses with metal deck diaphragm.

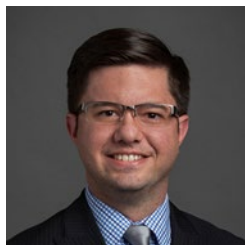
Chambers Reservoir Pump Station | Arapahoe County Water and Wastewater Authority

Parker, Colorado

OnSite engineer. Observed and inspected construction. The project consisted of a pump station for irrigation water.

RYAN LANG, RA, ENV SP

Lead Architect



With more than 16 years of experience in the field of architecture, Ryan has served as the lead project architect on a variety of municipal, industrial, commercial and public building projects. His involvement includes project management, construction administration, design, fast-tracked design-build, the preparation of the architectural plans and specifications, and 3D design.

EDUCATION

- ▶ BS, Architecture

REGISTRATIONS

- ▶ Envision SP: Registered Architect (AR, CO, FL, GA, IL, KS, LA, MO, NE, OK, SD, TN, TX, WY)

11 YEARS WITH BURNS & MCDONNELL

16 YEARS OF EXPERIENCE

Lynn R. Morgan WTP Expansion | Town of Erie

Erie, Colorado

Lead architect. Worked on the expansion of the Lynn R. Morgan Water Treatment Facility in Erie, Colorado. The project will increase the water treatment plant capacity from 9.9 to 16.7 MGD to serve increasing growth in the town. The project involves design of an additional pretreatment facility, the addition of new filtration membranes, additional yard piping and an increase in pump capacity. Responsibilities included the architectural design of the new pretreatment facility.

Pressure Zone 3 Expansion | City of Westminster

Westminster, Colorado

Lead architect. Worked on the new Gregory Hill Pump Station as part of the two 3 MG above ground tank and pump station project. The facility is part of a large pressure zone expansion project that will increase water storage capacity and water pressure within Zone 3 of the City of Westminster's water distribution system. Responsibilities included architectural design for the pump station.

K7/K10 Composite Elevated Water Storage Tanks | Water District No. 1 of Johnson County

Olathe, Kansas

Lead architect. Ryan led the design effort of three proposed water towers to extend the reach of the client. In doing so, the reliability of their water supply is increased. These towers are to be placed at two different sites; one being the intersection of K-7 and K-10, and the other being the intersection of 199th & Lackman. A primary goal of the project is to be unobtrusive to the natural environment, as the site is situated in a lesser populated area.

Lamar Pump Station Improvements | Water District No. 1 of Johnson County

Overland Park, Kansas

Lead architect. Involved in the design of the improvements to this existing pump station for Water District No. 1 of Johnson County. Improvements included: new louvers, baseboard and door hardware replacement, trolley and hoist replacement, and protective coatings.

RYAN LANG, RA, ENV SP

(continued)

Belinder 75th Nall & Brush Creek Pump Station | Johnson County Wastewater

Fairway, Kansas

Lead architect. Provided improvements at three pump stations in Kansas City. Minor architectural improvements were made at all three locations: 75th & Nall, Brush Creek, and Belinder & 57th. These improvements consisted of a door replacement, added windows and window shades, a downspout addition, new coatings, and improvements to a retaining wall. The work done was part of a package of improvements decided upon by the client.

Ridgway Pump Station Improvements | Water District No. 1 of Johnson County

Overland Park, Kansas

Architect. Involved with the design, bid, and construction phase improvements to this existing pump station for Water District No. 1 of Johnson County. Improvements included: stair replacement, trolley and hoist replacement, new louver installation, cultured stone veneer masonry cladding addition, and protective coatings. The focus of the exterior architecture of this pump station was to make the pump station blend into its surroundings. The interior focused on durability, unmanned longevity, and used high performance coatings to protect piping and electrical conduit.

Nall Avenue Pumping Station | Water District No. 1 of Johnson County

Leawood, Kansas

Architect. During the construction phase of the new 54 million gallon per day pump station for Water District No. 1 of Johnson County. The Pump Station is a concrete and brick masonry building with steel roof trusses supporting a metal deck roof. The Pump Station was designed to blend in with its upscale surroundings. As a recent win, we will be adding a second planned underground storage tank and associated capacity upgrade.

67th Street Pumping Station and Crouthers Pumping Station Improvements | Water District No. 1 of Johnson County

Kansas

Architect. Responsible for the improvements to these existing Pump Stations for Water District No. 1 of Johnson County. Improvements included asbestos and/or lead paint removal and overhead hoist additions/improvements.

67th Street Pumping Station and Woodson Pumping Station Improvements | Water District No. 1 of Johnson County

Kansas

Architect. During the construction phase of the new 54 million gallon per day pump station for Nall Avenue. The pump station is a concrete and brick masonry building with steel roof trusses supporting a metal deck roof. The pump station was designed to blend in with its upscale surroundings.

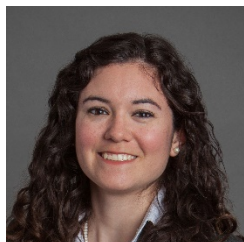
Lift Station Replacement | City of Olathe

Olathe, Kansas

Architect. Involved with the replacement of the Cedar Lake Lift Station in Olathe, Kansas. Part of Ryan's responsibilities included meeting with vendors to find the best suited materials for the project, as well as making color selections for the stone and roofing to match the existing surrounding Cedar Lake park area.

SHAWN DALGLISH, EIT

Architect



Shawn is a civil and structural engineer with five years of experience in water project design and construction. Her project experience varies from project conceptual design, project planning, and detailed design of concrete, masonry, and steel structures. Shawn has worked on several existing facility expansions as well as new facility design

and construction. She also has a background in architectural and interior design. Shawn is proficient in several structural and architectural design drafting software applications including RISA 3D, Visual Analysis, Revit, AutoCAD, and Photoshop.

EDUCATION

- ▶ ME, Civil/Structural Engineering
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Engineer-in-Training (TX)

5 YEARS WITH BURNS & MCDONNELL

5 YEARS OF EXPERIENCE

Lynn R. Morgan Water Treatment Plant Expansion | Town of Erie

Erie, Colorado

Structural design engineer and architect. Worked on the expansion of the Lynn R. Morgan Water Treatment Facility in Erie, Colorado. The project will increase the water treatment plant capacity from 9.9 to 16.7 MGD to serve increasing growth in the town. The project involves design of an additional pretreatment facility, the addition of new filtration membranes, additional yard piping and an increase in pump capacity. Responsibilities include structural and architectural design of the new pretreatment facility.

TDS Compliance Project at Water Reclamation Facility | Cherokee Metropolitan District

Colorado Springs, Colorado

Design Architect for the TDS Reduction Facility Project. Performed Code Review and analysis of the new structures on site including the Filter Building, Chemical Building, and Headworks Building. Coordinated building department review with local authorities. Performed Hazardous Materials analysis for the Chemical Building. Worked with the Engineering Project Manager and the client to match the exterior aesthetic of the new buildings to existing buildings at the facility. Reduced the overall construction cost of the project by working with the regional building department to approve two variances from the jurisdiction's stringent energy code requirements.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Structural design engineer and architect. Worked on a multi-structure, wastewater treatment facility to increase capacity of the existing wastewater treatment plant. The project involves design of a new headworks facility, oxidation ditch, secondary clarifiers, UV disinfection system, modified river discharge, aerobic digesters, dewatering system, and composting facility. Responsibilities include structural and architectural design of all above ground structures at the facility.

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Structural design engineer and architect. Worked on the expansion and upgrade of the existing Plum Creek Water Reclamation Facility. The project involved the addition of a new process building which includes a headworks facility, thickening system, pump room, ThermAer tanks, and separate UV disinfection facility. Responsibilities included structural and architectural design of the above and below grade structures for the project.

SHAWN DALGLISH, EIT

(continued)

Wastewater Treatment Facility Expansion | City of Green River

Green River, Wyoming

Structural design engineer and architect. Worked on a multi-structure, wastewater treatment facility to replace the existing wastewater treatment plant. Project involves design of a new headworks facility, oxidation ditch, secondary clarifiers, UV disinfection system, modified river discharge, aerobic digesters, dewatering system, and composting facility. Responsibilities include structural and architectural design of all above ground structures at the facility.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre

Pierre, South Dakota

Design architect. Worked on renovation and upgrades to a multi-structure, wastewater treatment facility in the City of Pierre. Project involves design of a new influent lift station, administration building upgrades, and modifications to an existing headworks facility. Responsibilities include architectural design of all above ground structures at the facility.

Dodd WTP Hydroelectric Project | Left Hand Water District

Niwot, Colorado

Structural design engineer. Worked on a new hydro turbine facility to be part of the overall water treatment plant capacity increase. The project purpose is to install a new hydro turbine on a new water line to be connected to the DODD Water Treatment Plant. The new hydro turbine will reduce flow into the plant while converting excess pressure into electricity. Responsibilities include foundation design, facility design, and structural design to accommodate vibrations of the turbine.

Pressure Zone 3 Expansion: Gregory Hill Pump Station and Tanks | City of Westminster

Westminster, Colorado

Structural design engineer and architect. Worked on the new Gregory Hill Pump Station as part of the two 3 MG above ground tank and pump station project. The facility is part of a large pressure zone expansion project that will increase water storage capacity and water pressure within Zone 3 of the City of Westminster's water distribution system. Responsibilities include structural and architectural design and construction phase services for the pump station.

West Side Pump Stations [Countryside and Zone 5] | City of Westminster

Westminster, Colorado

Structural design engineer and architect. Worked on the new West Side Pump Station as part of the 3 MG water storage tank rehabilitation and pump station project. The facility is part of a large pressure zone expansion project that will increase water storage capacity and water pressure within Zone 3 of the City of Westminster's water distribution system. Responsibilities include structural and architectural design of the pump station as well as construction phase services for the project.

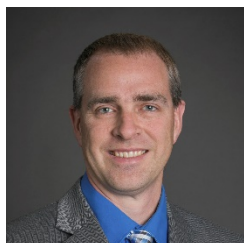
Erger's Pond Augmentation Stations | City of Brighton

Brighton, Colorado

Structural design engineer. Worked on the Augmentation Station at Erger's Pond. The project will utilize the existing reservoirs in Brighton to augment water supply out and fill with free river water to maximize raw water supply on hand for the surrounding community. The project involves design of a sediment resistant intake structure, augmentation pump station, and required electrical facilities. Responsibilities include structural and design below grade concrete intake structures, wet wells, and vaults and above grade electrical facilities.

DAVID OLSEN, PE

Mechanical Engineer



David is a mechanical engineer with 20 years of experience designing HVAC and plumbing systems for a variety of building types. He has recent water treatment plant experience and is currently working on projects for the Town of Castle Rock, City of Thornton and City & County of Broomfield.

EDUCATION

- ▶ BS, Mechanical Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, WY, MT, SD)

3 YEARS WITH BURNS & MCDONNELL

20 YEARS OF EXPERIENCE

Lynn R. Morgan Water Treatment Plant Expansion | Town of Erie

Erie, Colorado

Mechanical engineer. Designed and construction administration for the mechanical and plumbing for the expansion of this facility from 9.9 to 16 MGD.

Plum Creek WPF Advanced Treatment Project | Town of Castle Rock, Colorado

Castle Rock, Colorado

Mechanical engineer. Responsible for designing the HVAC and plumbing for a new advanced treatment building at the Plum Creek Water Purification Facility. This included doing building loads, equipment loads and calculating ventilation requirements. Then designing a system to meet these requirements. The plumbing included multiple hot water systems to meet the requirements of the process needs, emergency showers and lab requirements.

Broomfield Water Treatment Plant Expansion | City and County of Broomfield

Broomfield, Colorado

Mechanical engineer. Responsible for designing the HVAC and plumbing for a new chemical building and remodel of existing water treatment plant including office and lab space at the Broomfield Water Treatment Plant. This included doing building loads, equipment loads and calculating ventilation requirements. Then designing a system to meet these requirements. The plumbing included multiple hot water systems to meet the requirements of the process needs, emergency showers and lab requirements.

Thornton Water Treatment Plant Replacement Project | City of Thornton

Thornton, Colorado

Mechanical engineer. Design and construction services for a new 20 MGD water treatment plant that includes advanced treatment technologies for taste and odor removal. The facilities include many different types of rooms and equipment to meet the requirements of these rooms. The mechanical design included integration and controls for multiple rtu's and exhaust fans to meet the heating, cooling and ventilation of the various rooms.

Hydroelectric Project, Lynn R. Morgan Water Treatment Facility | Town of Erie

Erie, Colorado

Mechanical engineer for the detailed design of an 80 kW micro-turbine addition at the existing 17 MGD Lynn R. Morgan Water Treatment Facility. Erie has received raw water from Northern Colorado Water's SWSP pipeline for nearly 20 years. The potential energy in this pipeline was dissipated through an existing buried sleeve valve vault. The addition of a

DAVID OLSEN, PE

(continued)

hydroelectric generator proved feasibility after a study compared applicable turbine technologies, potential installation locations and several financial scenarios.

Maple Grove Water Treatment Solids Handling | The Consolidated Mutual Water Company

Lakewood, Colorado

Mechanical engineer. Responsible for design of the HVAC and plumbing for a new solids handling building for the existing water treatment plant. This included doing building loads, equipment loads and calculating ventilation requirements. Then designing a system to meet these requirements. The plumbing included multiple hot water systems to meet the requirements of the process needs and emergency showers.

TDS Compliance Project | Cherokee Metropolitan District

Colorado Springs, Colorado | Jan 2020 -

Mechanical engineer. Design HVAC and plumbing for 3 new buildings. This project required emergency shower/eye wash for a site that did not have adequate water (both quantity and quality), was able to come up solutions. This project has required multiple redesigns and complex coordination's with a tight timeframe to meet state mandates.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Mechanical engineer. Responsible for the equipment selection, system evaluation and design review. The Green River Wastewater Treatment Plant is a \$33M design-build project. The facilities include different types of rooms, buildings and equipment to meet the requirements of these rooms, including a Class 1 Div 1 space. The mechanical design included integration and controls for multiple rtu's and exhaust fans to meet the heating, cooling and ventilation of the various rooms.

Wastewater Treatment Facility Expansion | City of Green River

Green River, Wyoming

Mechanical engineer. Responsible for the equipment selection, system evaluation and design review. The Green River Wastewater Treatment Plant is a \$30M design-build project. The facilities include different types of rooms, buildings and equipment to meet the requirements of these rooms, including a Class 1 Div 1 space. The mechanical design included integration and controls for multiple rtu's and exhaust fans to meet the heating, cooling and ventilation of the various rooms.

Ft Lupton WWTP Upgrades | City of Fort Lupton, Colorado

Fort Lupton, Colorado

Mechanical engineer. Coordinate and design the mechanical and plumbing for the 3 remodeled buildings and 2 new buildings.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre, South Dakota

Pierre, South Dakota

Mechanical engineer. Design and redesign the HVAC and plumbing for 6 buildings with use and equipment changes.



Town of Johnstown
Water Treatment Plant Expansion from 5 to 12.5 mgd

Work Breakdown Structure and Fee Schedule - Option 4 Ozone & Biologically Active Filtration

Item #12.

BASIC SERVICES	Project Manager	Quality Control	Lead Process	Process	Structural	Architectural	Civil	Mechanical	Electrical, Instrumentation & Controls	Construction	CAD / Designer	Fire Protection	Environmental	BMCD Total Labor		Expenses	Sub- Consultants	Total Cost
	Pugh	Schaefer	Kinser	Rachelson Lundgren	Kienholz	Lang Dalglish	Tessitore	Olsen	Johnson Patwari	Herrington Other	Ellis	DeGroff Ginsberg	Woehler Rowe					
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Direct	Cost	
TASK SERIES 100 - Project Initiation & Coordination																		
101 - Project Kick Off Meeting	4		4											8	2024	\$80		\$ 2,104
102 - Weekly Review Meetings	120		60	60	8		8	8	16					280	\$64,999	\$2,600		\$ 67,599
103 - Project, Risk and Resource Management, Schedule and Budget Controls	240													240	\$60,480	\$2,420		\$ 62,900
Sub-Total Series 100	364	0	64	60	8	0	8	8	16	0	0	0	0	528	\$127,503	\$5,100	\$0	\$132,603
TASK SERIES 200 - Review Existing Data & Basis of Design																		
201 - Review Existing Records	4		8	16										28	\$6,008	\$240		\$ 6,248
202 - Develop Permitting Matrix	2			4									4	10	\$2,072	\$80		\$ 2,152
203 - Desktop Analysis ¹	24	4	60	100	60	24	24		40		40			376	\$76,673	\$3,070		\$ 79,743
204 - Workshop 1 - Overall Treatment Train Options Selection	4		4	4										12	\$2,766	\$110		\$ 2,876
205 - Water Characterization ²	8		24	40										72	\$15,532	\$620	\$20,000	\$ 36,152
206 - Pretreatment Capacity Analysis ³	4		24	40										68	\$14,524	\$580		\$ 15,104
207 - Prepare 2 Layout Options for Selected Treatment Train	20		40	80							60			200	\$35,920	\$1,440		\$ 37,360
208 - Taste & Odor Control Option Selection ⁴	40		60	80										180	\$40,160	\$1,610		\$ 41,770
209 - Workshop 2 - Taste & Odor Control Option Selection	4		4	4										12	\$2,766	\$110		\$ 2,876
210 - Disinfection & Distribution Pump Station Options Development ⁵	12		24	40	8				8					92	\$20,114	\$800		\$ 20,914
211 - Workshop 3 - Alternative Design Comparison ⁶	4		4											8	\$2,024	\$80		\$ 2,104
212 - Prepare Conceptual Design ⁷	8		16	60	16	8	32	4	40		40			224	\$41,420	\$1,660		\$ 43,080
213 - Prepare WTP Siting Options, Construction & Prioritization Phases ⁸	12		24	48	20				24	8	60			196	\$35,699	\$1,430		\$ 37,129
214 - Basis of Design Report ⁹	4	2	4	40	4	4	8	4	8	4	8		24	114	\$22,435	\$900		\$ 23,335
215 - Workshop 4 - Review Conceptual Design	4		4	4										12	\$2,766	\$110		\$ 2,876
Sub-Total Series 200	518	6	364	620	116	36	72	16	136	12	208	0	28	2132	\$448,383	\$17,940	\$20,000	\$486,323
TASK SERIES 300 - Preliminary Design 30%																		
301 - Develop Preliminary Design	60	4	120	360	220	100	80	60	240		240	20		1,504	\$291,616	\$11,660		\$ 303,276
302 - Topographic Survey							8							8	\$1,408	\$60	\$15,525	\$ 16,993
303 - Geotechnical Investigations					8									8	\$1,920	\$80	\$26,268	\$ 28,268
304 - Review Meeting 1 - Preliminary Design	4		4						2					10	\$2,438	\$100		\$ 2,538
305 - Preliminary Design Report	16	4	40	120	36	24	40	8	32	8		20	24	372	\$77,682	\$3,110		\$ 80,792
Sub-Total Series 300	80	8	164	480	264	124	128	68	274	8	240	40	24	1902	\$375,064	\$15,010	\$41,793	\$431,867
TASK SERIES 400 - Detailed Design 60%																		
401 - Prepare 60% Design	60	4	120	400	360	160	80	80	320	8	280	20		1,892	\$372,040	\$14,880		\$ 386,920
402 - Utility Locates & Test Holes ¹⁰				2										2	\$371	\$10	\$30,000	\$ 30,381
403 - Review Meeting 2 - 60% Design	2		2						2					6	\$1,426	\$60		\$ 1,486
404 - Initial Permitting Support ¹¹	32	2	12	40	12	12	12	2	4		8	8	16	160	\$33,556	\$1,340		\$ 34,896
Sub-Total Series 400	94	6	134	442	372	172	92	82	326	8	288	28	16	2,060	\$407,392	\$16,290	\$30,000	\$453,682

TASK SERIES 500 - Final Design																		Item #12.
501 - Prepare 90% Design	60	4	80	360	340	120	120	60	240	8	240	30		1,662	\$325,592	\$13,020		\$ 336,012
502 - Review Meeting 3 - 90% Design	2		2											4	\$1,012	\$40		\$ 1,052
503 - Final Permitting Support	8			16		24						8	24	80	\$16,619	\$660		\$ 17,279
504 - Prepare Construction Documents	4	2	8	30	16	8	12	8	32		40			160	\$29,021	\$1,160		\$ 30,181
505 - Review Meeting 4 - Construction Documents	2		2											4	\$1,012	\$40		\$ 1,052
Sub-Total Series 500	76	6	92	406	356	152	132	68	272	8	280	38	0	1910	\$373,256	\$14,920	\$0	\$388,176
TASK SERIES 600 - CMAR Selection																		
601 - Project Delivery Workshop	4		4	4										12	\$2,766	\$110		\$ 2,876
602 - CMAR Excecution Workshop	4		4	4										12	\$2,766	\$110		\$ 2,876
603 - Preparation of Request for Qualifications Documents	8	2	8	16										34	\$7,520	\$300		\$ 7,820
604 - Review Meeting 5 - CMAR RFQ Documents	4		4	4										12	\$2,766	\$110		\$ 2,876
605 - Evaluation of Received Qualification Packages & Development of Short List	6	4	4	4										18	\$4,278	\$170		\$ 4,448
606 - Preparation of Request for Proposals	8	2	8	16				2						38	\$8,438	\$340		\$ 8,778
607 - RFP Period Support	4			16										20	\$3,976	\$160		\$ 4,136
608 - Evaluation of CMAR Proposals & Contractor Negotiation	8	4	8											20	\$5,056	\$200		\$ 5,256
609 - Review of Cost Estimates, Schedules, Value Engineering & Constructability Issues	16		16	32	6	8	6	12						104	\$22,746	\$910		\$ 23,656
Sub-Total Series 600	62	12	56	96	6	8	6	14	0	0	0	0	0	270	\$60,312	\$2,410	\$0	\$62,722
TASK SERIES 700 - Equipment Procurement																		
701 - Prepare Documents for Early Procurement Packages	4	1		16										21	\$4,228	\$170		\$ 4,398
702 - Prepare Procurement Request for Proposal Packages	2	1	4	16				8						35	\$7,452	\$300		\$ 7,752
703 - Review Meeting - Procurement Documents	2		2											4	\$1,012	\$40		\$ 1,052
704 - Procurement Period Support	4			6										10	\$2,121	\$80		\$ 2,201
705 - Evaluation & Negotiation of Procurement Packages	4		4	8				8						26	\$5,740	\$230		\$ 5,970
706 - Submittal Review	16		60	120	40			16	60					318	\$68,484	\$2,740		\$ 71,224
707 - Coordination with Installing Contractor	32			16										48	\$11,032	\$440		\$ 11,472
Sub-Total Series 1000	64	2	70	182	40	0	0	32	60	0	0	0	0	462	\$100,069	\$4,000	\$0	\$104,069
Project Subtotals - Basic Services	1258	40	944	2286	1162	492	438	288	1084	36	1016	106	68	9264	\$1,891,979	\$75,670	\$91,793	\$2,059,442
ADDITIONAL SERVICES																		
TASK SERIES 800 - Optimize Operations																		
801 - Identify Optimization Tasks	8	2	8	24					4					46	\$9,831	\$390		\$ 10,221
802 - Workshop 6 - Operations Investigation	4		4	4										12	\$2,766	\$110		\$ 2,876
803 - WTP Operations Support	20		80	80										180	\$40,200	\$1,610		\$ 41,810
804 - Procurement & Installation Support	16		40	60	16			8	32					172	\$37,532	\$1,500		\$ 39,032
Sub-Total Series 500	48	2	132	168	16	0	0	8	36	0	0	0	0	410	\$90,329	\$3,610	\$0	\$93,939
TASK SERIES 900 - Pilot Testing																		
206 - Jar Testing ^{2A}	16	4	60	120										200	\$42,540	\$1,700	\$24,000	\$ 68,240
207 - Bench Scale Ozone Testing ^{2B}	16	4	60	80										160	\$35,120	\$1,400	\$22,000	\$ 58,520
251 - Develop testing protocol	16	2	16	40										74	\$16,020	\$640		\$ 16,660
252 - Field Implementation of Pilot Testing	8		40	60	20		8		40	8	24			208	\$42,170	\$1,690		\$ 43,860
253 - Pilot Testing Supervision	16		80	320										416	\$83,712	\$3,350	\$55,000	\$ 142,062
254 - Evaluation of Results	8	2	32	40										82	\$18,068	\$720		\$ 18,788
255 - TM7 - Pilot Testing Results	8	2	24	80							8			122	\$24,240	\$970		\$ 25,210
256 - Workshop 4 - Confirmation of Process Design	4		4	4										12	\$2,766	\$110		\$ 2,876
Sub-Total Series 200A - Pilot Testing	92	14	316	744	20	0	8	0	40	8	32	0	0	1274	\$264,636	\$10,580	\$101,000	\$376,216
TASK SERIES 1000 - Owner Costs by Engineer																		
251 - Ozone Pilot Testing Equipment Rental	8													8	\$2,016	\$80	\$140,800	\$ 142,896
252 - BAF Pilot Testing Equipment Rental	8													8	\$2,016	\$80	\$160,600	\$ 162,696
253 - Pilot Site Implementation	16	2	24	40	8									90	\$19,972	\$800	\$128,700	\$ 149,472
Sub-Total Series 200A - Pilot Testing	32	2	24	40	8	0	0	0	0	0	0	0	0	106	\$24,004	\$960	\$430,100	\$455,064
Project Subtotals - Additional Services (Allowance Not to Exceed)	124	16	340	784	28	0	8	0	40	8	32	0	0	1380	\$288,640	\$11,540	\$531,100	\$831,280
Project Total	1382	56	1284	3070	1190	492	446	288	1124	44	1048	106	68	10644	\$2,180,619	\$87,210	\$622,893	\$2,890,722

- Notes:**
- Review data provided by Town (record drawings, operating records). Conduct field visual assessment of existing assets to determine if assets suitable to integrate in expanded WTP.
 - Town to provide population projections as basis for future water demand calculations. Use existing water quality data and conduct additional lab analysis to characterize water quality. Includes \$10,000 allowance for laboratory costs.
 - 2A. Jar testing scope to assess chemical dosing options for select constituent removals.
 - 2A. Conduct bench scale testing to determine if raw or intermediate ozone preferred. Determine bromate interaction and disinfection byproduct formation potential. Use BMcD owned ozone generator and laboratory analysis. Spike feed water to simulate peak taste and odor conditions.
 - Convert existing DAF to SAF. Send sample water to SAF vendor for jar testing.
 - Prepare comparison of T&O options including GAC, Ozone, BAF. Prepare conceptual design for GAC system, leased to own system to incorporate in WTP expansion.
 - Develop disinfection, distribution storage and pumping analysis, including design of new disinfection contact basin. Perform desktop analysis on corrosion impact to distribution system.
 - Select process train for conceptual design.
 - Resolve treatment train, layout on existing WTP site, estimate construction cost, schedule and phases.
 - Prepare 3 concepts for WTP layout on the existing property and two additional properties.
 - Document decisions and design criteria, based on feedback at Workshop. Select WTP site.
 - Includes allowance for 10 utility test holes at \$1,000 each.
 - Prepare initial submittals to CDPHE Water Quality Division, Town Planning and Building Permit, Weld County.

Basic	\$2,059,442
Additional	\$831,280

Owner Costs

Our experiences shows that it is more efficient for the Owner to contract directly with pilot equipment suppliers. Below are estimated costs for ozone and biologically active filtration pilot tests. These costs are incorporated into the additional services above. Our approach is flexible if the Town prefers the consultant to carry these

Item #12.

Activity	Total Cost
Ozone Pilot Testing Equipment (Inuitech)	
Equipment Rental (12 weeks)	\$ 35,000
Round Trip Shipping	\$ 15,000
Onsite Commissioning and Training	\$ 10,000
Laboratory Analysis	\$ 20,000
Operation	\$ 48,000
Sub-Total - Ozone Pilot Testing Equipment	\$128,000
Biologically Active Filter Pilot Testing Equipment (WesTech or DeNora)	
Equipment Rental (12 weeks)	\$ 35,000
Chemical Systems	\$ 18,000
Round Trip Shipping	\$ 15,000
Onsite Commissioning and Training	\$ 10,000
Laboratory Analysis	\$ 20,000
Operation	\$ 48,000
Sub-Total - BAF Pilot Testing Equipment	\$146,000
Pilot Testing System Installation (General Contractor)	
Mobilization	\$ 30,000
Site Preparation	\$ 20,000
Ozone Pilot Installation	\$ 15,000
Chemical Systems Installation	\$ 12,000
Filter Pilot Installation	\$ 15,000
Demobilization	\$ 25,000
Sub-Total - Pilots System Installation	\$117,000
Owner Cost Sub-Totals (Estimated, Pending Supplier Quotes)	\$391,000

Notes:
1. Excludes operating costs (water, power, chemicals, waste removal).

AQUA Engineering

Town of Johnstown Water Treatment Facility Expansion and Upgrades - Fee Summary and Options. 2-5-21

Design Element	Fee
Filtration Capacity Expansion Options	
1 - Conventional Mixed Media Filters w/New Filter Building	\$720,123
2 - Pressure Membranes w/New Filter Building	
4 - Ceramic Membranes, w/New Filter Building	
--OR--	
3 - Submerged Membranes with Retrofit of Existing Filter Building	\$537,912
Taste and Odor Control Options	
A - Ozone w/New Concrete Contactors and Building	\$308,910
--OR--	
B - UV/AOP w/New Building	\$278,019
C - Optional GAC Polishing Filter, Retrofit Existing Filters	\$200,000

Notes and Clarifications:

1. Total Fee will be the sum of one of the selected Filtration Options and one of the T&O Options. Proposed fees are based on our understanding of the Town's intent to construct improvements quickly to meet increased demands and address water quality (T&O)
2. Filtration Options include preliminary engineering services for identifying T&O alternatives and can be reduced to accommodate the Town's budget and direction on the complete scope of work to be included in the Project.
3. Raw and finished (distribution) water pump station and pipeline designs are not currently included and will be defined and budgeted upon the Town's selection of its preferred scope.
3. Lonetree Raw Water PS and pipeline and East DS PS designs are not currently included and will be defined and budgeted upon the Town's selection of its preferred scope.

 Innovative Engineering Solutions		Town of Johnstown Water Treatment Plant Expansion																	\$846,822					February 5, 2021						
		FEE for Submerged Membrane Retrofit with Ozone for Taste and Odor Control																												
		LEVEL OF EFFORT (hours)																	Total AQUA Labor \$	Subconsultants					Travel Expenses	Direct Expenses	AQUA Expenses and Subs Markup	Total AQUA Fee		
		PIC	PM / Lead Engineer	Sr. Site Civil Engineer	Site Civil Engineer	Principal Structural Engineer	Sr. Process Eng III	Engineer I	Principal Electrical Eng.	Electrical Engineer III	Electrical Engineer II	Controls Engineer	Sr. Electrical Designer	Sr. CAD Designer	Sr. CAD Designer	Designer	Project Admin	Kumar and Associates (Geotech)		Altura (Surveying)	Kahuna(Lidar - 3D Modeling)	EDOS (Architectural)	Galloway Engineering (HVAC)							
TASKS AND SUBTASKS		\$190/hr	\$180/hr	\$165/hr	\$150/hr	\$180/hr	\$165/hr	\$125/hr	\$175/hr	\$165/hr	\$155/hr	\$135/hr	\$115/hr	\$115/hr	\$115/hr	\$105/hr	\$85/hr	336	\$54,440							\$2,580	\$378	\$58,598		
100	Project Initiation/Coordination	30	142	4		4	100		6								50													
		\$5,700	\$25,560	\$660		\$720	\$16,500		\$1,050								\$4,250													
101	Existing WTP Operations and Facility Review		12				24											36	\$6,120							\$300	\$30	\$6,450		
102	Project Kickoff Meeting	6	10	4		4	12		6									42	\$7,350					\$1,200	\$300	\$150	\$9,000			
103	TM #1 - Level of Service Goals & Existing Conditions	4	16				20											40	\$6,940									\$6,940		
104	Project Coordination	20	104				44										50	218	\$34,030							\$1,980	\$198	\$36,208		
200	Alternatives Evaluation	12	72	12		12	44	46	16	8				32	66			320	\$47,780	\$14,000	\$10,000	\$13,500		\$5,000		\$1,050	\$4,715	\$99,645		
		\$2,280	\$12,960	\$1,980		\$2,160	\$7,260	\$5,750	\$2,800	\$1,320				\$3,680	\$7,590															
201	Site Visits & Date Review		16	8		8	8	12	8	8								68	\$11,180						\$2,400	\$750	\$315	\$14,645		
202	TM #2 - Alternatives Evaluation	4	40				20	30						24	50			168	\$23,520					\$5,000			\$500	\$29,020		
203	Workshop No. 1	4	8	4		4	8	4	8					8	16			64	\$9,560						\$1,200	\$300	\$150	\$11,210		
204	Geotech,Survey, and 3D Lidar Model						4											4	\$660	\$14,000	\$10,000	\$13,500					\$3,750	\$41,910		
205	QAQC	4	8				4											16	\$2,860									\$2,860		
300	Preliminary Design	20	108	48	36	32	144	48	32	28	8	8	80	28	96	80	8	804	\$117,160				\$5,000	\$10,000		\$1,000	\$1,720	\$136,080		
		\$3,800	\$19,440	\$7,920	\$5,400	\$5,760	\$23,760	\$6,000	\$5,600	\$4,620	\$1,240	\$1,080	\$9,200	\$3,220	\$11,040	\$8,400	\$680													
301	Preliminary Engineering Report	8	20	4	16	4	64		8	8		8					4	144	\$23,600				\$5,000				\$500	\$29,100		
302	30% Design Progress Package		60	32	20	16	60	40	8	16	8		80	20	80	80		520	\$71,240					\$10,000		\$500	\$1,050	\$82,790		
303	Workshop No. 2	4	12	4	4	4	8	8	8					8	16			72	\$10,780						\$1,200	\$500	\$170	\$12,650		
304	CMAR Procurement Assistance	4	8	4			12										4	32	\$5,180									\$5,180		
305	QAQC	4	8	4		8			8	4								36	\$6,360									\$6,360		
400	60% Design Progress	18	86	36	20	32	100	104	36	24	20	8	80	28	88	80		760	\$108,480				\$8,000	\$8,000		\$500	\$1,770	\$127,950		
		\$3,420	\$15,480	\$5,940	\$3,000	\$5,760	\$16,500	\$13,000	\$6,300	\$3,960	\$3,100	\$1,080	\$9,200	\$3,220	\$10,120	\$8,400														
401	Prepare 60% Design Review Package	4	50	20	20	16	60	80	20	16	20	8	80	20	80	80		574	\$78,260				\$8,000	\$8,000			\$1,600	\$95,860		
402	Finalize Preliminary Engineering Report	2	16	4		4	24	24										74	\$11,600									\$11,600		
403	Workshop No. 3	4	12	4	4	4	16		8					8	8			64	\$10,180						\$1,200	\$500	\$170	\$12,050		
404	QAQC	8	8	8		8			8	8								48	\$8,440									\$8,440		
500	Final Design Progress	8	68	32	20	28	76	82	32	24	16	16	80	28	98	80		688	\$96,160				\$8	\$16,000		\$500	\$1,771	\$115,639		
		\$1,520	\$12,240	\$5,280	\$3,000	\$5,040	\$12,540	\$10,250	\$5,600	\$3,960	\$2,480	\$2,160	\$9,200	\$3,220	\$11,270	\$8,400														
501	Prepare Final Design Review Package		40	20	20	16	40	50	16	16	16	16	80	20	80	80		510	\$68,410				\$8	\$8,000			\$801	\$77,219		
502	Prepare CDPHE Review Submittal		8				8	8										24	\$3,760									\$3,760		
503	Workshop No. 4		12	4		4	8	4	8					8	8			56	\$8,600						\$1,200	\$500	\$170	\$10,470		
504	Prepare Issue for Bid Package(s)		8				20	20							10			58	\$8,390					\$8,000			\$800	\$17,190		
505	QAQC		8	8		8			8	8								40	\$7,000									\$7,000		
550	Taste & Odor Design (Optional)	34	190	104	220	88	170	190	20	40	20		200	280	300	280		2136	\$290,760				\$7,500	\$9,000			\$1,650	\$308,910		
		\$6,460	\$34,200	\$17,160	\$33,000	\$15,840	\$28,050	\$23,750	\$3,500	\$6,600	\$3,100		\$23,000	\$32,200	\$34,500	\$29,400														
551	Alternatives Evaluation	4																4	\$760									\$760		
552	Option A1 Ozone: Preliminary Design Progress	10	50	32	60	24	50	50	6	12	6		60	80	80	80		600	\$81,660				\$2,500	\$3,000			\$550	\$87,710		
553	Option A1 Ozone: 60% Design Progress	10	70	32	80	32	80	60	8	16	8		80	100	100	100		776	\$106,220				\$2,500	\$3,000			\$550	\$112,270		
554	Option A1 Ozone: Final Design Progress	10	70	40	80	32	40	80	6	12	6		60	100	120	100		756	\$102,120				\$2,500	\$3,000			\$550	\$108,170		
Project Fee Summary		122	666	236	296	196	634	470	142	124	64	32	440	396	648	520	58	5,044	714,780	14,000	10,000	13,500	20,508	48,000	8,400	5,630	12,004	\$846,822		
		Task Hours																												
		Task Fees																												
		\$23,180	\$119,880	\$38,940	\$44,400	\$35,280	\$104,610	\$58,750	\$24,850	\$20,460	\$9,920	\$4,320	\$50,600	\$45,540	\$74,520	\$54,600	\$4,930													

 Innovative Engineering Solutions		Town of Johnstown Water Treatment Plant Expansion																			\$1,029,033					February 5, 2021		
		FEE for Conventional Media OR Pressure Membrane Filtration with UV/AOP for Taste and Odor Control																										
		LEVEL OF EFFORT (hours)																Total AQUA Labor \$	Subconsultants					Travel Expenses	Direct Expenses	AQUA Expenses and Subs Markup	Total AQUA Fee	
		PTC	PM / Lead Engineer	Sr. Site Civil Engineer	Site Civil Engineer	Principal Structural Engineer	Sr. Process Eng III	Engineer I	Principal Electrical Eng.	Electrical Engineer III	Electrical Engineer II	Controls Engineer	Sr. Electrical Designer	Sr. CAD Designer	Sr. CAD Designer	Designer	Project Admin		Kumar and Associates (Geotech)	Altura (Surveying)	Kahuna(Lidar - 3D Modeling)	EDOS (Architectural)	Galloway Engineering (HVAC)					
TASKS AND SUBTASKS		\$190/hr	\$180/hr	\$165/hr	\$150/hr	\$180/hr	\$165/hr	\$125/hr	\$175/hr	\$165/hr	\$155/hr	\$135/hr	\$115/hr	\$115/hr	\$115/hr	\$105/hr	\$85/hr	336	\$54,440							\$2,580	\$378	\$58,598
		Bob Franchetti	Brian Daw	Nick Graue	Mike Maughan Hayden Karen	Darin Hawkes	Craig Matsuda Eric Sahm	Cody Yavira Mitchell Weldon	Ryan Pack	Andy Wells	Lindsay Stevens	Bob Buckner	Dan Leavitt	Kenneth Baetz (Structural)	Keith Rindt (Process)	Derek Hyde	Ernestine Trujillo											
100	Project Initiation/Coordination	30	142	4		4	100		6								50											
		\$5,700	\$25,560	\$660		\$720	\$16,500		\$1,050								\$4,250											
101	Existing WTP Operations and Facility Review		12				24										36	\$6,120							\$300	\$30	\$6,450	
102	Project Kickoff Meeting	6	10	4		4	12		6								42	\$7,350					\$1,200	\$300	\$150	\$9,000		
103	TM #1 - Level of Service Goals & Existing Conditions	4	16				20										40	\$6,940									\$6,940	
104	Project Coordination	20	104				44										50	\$34,030							\$1,980	\$198	\$36,208	
200	Alternatives Evaluation	12	76	12		12	44	56	16	8			32	66				334	\$49,750	\$14,000	\$10,000	\$13,500		\$5,000	\$1,050	\$4,715	\$101,615	
		\$2,280	\$13,680	\$1,980		\$2,160	\$7,260	\$7,000	\$2,800	\$1,320			\$3,680	\$7,590														
201	Site Visits & Date Review		16	8		8	8	12	8	8							68	\$11,180					\$2,400	\$750	\$315	\$14,645		
202	TM #2 - Alternatives Evaluation	4	40				20	40						24	50		178	\$24,770					\$5,000			\$500	\$30,270	
203	Workshop No. 1	4	12	4		4	8	4	8					8	16		68	\$10,280							\$1,200	\$300	\$11,930	
204	Geotech,Survey, and 3D Lidar Model						4										4	\$660	\$14,000	\$10,000	\$13,500					\$3,750	\$41,910	
205	QAQC	4	8				4										16	\$2,860									\$2,860	
300	Preliminary Design	20	128	48	96	48	184	108	34	32	10	8	100	108	116	80	8	1128	\$161,860				\$5,000	\$15,000		\$1,000	\$2,220	\$186,280
		\$3,800	\$23,040	\$7,920	\$14,400	\$8,640	\$30,360	\$13,500	\$5,950	\$5,280	\$1,550	\$1,080	\$11,500	\$12,420	\$13,340	\$8,400	\$680											
301	Preliminary Engineering Report	8	20	4	16	4	64		8	8		8					4	144	\$23,600				\$5,000			\$500	\$29,100	
302	30% Design Progress Package		80	32	80	32	100	100	10	20	10		100	100	100	80		844	\$115,940					\$15,000		\$500	\$1,550	\$132,990
303	Workshop No. 2	4	12	4		4	8	8						8	16			72	\$10,780						\$1,200	\$500	\$170	\$12,650
304	CMAR Procurement Assistance	4	8	4			12										4	32	\$5,180									\$5,180
305	QAQC	4	8	4		8			8	4							36	\$6,360										\$6,360
400	60% Design Progress	18	136	56	80	40	140	184	36	50	20	8	210	108	108	100		1294	\$180,660				\$8,000	\$10,000		\$500	\$1,970	\$202,330
		\$3,420	\$24,480	\$9,240	\$12,000	\$7,200	\$23,100	\$23,000	\$6,300	\$8,250	\$3,100	\$1,080	\$24,150	\$12,420	\$12,420	\$10,500												
401	Prepare 60% Design Review Package	4	100	40	80	24	100	160	20	42	20	8	210	100	100	100		1108	\$150,440				\$8,000	\$10,000			\$1,800	\$170,240
402	Finalize Preliminary Engineering Report	2	16	4		4	24	24										74	\$11,600									\$11,600
403	Workshop No. 3	4	12	4		4	16		8					8	8			64	\$10,180					\$1,200	\$500	\$170	\$12,050	
404	QAQC	8	8	8		8			8	8								48	\$8,440									\$8,440
500	Final Design Progress	8	88	32	40	28	148		40	50	16	16	210	108	118	100		1002	\$138,630				\$10,000	\$18,000		\$500	\$2,970	\$171,300
		\$1,520	\$15,840	\$5,280	\$6,000	\$5,040	\$24,420		\$7,000	\$8,250	\$2,480	\$2,160	\$24,150	\$12,420	\$13,570	\$10,500												
501	Prepare Final Design Review Package		60	20	40	16	80		16	42	16	16	210	100	100	100		816	\$108,200				\$10,000	\$10,000			\$2,000	\$130,200
502	Prepare CDPHE Review Submittal		8				16											24	\$4,080									\$4,080
503	Workshop No. 4		12	4		4	12		8					8	8			56	\$8,760					\$1,200	\$500	\$170	\$10,630	
504	Prepare Issue for Bid Package(s)		8				40								10			58	\$9,190				\$8,000					\$17,990
505	QAQC	8		8		8			16	8								48	\$8,400									\$8,400
550	Taste & Odor Design - Optional	34	190	104	220	88	170	190	20	40	20		200	280	300	280		2136	\$290,760				\$7,500	\$9,000			\$1,650	\$308,910
		\$6,460	\$34,200	\$17,160	\$33,000	\$15,840	\$28,050	\$23,750	\$3,500	\$6,600	\$3,100		\$23,000	\$32,200	\$34,500	\$29,400												
551	Alternatives Evaluation	4																4	\$760									\$760
552	Option A1 Ozone: Preliminary Design Progress	10	50	32	60	24	50	50	6	12	6		60	80	80	80		600	\$81,660				\$2,500	\$3,000			\$550	\$87,710
553	Option A1 Ozone: 60% Design Progress	10	70	32	80	32	80	60	8	16	8		80	100	100	100		776	\$106,220				\$2,500	\$3,000			\$550	\$112,270
554	Option A1 Ozone: Final Design Progress	10	70	40	80	32	40	80	6	12	6		60	100	120	100		756	\$102,120				\$2,500	\$3,000			\$550	\$108,170



Professional Engineering Services Proposal

Town of Johnstown
Water Treatment Plant Expansion Design
February 2021





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Town of Johnstown Water Treatment Plant Expansion

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Marco Carani
Director of Public Works
Town of Johnstown
450 South Parish Avenue
Johnstown CO, 80534

February 5, 2021

RE: Letter of Transmittal
AQUA/SKM Professional Engineering Services Proposal for Expansion Design of the Johnstown Water Treatment Plant Expansion 5 to 10 MGD

Dear Marco,

Thank you for the opportunity to provide our proposal for the Expansion Design of the Town of Johnstown Water Treatment Plant. AQUA Engineering (AQUA) will engage and collaborate with the Town's staff and Ramey Environmental Compliance to develop a cost-effective and timely expansion project to address hydraulic and treatment capacity constraints and seasonal taste and odor issues. Our approach will emphasize the value of your existing facility, and we will design a plant that is easy to operate and maintain, that addresses current water quality concerns and prepares you for future expansions. We are an excellent fit for this project and will provide you and the Town with:

- ✓ Experience and capacity to deliver a high-quality project
- ✓ Our Dedicated "A-Team" staff made up of a combination of our in-house engineering disciplines, including electrical/controls engineering
- ✓ Innovative and cost-effective solutions to optimize the value of the existing WTP facilities
- ✓ A commitment to an aggressive completion schedule with the goal of achieving construction Substantial Completion by summer 2022

Experience and Capacity

AQUA has the engineering resources and experience to deliver this project. AQUA was founded in 1991 and has been delivering water and wastewater facility projects for 29 years. We are a full-service team of over 70 people and have all of the core wastewater engineering and construction management disciplines "in-house" including process design, civil, structural, mechanical, and system integration, controls, and electrical (ICE) engineering. AQUA's affiliate SKM has provided system controls engineering for multiple water treatment plants across the USA, including the Salt Lake City, UT WTP.

We assure the Town that we have the available technical staff and resources for not only this project, but also to continue our level of service and standard of care on the ongoing Low Point WWTP Expansion Project. We note that the "Johnstown Water Team" staff who will work on this project include additional AQUA staff members that are not involved in the Town's WWTP project with AQUA.

Dedicated A-Team includes Principals and Senior Engineers.

As shown on our fee estimate and staffing plan, AQUA Principal Engineers/firm owners Bob Frachetti,

Mr. Marco Carani | Director of Public Works
Town of Johnstown Water Treatment Plant Expansion
February 5, 2021

Darin Hawkes, and Ryan Pack will be actively involved on the Johnstown Water Team. In addition, our Project Manager and Lead Engineer will be Brian Daw. Brian has over 26 years of water treatment facility planning, design, and construction expertise and experience. Brian recently led the project management and engineering design for the City of Boulder's 40 MGD Betasso WTP Capital Improvements Project and the City of Westminster's Semper 65 MGD High Service Pump Station Reliability Project (while with his prior firm). Thus, Johnstown and REC will work hand-in-hand with AQUA's dedicated "A-Team" engineering staff and leadership.

Innovation and Cost-Effective Solutions

AQUA Engineering has a reputation and successful history of delivering cost-effective and innovative projects. In preparing our proposal, we developed preliminary engineering concepts and evaluated a variety of technologies and potential solutions. We are comfortable with the traditional approaches to expand capacity and address taste and odor; such as membrane or conventional filtration to increase plant capacity, and ozone/AOP, GAC, or UV/AOP for taste and odor treatment. We have already assessed conceptual layouts and costs for these established approaches and are prepared to review these with the Town during the alternative evaluation phase of the project.

However, we are also open-minded to consider alternative and innovative approaches to increase treatment capacity and address taste and odor. One such approach is ceramic ultrafiltration with advanced coagulation technology. As part of our preliminary technology assessment, we identified a technology provider/manufacture named Purifics that can potentially address pre-treatment, taste and odor control, and expanded filtration capacity with one innovative process. (www.purifics.com) We received a detailed proposal from Purifics along with supporting information of its performance in comparison with polymeric membranes. We believe this innovative approach should be considered further with adequate demonstration testing before further consideration. This pilot testing would need to be done early in the project and extend into the summer to evaluate effectiveness under challenging raw water quality conditions.

Commitment to a Substantial Completion Goal of Summer 2022

We have developed a collaborative CMAR project delivery plan to reach project substantial completion by July 2022 – just in time for increased demand and in advance of most taste and odor issues.

Conclusion

AQUA is uniquely qualified for this project. We are already invested and engaged in the preliminary design and eager to continue.

Please contact either Bob Frchetti at (303) 995-7800 or Brian Daw at (303) 249-7510 with any questions about our qualifications or our concept ideas. We encourage you to contact our references.

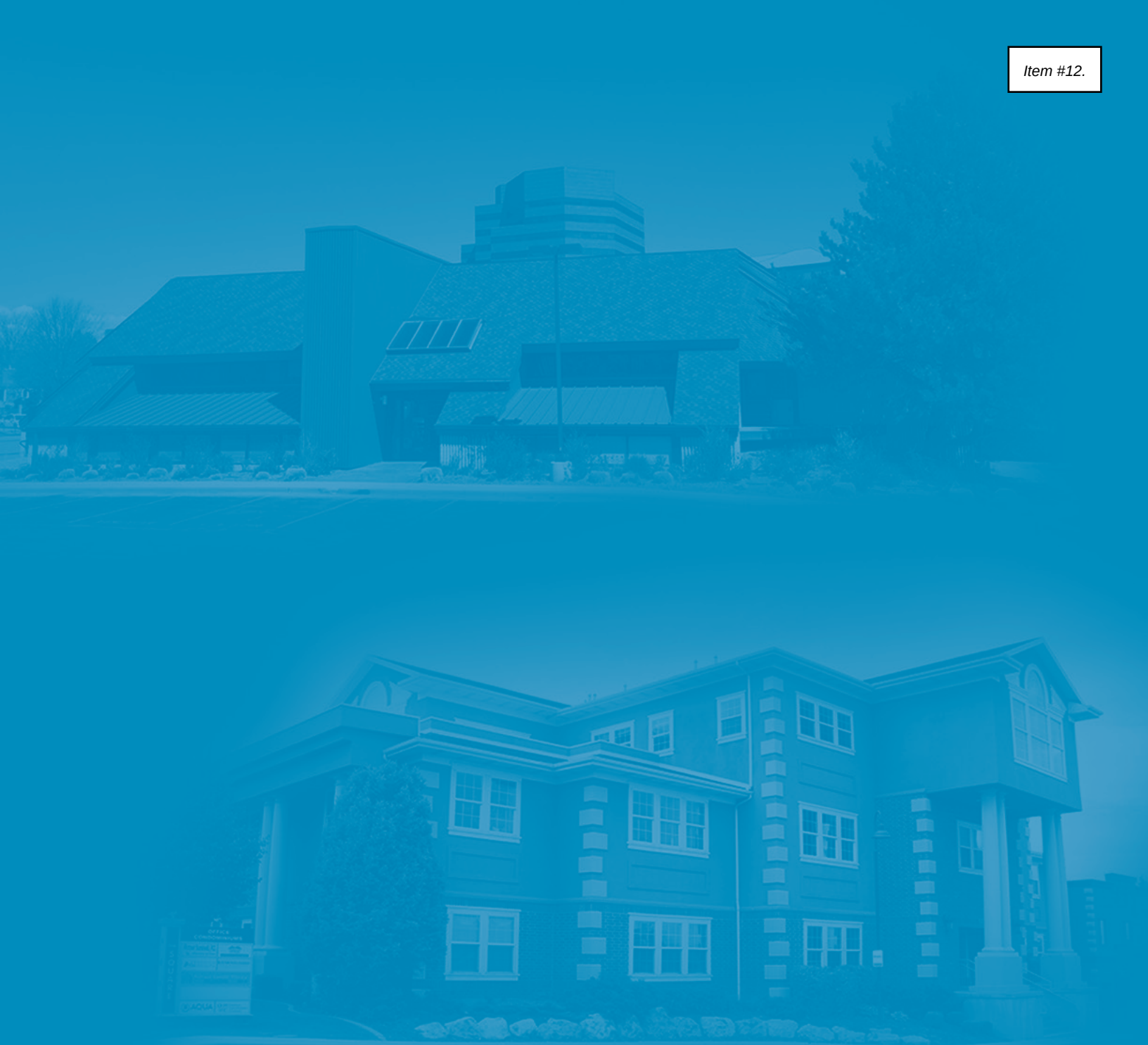
Sincerely,



Bob Frchetti, P.E.
Principal



Brian C. Daw, P.E.
Project Manager | Lead Engineer



Section 1

Identification of Proposer

The AQUA Engineering Group

We are the AQUA Engineering Group, an assembly of over 70 highly-qualified professionals unlike any other. We provide innovative engineering solutions for public and private sector markets nationwide. Our clients look to us for our quality services and our outstanding ability to effectively and efficiently solve complex engineering challenges that achieve sustainable results. AQUA is made up of a team of experienced engineering professionals, leaders, and associates who are experts in their disciplines and fully committed to helping our clients accomplish their project goals while protecting the environment and enhancing the quality of life for the people in our communities. We seek out opportunities to work with others who share our vision for success and promise to give you the best engineering experience possible on every project. Together, we can create a bright and prosperous future.



AQUA Engineering (AQUA) provides innovative engineering, operations, and construction solutions to clients nationwide. Since 1992, we have served the public and private sector. AQUA’s proven experience demonstrates our capacity and stability to deliver projects that are sustainable and operable. Our team consists of experienced professionals, designers, programmers, technicians, and associates who are capable of solving your needs and are fully committed to your success.

533 W 2600 S Suite 275
Bountiful, UT 84010
801.299.1327

5325 S Valentia Way
Greenwood Village, CO 80111
720.667.1250



SKM Engineering (SKM) was founded in 1989. SKM provides sound and proven electrical, instrumentation and control (EI&C) engineering, along with dependable and prompt service at the best value. The SKM team has the knowledge, training, and hands-on experience required to meet EI&C needs for your facilities. They apply a unique and fresh perspective and are recognized by clients for their ability to solve challenging technical problems quickly with simple and cost effective solutions. SKM provides services for over 100 clients throughout the US and Canada with offices in Utah and Colorado.

533 W 2600 S Suite 25
Bountiful, UT 84010
801.677.0011

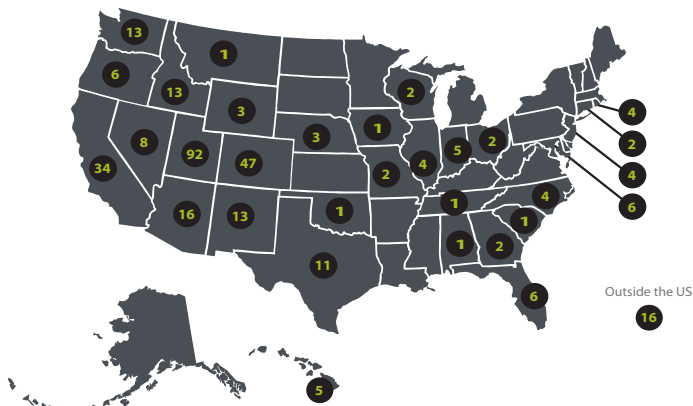


Aqua Environmental Services, Inc. (AES) is a division of the AQUA Engineering group, which provides operations consulting, start-up and commissioning services, and instrument calibration to many public and private sector clients. AES has developed a loyal base of clients in need of assistance with contract operations, small turnkey projects, facility management projects, and systems troubleshooting. With its low overhead, AES is able to offer services to many clients that would be difficult to provide with in-house staff, or in the case with small systems, with what would be costly full-time employees.

89 Monarch Dr
Bountiful, UT 84010
801.694.9106

Extensive Project Experience Relative to Your Needs

Over the years, we have worked on major design and engineering projects that have given us valuable experience with the processes and technologies necessary for completing work effectively and efficiently. We are honored by the trust and confidence our clients have in us and look to extend our track record of success in developing new facilities and in improving the performance of existing facilities for many years to come. On each and every project, we demonstrate our ability to provide excellent engineering services that make a difference for our clients and communities.



AQUA Group Project Sites

History of Excellence

Numbers often speak louder than words. We will bring you success in your projects, as we have with hundreds of our clients across the nation. By designing systems and facilities that perform at the highest level, we can promise you results and unmatched service satisfaction.

AQUA got to where it is today by consistently delivering excellent engineering results that made a difference for our clients and communities. We have created a culture that fosters success and have redefined what it means to be experts in design and engineering.

Proven Ability to Achieve Results

For nearly 3 decades, AQUA has helped clients, big and small, complete thousands of infrastructure engineering and community projects. We are recognized as the top engineering solutions provider because of how well we are able to solve unique project challenges, stay on-schedule and within budget, and achieve innovative and lasting results.



MRW Signal Hill WTP



Colorado River Resort WTP



Blanding WTP



Wasatch Resource Recovery



Tooele Solar Drying



Wolf Creek Water

Project Team Contact Information

Person	Role	Office	Email	Phone
Bob Frchetti, PE	Principal in Charge	AQUA Colorado	bob.frchetti@aquaeng.com	720-667-1251
L. Scott Rogers, PE	Principal	AQUA Utah	scott.rogers@aquaeng.com	801.683.1327
Brian Daw, PE	Project Manager	Colorado	briandaw@gmail.com	303.249.7510
Darin Hawkes, PE	Structural Engineer	AQUA Utah	darin.hawkes@aquaeng.com	801.683.3727
Nick Graue PE	Senior Project Engineer	AQUA Utah	nick.graue@aquaeng.com	801.683.3733
Craig Matsuda, PE	Senior Project Engineer	AQUA Colorado	craig.matsuda@aquaeng.com	720.667.1255
Eric Sahm, PE	Senior Project Engineer	AQUA Utah	eric.sahm@aquaeng.com	801.683.3729
Naho Garvin, PE	Project Engineer	AQUA Utah	naho.garvin@aquaeng.com	801.683.3741
Cody Vavra, EIT	Project Engineer	AQUA Colorado	cody.vavra@aquaeng.com	720.667.1254
Mike Maughan, EIT	Project Engineer	AQUA Utah	mike.maughan@aquaeng.com	801.683.3750
Mitchell Weldon, EIT	Project Engineer	AQUA Colorado	mitchell.weldon@aquaeng.com	720.667.3781
Ryan Pack, PE	EI&C Engineer	SKM Utah	ryan.pack@skmeng.com	801.683.3761
Bob Buckner, PE	Electrical Engineer	SKM Colorado	bob.buckner@skmeng.com	720.667.3749
Keith Rindt	CAD Designer	AQUA Colorado	keith.rindt@aquaeng.com	720-667-1250

Subconsultant Identification**Galloway**

5265 Ronald Reagan Blvd., Suite 210 Johnstown, CO 80534

P: 970.800.3300 | www.gallowayus.com



Galloway's mechanical team consists of the most knowledgeable, dedicated and talented individuals in the industry who truly care about your success. We offer thoughtful, creative design solutions for building systems – from alternative energy solutions and life-cycle costing, to construction load analysis. Through the use of both AutoCad and Revit BIM format, we provide design, engineering and energy modeling to support LEED certification, EPA Energy Star designation and ASHRAE 90.1 compliance requirements. Additional services include building audits, code compliance and peer review.

Personnel Contact Information

*Address information found at the top of firm introductions

Person	Role	Office	Email	Phone
Alicia Thorpe, PE	Sr. Mechanical Project Manager	Johnstown, CO	aliciathorpe@gallowayus.com	970.396.5719
Jay Cooper, PE	Mechanical Project Manager	Johnstown, CO	jaycooper@gallowayus.com	970-800-3300

Eidos Architects

5400 Greenwood Plaza Boulevard, Greenwood Village, CO 80111

P: 720.200.0630 | www.eidosarch.com



Eidos Architects provides complete architectural services to our clients from the start of programming for your facility through completion of construction and building occupancy. We also act as a team leader and project manager for our clients throughout their project, and as a collaborative team we bring the vision of our clients to a successful design solution that responds to the sometimes complex and varied needs of a project. We take pride in being good listeners and being responsive to our clients throughout the project process and meeting their needs within the constraints of their time schedules and budget.

Our clients want to be able to visualize their buildings before they are built and reach a better understanding of design concepts. We are continuously updating our 3D modeling capabilities to serve as a design tool and create more realistic and accurate presentations. We can also provide clients with physical models for display. Clients feel that our 3D models and movie animations help their fundraising efforts and simplify communications throughout a project.

Personnel Contact Information

*Address information found at the top of firm introductions

Person	Role	Office	Email	Phone
Lori Hanson, AIA	Architect	Greenwood Village, CO	lhanson@eidosarch.com	720.488.1303

Altura Land Consultants

6950 S. Tucson Way, Unit C Centennial, CO 80012

P: 720.488.1303 | www.altalandsurveying.com



Altura Land Consultants offers a wide range of Professional Land Surveying services, serving large and small projects alike. Our staff of licensed surveyors will work with you from the beginning of your project providing consultation to determine your needs and will be there all the way to the end providing the necessary services.

Personnel Contact Information

*Address information found at the top of firm introductions

Person	Role	Office	Email	Phone
Jesse Lugo, PLS	Surveyor	Centennial, CO	jesse@alturaland.com	720.488.1303

Kumar & Associates

2390 South Lipan Street, Denver, CO 80223

P: 303.742.9700



Kumar & Associates, Inc. (K+A) is an employee-owned consulting engineering firm providing professional and technical services in the areas of geotechnical engineering, environmental sciences, engineering geology, and construction observation and materials testing. The firm was established in 1989 and has a current staff of more than 150 professional engineers and geologists, environmental scientists, engineering technicians, and support personnel. Our offices are located in Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado.

Personnel Contact Information

*Address information found at the top of firm introductions

Person	Role	Office	Email	Phone
Chad Bringle, PE	Geotechnical	Denver, CO	cbringle@kumarusa.com	303.742.9700
Jim Noll, PE	Geotechnical	Denver, CO	jnoll@kumarusa.com	303.742.9700

Kahuna

11400 Westmoor Circle, Suite 325 Westminster, CO 80021

P: 303.451.7374 | www.kahunausa.com/

Kahuna's Laser Scanning and Modeling Team specializes in supporting engineers and asset managers with BIM model data and reality capture. With roots in the energy infrastructure industry, Kahuna understands the value behind precise data in a timely and cost-effective manner. Our expertise and knowledge of geospatial survey technology and Revit/ 3D modeling software allows us to supplement your current scan team, or provide a full suite of laser scanning, point cloud, Revit and 3D modeling services.

Personnel Contact Information

*Address information found at the top of firm introductions

Person	Role	Office	Email	Phone
Jess Payton	LiDAR	Westminster, CO	jpayton@kahunausa.com	303-451-7374

Section 2

Project Overview & Approach

Project Overview & Approach

Our team considered the Town's goals shared in the RFP and during the pre-submittal conference and reviewed related information to develop our understanding of the key project issues and develop our approach to working with the Town to plan, design and construct a successful project.

Our approach is based on our preliminary analysis of available information and cumulative experience along with initial coordination with treatment process equipment manufacturers. Based on our analysis and their input, we identified proposed improvements and their general design basis best suited to improve treated water quality to meet the Town's level of service goals.

AQUA will provide the Town of Johnstown (the Town) with a practical and cost-effective solution to meet the following objectives:

- ✓ Increase the WTP's rated treatment capacity to 10 to 12 million gallons per day (mgd) by increasing its' filtration capacity and pathogen removal (disinfection) capabilities.
- ✓ Develop and implement a taste and odor (T&O) control project.
- ✓ Increase the capacity for the Lonetree Raw Water Pump Station and transmission main.
- ✓ Plan for future capacity expansions and other opportunities to improve treatment performance and finished water quality.
- ✓ Reach Construction Substantial Completion for both the filtration upgrades and taste and odor facilities by Summer 2022.



Of these objectives, schedule is perhaps the most challenging. With this in mind, AQUA has already started preliminary engineering and has consulted with numerous equipment suppliers, contractors, and CDPHE. We understand the critical path elements required to complete the project by Summer 2022 and have developed an aggressive project delivery schedule. The schedule considers minimal time allowances for preliminary engineering and technology selection, regulatory reviews, equipment selection and procurement, equipment lead times, Final Design and CDPHE approval, and construction/ commissioning. Our schedule is based on a collaborative and coordinated effort between all involved parties that includes:

- Using a construction management at-risk (CMAR) delivery approach to allow on-site construction to start in 2021, in advance of equipment delivery. We will work with the Town to onboard a qualified CMAR contractor as soon as possible (April 2021) to participate in the preliminary and final design phases - with the intent of beginning strategic on-site construction activities starting in late fall 2021 to prepare for equipment delivery in early 2022 -with installation and commissioning occurring from January 2022 to July 2022.
- Working collaboratively with CDPHE to submit and obtain approval of long lead equipment so this equipment can be ordered earlier in the project schedule. This will involve a separate equipment package submittal to CDPHE for review and approval in advance of the typical Final Design submittal for construction approval.
- Preselect and order long lead process equipment as soon as CDPHE approves the equipment design criteria. We have been advised that filtration equipment lead times are at 20 weeks from purchase order, and taste and odor control equipment (such as ozone generators) lead times were quoted to be as long as 24 to 26 weeks. Thus, pre-selection of equipment along with an early submittal to CDPHE for approval, and timely purchase by the Town is required to meet a Summer 2022 completion date.

A detailed schedule is included in Section 6.

Introduction

We look forward to working with the Town to deliver a successful project that will upgrade and improve water treatment capabilities and improve customer satisfaction with the Town's drinking water. The AQUA Team will collaborate with the Town and your operations specialist, Ramey Environmental Compliance (REC), to identify, evaluate and select preferred alternatives for meeting the Town's level of service goals and improve potable water quality while considering the Town's unique considerations, needs and preferences.

To demonstrate our engineering and construction experience, the following sections highlight our:

- ✓ Understanding of the Town's goals.
- ✓ Technical Approach to partnering with the Town to provide for the informed selection of preferred WTP improvements; and
- ✓ Proposed Project Task Workflow outlining our Scope of Services and the Deliverables that will provide the Town with a roadmap for selecting and implementing WTP improvements.

We also outline value-added services that AQUA can offer the Town, including using CMAR as an alternative project delivery method and performing hydraulic modeling to verify distribution system capacity and responses during high demand periods.

Your project is an excellent fit for our team, and we will provide the Town with the experience, enthusiasm and expertise to successfully identify and implement a practical approach meeting the Town's expectations for a successful project. Our experience allows us to deliver an efficient and cost-effective scope and associated fee, and our innovative ideas will bring value to the Town's decision-making and budgeting for both capital costs and operations and maintenance costs.

Project Understanding

AQUA has reviewed the RFP document, the Town's latest Water System Master Plan (2015) and studied available facility design drawings to inform our approach. We also visited the WTP and reviewed operations with public works staff during the pre-submittal conference. We have a solid understanding of the existing facility and needs for the expansion project.

Figure 1 provides a general overview of the Town's water treatment system that highlights the WTP's processes along with the general project considerations summarized in the following paragraphs. We used general engineering assumptions to develop a "Hydraulic and Treatment Capacity Evaluation" to highlight the capacity constraints through the WTP processes shown in Figure 1. The Evaluation reflects the estimated "gap" (in mgd) which highlight key project considerations along with water quality factors as the initial basis for identifying the needed improvements to meet the Town's project goals:

- The Lonetree and Johnstown Reservoirs supply the Town's WTP and are subject to algal blooms and T&O occurrences that give rise to customer complaints during the high demand periods in the spring and summer. Geosmin and 2-methylisoborneol (MIB) concentrations have been observed by the Town to occur in excess of 100 ng/L. The project is to include a long-term strategy for managing T&O occurrences originating from algal blooms. Possible solutions include source water management approaches at the reservoirs and treatment process upgrades.
- The Lonetree Raw Water Pump Station currently provides a total capacity of



4.7 mgd (4.3 mgd firm capacity) for transferring raw water from the reservoir to the WTP. An existing 16-inch diameter, 10.6-mile transmission main conveys raw water to the WTP. The pump station and transmission capacity must be increased to provide a total capacity of 10 to 12 mgd to convey raw water to the expanded WTP.

- The Johnstown Reservoir Raw Water Pump Station and transmission main provides additional raw water supply capacity up to 6.7 mgd. Additional capacity for the pump station is not anticipated as part of the project.
- The existing pretreatment dissolved air flotation (DAF) process consists of two (2) 5-mgd trains that routinely produce settled water turbidity of 0.5 NTU or less. Rerating the DAF to provide an approved 12 mgd capacity may be possible based on discussions with the manufacturer's representative and CDPHE drinking water engineers.
- Two (2) mixed media filters provide a firm capacity of 3.1 mgd (with one filter out of service) and total capacity of 6.2 mgd. The filters were recently retrofitted with new anthracite coal, silica sand and garnet sand media and have historically produced reliable filtered water turbidity levels below 0.3 NTU. Filtration capacity will need to be increased to meet the Town's 10 to 12 mgd rated WTP capacity goal. Firm filtration capacity will need to be designed based on one filter being out of service (e.g., for backwashing) to achieve the firm rated capacity and meet redundancy requirements outlined in the CDPHE Potable Water Design Criteria.
- Sodium hypochlorite and sodium hydroxide are added to the filtered water wetwell below the existing filters for disinfection and pH adjustment, respectively. The DAF and mixed media filter processes provide removal credits of 2-log Cryptosporidium, 2.5-log Giardia and 2-log virus log reduction values (LRV) for meeting Colorado Primary Drinking Water Regulations. Chlorine disinfection currently provides an additional 0.5-log Giardia and 2-log virus LRV to meet regulatory requirements and may only need to provide for virus LRV with the proposed upgrades to the WTP.
- The high service pump station in the Filter Building transfers chlorinated filtered water into two (2) 750,000-gallon aboveground steel tanks (clearwells) that are operated in parallel to provide disinfection contact time for Giardia and viruses. The clearwells are estimated to provide 0.5-log Giardia LRV when operated at a minimum water level of 35 to 40-ft at a WTP flow of 6.2 mgd. The project will need to consider options for increasing disinfection capacity up to a maximum day flow of 12 mgd.
- Finished water is then routed from the clearwells to the Distribution System Pump Station which consists of two (2) 125-hp East Zone pumps and two (2) 250-hp West Zone pumps. With no storage tanks located in either Zone, the pumps are designed to meet instantaneous demand during peak hour events and fire flow requirements. The West Zone pumps can augment flow to the East Zone through a PRV along the common pump station discharge header to provide some additional capacity to the East Zone. The Town is designing a new elevated tank in the East Zone to provide additional storage and is evaluating operations of the existing North Tank to cycle its operational volume and minimize stagnation. With the increased demand in the system, the East Zone pumps will need to be replaced or expanded to provide adequate capacity.
- Three (3) emergency interconnects provide the Town with up to 8 mgd for short periods. It is not typical for a utility to rely on these connections to make up its treatment capacity. Based on CDPHE design policy,



a utility's WTP filtration capacity is rated at a maximum flow equal to its available filtration capacity with a single filter out of service, e.g., an "n+1" design. Interconnects are not typically relied on to offset the need for the WTP to be designed with suitable capacity to meet maximum day or peak hour demands in the Town's case. Our filtration solutions are intended to provide a maximum rated treatment capacity to meet the Town's maximum day demand based on CDPHE design policy.

As illustrated in Figure 1, the hydraulic and treatment capacity constraints outlined above provide the Town with a general overview of the limiting factors to be addressed during the project or in the near future.

Technical Approach

AQUA will design the Project improvements based on our collective treatment and facility experience, state-of-the-industry engineering practices and the professional standard of care consistent with the requirements of CDPHE's Policy 5 – Design Criteria for Potable Water Systems. In summary, AQUA's preliminary process design will expand the WTP to have a rated maximum daily flow capacity of 10 to 12 mgd of treatment capacity for meeting water quality, taste and odor and disinfection requirements. The specific rated treatment capacity will be confirmed upon review of the historical flow and raw water quality records provided by the Town.

Based on our review of the existing WTP design criteria, we have identified major project elements to inform the Town with our technical approach. Figure 2 illustrates options we've identified as potential improvements to manage T&O occurrences, increase filtration capacity, increase disinfection capacity and provide other potential value-added improvements.

The preliminary technical design alternatives we've developed will provide the Town with an updated, reliable, and resilient facility designed to meet challenging water quality conditions and accommodate future expansion. We've performed preliminary process calculations for sizing the proposed facilities and unit processes, and we are confident in the feasibility of the alternatives for meeting the Town's goals once water quality data can be provided by the Town. We also propose to prepare project enhancements that are not specifically requested in the RFP that help with meeting the desired capacity requirements.

Our conceptual designs are based on using existing facility infrastructure where advantageous and maximizing the functionality of the existing site features in anticipation of future expansions. Specifically, in addition to the filtration approaches requested in the RFP to expand the facility using conventional media filtration or pressure membrane microfiltration, we are suggesting that the Town consider two (2) additional membrane technologies.

We propose to evaluate the following treatment processes for the expansion of filtration capacity, managing T&O compounds and providing necessary disinfection to achieve adequate LRV for pathogens

Filtration Capacity Expansion: WTP filters serve as the primary barrier to pathogens in the source water. CDPHE design policy requires that the capacity of the filters be designed considering one filter out of service. Both conventional and membrane filtration are successfully used to meet the regulatory requirements for removing pathogens. For the Town's project, the following filter technologies are suitable for increasing the WTP's treatment capacity from 6.2 mgd up to 12 mgd:

- ✓ Conventional Media Filtration
- ✓ Pressure Membrane Micro/Ultrafiltration (MF/UF)
- ✓ Membrane Gravity UF
- ✓ Ceramic Membrane UF



Pressure membrane modules provide a compact footprint in comparison with conventional media filters.

Membrane filtration provides the advantage of a more compact footprint than conventional media filters. The compact footprint allows for installing a higher filtration capacity at the WTP or possibly reusing the existing filter basins to meet the Town's treatment capacity goals.

Of particular interest, we have contacted a ceramic membrane system manufacturer, Purifics, that has successfully piloted and designed their system for similar applications. Their continuous ultrafiltration (CUF) system anecdotally is capable of removing algae, reducing total organic carbon (TOC) and mitigating T&O issues. The design consists of an integral coagulant rapid-mix tank following by a ceramic ultrafiltration membrane, without the need for pretreatment flocculation and sedimentation (i.e., DAF). In challenge pilot testing, the unit exhibited 4 times the flux rate of polymeric membranes and greater TOC removal. While the supporting data is favorable, T&O compound removal was not directly tested, and we are uncertain if additional treatment is needed to reduce MIB and geosmin levels. **The manufacturer offered to arrange for a pilot unit to be delivered within 2 to 4 weeks. AQUA is prepared to coordinate a pilot-testing plan if the Town would like to consider this technology.**



Ceramic membranes have been demonstrated to operate at flux rates of 250 gfd compared with 30 to 40 gfd for polymeric membranes.

For a general comparison of the relative footprints of each filtration option, Figures 3-1 and 3-2 illustrate preliminary building sizes and their general arrangement on the WTP site. The membrane gravity UF system is proposed to be installed in the existing filter building, potentially lessening total project costs by reusing the existing filter cells. The capacity of the gravity UF filters may be limited to the lower end of the Town's preferred capacity, though the addition of planned storage in the distribution system and the membranes' pathogen removal capabilities may reduce the needed filtration capacity.

T&O Compound Control: Taste and odor occurrences regularly occur in the summer months when reservoir turnover is occurring, water temperatures increase, and sunlight increases. Algae releases geosmin and MIB that are the primary algal metabolites contributing to T&O complaints. Algal blooms also result in the release of cyanotoxins that are becoming a more prevalent water quality concern. These compounds are not currently regulated but are subject to CDPHE's health advisory requiring public notice of their potential health impacts in drinking water. The following treatment processes are proposed for the Town's consideration:

- ✓ Reservoir Surface Mixers
- ✓ Intermediate Ozone Addition
 - ✓ Ultraviolet (UV) Advanced Oxidation Process (AOP)
 - ✓ Granular Activated Carbon (GAC)



Treatment at the WTP using ozone, UV or GAC can successfully eliminate T&O compounds as well as be used to treat cyanotoxins. Ozone and UV also have the added benefit of providing disinfection LRV credits for Cryptosporidium, Giardia and viruses. As noted above, source water management practices such as using surface mixers may be an option to improve the water quality at the Town's reservoirs – we understand that the Town shares storage rights with other users, and this option may not be feasible.

Figure 3-3 illustrates the relative footprints for implementing ozone, UV and GAC at

the WTP site. Final locations will depend on the selected filtration option, with the goal to integrate the selected process into the WTP process train by taking advantage of existing structures and considering future capacity expansion of the WTP.

Disinfection Capacity: Removal and/or inactivation of pathogens is required to meet Safe Drinking Water Act treatment technique requirements, e.g., pathogen LRV. **The selection of the filtration and T&O treatment processes will contribute to removing pathogens and allow the Town to optimize its onsite storage in the Clearwell Tanks or consider options for locating additional storage in the distribution system and reduce congestion on the WTP site.** The following options outline how the Town can achieve required primary pathogen disinfection/removal:

- ✓ Membrane MF/UF provides 2.0-log LRV for Cryptosporidium and 3.0-log LRV for Giardia
- ✓ Ozone in addition to treating T&O compounds provides LRV credits for Cryptosporidium, Giardia and virus inactivation
- ✓ UV AOP in addition to treating T&O compounds, provides LRV credits for Cryptosporidium, Giardia and virus inactivation
- ✓ Chlorination provides adequate LRV credits for virus

Table 4.1 - Log removal compliance credit for membrane filtration

Giardia lamblia	3.0 - Log
Cryptosporidium	3.0 - Log
Viruses	no credit granted

CDPHE Policy 5 allows for membranes to be rated with up to 3-log removal for Crypto and Giardia, reducing the Town’s disinfection/inactivation requirements to 4-log virus which can be achieved in the existing Clearwell Tanks.

Based on the planned filtration expansion and the T&O treatment options, the proposed improvements will provide multiple barriers to pathogens and will achieve the necessary disinfection/removal to meet water treatment regulations. Ozone provides a robust barrier against pathogens, T&O, and other emerging contaminants including cyanotoxins. UV AOP doses to remove geosmin and MIB are greater than those required to achieve pathogen disinfection. GAC filtration is less operator-friendly due to its relatively quick exhaustion resulting from the strong uptake of organics including geosmin and MIB, and regular replacement or regeneration costs. GAC is recommended only to be considered as a polishing process downstream of either ozone or UV but is not necessary to meet treatment goals.

Discussion of Preliminary Design Concepts

The following information provides a brief review of our preliminary design concepts to illustrate how the treatment options presented above can be applied to the Town’s goals. The discussion is organized to reflect the Town’s water system from raw water sources through to the distribution system pump station. Figure 4 provides a general schematic of the proposed treatment improvements outlined below. Figures 3-4 and Figure 4 provide a general site arrangement and process schematic of the proposed treatment improvements outlined below.

Lonetree Reservoir and Raw Water Pump Station

- We acknowledge that there are hydraulic pumping and transmission capacity limitations for the pump station to provide up to 12 mgd of flow. We look forward to working with the Town to review the pump station conditions, evaluate the existing transmission main alignment and prepare a practical design to convey the required flow from the reservoir to the WTP.
- Our team includes conveyance engineers supported by civil, structural, electrical and controls engineers and designers that have completed similar projects.

Johnstown Reservoir and Raw Water Pump Station

- Surface-mounted mixers can be used to destratify the reservoir water column and improve water quality conditions to mitigate algal blooms.



- One manufacturer, SolarBee, has installed surface mixers in a Loveland, Colorado reservoir and the case study indicates a reduction in cyanobacteria and geosmin levels over the previous 4 years.
- Surface mixers can be solar-powered or submerged mixers fitted with air hoses to induce mixing along the thermocline in the reservoir. The mixing action assists with maintaining dissolved oxygen levels throughout the water column, encouraging “good” algae to grow and mitigating algal blooms that result in the release of geosmin, MIB and cyanotoxins.

Dissolved Air Flotation

- The DAF system provides a rated capacity of 10 mgd. Based on discussions with CDPHE drinking water engineers and with the manufacturer’s representative, the DAF system could be re-rated to a higher capacity.
- Re-rating can be based on results and observations of DAF performance at other utilities with similar water quality.
- Another option is to consider the manufacturer’s floc recirculation upgrade for increasing the rated capacity up to 12 mgd.

T&O Control

- Based on review of the project flows and elevated geosmin/MIB concentrations between 100 and 200 ng/L, ozone provides a reasonable multi-barrier approach to T&O control along with DAF. While DAF will remove the algal cells, the ozone will target the dissolved geosmin and MIB, and organic compounds including cyanotoxins.
- Combined with membrane or conventional filtration, ozone provides a multi-barrier approach to pathogen inactivation/removal at relatively lower doses than required for removing geosmin and MIB.
- Relatively short ozone contact times provide efficient disinfection and removal of organic compounds allowing for a relatively small footprint of the ozone contact basin (OCB). The dynamics of ozone injection require deep OCBs of 16-ft to 18-ft to provide efficient ozone transfer into the water. The demolition of the existing clarifiers will provide for a ready excavation to construct the OCBs.
- Adjacent to the OCB will be an ozone generator building designed to house the ozone generators.
- Generator options include modular generators and larger vessel generators. It is anticipated that ozone would be injected year-round, but it can also be turned off for periods of the year with appropriate preparation.
- The addition of the ozone equipment will merit a review of the existing emergency generator and evaluation of a new site-wide generator or daisy-chained electrical system to provide sufficient emergency power to continue producing potable water.

Membrane Gravity Filter

- As a cost-management approach for the project, installing membrane gravity filter modules into the existing filter cells would provide cost savings for the project. The membranes would double the filtration capacity in the footprint of the existing cells. In addition, the cells could be split into 4 total filters giving the Town flexibility for backwash sequencing and operating less equipment to meet production during low demand periods.
- The filter basement and gallery would be used to install ancillary equipment to the membrane system, i.e., air compressor and air blowers used for backwash.
- For the intermittent cleaning of the membranes using sodium hypochlorite or caustic soda, the existing bulk tanks will need



to be evaluated for supplying sufficient chemicals for the intermittent cleaning of the membranes.

- Replacing or adding new high-service pumps is necessary to augment the two (2) existing 2,600-gpm pumps to provide sufficient capacity for conveying up to 12 mgd to the clearwells from the filtered water wetwell.
- Separate chemical feed systems would be co-located with existing chemical feed pumps to maintain primary disinfection and pH adjustment in the clearwells.

Disinfection Clearwells

- The two (2) clearwells are sufficient for providing 4-log virus inactivation at low water levels of 15-ft or higher. With the addition of ozone and/or membrane filtration, the LRVs for *Cryptosporidium* and *Giardia* can be met without chlorine contact time.
- The noted disinfection capacity for virus only will provide the Town more operating flexibility for managing storage in the system without the risk of not meeting disinfection contact-time requirements.

Distribution System (DS) Pump Station

- The East DS pumps are currently undersized for meeting the estimated peak hour demand in the East Zone. The existing pumps, flow rates, operating pressures and motors can be used to identify potential pump upgrades or replacement options to meet current and future system demands.

SCADA | Electrical

- Our in-house team of over 20 electrical engineers and SCADA experts will work with the Town's integrator and process equipment and technology providers to ensure the facility has a modern SCADA system.
- Facility electrical system will be upgraded to incorporate additional electrical and equipment loads.

Project Plan

Our Project Plan includes a discussion of our collaborative project management approach to team with Town. The following detailed Table of our proposed Scope of Services and Deliverables demonstrates the elements of our approach.

The main Tasks in our Project Plan are:

1. Project Initiation and Coordination
2. Alternatives Evaluation
3. Preliminary Design Progress (CMAR, Basis of Design Report, Equipment Pre-Selection and Pre-Purchase, and 30% drawings)
4. 60% Design Progress (Final Draft Basis of Design Report and 60% drawings)
5. Final Design (Construction Plans & Specs) and CDPHE Construction Approval Application
6. Construction Management and Engineering (with As-Built Documentation) [Future Task]

Key elements of our Project Plan are highlighted below along with other value-added services:

- **Collaborative Communication and Workshops.** AQUA believes in interactive and collaborative communication. We thus propose to have at least monthly project meetings or workshops. The frequency and agenda for these meetings will depend on where we are in the project implementation process.
- **Technical Memorandums.** We propose to prepare Technical Memoranda during the planning and preliminary engineering phases of the project to document alternative evaluations, recommendations, and decisions. These memoranda will be the foundation for the Basis of Design Report and the Final Design.
- **Alternative Project Delivery.** AQUA understands the Town's desired schedule to complete construction

"ASAP" Bob and AQUA have helped other communities meet the desired schedule by using a Construction Manager at Risk (CMAR) project delivery method. Our value-added services under this task would be to guide the Town through the process of advertising for and selecting a qualified CMAR contractor. Our services would include preparing and administering a public CMAR RFP and selection process, and also providing a tested standard CMAR-Owner Agreement to the Town.

AQUA and particularly Bob Frachetti and Brian Daw are very experienced with and embrace alternative and integrated project delivery methods and value the timely project participation of a qualified general contractor as part of the design process. This appreciation for the value of an integrated owner-engineer-contractor team was learned first-hand during Bob Frachetti's direct experience as a General Contractor and his years as Resident (Field) Engineer. Brian also has direct experience leading integrated project delivery teams. Bob and AQUA have a significant track-record of over 20 successful design-build and CMAR projects.

- **Cost Estimating and Constructability Review.** In recognition of the constructability and cost-estimating expertise of a qualified general contractor, we also offer the Town the value-added additional service for including an experienced General Contractor as a subcontractor to the AQUA team. Their input would provide the Town and AQUA early feedback on constructability, work sequencing, and scheduling; and more accurate construction cost estimates. AQUA has multiple relationships with contractors that will be leveraged should this approach be desired.
- **Hydraulic Modeling.** AQUA also recommends a hydraulic modeling effort to verify the impact of the storage tank currently under design on the firm (and total) capacity to be used for the WTP expansion. Combined with the proposed ozone and membrane filtration improvements, the new storage tank will provide operational storage for meeting peak hour demands along with the existing two (2) storage tanks at the WTP and reduce the instantaneous demand to the distribution system pump station and WTP. This "smoothing" of the production rate at the WTP will be beneficial for sizing distribution pumps and maintaining consistent operations at the WTP.

Scope of Services and Deliverables

Comments and Clarifications to the Scope, Schedule, and Fee

1. All customary WTP predesign and design engineering services including Civil, Architectural, Structural, Process, Mechanical/HVAC, Electrical, and Instrumentation and Controls are provided. Geotechnical and Survey Services are also included.
2. We will base the design drawings and associated basis of design report on the results of Task 200 – Alternatives Evaluation.
3. Bidding and Construction Phase Services: We have NOT included bidding assistance or construction phase services as a part of this proposal. Upon completion of the design we anticipate proposing for the addition of these services to our scope and fee. This approach allows the Town and AQUA to better assess the level of service required based on the final configuration of the WTP, the complexity involved with its construction, the type of bidding and construction delivery method selected and the costs associated with the level of service that is desired.
4. Permitting or CDPHE review fees are not included.

AQUA is open to modifying the Scope of Services to meet the Town's need.

Our proposed Scope of Services and associated Deliverables are presented on the following page as a Task Workflow exhibit.

Task 100
Project Initiation/Coordination

Key Tasks

Review Existing WTP Operations & Process Performance

- Develop general understanding of WTP operations, existing systems and equipment, and water quality (WQ) characteristics
- Review available WQ data and identify potential data gaps for sampling by Town

Facilitate Project Kickoff Meeting

- Review existing WTP operations and conditions
- Brainstorm the Town’s objectives and critical success factors
- Identify the Town’s desired level of service
- Identify key operational goals and constraints

Prepare TM #1 – Project Goals & Existing Conditions Summary

- Outline project objectives, level of service, operational goals, and critical success factors
- Summarize results of operations and treatment process reviews

Coordinate Project Activities

- Conduct regular progress meetings with the Town to review activities, schedule, and key findings; exchange ideas; coordinate activities; and identify issues/concerns to be addressed
- Maintain Action Items and Decision Logs to summarize key responsibilities and decisions during the project
- Monitor project scope, schedule and budget, and coordinate with team to proactively manage progress
- Collaborate with the Town to identify projects issues/concerns and modify tasks, deliverables and schedule to meet the Town's expectations
- Prepare monthly progress reports and invoices

QAQC (*All Tasks)

- Review deliverables for conformance with project requirements and industry standards

Deliverables

- ◆ Project Kickoff Meeting Agenda and Summary Notes
- ◆ Technical Memo #1 – Project Goals and Existing Conditions Summary
- ◆ Decision & Action Item Logs
- ◆ Monthly Project Updates and Invoices

Task 200
Evaluate Alternatives

Key Tasks

Conduct Draft Basis Site Visits & Data Reviews

- Inventory existing treatment processes, equipment and ancillary systems
- Record visual observations and collect field data, e.g., motor nameplate, pump capacities, switchgear capacity
- Identify data gaps to obtain from Town
- Prepare treatment and hydraulic capacity evaluation
- Collaborate with the Town staff to identify process alternatives
- Coordinate with the Town to solicit technology demonstrations by interested manufacturers
- Coordinate bench-/pilot-scale testing requirements to establish design criteria treatment equipment
- Conduct field investigations (site feature survey, subsurface geotechnical investigation, 3D LiDAR survey, subsurface utility survey, etc.)

Evaluate Alternatives

- Develop process schematics, flow balances, treatment performance and conceptual layouts
- Review proposed alternatives with the Town to receive input and brainstorm potential solutions to concerns/issues
- Develop planning level opinion of probable construction costs (OPCC) [AACE Class 5] and operational costs
- Prepare TM #2 – Alternatives Evaluation with summary of alternatives considered and relative advantages of each

Workshop No. 1

- Present alternatives for review with Town
- Facilitate the Town’s ranking of alternatives using weighted evaluation criteria and select preferred alternative
- Discuss implementation of preferred alternative(s)

Deliverables

- ◆ Site Visits
- ◆ Site Survey / 3D Facility Model of Existing Filter Building
- ◆ Geotechnical Design Report
- ◆ TM #2 – Alternatives Evaluation
- ◆ Workshop No. 1 Agenda and Summary Notes
- ◆ TM #2 Review Comment and Responses

Task 300
Preliminary Design

Key Tasks

CMAR Procurement

- Prequalify contractors to respond to a CMAR request for proposals (RFP)
- Prepare and advertise RFP
- Evaluate proposals and make recommendation for selecting CMAR
- Assist Town with CMAR award letter

Draft Basis of Design Report (BDR)

- Develop design criteria summary for the evaluated filtration and T&O processes
- Summarize proposed and preferred alternatives incorporated in the project
- Define operational and equipment design criteria for evaluated equipment
- Prepare summary permit matrix for coordinating phasing and regulatory reviews, i.e., CDPHE construction approval, grading permit, building permit

Prepare 30% Progress Design Package

- Solicit quotes and submittals from equipment vendors
- Preselect filtration and T&O equipment manufacturers
- Develop preliminary progress drawings of proposed improvements including site layouts, equipment arrangements, building elevations, electrical one-line diagrams, and process diagrams
- Prepare table of contents for specifications in CSI format
- Update OPCC (AACE Class 4)
- Submit package to the Town for review
- Submit preselected equipment packages and design criteria to CDPHE for review/approval

Workshop No. 2a

- Review filtration equipment quotes and recommendation of filtration supplier
- Select filtration supplier/equipment

Workshop No. 2b

- Review T&O equipment quotes and recommendation of T&O process
- Select T&O supplier/equipment

Pre-Purchase Selected Equipment

- Assist with development of pre-purchase contracts for selected equipment

Deliverables

- ◆ CMAR - RFP, Evaluation and Award
- ◆ 30% Design Progress Review Package
- ◆ Workshops No. 2a and 2b Agendas and Summary Notes
- ◆ Preselected equipment packages.
- ◆ Equipment Pre-Purchase (by Town)

Task 400
60% Progress Design

Key Tasks

Prepare 60% Progress Design Package

- Coordinate with Town to incorporate Town’s Contract for Construction and other Division 0 specifications in CSI format
- Respond to the Town’s 30% review comments
- Advance the design drawings to the 60% design progress level
- Compile draft technical specifications for major equipment, e.g., for purchase by CMAR
- Update BDR with specific engineering design criteria for structures, equipment and other design features included in the project
- Submit package to the Town for review

Workshop No. 3

- Conduct review meeting to present preliminary site plan, facility layouts, and discuss key issues and receive direction from the Town
- Present detailed progress plans for improvements including treatment process equipment, building sections, and electrical equipment
- Review OPCC estimates and budgetary quotes from manufacturers
- Discuss overall implementation plan for constructing project and sequencing of work

Finalize BDR

- Respond to the Town’s Draft BDR comments
- Submit draft Final BDR to the Town for review
- Facilitate introductory meeting with the Town and CDPHE to review proposed improvements, project schedule and applicable design criteria
- Respond to technical comments provided by CDPHE

Deliverables

- ◆ 30% Design Review Comment-Response Log
- ◆ Draft Final BDR
- ◆ 60% Design Progress Review Package

Task 500
Final Design

Key Tasks

Prepare Final Design Package

- Respond to the Town’s 60% review comments
- Provide final updates to and finalize BDR
- Finalize design drawings
- Finalize technical specifications
- Submit final design review package to the Town for review
- Incorporate the Town’s final design review comments after Workshop No. 4 into the final plans and specifications
- Prepare final plans and specifications for Issue for Bid release to CMAR

Prepare CDPHE Construction Approval Application

- Prepare Construction Approval Permit application for submitting to CDPHE
- Compile hard and electronic copies for authorization by the Town and submittal to CDPHE

Workshop No. 4

- Conduct review meeting to discuss remaining issues and receive direction from the Town
- Review implementation plan for constructing project and sequencing of work

Deliverables

- ◆ 60% Design Review Comment-Response Log
- ◆ CDPHE Meeting Summary Notes
- ◆ Final BDR
- ◆ Final Design Progress Review Package
- ◆ CDPHE Construction Approval Permit Application
- ◆ Issue for Bid Contract Documents, plans and specifications

Task 600
Construction Services

Key Tasks

Construction Engineering Services

- Facilitate preconstruction conference with Town, AQUA, and CMAR team
- Coordinate with the Town to manage electronic construction records
- Facilitate bi-weekly progress meetings
- Review CMAR’s monthly pay apps and redline markups to Contract Documents
- Review shop drawing submittals/ materials testing results
- Clarify contract documents as needed
- Review & respond to CMAR RFI/ PCO
- Prepare recommended FO and WCDs for Town
- Incorporate above responses/ changes to the contract into Change Orders

Field Services

- Onsite RPR to monitor/ observe work conforms to Contract
- Regular engineering site visits to observe construction progress and
- Review CMAR and manufacturer start-up and training activities
- Operational overview for training and start-up

Construction Closeout

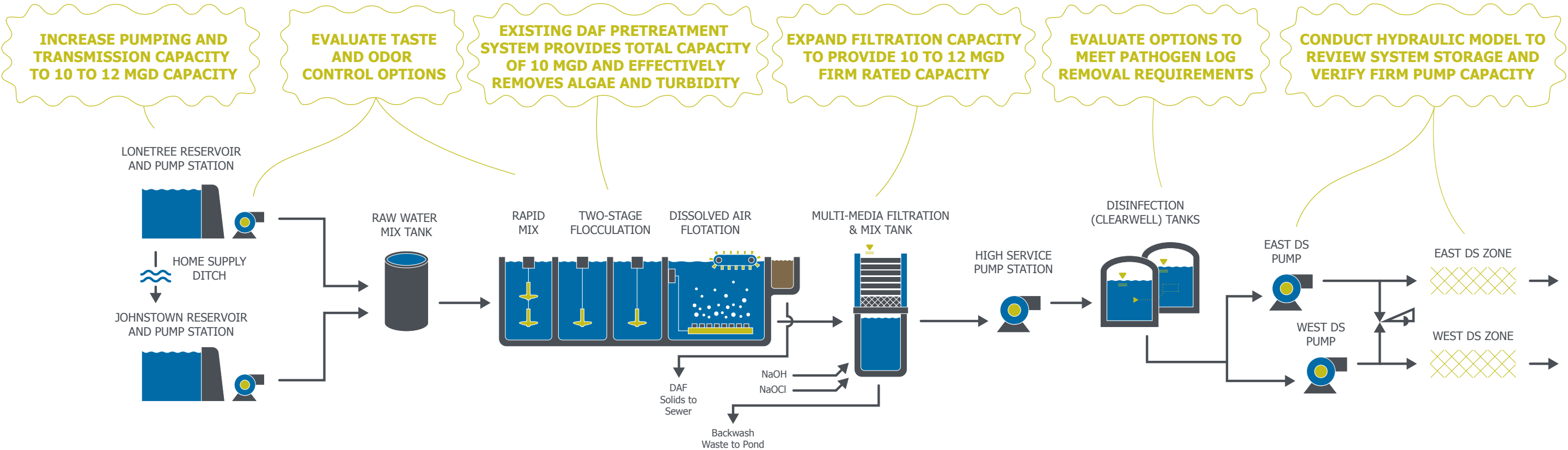
- Conduct punch list review
- Conduct final completion walkthrough to resolve final punch list
- Prepare record drawings
- Conduct warranty and performance reviews of work
- Prepare performance review memoranda for Town

Deliverables

- ◆ Pay Application Reviews
- ◆ Submittal Review Comments
- ◆ RFI and PCO Response
- ◆ FO, WCD and CO for Town’s authorization
- ◆ RPR and Engineering Observation Reports
- ◆ Substantial/Final Completion Punch Lists
- ◆ Warranty Review Visits and Memos

Figure 1 - WTP Expansion Considerations

GENERAL PROJECT CONSIDERATIONS



HYDRAULIC/TREATMENT CAPACITY EVALUATION

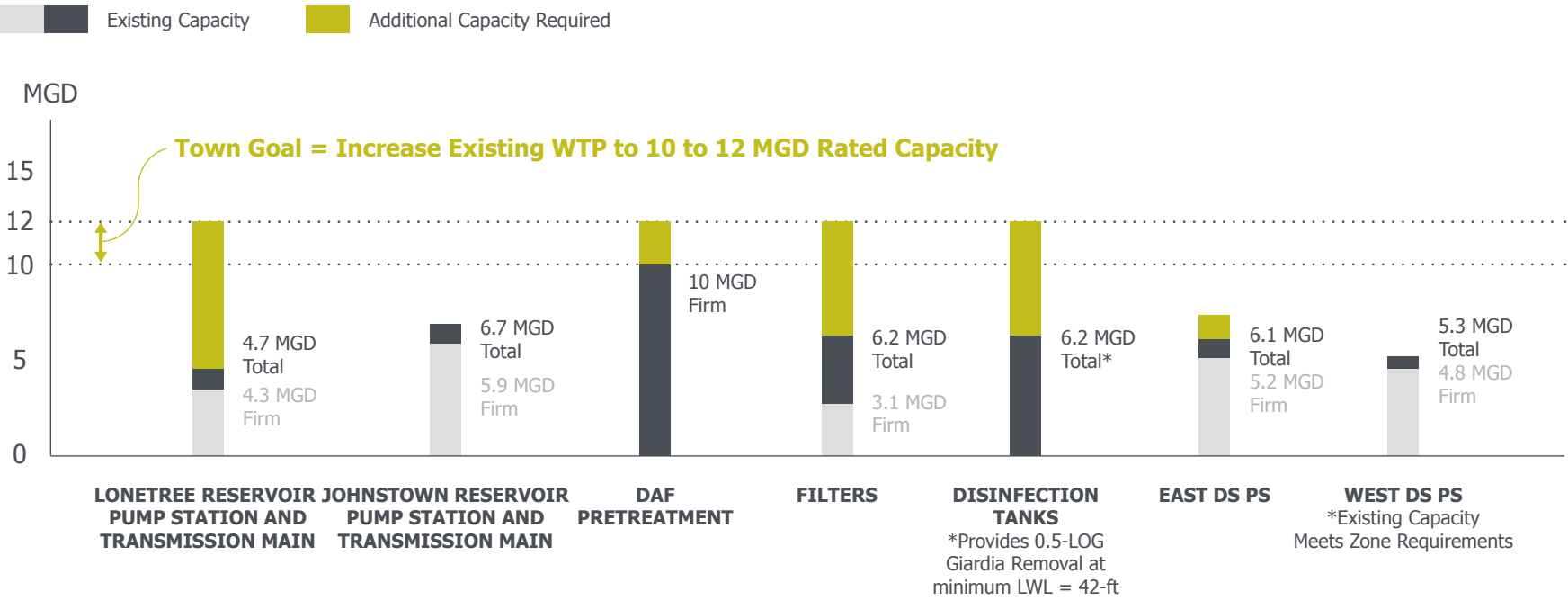
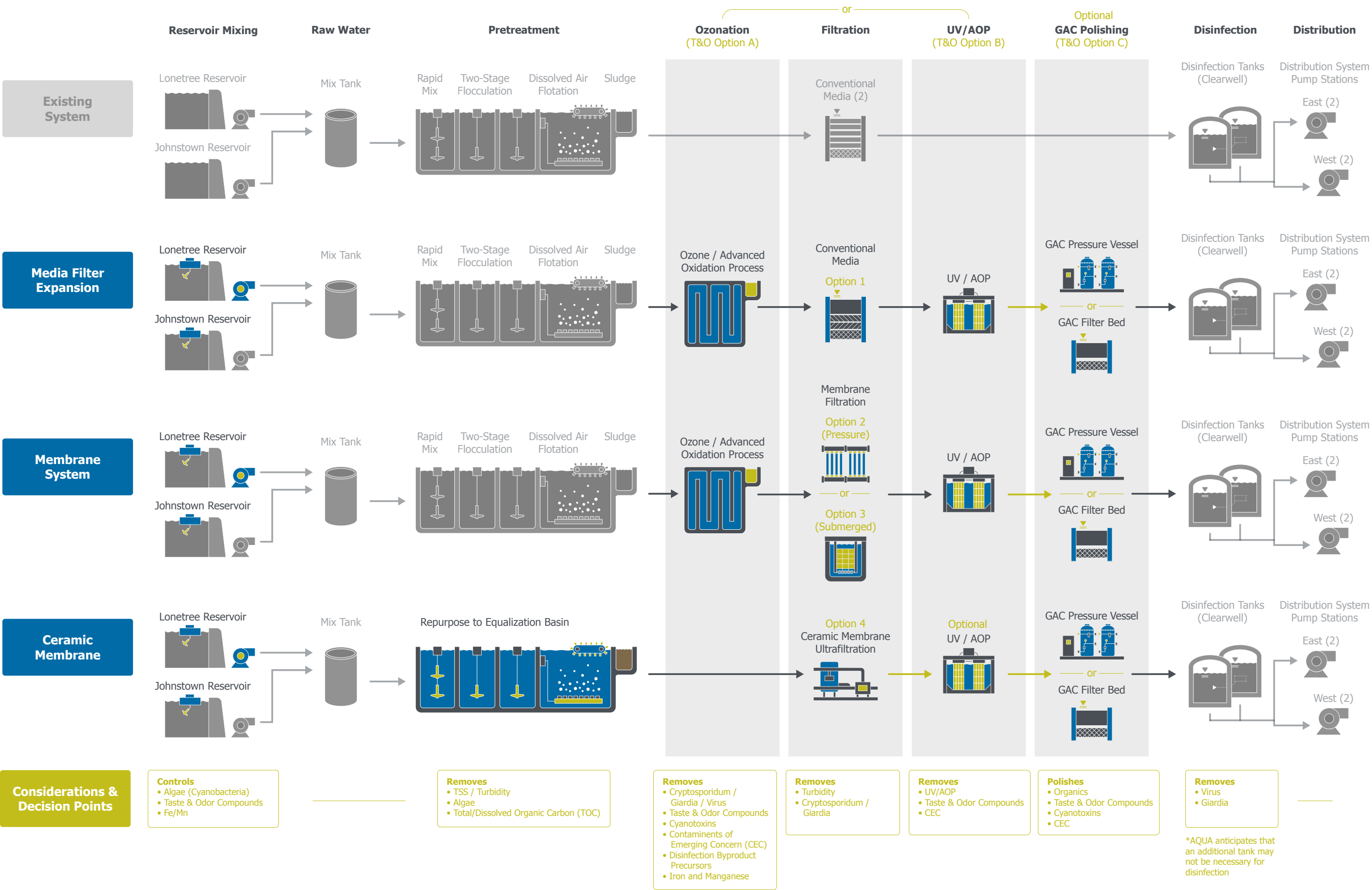


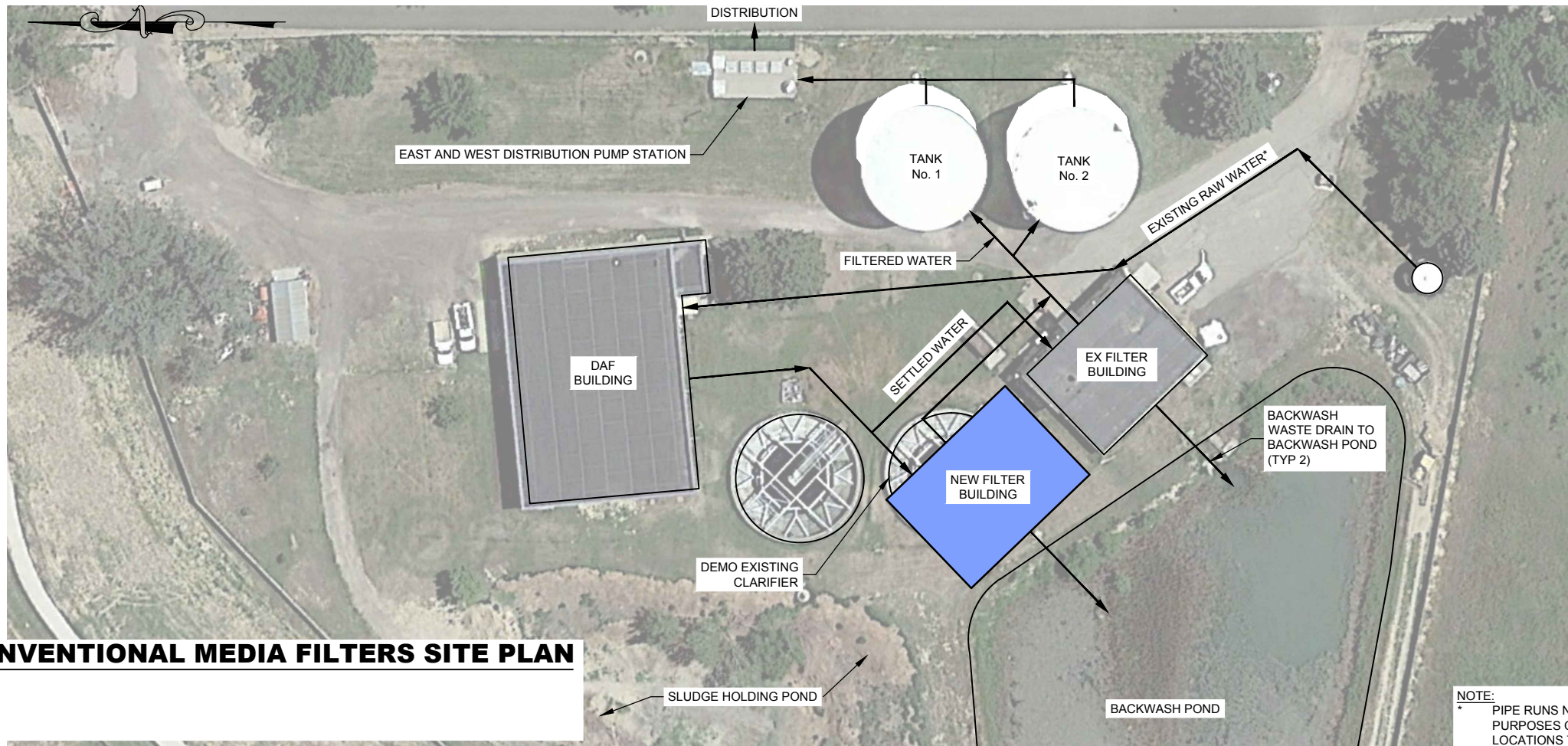
Figure 2 - Treatment Alternatives Evaluation Schematic



2/5/2021 C:\AUSERS\KEITH\AQUA ENGINEERING\001.3 003 JOHNSTOWN WTP EXPANSION - GENERAL\DRAWING\FIGURES\FIGURE 3-1.DWG

OPTION 1 - CONVENTIONAL MEDIA FILTERS SITE PLAN

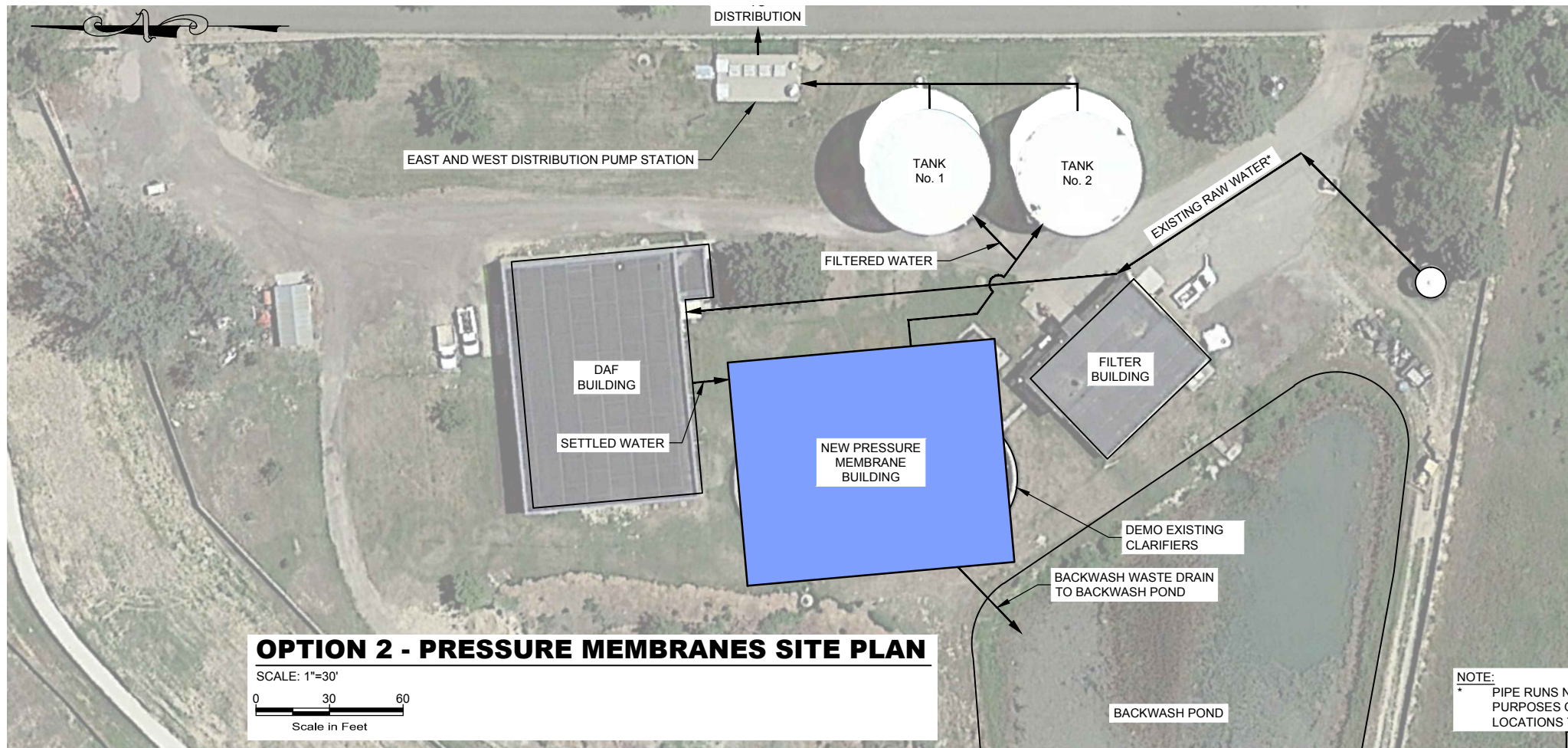
SCALE: 1"=30'
0 30 60
Scale in Feet



NOTE:
* PIPE RUNS NOTED FOR SCHEMATIC PURPOSES ONLY. BURIED PIPE LOCATIONS TO BE VERIFIED.

OPTION 2 - PRESSURE MEMBRANES SITE PLAN

SCALE: 1"=30'
0 30 60
Scale in Feet



NOTE:
* PIPE RUNS NOTED FOR SCHEMATIC PURPOSES ONLY. BURIED PIPE LOCATIONS TO BE VERIFIED.

PRELIMINARY
NOT FOR CONSTRUCTION OR RECORDING

Item #12.

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE					ORIGINAL				REVISIONS			
NO.	DATE	DESIGN	DRAWN	CHECKED	CV	KR	NT					
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TOWN OF JOHNSTOWN
WATER TREATMENT PLANT EXPANSION
23205 CO RD 13 JOHNSTOWN, CO 80534
CONVENTIONAL FILTER AND
PRESSURE MEMBRANE SITE PLAN

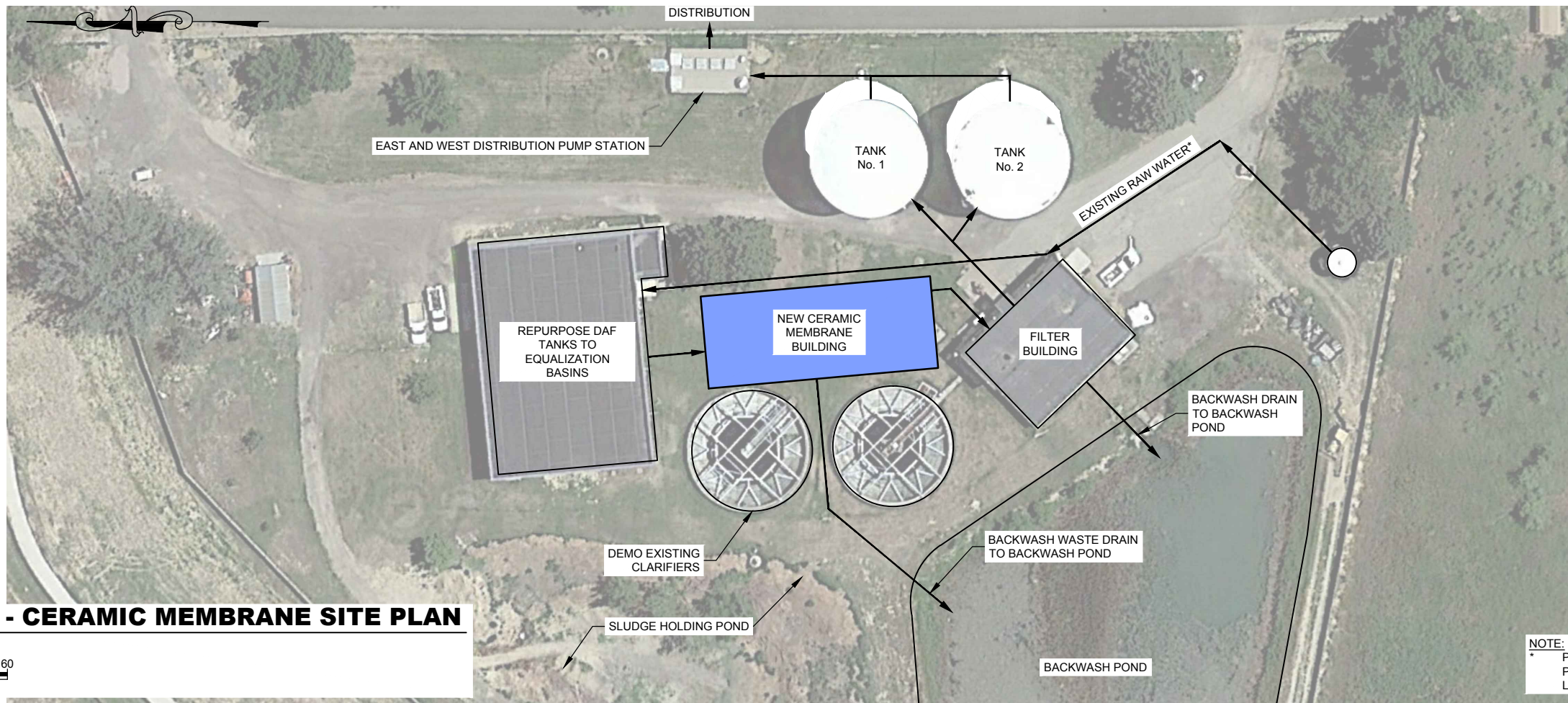
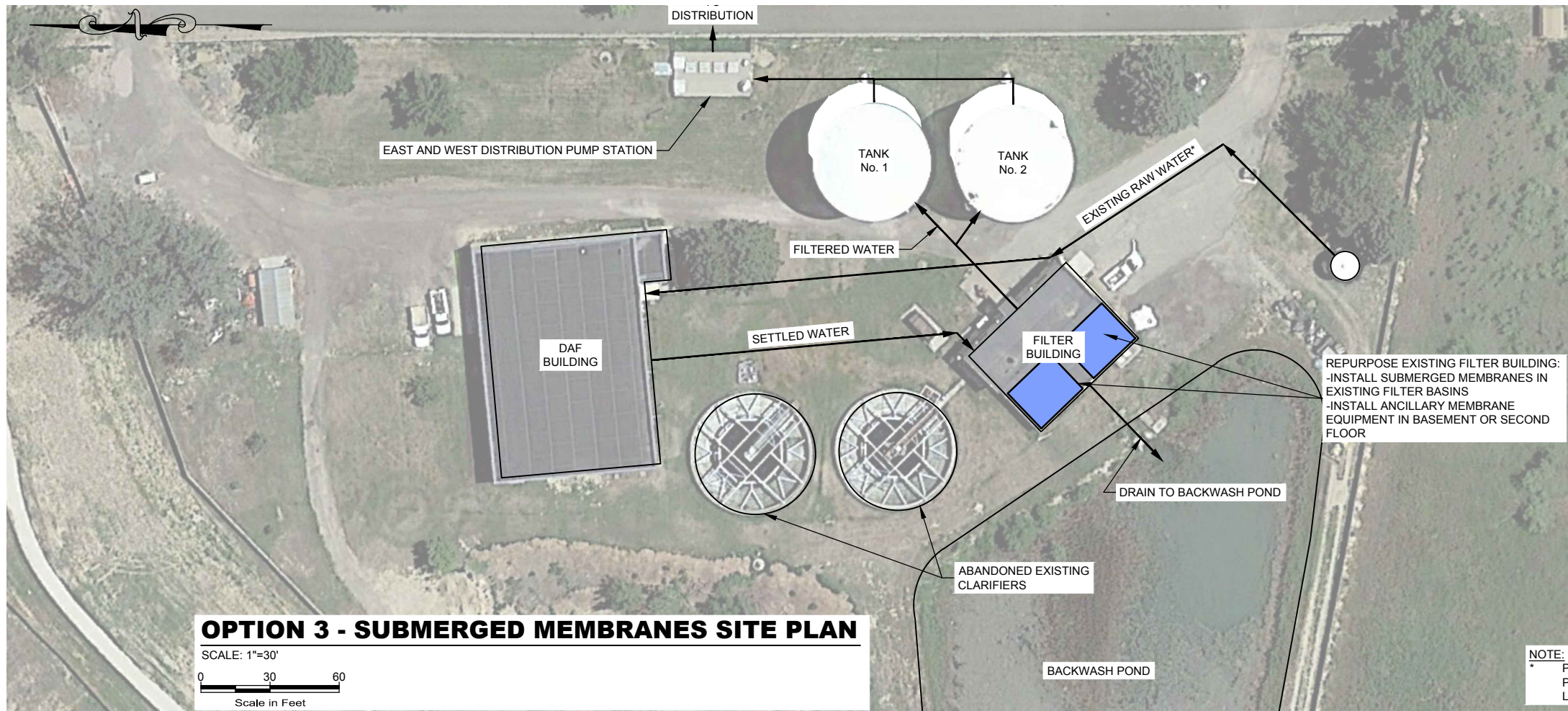


DRAWING NO.

FIGURE 2.1

SHEET OF 523

2/5/2021 C:\USERS\KEITH\AQUA ENGINEERING\001_3 003 JOHNSTOWN WTP EXPANSION - GENERAL\DRAWING\FIGURES\FIGURE 3-2.DWG



Item #12.

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ORIGINAL				
NO.	DATE	DESIGN	DRAWN	CHECKED
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REVISIONS				

TOWN OF JOHNSTOWN

WATER TREATMENT PLANT EXPANSION

23205 CO RD 13 JOHNSTOWN, CO 80534

MEMBRANE GRAVITY FILTER AND CERAMIC MEMBRANE SITE PLAN



DRAWING NO.

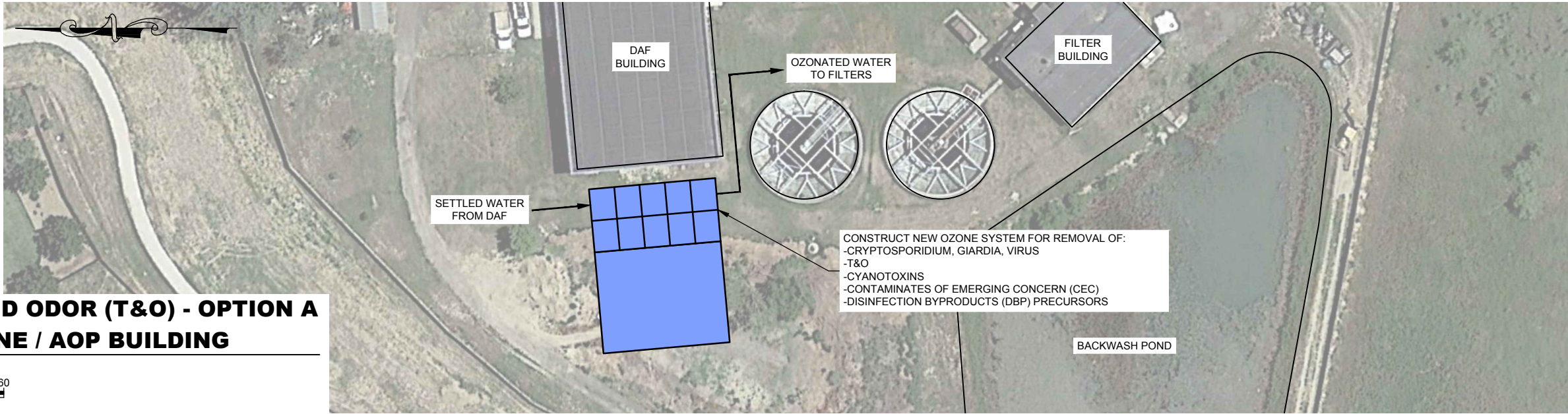
FIGURE 2-2

SHEET OF

524

PRELIMINARY
NOT FOR CONSTRUCTION OR RECORDING

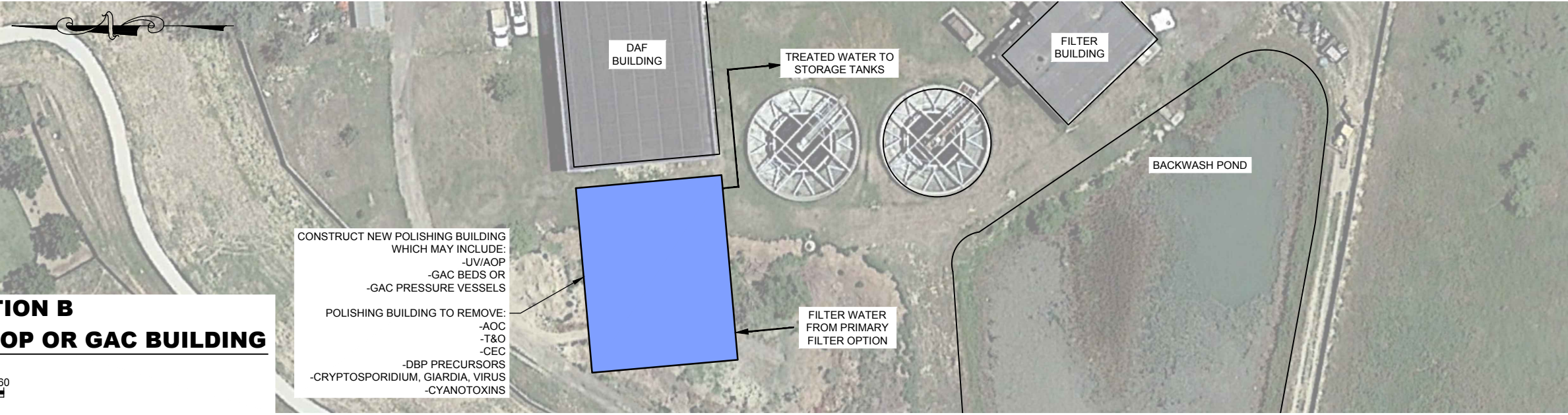
2/5/2021 C:\USERS\KEITH.RIND\AQUA ENGINEERING\001_3 003 JOHNSTOWN WTP EXPANSION - GENERAL\DRAWING\FIGURES\FIGURE 3-3.DWG



TASTE AND ODOR (T&O) - OPTION A
NEW OZONE / AOP BUILDING

SCALE: 1"=30'
0 30 60
Scale in Feet

CONSTRUCT NEW OZONE SYSTEM FOR REMOVAL OF:
-CRYPTOSPORIDIUM, GIARDIA, VIRUS
-T&O
-CYANOTOXINS
-CONTAMINATES OF EMERGING CONCERN (CEC)
-DISINFECTION BYPRODUCTS (DBP) PRECURSORS

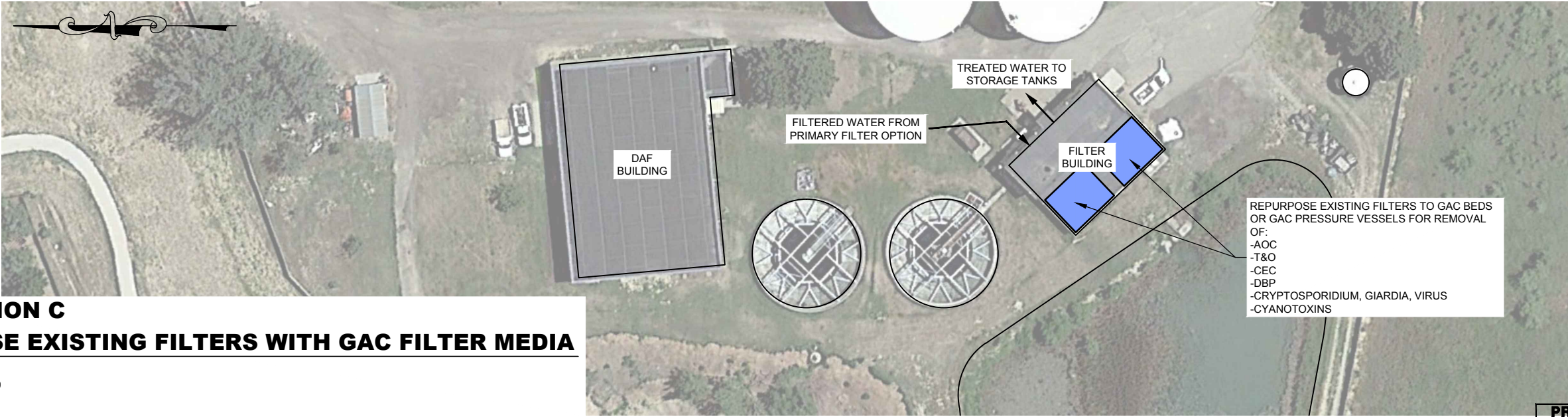


T&O - OPTION B
NEW UV/AOP OR GAC BUILDING

SCALE: 1"=30'
0 30 60
Scale in Feet

CONSTRUCT NEW POLISHING BUILDING
WHICH MAY INCLUDE:
-UV/AOP
-GAC BEDS OR
-GAC PRESSURE VESSELS

POLISHING BUILDING TO REMOVE:
-AOC
-T&O
-CEC
-DBP PRECURSORS
-CRYPTOSPORIDIUM, GIARDIA, VIRUS
-CYANOTOXINS



T&O - OPTION C
REPURPOSE EXISTING FILTERS WITH GAC FILTER MEDIA

SCALE: 1"=30'
0 30 60
Scale in Feet

REPURPOSE EXISTING FILTERS TO GAC BEDS
OR GAC PRESSURE VESSELS FOR REMOVAL
OF:
-AOC
-T&O
-CEC
-DBP
-CRYPTOSPORIDIUM, GIARDIA, VIRUS
-CYANOTOXINS

Item #12.

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE		ORIGINAL				REVISIONS			
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TOWN OF JOHNSTOWN
WATER TREATMENT PLANT EXPANSION
23205 CO RD 13 JOHNSTOWN, CO 80534
TASTE AND ODOR IMPROVEMENTS
SITE PLAN



DRAWING NO.

FIGURE 2.2

SHEET OF

PRELIMINARY
NOT FOR CONSTRUCTION OR RECORDING

525



PRELIMINARY
NOT FOR CONSTRUCTION OR RECORDING

tem #12.

[illegible]

TOWN OF JOHNSTOWN
WATER TREATMENT PLANT EXPANSION
23205 CO RD 13 JOHNSTOWN, CO 80534
CIVIL
PROPOSED TREATMENT TRAIN
SITE PLAN



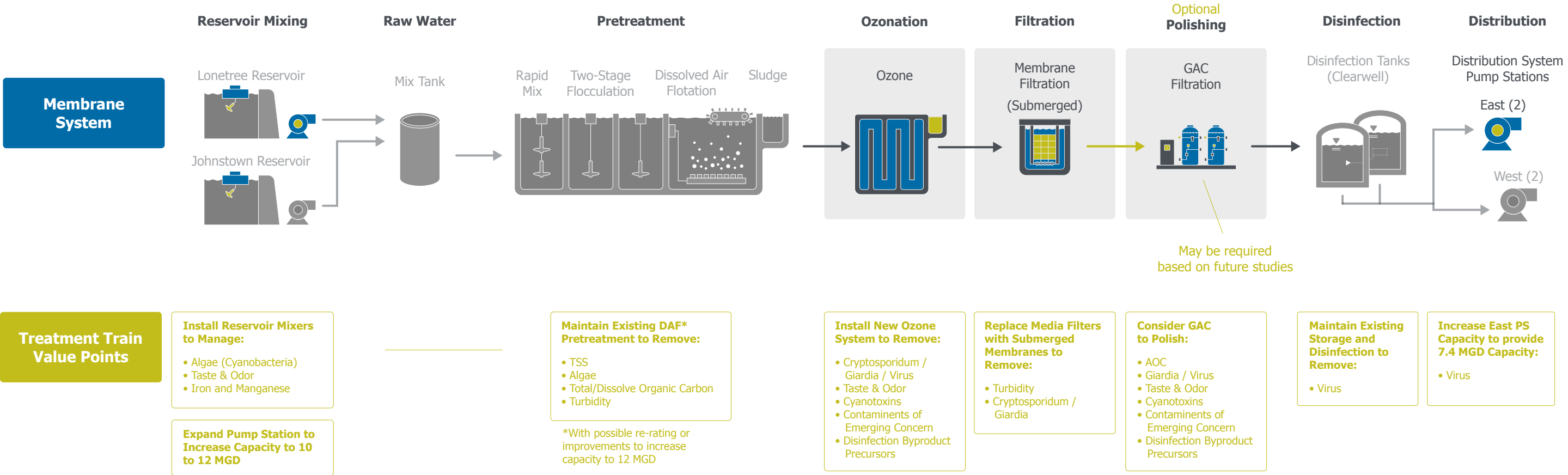
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FIGURE 2-4

SHEET OF

526

Figure 4 - Proposed Treatment Train



Section 3

Management Approach

Collaborative Management Approach

AQUA recognizes that the most important success factor for any project is effective communication and collaboration between all stakeholders, accountability, and documentation of key decisions. This team development process must continue from the conceptual and planning stages of the project all the way through facility start-up and commissioning.

Our collaborative approach will take the Town of Johnstown from the very first meeting through the final and successful commissioning of the facility and will include the following elements:

- ✓ Clear understanding of the Project Objectives and Success Criteria.
- ✓ Development and acceptance of Project Work Plan and Critical Path Project Schedule.
- ✓ Regularly Scheduled Conference Calls between AQUA and the Town.
- ✓ Regularly Scheduled Coordination Meetings / Calls between AQUA's team members.
- ✓ Budget, Progress Tracking, and Progress Status Updates.
- ✓ Deliverable Review Meetings & Workshops with AQUA, the Town, and Ramey Environmental Compliance.



Project Management Tools

AQUA's approach to controlling project budget and schedule includes a pre-planning process to identify Project tasks, duration, and associated personnel efforts. A Work Plan will be used to establish the major tasks, deliverables, and task durations to confirm the project effort for each task. Microsoft Project will also be used to document the major components of the project and to tie the individual work tasks with the resource needs.

Cost Controls

The engineering budget for the scope of services will be tracked using our accounting software in combination with an internet cloud-based Microsoft Project Server with the work breakdown structure outlined in the Work Plan. Associated resource costs for major tasks are compared with the overall project schedule, to identify progress along with the fees incurred for the invoice period. In addition, costs will be controlled by using team members with significant experience or particular knowledge of the project to complete specific tasks.

Project Status Reporting System

The AQUA team will provide progress status updates and facilitate necessary discussions. AQUA will schedule and prepare an agenda for each meeting and administer the meeting. Meeting discussions will include a report on progress, present critical issues for discussion and decision-making. As a follow up to the meetings AQUA will prepare meeting notes.

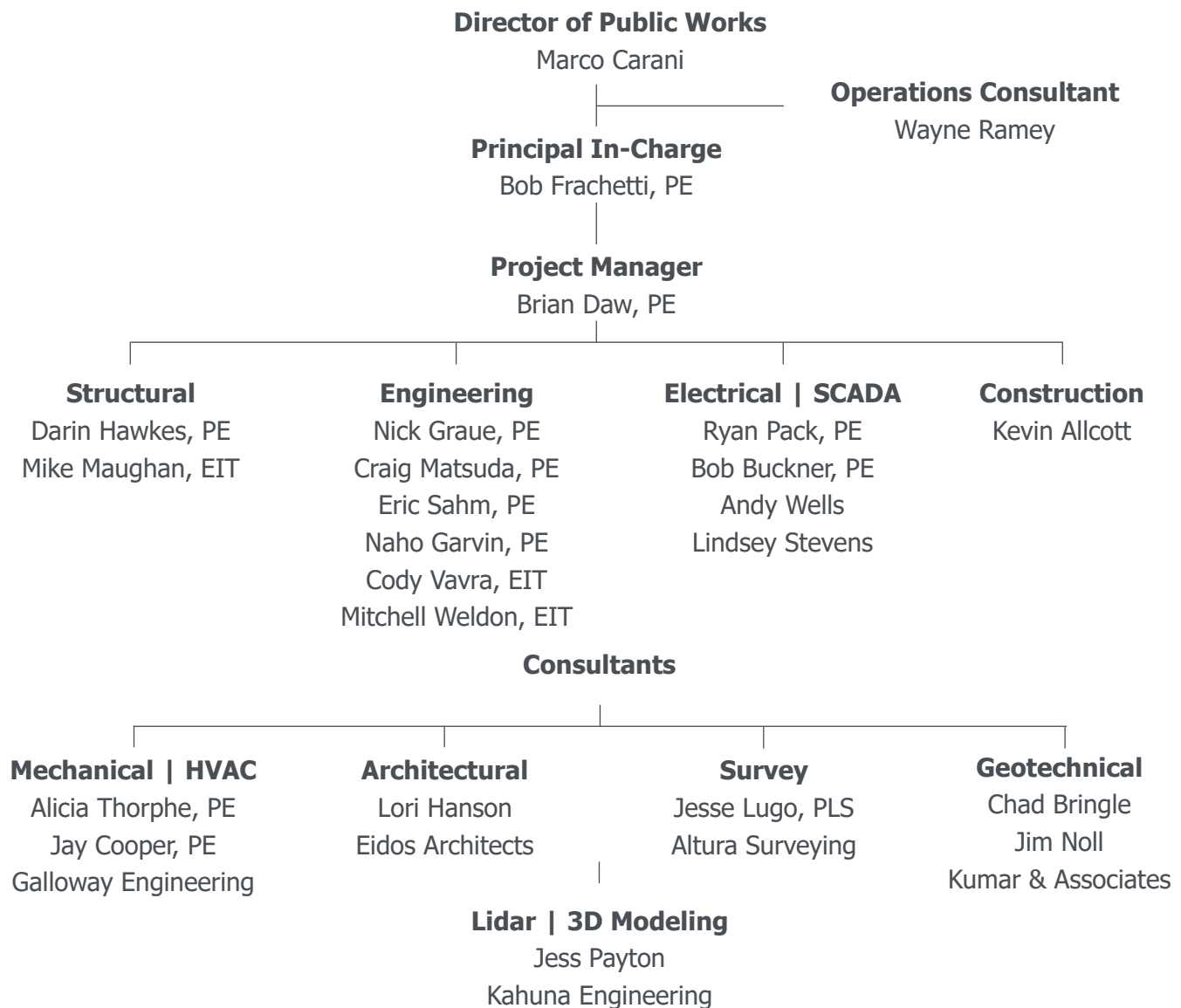


Section 4

Staff Qualifications

Your Water Treatment Team!

AQUA has assembled a team of experts and specialists to provide the Town with the right combination of skills and experience to meet the requirements and expectations associated with the Johnstown WTP Expansion project. Our proposed project team has similar experience locally and throughout the country, including upgrades and/or conventional capacity expansions. This team is readily available and prepared, fully committed, and passionate about working with the Town.



Key Personnel

Bio’s for our key personnel follow. Team Resumes are included in Appendix A for your reference.



Bob Frachetti, P.E. | Principal in Charge

Contact: bob.frachetti@aquaeng.com | 801.683.1251
Education: BS Civil and Environmental Engineering, Clarkson University, Potsdam NY
Licenses: Professional Engineer | CO, NM
Location: AQUA Colorado | 5325 S Valentia Way, Greenwood Village, CO 80111

Bob has over 29 years of project management and technical experience in virtually all areas of water and wastewater engineering including facilities planning, permitting, design, construction, facility commissioning, performance evaluations, and energy efficiency audits. His strengths include process modeling and design, technology and equipment selection, detailed design engineering, energy efficiency upgrades, hydraulics, and construction engineering and management. He also has significant experience with integrated project delivery methods including design-build, CMAR, and performance contracting.

Douglas Sullivan Acting PE W, WW & Stormwater City of Boulder 303.263.0708 Relationship: Client Reference	Daymon Johnson, Public Works Director, Town of Bennett 720.273.9528 Relationship: Client Reference	Parker Newbank III, Eagle River Water & Sanitation District 970.471.1326 Relationship: Client Reference
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Brian Daw, P.E., ENV SP | Project Manager

Contact: briandaw@gmail.com | 303.249.7510
Education: M.S Civil and Environmental Engineering, University of Colorado Boulder
B.S. Civil Engineering California Polytechnic State University, San Luis Obispo
Licenses: Professional Engineer | CO, CA

Located in Denver, Brian brings 25 years of civil engineering and project management experience with the evaluation, planning, design, and construction administration of water and wastewater treatment and infrastructure projects for municipal and industrial clients. Brian is a registered professional civil engineer specializing in potable water treatment including pretreatment, filtration and disinfection process design; residuals handling systems; chemical feed systems; and storage and distribution system modeling and conveyance design. He also has valuable experience guiding utilities with long-term planning efforts that address the variety of treatment, processes, distribution, storage, and general facility issues and improvements that small and large utilities face.

Brian’s project responsibilities regularly include leading multi-disciplined engineering teams during treatment evaluations used to identify and develop recommendations for implementing capital and operations projects.

Stephen Grooters, PE, CWP, ENV SP Engineering Services Manager City of Boulder 303.441.3242 Relationship: Client Reference	Julie Koehler, PE, ENV SP Utilities Engineering Manager City of Westminster 303.658.2178 Relationship: Client Reference	Scott O’Brien, CWP, Public Works Director Town of Dillon 970.262.3408 Relationship: Client Reference
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Darin Hawkes, P.E. | Principal | Structural Engineer

Contact: darin.hawkes@aquaeng.com | 801.683.3727
Education: B.S. Civil Engineering, University of Utah
Licenses: Professional Engineer | UT, CO
Location: AQUA Utah | 533 W 2600 S Suite 275, Bountiful, UT 84010

Mr. Hawkes’ has a vast amount of experience in various civil engineering disciplines. He specializes in difficult projects that often have space, access and/or extreme time constraints. He has developed a reputation for being able to view a problem from multiple angles to develop a solution that works for his client. His experience ranges from pumping system design, concrete storage tanks and open reservoir design, to large concrete water storage facilities and high elevation snowmaking reservoirs and dams. Many of his projects are provide as turn-key solutions for his clients with his direct involvement from conceptual design through contract administration and project close-out. As part of the AQUA team, he has lead and assisted in the completion of several System Capacity Analyses, Municipal Capital Facility Plans and large-scale Master Plans for both culinary water and wastewater.

Scott Morrison, General Manager,
Mountain Regional Water SSD
435.940.1916
Relationship: Client Reference

Ron Salvesen, City Administrator,
City of Hyrum
435.245.6033
Relationship: Client Reference

Chris Melville, City Manager
City of West Wendover
775.664.3084
Relationship: Client Reference



Nick Graue, P.E. | Senior Project Engineer

Contact: nick.graue@aquaeng.com | 801.683.3733
Education: B.S. Civil Engineering, University of Utah, 2013
Licenses: Professional Engineer | UT, CO
Location: AQUA Utah | 533 W 2600 S Suite 275, Bountiful, UT 84010

Mr. Graue is an intensely ambitious Professional Engineer and Project Manager backed by over a decade of experience in the Water and Energy sectors with a proven track record of successful project delivery and program implementation. Nick’s deep passion for natural resource conservation has steered him to managing engineering projects where technology can be leveraged to achieve a more sustainable infrastructure. Nick’s work experience involves the entire life cycle of engineering projects, from capital planning feasibility analyses and engineering design to contract administration, construction management, facility commissioning and operations consulting. Nick is particularly adept at managing multi-disciplinary projects where tight coordination between discipline leads is of paramount importance. Prior to his time with AQUA, Nick was employed by Park City, UT as Public Utilities Engineer where he managed the water system hydraulic model, GIS and asset management programs, performed water system master planning, and assisted in the planning, engineering and construction management of capital infrastructure projects.

Scott Morrison, General Manager,
Mountain Regional Water SSD
435.940.1916
Relationship: Client Reference

Ron Salvesen, City Administrator,
City of Hyrum
435.245.6033
Relationship: Client Reference

Chris Melville, City Manager
City of West Wendover
775.664.3084
Relationship: Client Reference

**Ryan Pack, P.E. | Principal | Electrical/SCADA Engineer**

Contact: ryan.pack@skmeng.com | 801.683.3761

Education: BS Electrical Engineering, University of Utah | MBA , Weber State University

Licenses: Professional Engineer | UT, ID, NV, WY, CO, HI, NM

Location: SKM | 533 W 2600 S Suite 25, Bountiful, UT 84010

Mr. Pack has experience with many components of SCADA and controls. He has worked with controls as simple as relay logic and PID loop controllers thru complex radio controlled SCADA systems. He has worked with many different programmable logic controllers and Operator interfaces including Allen Bradley, Control Microsystems, GE, Koyo, Modicon, Siemens, and others. He has utilized many software packages for human machine interface including Allen Bradley, GE Proficy (Intellution), Wonderware, and National Instruments Lookout. He has designed and installed new systems, replaced old systems, and expanded existing control systems. Mr. Pack has worked with many communications systems including radio, fiberoptics, ethernet, serial, and proprietary communications systems such as controlnet and profibus. He has conducted numerous path studies, for both licensed and non-licensed radio communications systems. He has designed and installed radio telemetry systems with over 50 remote sites.

Omar Hammoud
President APG Neuros
450-939-0799
Relationship: Client Reference

David Richards, Water Department
Engineer, City of Idaho Falls |
208.612.8471
Relationship: Client Reference

Matt Meyers, South Davis Sewer
District Engineer (WRR)
801.295.3469
Relationship: Client Reference

**Kevin Allcott | Construction Engineer**

Contact: kevin.allcott@aquaeng.com | 801.683.3724

Education: B.S. Construction Management, Boise State University

Location: AQUA Utah | 533 W 2600 S Suite 275, Bountiful, UT 84010

Mr. Allcott has over 32 years experience in the construction industry. As a construction manager for AQUA, Mr. Allcott specializes in construction oversight, contract administration, dispute resolution, and construction management. His experience has included trouble shooting, scheduling, contract dispute resolution and performance measurement systems implementation on projects ranging in value from \$2.5 to \$350 million. Mr. Allcott has developed sophisticated computer models of complex construction projects for use in project management as well as recovery plans. These models have also been used to determine cause and affect relationships between changes and increased costs. He has assisted in the defense of claims for additional compensation on several multi-million-dollar constructions projects.

Jeff Walker, Stellar J Corporation
360.518.5097
Relationship: Client Reference

Kathy Parker
208.869.7537
Relationship: Personal Reference

Mike Wright, Giza Development
801.809.3958
Relationship: Client Reference

Alicia Thorpe, PE | Sr. Mechanical Project Engineer

Contact: aliciathorpe@gallowayus.com | 970.800.3300
Education: Bachelor of Science in Architectural Engineering, University of Wyoming, 1997
Licenses: Professional Engineer | CO
Location: 5265 Ronald Reagan Blvd., Suite 210 Johnstown, CO 80524

Alicia offers more than 20 years of experience as a project manager in mechanical HVAC design. She is dedicated to building client relationships and providing the highest level of service. Alicia has worked extensively on a wide variety of projects, including commercial, municipal and educational facilities.

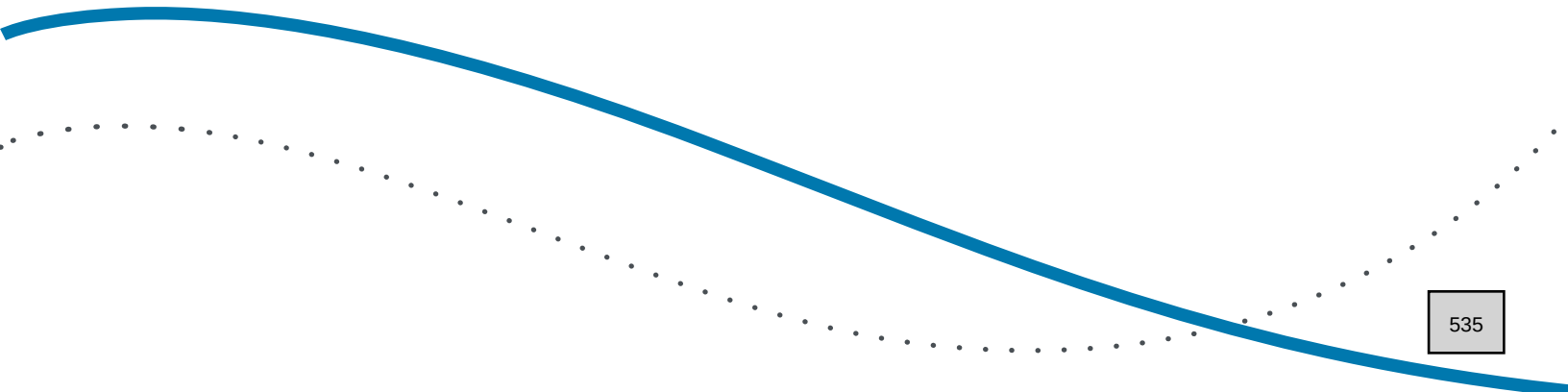
Tricia Quigley HDR, Inc. Phone: 303.565.7696 Relationship: Professional Reference	Mark Beebe HDR, Inc. Phone: 303.318.6353 Relationship: Professional Reference	Dean Smith Shears Adkins Rockmore Architects. 303.436.9551 Relationship: Professional Reference
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Jay Cooper, PE | Mechanical Project Engineer

Contact: jaycooper@gallowayus.com | 970.800.3300
Education: Bachelor of Science in Mechanical Engineering, Colorado State University, 2015
Licenses: Professional Engineer | CO
Location: 5265 Ronald Reagan Blvd., Suite 210 Johnstown, CO 80524

Jay offers five years of experience in mechanical engineering. Jay is a results-driven engineer who uses his knowledge of the building construction process for the benefit of all project stakeholders. He has efficiently designed mechanical and plumbing systems for a wide variety of clients, with a strong base of knowledge in multifamily, commercial and municipal projects. Jay has experience coordinating with internal and external team members to ensure a successful project.

Don Watkins Belford Watkins Group Phone: 970.212.1243 Relationship: Professional Reference	James Ohlson r4 Architects Phone: 970.224.0630. Relationship: Professional Reference	Kristin Tresner Shears Adkins Rockmore Architects Phone: 303.436.9551 Relationship: Professional Reference
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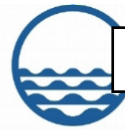


Section 5

Project Related Experience

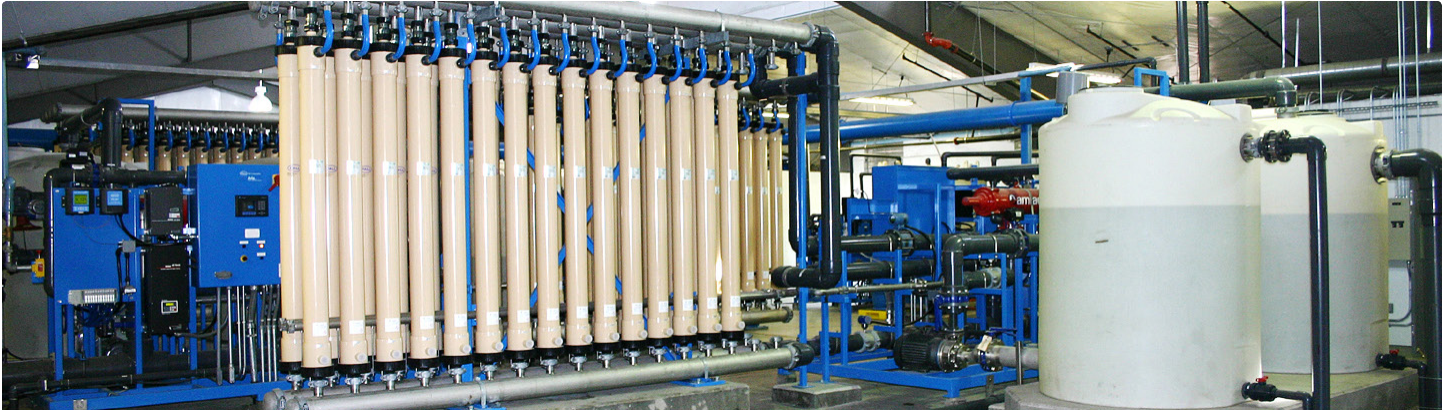
Mountain Regional Water District

Signal Hill Water Treatment Plant & Lost Creek Pipeline



Item #12.

MOUNTAIN REGIONAL WATER
SPECIAL SERVICE DISTRICT



Client: Mountain Regional Water Special Service District
Reference: Scott Morrison, General Manager
Contact: 435.940.1916 | E: scottm@mtregional.org
Location: Park City, Utah
Dates: 2002 - 2011
Capacity: 3MDG expandable to 6 MGD
Cost: \$141K (Design) | \$1.4M (Construction)
Firm: AQUA Engineering
Key Team: Scott Roger, PE, Darin Hawkes, PE, Ryan Pack, PE

- ✓ **ACEC Award Winning Project**
- ✓ One of the first Microfiltration Plants in Utah
- ✓ Design/Build
- ✓ 5.2 Miles of 24" Pipe
- ✓ Riverbank Infiltration System
- ✓ New Telemetry | SCADA

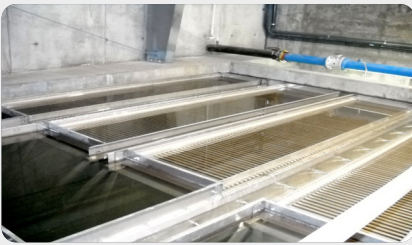


In 2002, AQUA Engineering was hired by Mountain Regional Water Special Services District (MRWSSD) to design the first phase (3 million gallon a day) of a 6 million gallon a day water treatment facility and to investigate options to access water from the Weber River. An alignment in Lost Creek Canyon was chosen for the pipeline, thus giving the project its name. Signal Hill in the Promontory Ranches Development was chosen as the site for the water treatment plant. Construction started in 2003 and the water plant received operational approval from the Utah Division of Drinking Water in February of 2005, marking the end of the \$14 million dollar project. AQUA Engineering teamed with Ames Construction of Salt Lake City on the design-build project which features the first riverbank, groundwater collection system in Utah. It includes a large, high-flow, high-pressure booster pump station with pumping capacity of over 3,000 gpm spread between six 350 horsepower pumps. The pump station was designed with expansion capabilities and has been upgraded since the initial construction to over 10,000 gpm to supply raw water to both MRWSSD and Park City's Quinn's Junction water treatment facility. A 5.2 mile, 24-inch diameter mortar lined, and coated-welded steel, ductile iron, and high-density poly-ethylene transmission pipeline connects the pump station to the water treatment facility. A 1,000-foot rise in elevation occurs along the alignment, which

Signal Hill Water Treatment Plant & Lost Creek Pipeline

passes through sensitive environmental areas, two highway crossings and one river crossing. The terminal reservoir was designed as a low-hazard impoundment and holds 40 acre-feet of water. The treatment plant is one of the first microfiltration membrane plants in the State of Utah and currently treats 4 million gallons of water per day. The riverbank infiltration system developed 1,480 acre-feet of water but has been replaced with a concrete surface diversion structure to supply river water to the plant.

In 2009 AQUA was hired to help the district expand the plant from its equipped capacity of 3 MGD to 4 MGD and to add granular activated carbon (GAC) vessels. The GAC vessels were implemented to control taste and color issues associated with tannic acids produced by decomposition of leaves and foliage entering the river during the change of seasons. The expansion was completed inside a new building addition to the primary structure. The initial design accounted for expansion of the primary clarification of the source water by implementing basins to which lamella plate clarifiers were added along with chemical dosing capabilities for primary treatment. Along with the addition of the clarifiers, sludge settling, collection, aerated storage and dewatering systems were added to the facility to manage and dispose of associated sludge.



Scope Summary

- ✓ Master planning
- ✓ Funding assistance
- ✓ Project Permitting
 - Utah DEQ (Division of Drinking Water & Division of Water Quality)
 - Army Corps of Engineers (Nationwide Permit Program)
 - Utah Stream Alterations
 - State Historic Preservation Organization (SHPO)
 - Utah Department of Transportation
- ✓ County permitting and approvals
- ✓ Construction Management & Observation
- ✓ Detailed design
- ✓ Bidding services (2009 Expansion Project)
- ✓ SCADA & Telemetry System
- ✓ Start-up services

Hooper Water Improvement District

Hooper Water Treatment Plant



Item #12.



The district previously drilled a well that produced about 2700 gpm but the customers complained of taste and odor issues. AQUA worked with the district and their engineer to identify the primary culprit for the taste and odor as iron and manganese. A Pureflow pilot was operated onsite to determine the treatability of the water. Chlorine was used to oxidize the iron and manganese and pressure filtration vessels were installed to filter the water. A backwash tank with a water recovery system was installed. The backwash water allows the iron and manganese settle to the bottom of the tank and the water on the top of the tank is fed back through the treatment system so there is a 99% recovery of the water pumped from the well. The solids are disposed of through the sanitary sewer system. AQUA's service included equipment procurement, bidding document preparation, including technical specifications, and drawings. AQUA also conducted limited construction management for the project.

Client: Hooper Water Improvement District
Reference: Scott Christiansen, District Manager
Contact: P: 801.985.1991 | E: scottsc@hooperwater.net
Location: Hooper, Utah
Dates: 2014 - 2020 (Design/Const. Mngmt)
2019 - 2020 (Construction)
Capacity: ~4 MGD
Cost: \$205K (Design) | \$2.2M (Construction)
Firm: AQUA Engineering
Key Team: Brad Rasmussen, PE, Naho Garvin, PE, Lindsey Stevens

- ✓ Detailed design
- ✓ Bidding services
- ✓ Construction services
- ✓ Telemetry / SCADA maintenance





In 2008, AQUA Engineering consulted with Blanding City to design a 3 million gallon a day microfiltration water treatment plant and a new transmission line to the plant from a storage reservoir which facilitated gravity flow operation. In addition to the treatment plant and pipeline, a brand-new Telemetry and SCADA system was designed and installed throughout the City to connect the city's wells, flow monitoring, booster pumps, storage tanks, and irrigation pump system to the treatment plant system. The new treatment plant is located adjacent to the existing facility, directly north of Blanding City. Construction started in 2009 and the treatment plant was brought online in April of 2010, completing the \$2.6 million dollar project.

The treatment plant is one of few microfiltration treatment plants in the State of Utah, which treats 3 million gallons a day, and is easily expandable to treat 4 million gallons a day. No pumping is necessary to move water through the treatment plant. A new 16-inch transmission pipe supplies settled reservoir water via gravity flow to the new treatment plant. The treated effluent is stored offsite in a 1-million-gallon storage tank which feeds Blanding City.

Client: City of Blanding
Reference: Terry Ekker, City Engineer
Contact: P: 435.678.2791 x 3487 | E: tekker@blanding-ut.gov
Location: Blanding, Utah
Dates: 2009 - 2010 (Design) | 2009 - 2010 (Construction)
Capacity: 3 MGD
Cost: \$162K (Design) | \$2.6M (Construction)
Firm: AQUA Engineering
Key Team: Scott Rogers, PE, Darin Hawkes, PE

- ✓ Master planning
- ✓ Funding assistance
- ✓ Detailed design
- ✓ Bidding services
- ✓ Start-up services
- ✓ Construction services
- ✓ Telemetry / SCADA maintenance



City of Boulder

Betasso Water Treatment Facility Capital Improvements



Mr. Daw was responsible for developing and coordinating a multi-disciplined engineering assessment of the City's existing 40-mgd conventional surface water treatment plant and developing decision-support analysis to evaluate options to increase pretreatment capacity, update or replace aging filter equipment and media, implement residuals handling (dewatering) improvements, increase reliability and redundancy of the facility's electrical service and electrical distribution system, and migrate existing equipment from motor control centers exceeding their useful lives. A decision-support matrix was used to prioritize capital and maintenance improvements including new pretreatment basins using high-rate clarification modules; filtration upgrades including replacing existing filter multimedia with dual media, new surface wash systems, new filter valves and actuators, and new backwash troughs; and the implementation of a residuals dewatering system using a combined gravity belt thickener and belt filter press to achieve 16% to 18% solids and reduce the sludge hauling requirements for the City's operations. Brian led the multi-disciplined preliminary design, final design, bidding and construction administration of the \$32M project that was successfully completed in 2019 with <3% change orders and 10% under the engineering budget. Additional services were completed using the remaining budget to complete a 3D model of the entire facility and a CT-tracer study used to identify disinfection limitations in the WTP's aboveground steel clearwells/storage tanks.

Client:	City of Boulder
Contact:	Stephen Grooters, PE, Utilities Engineering Services Manager P: 303.441.3242 Jon Stoddard, Water Treatment Superintendent P: 720. 564.2303
Dates:	2014 - 2019
Capacity:	40 MGD
Location:	Boulder, Colorado
Design Cost:	\$2.4M
Construction Cost:	\$30M

City of Westminster

Semper High-Service Pump Station Reliability and Redundancy Improvements



WESTMINSTER
COLORADO



Mr. Daw was responsible for evaluating, developing and coordinating multi-disciplined assessment and design of electrical system and pumping reliability improvements for the 68-mgd Semper HSPS. The project includes hydraulic transient analysis and design of a new 32,000-gallon surge tank, conversion of a dual 2400V/480V onsite distribution system to 480V, replacing 2400V 600-hp pump motors, a new 1.75MW generator, and a new 36-inch discharge header as a secondary connection to the City's distribution system. Additional scope added by the client includes replacing VFDs, pumps, and critical valves at the Northwest and Reclaimed WTFs.

Client:	City of Westminster
Contact:	Julie Koehler, PE, Utilities Engineering Manager P: 303. 658.2178 Tom Scribner, Water Treatment Superintendent P: 303. 430.2447
Dates:	2017 - 2019
Capacity:	64 MGD
Location:	Boulder, Colorado
Design Cost:	\$1.27M
Construction Cost:	\$14M

SECTION 5 - PROJECT RELATED EXPERIENCE

Extensive Project Experience Relative to Your Needs Municipal & District Consulting Services

Each city, county, and service district has their own unique challenges as it strives to meet the needs of its rate payers. Our goal is to learn and become familiar with these challenges and to find solutions that best fit your circumstances and operations. We listen to your ideas and needs instead of imposing our solutions on you. AQUA has established a reputation for designing municipal infrastructure and facilities that are maintenance friendly and cost effective.

Services Include:

- ✓ Mapping & Modeling Utilities
- ✓ Master Planning
- ✓ Road Systems Design
- ✓ Construction Standards Development
- ✓ Construction Specifications
- ✓ Water Resources
- ✓ Solid Waste Disposal Landfills
- ✓ Transfer Facilities
- ✓ Capital Facility Planning and Impact Fee Analysis
- ✓ Subdivision & Land Development
- ✓ Environmental Compliance
- ✓ Parks & Recreation
- ✓ Streets & Boulevards
- ✓ Storm Drainage Systems
- ✓ Sewer Collection
- ✓ Water Distribution and Storage
- ✓ Grants and Loans Applications

Hyrum City

Ron Salvesen, City Administrator, Hyrum City
P: 435.245.6033 | E: rsalvesen@hyrumcity.com

AQUA Engineering serves as the contract City Engineer for Hyrum City, Utah. As part of their responsibilities they have designed numerous improvements and additions to the City's water distribution, source and storage systems, as well as the City's wastewater collection system and treatment works. They have updated 1,000-3,000 feet of pipe each year since 2006, replacing outdated or undersized piping with 8" or larger pipe to meet State size, material, flow and pressure requirements. The 2011 Water Improvement Project included 3100 feet of 8-inch to 14-inch mainline, cased installation in UDOT right of way, coordination to avoid construction delays and traffic interruptions, as well as the replacement of all the services. It also included 2 PRV Stations. AQUA has designed numerous pump station for both potable, irrigation and wastewater conveyance including a 2100 gpm facility to pump treated wastewater effluent into the pressurized secondary irrigation system. This facility was design and permitted by AQUA.

Grantsville City

James Waltz, Public Works Director | Grantsville City
P: 435.884.0627 | E: jwaltz@grantsvilleut.gov

AQUA Engineering serves as the contract City Engineer for Grantsville City, Utah. As part of its duties AQUA has been responsible for the design of numerous improvements and additions to the City's water distribution system, streets and drainage network, and several municipal facility projects. AQUA has helped the City to design and construct thousands of feet of waterline from 8-inch to 16-inch, multiple PRVs, booster pump stations, groundwater development projects and disinfection facilities. In addition to the dozens of projects that AQUA has designed for the City, we have also implemented standard details and specifications for all projects occurring in City limits, and have assisted the City with review, approval, inspection of projects ranging from single family homes to multi-phase subdivisions and commercial business parks.

City of West Wendover

Chris Melville, City Manager | City of West Wendover
P: 775.664.3081 | E: cmelville@westwendovercity.com

AQUA Engineering serves as the contract city engineer for The City of West Wendover. AQUA reviews and inspects all new subdivision and site developments, improvement of existing developments, and also ensures compliance with Pollution Discharge Elimination System storm water and erosion control requirements. Our efforts also include project inspection and QA/QC as well as coordinating and working with planning commissions, city councils, and associated staff to make sure projects are designed and constructed correctly.

Elk Ridge City

David Jean, Public Works Director | Elk Ridge City
P: 801-423-2300 Ext. 5 | E: davidj@elkridgecity.org

AQUA Engineering serves as the contract city engineer for Elk Ridge City. AQUA reviews and inspects all new subdivision and site developments, improvement of existing developments, and also ensures compliance with Utah Pollution Discharge Elimination System storm water and erosion control requirements. Our efforts also include project inspection and QA/QC as well as coordinating and working with planning commissions, city councils, and associated staff to make sure projects are designed and constructed correctly. In addition to its' typical City Engineering duties, AQUA has helped Elk Ridge to design several projects ranging from water pipeline replacements, PRVs and booster pump stations, streets improvements and municipal facilities.

Mountain Regional Water District

Scott Morrison, General Manager | Mountain Regional
P: 435-645-2555

AQUA Engineering serves as contract District Engineer for Mountain Regional Water District. As the District Engineer, AQUA is responsible for assisting the district with water system master planning, design engineering and construction management services for various water system improvements projects. AQUA has completed several water system master plans and capital facility plans for the District as well as designed multiple pump stations, PRVs, storage tanks and an energy recovery facility and the district's flagship water treatment facility. Notable projects include the Signal Hill Water Treatment Plant, a 4MGD micro-filtration membrane plant; the Lost Canyon Booster Pump Station, a 4,000+ horsepower pumping facility that conveys 7,000 Acre-Feet of raw water to through 5 miles of high pressure welded steel pipe to the Snyderville Basin for regional water use by several water service districts including MRW; and the Silver Creek Tank and Pump Station which assists the District with its' sustainability goals by capturing the energy of water moving downhill through the use of micro-turbine, offsetting the District's energy costs by \$300,000 annually.

Emigration Improvement District

Eric Hawkes| Emigration Improvement District
P: 801-243-5741 | E: eric@ecid.org

AQUA Engineering has worked with Emigration Improvement District (EID) on various water related projects to improve water service and provide fire protection to the residents of Emigration Canyon. AQUA performed the initial water system evaluation and modeling followed by design and project management for the installation of 22,600 lineal feet of 8" water main along the main canyon road including fire hydrants, pressure reducing stations, connection to existing line, service laterals, and asphalt patching. Once this project was completed, the water model for the system was updated and calibrated based on actual fire flow tests at several fire hydrant locations. In addition, a fire hydrant map was generated for the Salt Lake County UFA.

Firm Experience Summary

- ✓ Over 200 Water & Wastewater Treatment Facilities
- ✓ National & International Experience
- ✓ Proven Record of Innovation, Efficiency, and Resource Recovery
- ✓ Reputation and successful history of efficient, cost-effective, and innovative projects
- ✓ Efficiency + Experience = low overhead, we can provide this high level of service and experience at very competitive billing rates.

Below is a select summary of our treatment plant clients by State, many with multiple projects:

Arizona

- Antelope Point Marina Wastewater Treatment Plant
- Big Park Water Reclamation Plant
- Black Canyon Arsenic WTP (3)
- Bullhead City Wastewater Treatment Plant
- Chino Valley Water Reclamation Facility
- Eagar Wastewater Lagoons
- Inscription Canyon Ranch Water Reclamation Facility
- Katherine Heights Wastewater Treatment System
- Page Wastewater Treatment Plant
- Parker Water Reclamation Plant
- Prescott City Airport Wastewater Treatment Plant
- Prescott Valley Water Reclamation Facility
- Wahweap Marina Wastewater Facility

California

- Beaumont Water Reclamation Facility
- California City Wastewater Treatment Plant
- Corona Water Reclamation Facility
- Heber Water Reclamation Facility
- Imperial Valley Water Reclamation Facility
- Las Gallinas Water Reclamation Facility
- Mesquite Lakes Water Reclamation
- Morongo Wastewater Treatment Plant
- Western Riverside County Regional Wastewater Authority
- Willow Creek Wastewater Treatment Facility

Canada

- Kamloops Wastewater Treatment Plant

Colorado

*Bob Frachetti, P.E. Colorado Principal Experience

- Bayfield Water Reclamation Facility
- Gem Village Wastewater Treatment Lagoons
- Avon Wastewater Treatment Facility Blower Control Project Eagle River Water & Sanitation District*
- Boulder County / Eldorado Springs Wastewater System *
- Briggsdale Water Storage Tank and Booster Pump Station*
- Broomfield Wastewater Treatment Facility Odor Control Assessment Study/Design*
- City of Boulder IBM Lift Station*
- City of Idaho Springs Wastewater Treatment Facility*
- Clearwater Water Reclamation Facility*
- Colorado Springs Utilities (CSU) Biogas Utilization Study
- Columbine Lake Water District*
- Dukes West MHP Water System Improvements*
- Gateway Village Water Storage Tank and Booster Pump Station*
- Henderson Mill Water Treatment Plant*
- Lake Forrest Mutual Water Company*
- Lookout Mountain Water District Membrane Filtration Upgrade*
- Mt Crested Butte Wastewater Treatment Facility Comprehensive Performance Evaluation (CPE)*
- Nederland Wastewater Treatment Facility*
- Plum Creek Wastewater Treatment Facility*
- Sludge Management Plan, 201 Facility Plan

Amendment Madison Metropolitan Sewerage District*

- Squaw Creek Wastewater Treatment Facility
- Eagle River Water and Sanitation District*
- St. Vrain Sanitation District Wastewater Treatment Facility*
- Tabernash Meadows Water & Sanitation District, Ground Water Well Permitting*
- Tabernash Meadows Water & Sanitation District Biosolids Handling Improvements*
- Town of Ault Wastewater Treatment Facility*
- Town of Bennett Wastewater Treatment Facility*
- Town of Bennett Water System Improvements*
- Town of Crested Butte Wastewater Treatment Facility*
- Town of Erie Wastewater Treatment Facility Facilities Plan and Comprehensive Performance Evaluation (CPE)*
- Town of Georgetown Wastewater Treatment Facility*
- Town of Georgetown Water Treatment Facility Improvements*
- Town of Kersey Wastewater Treatment Facility*
- Town of Lyons Wastewater Treatment Facility*
- Tri-Lakes Wastewater Treatment Facility*
- United Water & Sanitation District / Brannan Pit Raw Water Pump Station*
- Ute Lake Ranch Wastewater Reclamation Facility*
- Vail Wastewater Treatment Facility. Instrumentation Upgrades, Eagle River Water & Sanitation District*
- West Jefferson County Wastewater Treatment Facility*
- Wolf Creek Ski Area Wastewater Treatment Facility*

Hawaii

- Fort Shafter Water Reclamation Facility
- Pearl Harbor Water Reclamation
- Puako Water Reclamation

Idaho

- Cliffs Water Reclamation Facility Boise
- Franklin City Wastewater Treatment Plant
- Hailey Wastewater Treatment Plants
- Jerome City Wastewater Treatment Plant
- Jerome Pretreatment Facility
- Magic Valley Potato Process Water Treatment Facilities

(2)

- City Wastewater Treatment Plant
- Rexburg Wastewater Treatment Facility

Missouri

- Guys Foods Process Water Treatment Plant

New Mexico

- Edgewood Water Reclamation Facility
- Gallup Wastewater Treatment Plant
- Moriarty Wastewater Plant
- PaaKo Water Reclamation Facility
- Pinion Hills Wastewater Plant
- San Felipe Water Reclamation Facility
- Santa Rosa Wastewater Plant
- Springer Wastewater Plant
- Taos Wastewater Plant
- Tucumcari Wastewater Plant

Nevada

- Elko Wastewater Treatment Plant
- West Wendover Water Reclamation Facility

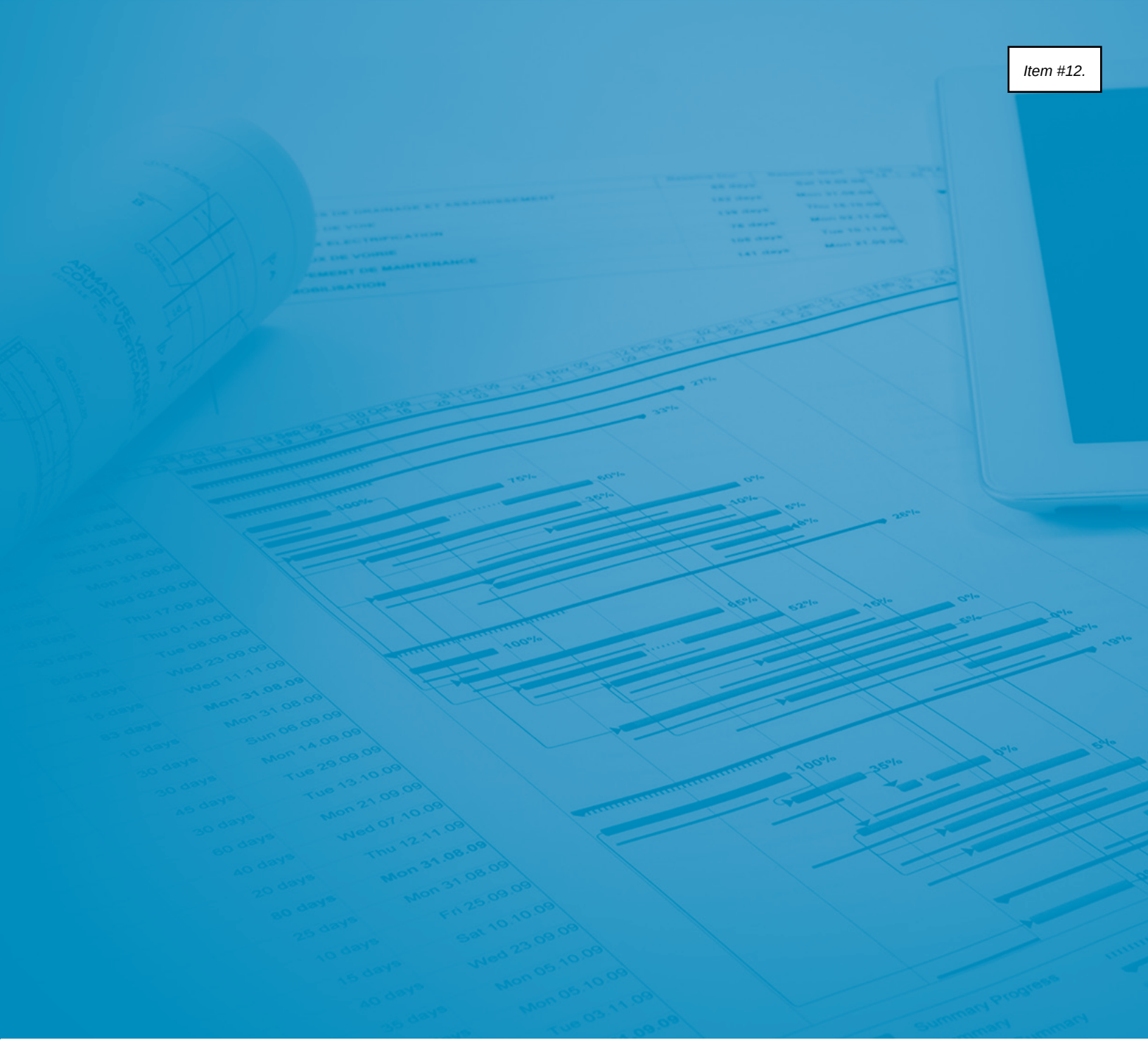
Utah

- Alta Water Treatment Plant
- Amangiri Wastewater Treatment Plant
- American Gourmet Process Water Treatment Plant
- Ananyu Water Reclamation Facility
- Ash Creek Wastewater Treatment Facility
- Bench Lake Water Reclamation Facility
- Bison Creek Water Reclamation Facility
- Blanding Water Treatment Plant
- Blue Mountain Energy Recover
- Bonneville Lime Slaking Facility
- Boundary Springs Water Treatment Facility
- Bountiful City Water Treatment Facility
- Brigham City Wastewater Treatment
- Bristlecone Water Reclamation Facility
- Brown's Canyon Water Treatment Plant
- Canyonlands by Night Water Plant
- Cedar City Wastewater Treatment Plant
- Central Davis County Sewer District Wastewater Treatment Plant

- Clover Club (Borden) Foods Process Water Treatment Facility
- Confluence Park Wastewater Treatment Plant
- Dameron Valley Wastewater Treatment Facility
- Dannon Yogurt Process Water Treatment Plant
- Day Break Water Treatment Facility
- Diamond Ranch Water & Wastewater Facility
- Diamond Ranches Wastewater Treatment Facility
- Diamond Ridges Wastewater Treatment Plant
- Driggs Wastewater Treatment Facility
- E.A. Miller Wastewater Treatment Plant
- East Zion's Special Service District – Wastewater Treatment Facility
- Elwood Wastewater Treatment
- Grantsville Wastewater Treatment Lagoons
- Green Hills Water Treatment
- H.C. Brill Foods Plant
- Heber Valley Water Reclamation Facility
- Hill Air Force Base Process Water Treatment Facility
- Hyclone Labs Pretreatment Facility
- Hyrum Wastewater Treatment Plant
- Jordanelle Water Treatment Plant
- Kennecott Mine Water Neutralization Treatment Facility
- Kennecott Refinery Wastewater Treatment Plant
- LDS Cannery Wastewater Treatment Plant
- Leeds Regional Water Reclamation Facility
- Lost Creek Water Treatment Project
- Magna Water Reclamation Facility
- Malt-O-Meal Pretreatment Facility
- Mancos Wastewater Facility
- Morgan Wastewater Treatment Facility
- Moroni Wastewater Treatment Plant
- Mosaic Water Reclamation Facility
- Mountain Green Wastewater Treatment Plant
- Nestle Pretreatment Facility
- Oakley Water Reclamation Facility
- Orem Wastewater Treatment Plant
- Pacific States Cast Iron Water Treatment
- Payson City Wastewater Treatment Plant
- Provo Wastewater Treatment
- Rainbow Ranch Water Treatment Facility Capitol Reef National Park
- Richmond Water Reclamation Facility
- Ruth's Diner Wastewater Treatment Plant – Emigration Canyon
- Salem Wastewater Treatment Lagoons
- Salt Lake City Airport Oil Skimming
- Salt Lake City Wastewater Treatment Plant
- Salt Lake Service Area #3 Water Treatment Plant
- Santaquin Wastewater Treatment Facility
- Shepherd's Egg Farm
- Silver Pointe Wastewater Plant
- Smith's Food King Dairy and Bakery Process Water Treatment Facility
- South Davis Co. Sewer Improvement Dist. North Wastewater Treatment Plant
- South Davis Co. Sewer Improvement Dist. South Wastewater Treatment Plant
- Spanish Fork Wastewater Treatment Plant
- Spring Creek Treatment Plant
- Springdale Wastewater Treatment Facility
- Springville Wastewater Treatment Facility
- Stansbury Wastewater Treatment Facility
- Stouffer Foods Process Water Treatment Plant
- Tooele Army Dept Process Water Treatment Plant
- Tooele Valley Water Reclamation Facility
- Tooele Wastewater Treatment Facility
- Tremonton Wastewater Treatment
- Tuhaye Ranch Wastewater Treatment
- United Park City Mines Water Treatment Facility
- Wasatch Resource Recovery Facility
- Wendover Wastewater Treatment Facility
- Wendover Water Treatment Plant
- West Point Dairy Wastewater Treatment Plant
- Western Quality Dairy
- Western Zirconium Process Wastewater Treatment
- Wolf Creek Water Reclamation Facility

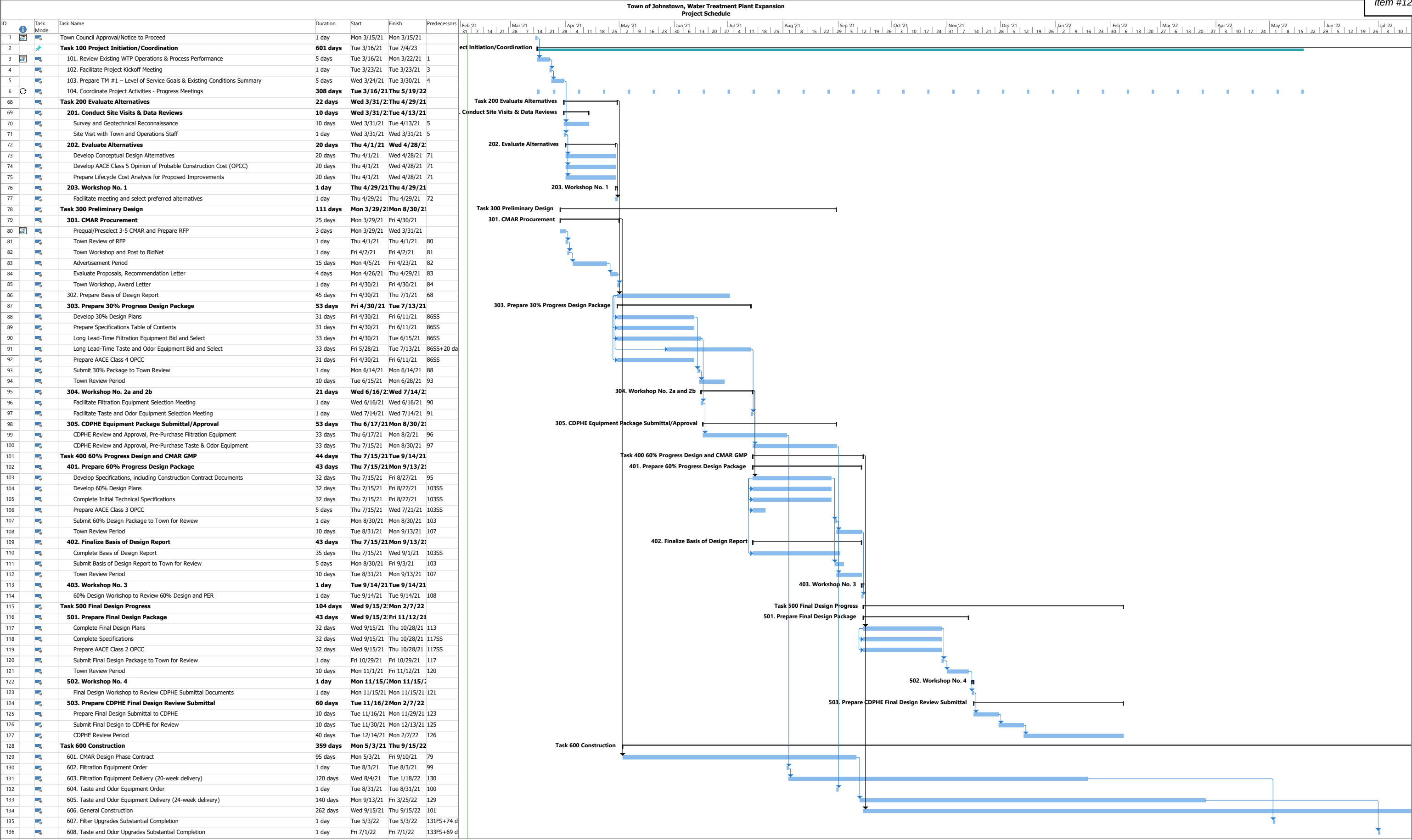
Wyoming

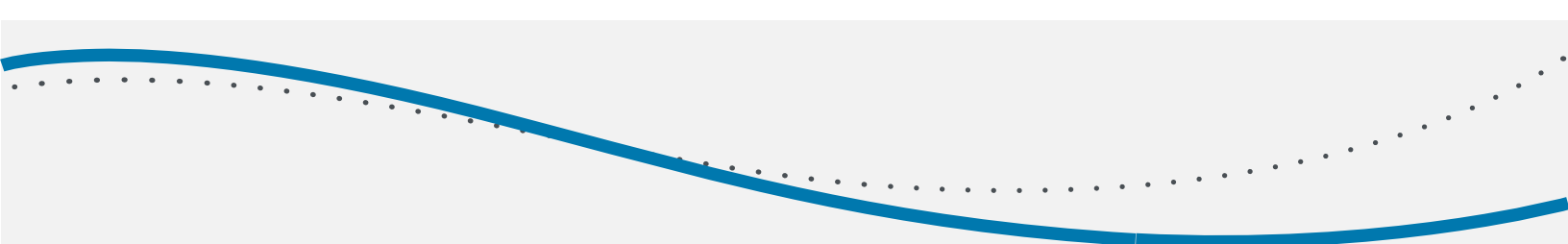
- Jona Well Field Water Treatment Plant



Section 6

Project Schedule





Appendix A | Resumes



Brian C. Daw. P.E | Project Manager

Phone: 801.683.3746 | **Email:** briandaw@gmail.com

Located in Denver, Brian brings 25 years of civil engineering and project management experience with the evaluation, planning, design, and construction administration of water and wastewater treatment and infrastructure projects for municipal and industrial clients. Brian is a registered professional civil engineer specializing in potable water treatment including pretreatment, filtration and disinfection process design; residuals handling systems; chemical feed systems; and storage and distribution system modeling and conveyance design. He also has valuable experience guiding utilities with long-term planning efforts that address the variety of treatment, processes, distribution, storage, and general facility issues and improvements that small and large utilities face.

Brian's project responsibilities regularly include leading multi-disciplined engineering teams during treatment evaluations used to identify and develop recommendations for implementing capital and operations projects. He also has a proven track record of maintaining transparency and well-documented records throughout the project lifecycle to facilitate decision-making and stakeholder records.

As Project Manager, Brian will diligently work with the Town to evaluate treatment options and related costs to assist you with identifying preferred approaches that meet the your operational and capital cost goals.

Project Experience

Project Manager | Betasso Water Treatment Facility Capital Improvements, City of Boulder (CO)

Brian was responsible for developing and coordinating a multi-disciplined engineering assessment of the City's existing 40-mgd conventional surface water treatment plant and developing decision-support analysis to evaluate options to increase pretreatment capacity, update or replace aging filter equipment and media, implement residuals handling (dewatering) improvements, increase reliability and redundancy of the facility's electrical service and electrical distribution system, and migrate existing equipment from motor control centers exceeding their useful lives. A decision-support matrix was used to prioritize capital and maintenance improvements including new pretreatment basins using high-rate clarification modules; filtration upgrades including replacing existing filter multimedia with dual media, new surface wash systems, new filter valves and actuators, and new backwash troughs; and the implementation of a residuals dewatering system using a combined gravity belt thickener and belt filter press to achieve 16% to 18% solids and reduce the sludge hauling requirements for the City's operations. Brian led the multi-disciplined preliminary design, final design, bidding and construction administration of the \$32M project that was successfully completed in 2019 with <3% change orders and 10% under the engineering budget. Additional services were completed using the remaining budget to complete a 3D model of the entire facility and a CT-tracer study used to identify disinfection limitations in the WTP's aboveground steel clearwells/storage tanks.

Project Manager | Semper High-Service Pump Station Reliability & Redundancy

Improvements, City of Westminster (CO). Brian was responsible for evaluating, developing and coordinating multi-disciplined assessment and design of electrical system and pumping reliability improvements for the 68-mgd Semper HSPS. The project includes hydraulic transient analysis and design of a new 32,000-gallon surge tank, conversion of a dual 2400V/480V onsite distribution system to 480V, replacing 2400V 600-hp pump motors, a new 1.75MW generator, and a new 36-inch discharge header as a secondary connection to the City's distribution system. Additional scope added by the client includes replacing VFDs, pumps, and critical valves at the Northwest and Reclaimed WTFs.

Project Manager | Advanced Water Treatment Water Quality Consulting Services, Town of Castle Rock (CO).

Brian was responsible for managing an ongoing on-call agreement with the Town to provide a variety of water quality consulting and engineering services focused on the integration of the Town's new advanced indirect potable reuse treatment plant. Services primarily consisted of evaluating the Town's water quality data to identify raw water, treatment process and finished water quality goals for the Town's integration of its new advanced treatment processes. Task orders included the evaluation of existing operating data to establish baseline performance for the treatment plant in meeting regulatory requirements; developing recommended water quality

Education

MS Civil & Environmental Engineering
University of Colorado – Boulder

BS Civil Engineering,
California Polytechnic State University

Registration

Professional Engineer:
CO, CA

Work Experience

25 Years

Expertise

- Water Treatment Planning, Design, and Construction Guidance
- Wastewater Collection and Treatment System Planning, Design, and Construction Oversight
- Cost-Benefit Analysis

Brian C. Daw. P.E | Project Manager

Project Experience continued

parameters and their respective concentrations/levels to be used for monitoring of taste and odor treatment processes, advanced oxidation (ozone) for removal of contaminants, biological filtration for removal of organics and emerging contaminants; granular activated carbon for water quality polishing for finished water distribution; and UV for disinfection and emerging contaminant removal. Other tasks included modeling intra-zone mixing and associated water quality in the distribution system, and providing the Town with technical support addressing customer questions regarding the indirect potable reuse and natural and anthropogenic contaminants.

Project Manager | Town of Dillon, Lead and Copper Rule Compliance Treatment Town of Dillon (CO).

Brian led the evaluation of corrosion control treatment alternatives in response to lead action-level exceedances observed in the Town's distribution system.

Project Manager | River Water Treatment and Pump Station Evaluation and Design, Confidential Client (WY).

Brian was responsible for leading the evaluation and alternatives analysis for a river water intake and treatment system that was subject to high particle loads from colloidal materials that had compromised an existing multimedia filtration and ion-exchange resin treatment system, resulting in the client's long-term lease of RO membrane filtration and ion-exchange equipment to meet treated water goals. The team analyzed ten (10) alternatives consisting of advanced treatment approaches to successfully identify a recommended treatment train incorporating ultrafiltration downstream of the media filters, purchase of a permanent RO membrane system and addition of a electrodeionization polisher to target remaining mineral contaminants.

Project Manager | Lead & Copper Rule Compliance Treatment Recommendations, Town of Dillon (CO).

Prepared a corrosion control treatment evaluation report in response to increased LCR sample concentrations observed in the Town's distribution system. The project included evaluating the Town's raw and distribution system water quality, and developing corrosion control strategies for minimizing LCR concentrations. Brian also led the coordination effort with CDPHE to identify reasonable, cost-effective approaches to managing LCR concerns observed within a concentration of multi-family residences. Brian was responsible for managing preparation of the plans and specifications for the recommended treatment option and guiding the recommendations through the CDPHE for approval.

Project Manager | City of Durango, College Mesa WTP Onsite Generation Disinfection System, Durango, CO.

The City of Durango requested assistance from HDR to prepare documentation required by the Colorado Department of Public Health and Environment for installing a temporary disinfection system consisting of a tablet feeder. The City is required to take their gas chlorine system off line. HDR was also asked to prepare documentation and transmit supporting information for the Construction Approval Application for the permanent installation of a MIOX disinfection system.

Project Manager | Town of Georgetown, WTF Improvements Project Georgetown, CO

Developed and coordinated a siting and treatment evaluation and decision-support analysis for capital improvements. The scope included distribution system hydraulic modeling and alternatives analysis of treatment facility and storage tank sites, conventional and membrane treatment processes, and pump station and distribution system improvements to replace outdated treatment processes and provide reliable potable water service. Prepared design documents for a new membrane filtration facility; microhydroelectric facility; rehabilitation of an existing 1.5-mg storage tank & foundation; and, a new pump station and 400,000-gallon storage tank with 2,200-lf main extension. The design phase was completed under strict deadline requirements enabling Town to secure loans made available through the American

Project Manager / Lead Engineer | Lookout Mountain Water District, Membrane Filtration Upgrade Project, Clear Creek County, CO Membrane filtration upgrades included process improvements for pretreatment of iron, manganese, and total organic carbon; installation of three Siemens Memcor membrane units (total capacity of 550 gpm); preparing regulatory applications; and, providing construction engineering services. The total project cost was \$1.25 million.

Project Engineer | Metro Wastewater Reclamation District, Chlorine Disinfection System Conversion, Central Treatment Plant (CTP), Denver, CO Project engineering responsible for leading multi-discipline engineering evaluation of alternatives and preliminary design for converting gaseous chemical storage and feed systems to bulk liquid systems for disinfection and dechlorination of 180-mgd wastewater discharge and constructing a new 4,000-gpm plant water pump station. Project was completed for approximately \$10 million. Responsibilities included managing multi-disciplined design team and cost-estimating team; facilitating client design meetings; developing bulk liquid storage facilities and chemical feed equipment; and developing a hydraulic model to evaluate alternative discharge scenarios under tight water elevations restrictions.



Bob Frachetti, PE | Principal

Phone: 303.995.7800 | **Email:** bob.frachetti@aquaeng.com

Bob has over 30 years of project management and technical experience in virtually all areas of water and wastewater engineering including facilities planning, permitting, design, construction, facility commissioning, performance evaluations, and energy efficiency audits. His strengths include process modeling and design, technology and equipment selection, detailed design engineering, energy efficiency upgrades, hydraulics, and construction engineering and management. He also has significant experience with integrated project delivery methods including design-build, CMAR, and performance contracting.

Project Experience

SELECT WATER ENGINEERING EXPERIENCE

Bennett On Call Engineering Services, 2017 - Current

Water Distribution System, Permitting Assistance, Davis Bacon Compliance Review, WWTF On Call Eng. Services, Water Storage Tank Evaluation, Lagoon & E. Interceptor, ISO Fire Flow Modeling, Cordella LS Immediate Improv., Reclaimed Water Permitting Evaluation, Renewable Water Supply Consulting

Indian Hill Water District On Call Engineering, Current

Engineering Analysis, Hydraulic Modeling, Water Master Planning, Project Management

Boulder County, CO San Souci Water Treatment Plant, 2020

Surface Water Treatment, Facility Planning, Design, Permitting, Project Management

Spring Valley Metro District #1, CO Arapahoe Well #2, 2020

Groundwater Development, Hydraulic Analysis, Design

Clear Water Metropolitan District, Water Treatment Storage & Distribution, 2018

Principal in Charge/Project Manager

Miller Ranch Pump Station Water Engineering, 2018

Principal in Charge/Project Manager

Town of Bennett Water System Improvements. Principal-in-Charge/ Project Manager. Managed and performed engineering for multiple projects including complete water system infrastructure audit and assessment, capital improvement plan, water system hydraulic model, new storage tank alternatives evaluation, multiple well house upgrades (pumps and SCADA), new groundwater well drilling, permitting, treatment, and connection to distribution system. Engineer of Record for new 0.5 MG elevated water storage tank and distribution system improvements project including planning, permitting, design, construction engineering.

Town of Georgetown WTF Improvements. Principal-in-charge for a \$3.6 million improvements project including a new 0.63 MGD membrane filtration facility; micro hydroelectric facility; replacement of an existing 1.5-mg storage tank; a new 1,500-gpm pump station; and a new 400,000-gallon welded steel storage tank with 2,000-lf distribution main extension. Design phase services were completed under strict deadline requirements enabling Town to secure \$3.34 million of loan forgiveness and 0% loans made available through the American Recovery and Reinvestment Act (ARRA) and Colorado state revolving funds.

Tabernash Meadows W&S District. Project Manager for new ground water well permitting and chlorination project.

Lookout Mountain Water District Membrane Filtration Upgrade. Principal-in-Charge for membrane filtration CL2 disinfection upgrades including process improvements for pretreatment of iron, manganese, and total organic carbon; installation of three Siemens Memcor membrane units (total capacity of 550 gpm); design of chlorine disinfection facilities; preparing regulatory applications; and, providing construction engineering services. The total project cost was \$1.25 million.

Education

BS Civil and Environmental Engineering, Clarkson University
Potsdam, New York, 1990

Graduate Level Coursework:

Syracuse University Environmental Chemistry and Analysis, 1992

SUNY Environmental Science and Forestry Water Pollution Engineering, 1992

Licensing

Professional Engineer Colorado, 1994
Professional Engineer, New Mexico, 2007 (inactive)

Work Experience

30 Years

Experience Highlights

- Project Manager/ Principal in Charge and Engineer of Record for numerous water and wastewater treatment facility projects
- Construction experience as a General Contractor and Resident Engineer
- Process design expertise and process equipment and technology specialist
- Alternative project delivery experience: design-build; CMAR; public private partnerships

Bob Frachetti, PE | Principal

Project Experience (continued)

Briggsdale Water Storage Tank and Booster Pump Station. Project Manager and lead design engineer for design and construction of a new bolted steel water storage tank and booster pump station. Project was funded by the USDA grant. Prepared Final Design (plans and specifications) and managed office and field engineering.

Gateway Village Water Storage Tank and Booster Pump Station. Project Manager for design and construction of new 0.5 MG bolted steel water storage tank and booster pump station.

United Water & Sanitation District / Brannan Pit Raw Water Pump Station. Project Manager / lead design engineer for 25 cfs raw water pumping station. Vertical turbine pumps and controls. 36" DIP discharge piping.

Lake Forrest Mutual Water Company. Project Manager / lead design engineer for RO water treatment system for fluoride removal.

Dukes West MHP Water System Improvements. Project Manager/ lead design engineer for well upgrades, chlorination, and storage tanks.

Henderson Mill Water WTP. Project Manager/ lead design engineer for new 0.25 MGD membrane water treatment plant.

Columbine Lake Water District. Project Manager/ lead design engineer for water treatment system upgrade to remove iron and manganese.



Darin Hawkes, PE | Principal

Phone: 801.683.3727 | **Email:** darin.hawkes@aquae.com

Mr. Hawkes' has a vast amount of experience in various civil engineering disciplines. He specializes in difficult projects that often have space, access and/or extreme time constraints. He has developed a reputation for being able to view a problem from multiple angles to develop a solution that works for his client. His experience ranges from pumping system design, concrete storage tanks and open reservoir design, to large concrete water storage facilities and high elevation snowmaking reservoirs and dams. Many of his projects are provided as turn-key solutions for his clients with his direct involvement from conceptual design through contract administration and project close-out. As part of the AQUA team, he has lead and assisted in numerous design projects, the completion of several System Capacity Analyses, Municipal Capital Facility Plans and large-scale Master Plans for both culinary water and wastewater.

Project Experience

Water Storage Facilities

Mountain Regional Water 2MG Rectangular Tank Design - 2016

Civil, Structural, Mechanical Design & Construction Management
Rectangular tank design, partially buried, conventionally reinforced concrete. Lead all aspects of civil engineering design and construction management services.

Promontory Ranch 1MG Concrete Tank Design - 2015

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, conventionally reinforced concrete, ridge-top site with difficult access. Lead all aspects of civil engineering design and construction management services.

Snowbird Snowmaking Reservoir Design - 2015

Civil, Structural, Mechanical Design & Construction Management
Open 10 MG lined reservoir, high altitude (10,200 msl), extreme access, blasting required, rock excavation. Lead all aspects of civil engineering design and construction management services.

Snowbasin Snowmaking Reservoir Design - 2014

Civil, Structural, Mechanical Design & Construction Management
Open 12 MG lined reservoir, high altitude (8,700 msl), extreme access, blasting required. Lead all aspects of civil engineering design and construction management services.

Owens Corning 225Kgal Fire Storage Tank Design - 2013

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, conventionally reinforced concrete with fire pump station structure built integral with the tank deck. Lead all aspects of civil engineering design and construction management services.

Hyrum City, Utah - 2MG Concrete Tank - 2011

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, conventionally reinforced concrete, space constraints required extensive hillside shoring using soil screws and retaining mesh. Lead all aspects of civil engineering design and construction management services.

Elk Ridge City, Utah - 1MG Prestressed Concrete Tank - 2008

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, prestressed reinforced concrete; assisted with structural design and construction management services.

Education

BS Civil Engineering,
University of Utah, 2003

Registration

Professional Engineer (Structural):
Utah

Work Experience

17 Years

Affiliations

ASCE

Expertise

- Hydro and Civil Structural Design (Storage Tanks, Retaining Walls, Platforms, etc.)
- Pumping System Design
- Industrial Facility Expansion, Remodel and Retrofit
- Hydraulic & Hydrologic
- Computer Modeling
- Facility Plans & Master Plans
- Water Resources Treatment

Darin Hawkes, PE | Principal

Project Experience (continued)

Pumping Stations

Deer Crest Booster Pump Station

Civil, Structural, Mechanical Design & Construction Management

Mountain Regional Water 2MG Tank Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Grantsville West Bench Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Mountain Regional Water Bear Hollow Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Mountain Regional Water Blackhawk Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Hyrum City Reclaimed Water Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Master Plans, Capital Facility Plans, Planning Documents

Driggs Idaho Water System Facility Plan

CAD software water modeling, Planning and system characterization

Western Zirconium Chemical Milling Facility Site Feasibility Study

Construction Feasibility Review

Sage Glen Well Preliminary Engineering Report

Develop PER as required per Utah Division of Drinking Water Requirements

Pole Canyon Wet Utilities Master Plan

Planning, Survey coordination, CAD Utility Modelling, Cost analysis

West Wendover Nevada Culinary Water and Wastewater System Master Plan

Planning

Wells and Groundwater Development

Utah Valley University Irrigation Well

Civil, Structural, Mechanical Design & Construction Management

Utah Valley University South Well Overdrill

Civil, Structural, Mechanical Design & Construction Management

Utah Valley University Heat Exchange Wells

Civil, Structural, Mechanical Design & Construction Management



Kevin Allcott | Construction Manager

Phone: 801.683.3724 | **Email:** kevin.allcott@aquaeng.com

Mr. Allcott has over 32 years experience in the construction industry. As a construction manager for AQUA, Mr. Allcott specializes in construction oversight, contract administration, dispute resolution, and construction management. His experience has included trouble shooting, scheduling, contract dispute resolution and performance measurement systems implementation on projects ranging in value from \$2.5 to \$350 million. Mr. Allcott has developed sophisticated computer models of complex construction projects for use in project management as well as recovery plans. These models have also been used to determine cause and affect relationships between changes and increased costs. He has assisted in the defense of claims for additional compensation on several multi-million-dollar constructions projects.

Project Experience

Construction Management

Rexburg City, ID WWTP Expansion and Upgrade, 2013

Utilized a fixed film process followed by existing oxidation ditches to bring the plant to a capacity of 4.8 mgd, adding ultraviolet disinfection, and a new screw press facility costing about \$9 million.

Stansbury Park Improvement District, 2012

Construction oversight for modifications to an existing lagoon facility including screens, lift station, blower building, and aeration and chlorine contact basins.

Tooele City, UT Wastewater Treatment Plant Phase 2 Upgrade, 2012

Expanded the plant from 2 mgd to about 4 mgd in two phases. Project cost expected to be about \$8.5 million. First phase construction complete. Second Phase includes sludge screw presses solar drying, and UV disinfection.

Tremonton, UT WWTP Salsnes Filter Building, 2011

Installed a new filtering system for redundancy to the primary clarifier.

Provo, UT Wastewater Treatment Dewatering Facility, 2010

The expansion of the sludge dewatering facility including a new building, centrifuge, and associated upgrades costing about \$2.5 million.

Brigham City, UT, WWTP Expansion, 2010

Increased the hydraulic capacity from 4 MGD to 6 MGD and installed new screw presses for biosolids dewatering.

Springville City, UT WWTP Upgrade, 2009

Expansion and Upgrade utilizing a STM Aerotor process that is in construction to bring the plant to a capacity of 6 mgd costing about \$11 million.

Tooele City, UT Wastewater Treatment Plant Phase 1 Upgrade, 2008

Expansion to bring the plant from 2 mgd to about 4 mgd in two phases. Project cost expected to be about \$8.5 million.

Jerome City, ID Wastewater Treatment Plant Upgrade, 2008

Expansion and Upgrade utilizing an MBR process. Included several phases to bring the plant to a capacity of 4.5 mgd costing about \$10 million.

Wolf Creek Sewer District, UT, 2008

0.8 mgd MBR facility at a cost of about \$7 million.

Tremonton, UT WRF Expansion and Upgrade, 2004

Expanded from a 1 mgd facility to 2.2 mgd using STM Aerotor costing \$2.2 million.

Hyrum City, UT WWTP Expansion and Upgrade, 2004

Utilized a Kubota membrane process for a 2 mgd plant with a cost of \$5 million.

Spanish Fork, UT WWTP Upgrade, 2004

Expanded capacity from 3.5 to 5 mgd using STM Aerotor costing \$2.8 million.

Education

B.S. Construction Management,
Boise State University, 1981

Work Experience

32 Years

Expertise

- Construction Oversight
- Contract Administration
- Dispute Resolution
- Construction Management

Kevin Allcott | Construction Manager

Project Experience (continued)

Oakley, UT Water Reclamation Facility, 2004
A new Zenon ZeeWeed 250,000 gpd facility costing \$1.7 million.

Construction Project Oversight
2002 Spanish Fork Belt Press Facility - Spanish Fork, Utah
2002 Orem Secondary Clarifier - Orem, Utah
2001 3-Mile Reservoir Rehab and Aluminum Cover - West Wendover, Nevada
2001 Orem Final Clarifier and DAF Thickener - Orem, Utah
2001 Orem Administration Building - Orem, Utah
2002 Payson WWTP Upgrade, STM Aerotor, Final Clarifier, Digester - Payson, UT
1981 -1985 Morrison-Knudsen Company - Boise, Idaho

Construction Management Consulting
1986 - 1988 Anheuser-Busch Companies Expansion - Newark, New Jersey
1989 - 1990 Honda Motors, Accord Manufacturing Facility - East Liberty, Ohio
1990 - 1992 Southwestern Bell Data Center - St. Louis, Missouri
1992 INEL Chemical Processing Plant - Idaho Falls, Idaho



Nicholas Graue, PE | Senior Project Engineer

Phone: 801.683.3733 | **Email:** nick.graue@aquaeng.com

Mr. Graue is an intensely ambitious Professional Engineer and Project Manager backed by over a decade of experience in the Water and Energy sectors with a proven track record of successful project delivery and program implementation. Nick's deep passion for natural resource conservation has steered him to managing engineering projects where technology can be leveraged to achieve a more sustainable infrastructure. Nick's work experience involves the entire life cycle of engineering projects from capital planning, feasibility analyses and engineering design to contract administration, construction management, facility commissioning and operations consulting.

Project Experience

Mayflower Mountain Resort Water Master Planning & Design, 2020

Engineering Analysis, Hydraulic Modeling, Water Master Planning, Water Storage Tanks, Pump Stations, Flow Control Facilities, PRVs, Utility Design, Project Management

Lakeview Business Park Water & Sewer Master Plan, 2020

Engineering Analysis, Hydraulic Modeling, Utility Master Planning, Design, Project Management

Boulder County, CO San Souci Water Treatment Plant, 2020

Surface Water Treatment, Facility Planning, Design, Permitting, Project Management
West Wendover Water GIS Mapping Update, 2020
GIS Master Planning, Database Design

Spring Valley Metro District #1, CO Arapahoe Well #2, 2020

Groundwater Development, Hydraulic Analysis, Design, Project Management
Snowbird Resort Mid-Gad Lodge Spring Collection & Disinfection Project, 2020
Groundwater, Site Utilities, Mechanical Design, Project Management

Salt Lake County Service Area 3 Chickadee Ski-Run Water & Sewer Realignment Project, 2020

Utilities, Water Distribution, Wastewater Collection, Construction Management

Oakley City, UT Cottonwood Springs Improvements, 2020

Groundwater, Mechanical Design, Project Management

Aspen Acres Association Spring Improvements, 2020

Groundwater, Mechanical Design, Instrumentation & Controls, Project Management, Construction Management

Mountain Regional Water, Glenwild Booster Station Upgrades, 2020

Hydraulic Analysis, Mechanical Design, Site Utilities, Permitting
Mountain Regional Water, Hidden Creek PRV & Booster, 2020

Construction Management

Metro Water District of Salt Lake and Sandy Telemetry Radio System Improvements, 2020

Telemetry System Planning & Design

Town of Alta, UT Bay City Mine Pump Improvements, 2020

Hydraulic Analysis, Mechanical Design, Permitting

City of Grantsville, UT Contract District Engineering, Ongoing

Land Use Planning, Utility Master and Capital Facility Plans, Development Plan Review, Hydraulic Modeling, Engineering Analysis

City of Driggs, Idaho Contract District Engineering, Ongoing

Development Plan Review, Hydraulic Modeling, Engineering Analysis

Education

BS Civil Engineering
University of Utah, 2013

Registration

Professional Engineer:
UT, CO, NV, ID, OR, WA

Certifications

Envision Sustainability Professional (ENV SP), Institute for Sustainable Infrastructure

Work Experience

12 Years

Affiliations

AWWA
AWWA/Energy Management Committee

Expertise

- Project Management
- Water System Master Planning
- Hydraulic Modeling
- Pumping System Design
- Intelligent Water Systems
- SCADA & Instrumentation
- Water Conveyance & Transmission
- Asset Management
- Site Utilities
- Water Distribution
- Water Storage Facilities

Nicholas Graue, PE | Senior Project Engineer

Project Experience (continued)

3Kings Water Treatment Plant

Replacement of Park City's existing Spiro Water Treatment Plant with a new 7 MGD mining influenced water treatment plant. The new facility will treat water from four unique water sources including two mine drainage tunnels and a spring. The project includes several sustainable measures like micro-hydro power generation and a water heat transfer HVAC system.

Land Use Planning & Development, Hydraulic Modeling, Pumping System Design, IT Network Design, SCADA & Instrumentation, Asset Management

Western Summit County Interconnect Project

Regional interconnect valve vault and transmission line to further interconnect Western Summit County water service districts.

Hydraulic Modeling, Utilities Design, Mechanical Design, Construction Management

Middle School Well Improvements

Assessment and replacement of existing Middle School Well pumping system including submersible pump and motor, soft starter, electrical and instrumentation.

Hydraulic Modeling, Pumping System Design, Construction Management, Electrical, Instrumentation

Park City Golf Course Maintenance Facility

New 10,000 sq. ft. maintenance building for Park City Golf Course operations, maintenance and administration offices. Project located in a sensitive residential area and involved heightened architectural features and significant public involvement.

Land Use Planning & Development, Architectural, Structural, Site Utilities, Construction Management

Empire Tank Replacement

Replacement of existing 1M gallon above ground steel water tank with a new partially buried concrete tank.

Land Use Planning & Development, Utilities Design, System Analysis

Deer Crest Pump Station and Transmission Line

New drinking water pumping station and transmission line located on a challenging site in a ski run on Deer Valley Resort. The project allowed Park City to save one million kilowatt-hours per year in electrical energy consumption due to a more efficient method of conveying water to the upper reaches of Deer Valley.

Land Use Planning & Development, Hydraulic Modeling, Energy Analysis, Pumping System Design, Mechanical Design, SCADA & Instrumentation Design, Construction Management

Creekside Water Treatment Plant

Reconstruction of two drinking water wells deemed under the influence of drinking water. Project included the demolition of two well houses and construction of a new consolidated well house to contain filtration and ultraviolet disinfection and on-site hypochlorite generation equipment to satisfy drinking water standards applied to groundwater deemed under the influence of surface water.

Land Use Planning & Development, Environmental Permitting, Pumping System Design, Mechanical Design, SCADA & Instrumentation Design, Construction Management

Park Meadows Well Improvements

Replacement of existing Park Meadows Well pumping system including submersible pump and motor, variable frequency drive, electrical and instrumentation.

Hydraulic Modeling, Pumping System Design, Construction Management

Park City Water SCADA and Telemetry System Replacement

Progressive design-build project to fully replace existing water utility SCADA system & telemetry communications system. The project replaced of all PLC and IO modules for two water treatment plants, three wells and 75 remote distribution system facilities and also included the construction of a high-speed 5G radio and fiber optic networks to support system communications.

SCADA & Telemetry System Master Planning, SCADA & Instrumentation Design, IT Network Design, Systems Integration, Construction Management

Park City Top of Main Street Pressure Reducing Station

New pressure reducing station serving the heart of Historic Old Town in Park City, UT.

Hydraulic Modeling, Site Utilities, Mechanical Design, Construction Management

Park City Heights Water Storage Tank

Water storage tank site selection feasibility study including construction feasibility assessment and preliminary engineering.

Hydraulic Modeling, Feasibility Study, Utilities Design, Construction Management

Park City Distribution System Hydraulic Model

Constructed and calibrated a full distribution system hydraulic model for Park City's water system and administered the hydraulic modeling program to support project development review, water system master planning and water system optimization efforts.

GIS, Hydraulic Modeling, Operations Analysis



Ryan Pack, P.E. - Principal

(801) 683-3761 - ryan.pack@skmeng.com

Mr. Pack has experience with many components of SCADA and controls. He has worked with controls as simple as relay logic and PID loop controllers thru complex radio controlled SCADA systems. He has worked with many different programmable logic controllers and Operator interfaces including Allen Bradley, Control Microsystems, GE, Koyo, Modicon, Siemens, and others. He has utilized many software packages for human machine interface including Allen Bradley, GE Proficy (Intellution), Wonderware, and National Instruments Lookout. He has designed and installed new systems, replaced old systems, and expanded existing control systems. Mr. Pack has worked with many communications systems including radio, fiberoptics, ethernet, serial, and proprietary communications systems such as controlnet and profibus. He has conducted numerous path studies, for both licensed and non-licensed radio communications systems. He has designed and installed radio telemetry systems with over 50 remote sites.

Work Experience

18 Years

Education

BS Electrical Engineering
University of Utah, 2002

MBA
Weber State University, 2005

Registration

Professional Engineer:
UT, ID, NV, WY, CO, HI, NM

Specialties

- Electrical and Controls
- Design
- Construction Oversight
- Control Systems
- Telemetry and SCADA Systems
- Design
- Control Testing
- Programming
- Startup and Maintenance
- Contracts

Project Experience

Lost Creek Project, Summit County, UT. Electrical/Controls Engineer

Mr. Pack worked on this project in all aspects from the shallow wells to the treatment facility. Ryan designed Mountain Regional Water's SCADA system, and has continued working on the system since original installation. He oversaw the programming and startup of the existing Lost Creek Canyon control system, and is extremely familiar with its layout, configuration, and applications. Ryan also worked on the design for the motor controls, power distribution, lighting, and instrumentation for this system.

Mountain Regional Water SCADA, Summit County, UT. Controls Engineer

SKM designed a new SCADA system for the district that included all of the water distribution, raw water collection, and treatment. He worked with the water district to design a new SCADA system that included all of the water distribution, raw water collection, and treatment. He worked with the water district to meet their monitoring, reporting, and control needs. Ryan coordinated the installation with their staff, and programmed much of the system. This included reporting, monitoring, alarming, and full control of the system. He continues to maintain the system with SKM's staff of service personnel.

Idaho Falls Water SCADA, Idaho Falls, ID. Controls Engineer

SKM designed a backup power generation system for the water department, as well as the control interface between the Generator and the SCADA system. Mr. Pack is currently maintaining their water system SCADA and controls, and is under contract to perform programming on their upcoming additions.

Santaquin SCADA, Santaquin, UT. Controls Engineer

SKM designed a new SCADA system for the city that included all of the water distribution, wastewater collection, and wastewater treatment facility. Mr. Pack worked with the city to meet their monitoring and control needs, and provide a system that would work for them. He coordinated the installation with local trades, and aided in the programming of the system. This included reporting, monitoring, alarming, and full system control.

Summit Park Boosters, Summit County, UT. Electrical/Controls Engineer

SKM worked on the electrical and controls design for the two pump stations, and flow control station required for this project. Mr. Pack designed the motor controls, instrumentation, and controls required to operate the facilities as required by Mountain Regional Water.

Bountiful City Water, Bountiful, UT. Electrical/Controls Engineer

SKM has worked on numerous projects for the City of Bountiful. Mr. Pack has designed numerous motor control and distribution systems for wells and boosters for the city. He has worked with the department head to incorporate complete system control from the motor control enclosure for each of these sites.

Davis and Weber Counties Canal SCADA, Weber County, UT. Controls Engineer

SKM is currently working on installation of a new SCADA monitoring system for the canal company. This includes the monitoring of all canal discharge flows, as well as monitoring of the primary canal flow. Ryan designed the radio network, control system, and aided the district in coordinating installation of required hardware.

East Zion SCADA, East Zion SSD, UT. Electrical/Controls Engineer

Ryan Designed the Electrical, Controls, and SCADA system for this community's water system. This included phase conversion for the booster pumps, tank level monitoring, well control and communications between the sites. Ryan designed all of the motor controls and instrumentation for this project.



Alicia Thorpe, PE

PRINCIPAL | SR. MECHANICAL PROJECT MANAGER

Alicia offers more than 20 years of experience as a project manager in mechanical HVAC design. She is dedicated to building client relationships and providing the highest level of service. Alicia has worked extensively on a wide variety of projects, including commercial, municipal and educational facilities.

PROJECT ROLE

Mechanical HVAC and plumbing design

Coordination of mechanical and plumbing systems

On-site problem solving

New construction and remodel projects

Building commissioning

EDUCATION

Bachelor of Science in Architectural Engineering, University of Wyoming, 1997

PROJECT EXPERIENCE: WATER TREATMENT FACILITIES

Gold Creek Wastewater Treatment Plant | Elizabeth, CO

Water Treatment Plant | Fallon, NV

Wastewater Treatment Plant | Lafayette, CO

Sterling Water Treatment Plant | Sterling, CO

Rifle Water Treatment Plant | Rifle, CO

Dory Hill Water Treatment Plant | Black Hawk, CO

City of Greeley Bellevue Water Treatment Plant | Fort Collins, CO

Eagle River Water and Sanitation District | Avon, CO

Consolidated Mutual Water Company Water Treatment Plant | Lakewood, CO

Scottsdale Water Treatment Plant | Scottsdale, AZ

UNC Central Campus Chilled Water Plant | Greeley, CO

CSU Engines and Energy Conversion Lab | Ft. Collins, CO

New Belgium Brewery Water Filtration Plant | Fort Collins, CO

MEMBERSHIPS & LICENSING

Professional engineer, licensed in Colorado and 23 other states

Member American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

Member National Council of Examiners for Engineering & Surveying (NCEES)



Jay Cooper, PE
MECHANICAL PROJECT ENGINEER

Jay offers five years of experience in mechanical engineering. Jay is a results-driven engineer who uses his knowledge of the building construction process for the benefit of all project stakeholders. He has efficiently designed mechanical and plumbing systems for a wide variety of clients, with a strong base of knowledge in multifamily, commercial and municipal projects. Jay has experience coordinating with internal and external team members to ensure a successful project.

PROJECT ROLE

Mechanical HVAC and plumbing design
Knowledge of design codes
Review of shop drawing submittals
Preparation of field observation reports and field investigations
Coordination with multiple other disciplines and stakeholders in system design to appropriately meet project needs
On-site problem solving
New construction and remodel projects

EDUCATION

Bachelor of Science in Mechanical Engineering, Colorado State University, 2015

MEMBERSHIPS & LICENSING

Professional Engineer
Licensed in Colorado

PROJECT EXPERIENCE

Greeley Water Treatment Plant | Greeley, CO
Loveland Fire Station | Loveland, CO
Gilcrest Fire Station | Gilcrest, CO
Platteville Fire Station | Platteville, CO
Legacy Academy | Elizabeth, CO
Aims General Services Building | Greeley, CO
Future Legends Sports Complex | Windsor, CO
Towneplace Hotel at DIA | Denver, CO
Aloft Hotel | Salt Lake City, UT
Huron Multifamily | Denver, CO
Bank of Colorado | Greeley, CO: 4,000 sf bank
New Belgium Clinic | Fort Collins, CO
The Broadmoor Resort | Colorado Springs, CO
Lyric Cinema Café | Fort Collins, CO
Golds Gym | Cheyenne, WY
Chuze Gyms | Various locations
Central Park Station | Aurora, CO
Gravity One Climb | Broomfield, CO

Chad Bringle, P.E.

Project Engineer

**Education**

Mississippi State University
B.S., Biological Engineering, 1997

Professional Registration

Registered Professional Engineer:
Colorado

Professional Affiliations

Colorado Association of
Geotechnical Engineers (CAGE)

American Society of Civil Engineers
(ASCE)

Qualifications Summary

Mr. Bringle has over **18 years of experience** in geotechnical engineering and construction materials testing. He is responsible for conducting project management for soil and foundation geotechnical investigations and subsequent geotechnical design level reports, and contract specification compliance. His design experience includes recommendations for shallow and deep foundations, retaining walls, floor slab performance, groundwater mitigation and dewatering, pavement subgrade stabilization, pavement thickness design, pavement condition and distress mitigation. Mr. Bringle's construction background includes shallow foundation excavation, deep foundation construction techniques and inspection, reinforcement steel inspection, mix designs overview, asphalt inspection, earthwork inspection, and stabilized subgrade techniques.

Professional Experience

▪ **Chatfield Reservoir Reallocation Project** (Littleton, CO): Provided geotechnical recommendations for proposed recreational and environmental improvements to the Chatfield State Park. Geotechnical recommendations included multiple bridge and building foundations, shore fill placement below the water table for Cigar and Titan Lakes, borrow area assessments and embankment fill recommendations, settlement considerations for new fill placement, and internal clay core considerations for proposed embankment dikes.

▪ **Semper High Service Pump Station** (Westminster, CO): Provided geotechnical recommendations for the proposed improvements to the Semper High Service Pump Station. The proposed improvements consisted of an emergency generator, two medium voltage transformers, voltage switchgear, four transformers, a new 32,000-gallon surge tank with a 24-inch buried pipe, a new flow meter vault with a buried 48-inch pipe, and site improvements including grading, retaining walls, and new pavement and new concrete flatwork.

▪ **Plum Creek Lift Station Phase I Infrastructure** (Douglas County, CO): Provided geotechnical recommendations for new lift station and water and sewer lines for the 400-acre Plum Creek Development.

▪ **1.5 MG Potable Water Tank and Water Treatment Plant** (Georgetown, CO): Provided field exploration and geotechnical recommendations for a new 1.5 MG water tank at an existing water tank site and new water treatment plant adjacent to Clear Creek at the base of Guanella Pass. The existing water tank was heavily distressed due to bearing on variable soil conditions consisting of bedrock on the uphill side and man-placed fill on the downhill side. Provided design level drawings and provided construction observation services for a reinforced segmental concrete block retaining wall to create a level pad above a steep bank down to Clear Creek for the new water tank.

▪ **Georgetown Wastewater Treatment Plant Expansion** (Georgetown, CO): Performed geotechnical engineering study for improvements to the existing wastewater treatment plant in Georgetown, Colorado.

▪ **88th Avenue Open Space Improvements** (Adams County, CO): Provided geotechnical recommendations for environmental restoration of the South Pond riparian habitat. Provided geotechnical recommendations for new fishing pier, backfill considerations and structures located on new shorebank construction.

▪ **Spinney Mountain Reservoir** (Park County, CO): Provided a Geotechnical Data Report for the Seepage Evaluation of Spinney Mountain Dam.

▪ **Onsite Wastewater Treatment System (OWTS) Design** (Summit, Grand, Larimer, Weld Counties, & Tri-County Health): Provided numerous OWTS design systems for residential and small business construction.

Jim Noll, P.E.

President

Principal-in-Charge

**Education**

University of Colorado
B.S. Civil Engineering, 1985

Winona State University
B.S., Geology, Winona, MN, 1979

Professional Registration

Registered Professional Engineer:
Colorado

Professional Affiliations

Past President Colorado Association of
Geotechnical Engineers (CAGE)

American Council of Engineering
Companies of Colorado (ACEC/CO)

American Society of Civil Engineers
(ASCE)

Qualifications Summary

Mr. Noll has over **37 years of experience** in geotechnical, geological and materials engineering. He has performed a wide variety of investigations and engineering services for projects including transportation; drainage/waterways; retail, industrial and commercial buildings; water and wastewater treatment/distribution facilities; residential development; earthen dams; and mining operations. Transportation related projects range from urban interchanges to mountainous terrain to rural aggregate surface roadways. Structures associated with the projects include single to multi span bridges and viaducts, and numerous retaining wall types. His background includes project management ranging from small-scale projects to large, multi-year contracts for various governmental agencies.

Professional Experience

- Project Manager for numerous drainage way projects throughout the Front Range of Colorado. The projects range from intermittent streams to large creeks and rivers. Various structures were included in the geotechnical studies including large earthen embankments and drop/grade control structures. The drop/grade control structures range from grouted sloping boulder drops to vertical drops with cutoff walls ranging from driven sheet piles to conventional concrete walls. Recommendations for reducing channel bank erosion, bank stabilization and methods for establishing vegetation were provided.

- Project Manager for a wide variety of water and wastewater projects including pipelines, 0.5 to 5 million-gallon water tanks, along with new treatment facility construction and existing facility expansion. The water and sanitation districts include the Town of Erie, City of Aurora, City of Arvada, City of Brighton, Centennial Water and Sanitation, Denver Water, Southgate Water and Sanitation, Stonegate Sanitation, Roxborough Water and Sanitation District, City of Thornton, and Westminster TOD Waterline, City of Westminster. A recent project includes the City of Aurora's Prairie Water Project which consists of 32 miles of a 60-inch diameter, flexible steel pipe which will transmit raw water from Brighton to the Aurora Reservoir. Also, a project for the Roxborough Water and Sanitation District included the Wastewater Regionalization Project which consisted of 13.5 miles of sanitary sewer installation.

- Project Manager for numerous roadway construction/interchange projects throughout Colorado. The projects include I-70 and S.H. 58 Interchange Improvements, Plum Creek Parkway Extension at I-25, I-25/23rd Avenue Braided Ramp, Collector/Distributor Road – Speer Boulevard to 19th Avenue, 144th Avenue and I-25 Interchange, I-225 and Alameda Avenue Interchange, C-470 and Alameda Parkway Interchange Improvements, C-470 Extension from I-70 to U.S. 6, Lucent Blvd. and C-470 Interchange, East and West Interchanges for U.S. 36 at Interlocken Loop, State Highway 40 Limon to Hugo, and State Highway 50C in Pueblo, and the Park Avenue Viaduct from the Platte River to Blake Street.

- Performed nondestructive deflection testing and overlay analysis for agencies such as the E-470 Public Highway Authority and CDOT. The pavement analysis was performed through the use of a Falling Weight Deflectometer (FWD) to determine the existing structural capacity of the pavement section and underlying subgrade materials for estimation of remaining pavement life and overlay requirements. The evaluation and analysis has been performed for a wide range of facilities including major interstate highways, low volume streets, airfield pavements and parking lot facilities.



INNOVATIVE ENGINEERING SOLUTIONS

AQUA Engineering UT
533 W 2600 S, Suite 275
Bountiful, UT 84010
801.299.1327

AQUA Engineering CO
5325 S Valentia Way
Greenwood Village, CO 80111
720.667.1250

SKM Engineering
533 W 2600 S, Suite 25
Bountiful, UT 84010
801.677.0011

Aqua Environmental Services, Inc.
89 Monarch Dr
Bountiful, UT 84010
801.694.9106

Fee Proposal

Carollo’s fee for this project is based on the proposed ozone and biofiltration approach (option 3). We have initially assumed approximately 250 drawings would be required for this project and have included 30%, 60%, and 90% design milestones. We are open to negotiating the fee based on the Town’s preference for how to progress the design and whether this project is ultimately delivered as Design Bid Build or CMAR. We have also included a series of optional tasks for your consideration.

Item #12.

Town of Johnstown | Johnstown WTP Expansion Carollo Engineers, Inc. Fee Estimate | 2/05/2020

	Team Member	Senior Specialist	Senior Professional	Lead Project Professional	Project Professional	Professional	Assistant Professional II	Assistant Professional I	Senior Designer	Senior Technician	Technician	Doc Processing	Clerical	Carollo Hours	Carollo Labor Cost	Sub Consultants	Carollo ODCs	Total Engineering Cost
Task	Description	\$275	\$250	\$225	\$200	\$175	\$160	\$140	\$180	\$160	\$135	\$120	\$100					
1	Task 1 - Project Management																	
1.1	Project Coordination	20	200											220	\$55,500	\$-	\$-	\$55,500
1.2	Progress Meetings	20	60	20	20	40	40	40				10		250	\$49,200	\$-	\$750	\$49,950
	Subtotal Hours Task 1	40	260	20	20	40	40	40	0	0	0	10	0	470				
	Subtotal Task 1	\$11,000	\$65,000	\$4,500	\$4,000	\$7,000	\$6,400	\$5,600	\$-	\$-	\$-	\$1,200	\$-	470	\$104,700	\$-	\$750	\$105,450
2	Task 2 - Preliminary Process Selection and Design																	
2.1	Process Alternatives Evaluation	20	80		20	40	40	80		8				288	\$55,380	\$-	\$250	\$55,630
2.2	Survey and Geotechnical Engineering		4		8		16			8	8			44	\$7,520	\$32,670	\$100	\$40,290
2.3	Preliminary Design	10	40	40	60	80	80	120	40	100	200	20	20	810	\$131,950	\$-	\$100	\$132,050
2.4	Preliminary QC	10	40	40										90	\$21,750	\$-	\$100	\$21,850
2.5	Conceptual Cost Estimate	4	80				10							94	\$22,700	\$-	\$100	\$22,800
	Subtotal Hours Task 2	44	244	80	88	120	146	200	40	116	208	20	20	1326				
	Subtotal Task 2	\$12,100	\$61,000	\$18,000	\$17,600	\$21,000	\$23,360	\$28,000	\$7,200	\$18,560	\$28,080	\$2,400	\$2,000	1326	\$239,300	\$32,670	\$450	\$227,970
3	Task 3 - Detailed Design (60% Drawings and Specifications)																	
3.1	Site Civil and Yard Piping				10		40		20		40	10		120	\$18,600	\$-	\$-	\$18,600
3.2	Structural		20				160		20	60	80	10		350	\$55,800	\$-	\$-	\$55,800
3.3	Architecture							40				4		44	\$6,080	\$41,580	\$-	\$47,660
3.4	Process Mechanical		20		80			180	40	60	200	10		590	\$91,200	\$-	\$-	\$91,200
3.5	Building Mechanical			20				100	20	60	100	10		310	\$46,400	\$-	\$-	\$46,400
3.6	Electrical					160			20	140	100	10		430	\$68,700	\$-	\$-	\$68,700
3.7	I&C					200		40	20	120	160	10		550	\$86,200	\$-	\$-	\$86,200
3.8	60% QC	12	60	60										132	\$31,800	\$-	\$-	\$31,800
3.9	60% Cost Estimate	4	30			4		4						42	\$9,860	\$-	\$-	\$9,860
	Subtotal Hours Task 3	16	130	80	90	364	200	364	140	440	680	64	0	2568				
	Subtotal Task 3	\$4,400	\$32,500	\$18,000	\$18,000	\$63,700	\$32,000	\$50,960	\$25,200	\$70,400	\$91,800	\$7,680	\$-	2568	\$414,640	\$41,580	\$-	\$456,220
4	Task 4 - Final Design (90% Drawings and Specifications)																	
4.1	Site Civil and Yard Piping				60		20		20	60	80	8		248	\$40,160	\$-	\$-	\$40,160
4.2	Structural		20				100		20	80	80	8		308	\$49,160	\$-	\$-	\$49,160
4.3	Architecture						40					4		44	\$6,880	\$20,790	\$-	\$27,670
4.4	Process Mechanical	4	40		80			140	60	100	120	8		552	\$90,660	\$-	\$-	\$90,660
4.5	Building Mechanical			40				100		60	80	8		288	\$44,360	\$-	\$-	\$44,360
4.6	Electrical					200			20	100	200	8		528	\$82,560	\$-	\$-	\$82,560
4.7	I&C					100		40	20	200	100	8		468	\$73,160	\$-	\$-	\$73,160
4.8	90% QC	4	60	60	40									164	\$37,600	\$-	\$-	\$37,600
4.9	90% Cost Estimate		24		4	4		6						38	\$8,340	\$-	\$-	\$8,340
	Subtotal Hours Task 4	8	144	100	184	304	160	286	140	600	660	52	0	2638				
	Subtotal Task 4	\$2,200	\$36,000	\$22,500	\$36,800	\$53,200	\$25,600	\$40,040	\$25,200	\$96,000	\$89,100	\$6,240	\$-	2638	\$432,880	\$20,790	\$-	\$453,670
5	Task 5 - Issued For Construction																	
5.1	IFC Drawings and Specifications	4	20		40	40	40	80	40	40	140	40	20	504	\$78,000	\$6,930	\$250	\$85,180
	Subtotal Hours Task 5	4	20	0	40	40	40	80	40	40	140	40	20	504				
	Subtotal Task 5	\$1,100	\$5,000	\$-	\$8,000	\$7,000	\$6,400	\$11,200	\$7,200	\$6,400	\$18,900	\$4,800	\$2,000	504	\$78,000	\$6,930	\$250	\$85,180
6	Task 6 - Permitting																	
6.1	Permitting	8	30		40	40		60		10		4	0	192	\$35,180	\$-	\$-	\$35,180
	Subtotal Hours Task 6	8	30	0	40	40	0	60	0	10	0	4	0	192				
	Subtotal Task 6	\$2,200	\$7,500	\$-	\$8,000	\$7,000	\$-	\$8,400	\$-	\$1,600	\$-	\$480	\$-	192	\$35,180	\$-	\$-	\$35,180
	Total Base Project Hours	120	828	280	462	908	586	1,030	360	1,206	1,688	190	40	7,698				
	Total Base Direct Labor Dollars	\$33,000	\$207,000	\$63,000	\$92,400	\$158,900	\$93,760	\$144,200	\$64,800	\$192,960	\$227,880	\$22,800	\$4,000		\$1,304,700	\$101,970	\$1,450	\$1,363,670
	Optional Tasks																	
	Electrical System Study		8			80	60	12			20		10	190	\$30,980	\$-	\$-	\$30,980
	Raw Water Pump Station and Pipeline Alternatives Evaluation		80		80					40				200	\$42,400	\$-	\$-	\$42,400
	CMAR Selection Support	12	20				12	12						56	\$11,900	\$-	\$-	\$11,900
	Ozone Bench Testing		8					12						20	\$3,680	\$-	\$25,000	\$28,680

Town of Johnstown

February 5, 2021 // Proposal

Professional Engineering Services for
Expansion Design of the Town of Johnstown

WATER TREATMENT PLANT EXPANSION FROM 5 MGD TO 10

Carollo's treatment approach cost-effectively provides new capacity, reliable taste and odor control, and easy expandability within the available site footprint.

February 5, 2021

Mr. Marco Carani
Director of Public Works
Town of Johnstown
450 S. Parish Avenue
Johnstown, CO 80534

Subject: Design of the Town of Johnstown Water Treatment Plant Expansion

Dear Mr. Carani and Selection Committee Members:

Rapid demand growth and persistent taste and odor (T&O) concerns demand confidence in design solutions for the Town's Water Treatment Plant expansion. You simply don't have time for trial and error. Carollo's design approach will yield a cost-effective, reliable, operable system, rooted in the following success factors:

- **Immediate treatment capacity expansion.** Our team recognizes the need for increased capacity expansion of the Johnstown Water Treatment Plant. Our approach will fast-track the design while remaining collaborative to include your input in defining treatment drivers and goals, which will lead to the right process selection. Our team is well-versed in every project delivery method; we will help you choose the project delivery approach that best meets your needs. We can leverage established CMAR procurement documents to minimize contractor on-boarding time if CMAR is deemed best for this project, and we can help you identify funding options for the project.
- **Addressing water quality challenges.** We will quickly evaluate process alternatives in partnership with your operations team. We have data and experience (e.g., Greeley, Thornton, Centennial) showing that ozone and biofiltration can reliably address the persistent T&O issues as well as TOC reduction challenges, while fitting within the available site footprint and avoiding costly and operationally-intensive PAC feed. Especially when coupled with an oxidant, this process is far more effective than PAC, and membrane filtration is completely ineffective to address these water quality challenges.
- **Flexibility to accommodate future capacity increases.** Like you, we have our eye on the future and we'll build expandability into the design from day one. We've done this recently at plants in Greeley, Centennial, Colorado Springs, and across the Front Range. And we'll help you get the most out of your footprint – for example, we worked with CDPHE to gain approval of the state's highest filter loading rates in Colorado Springs, maximizing capacity in a set footprint.
- **Dedicated local resources.** With over 150 personnel in our three Front Range offices, we'll staff the project with a 100 percent local team covering all the necessary design disciplines. The depth and breadth of our local resources, with established working relationships, provides a team you can rely on.

We look forward to collaborating with you on innovative solutions to deliver a cost-effective and highly successful project that quickly addresses your customers' capacity and water quality needs.

Sincerely,

CAROLLO ENGINEERS, INC.



Jason Assouline, PE
Project Manager



Vincent Hart, PE
Principal-in-Charge

SECTION

1

Identification of Proposer

Company Information

Since our founding in 1933, Carollo has been a leading expert in the planning, design, and construction management of water projects for municipalities across the country...**Water is all we do.**

Firm background

Carollo Engineers is an environmental engineering firm specializing in the planning, design, and construction of water and wastewater facilities and supporting infrastructure. Carollo's reputation is based upon exceptional client service and a continual commitment to quality. We currently maintain 49 offices throughout the U.S. During our 88-year history, Carollo has successfully completed more than 25,000 projects for public sector clients. We have provided engineering services for numerous water treatment plant designs for clients throughout Colorado with similar design challenges as the Town of Johnstown. Carollo is focused on client service, and values the interactive and collaborative relationships with the utilities with which we work.

Unlike the majority of our competitors, Carollo only provides water and wastewater engineering services. Our nationwide technical staff have an extensive background and training specific to this field. For that reason, the quality and professional standing of our core group of water and wastewater professionals equals or exceeds that provided by some of the largest engineering firms in the country.

Resources

Carollo's staff numbers more than 1,100 employees including more than 500 registered engineers. We are a full-service company with the experience and qualified professionals to successfully manage projects of any size. Our staff includes civil, sanitary, environmental, electrical, mechanical, chemical, structural, control system, and corrosion control engineers, as well as architects, planners, and specialists in other areas. Subconsultants are retained as needed in specialized fields depending on the specific needs of the project.

Carollo in Colorado

Carollo has been providing engineering services in Colorado for 25 years. Our Colorado operations started in Broomfield in 1996, followed shortly thereafter by offices in Littleton and Fort Collins. We continue to expand with highly motivated and talented personnel focused on providing engineering services to our municipal water and wastewater clients. Carollo's Colorado offices currently have over 150 employees including a professional staff of engineers, as well as additional personnel that provide technical and administrative support.

A Complete Colorado Team + National Subject Matter Experts for Johnstown

Our three local offices (Broomfield, Littleton, and Fort Collins) are the primary offices that will manage and execute this work for the Town. Our local offices house some of our firm's most well-known and respected water experts, not just at Carollo, but throughout our industry. We have the right local technical know-how backed by national support, and the necessary bandwidth and resources to support your projects for the long-term.



Identification of Proposer

Jason and Vincent as well as the rest of the project team are located in Carollo's Broomfield Office.

PROPOSER

Production Office:
Carollo Engineers, Inc.
390 Interlocken Crescent, Suite 800
Broomfield, Colorado 80021
P| 303.635.1220

PROJECT CONTACTS

Project Manager: Jason Assouline
P| 303.404.6372
E| jassouline@carollo.com

Principal-in-Charge: Vincent Hart
P| 303.404.6324
E| vhart@carollo.com



Carollo ranks number one among all design firms who work solely in water/wastewater, based on **ENR's "Top 500 Design Firms"** ranking.

Subconsultant firms on the core delivery team

As the prime consultant we selected the subconsultants on our team as a strategic partners in our team's success. There are a multitude of reasons that we value these subconsultants who we have worked with on several recent projects. Foremost, they each bring specific expertise that we know will add tremendous value to the project. The combined diversity of our experience and perspectives results in more robust solutions for you. Our collective team brings a keen understanding and unique perspective to your project, enabling us to tailor our approach and our deliverables to better serve your needs.

Lithos Engineering

Lithos Engineering focuses on geotechnical, tunnel, trenchless, and geological engineering and design services through innovative, collaborative, client focused consulting uniquely tailored to suit the needs of their clients and projects. Lithos staff has provided geotechnical engineering and design services for hundreds of projects around Colorado and beyond, and is experienced in geotechnical design, feasibility studies, and contract document preparation. Steve Kuehr has supported more than 95 percent of Carollo's Front Range design projects. He continually proves himself as reliable and trustworthy for quality results and understand Colorado-specific geotechnical issues.



Lithos Engineering
Geotechnical Engineer
2750 S. Wadsworth Blvd, Suite D-200
Denver, CO 80227
P| 303.625.9502

Subconsultant Contact:
Steve Kuehr, PE
P| 720.316.4858
E| steve@lithoseng.com

Precision Survey & Mapping, Inc.

Precision Survey & Mapping, Inc., is a full service professional land surveying company located in Denver, with specific experience on numerous WTP projects with Carollo. Precision is known for their reasonable rates and dedication to on-time completion of projects while maintaining the flexibility that's required to provide outstanding customized service. Precision utilizes only cutting edge technology including GPS, Robotics Total Stations, and the newest technology, High Definition Survey (HDS) or 3D Laser Scanning, allowing them to maximize their quality, productivity, and efficiency.



Precision Surveying & Mapping
Surveying
9025 E. Kenyon Ave., #150, Denver, CO 80237
P| 303.753.9799

Subconsultant Contact:
Chris Juliana, PLS
P| 303.753.9799
E| chris.juliana@precision-survey.com

Short and Brennan Architects

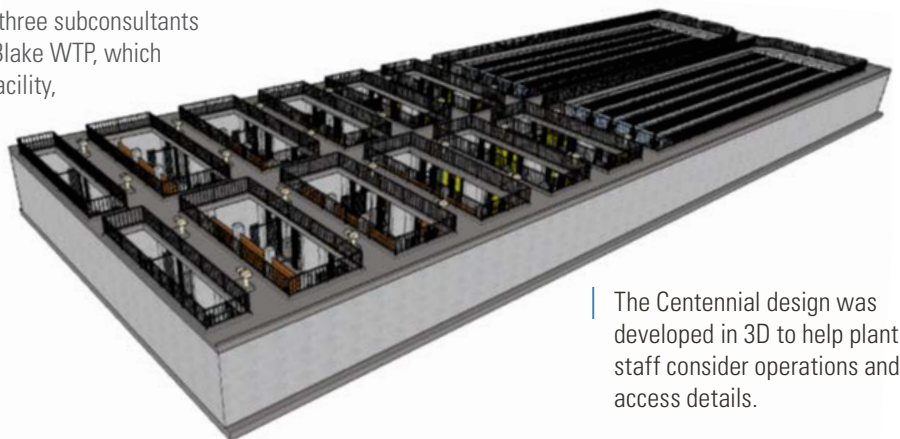
Short and Brennan Architects was founded in 1976, and is a professional design firm that offers comprehensive services in architecture, planning and programming, interior design, and project management. They have actively led and participated in community planning projects, and have designed and constructed projects on both new and existing water treatment plant sites. Their projects are successful because of their commitment to collaboration with the owner and the entire project team. Most recently, Short and Brennan has delivered water projects with Carollo for clients such as Greeley, South Adams County, and Centennial Water and Sanitation District (CWSD). Projects with Short & Brennan have been a mix of masonry structures and pre-fabricated metal buildings.



Short and Brennan Architects
Architectural
One Broadway, Suite A201,
Denver, CO 80203
P| 303.321.2043

Subconsultant Contact:
Greg Short, AIA, LEED AP, PMP
P| 303.321.2043
E| gshort@shortbrennan.com

Examples of Carollo's recent collaboration with all three subconsultants include the Phase I Improvements at Centennial's Blake WTP, which focused on overhauling the 44-mgd pretreatment facility, designing a new chemical building, and determining a comprehensive site plan. This team also collaborated on the City of Greeley's Boyd Lake WTP, which focused on ozone, biofiltration, and a new chemical facility.



The Centennial design was developed in 3D to help plant staff consider operations and access details.

SECTION

2

Project Overview and Approach

We have carefully reviewed the RFP scope of services to devise solutions that will best meet the project objectives and priorities for the Johnstown WTP. The following pages outline our proposed approach and methodology to systematically address the goals of the project by cost-effectively increasing treatment capacity while improving water quality. The concepts present a unique approach that will cost-efficiently and effectively address your objectives for the project. Carollo's treatment approach directly removes taste and odor, reduces residuals production, and avoids the operational costs and headaches associated with PAC.

Project Understanding

Increasing the capacity of the Johnstown WTP (JWTP) is the cornerstone of this project. Inclusive of the plant expansion, there are several additional aspects of the project that cannot be overlooked. Based on our initial analysis of your system we have identified the following key success factors for your project:



Immediate capacity expansion

- Providing additional filter capacity
- Options for raw water and finished water conveyance to match the expanded treatment capacity
- Maintaining robust disinfection for the full range of plant flows and water qualities



Addressing water quality challenges

- Taste and odor (T&O) mitigation
- Additional TOC reduction
- Improving distribution residual chlorine stability



Flexibility to accommodate future capacity increases

- Modularity in capacity expansion and comprehensive site planning

Current treatment expansion must include flexibility for future projects

Each of these aspects are interrelated and a comprehensive solution to the JWTP expansion should include provisions which address all of the above. For example, increasing treatment capacity must be coupled with raw water and finished water pumping and conveyance infrastructure to reliably move water to and from the plant. TOC reduction is a fundamental treatment performance requirement which is essential for controlling disinfection byproduct formation. The current process does not consistently remove TOC, which could lead to elevated THM and HAA concentrations as well as presents challenges with maintaining chlorine residual within the distribution system. Increasing the capacity of the plant without providing additional TOC removal will further strain the ability of the DAF system to provide an effective pre-treatment barrier.

Although not directly capacity related, taste and odor is also at the forefront of the Town's treatment concerns. Increasing plant capacity without providing treatment processes capable of managing MIB and Geosmin in the source water will lead to additional customer complaints, which may impede the rapid growth in the system. A temporary PAC system is a logical near-term solution, however this should not be considered a feasible long-term solution due to the chemical costs as well as the increased residuals which will be generated with this process.

Our approach to solving these challenges is outlined in this proposal and will result in a project that holistically meets the project goal of increasing capacity while efficiently addressing a multitude of other treatment and capacity considerations. Equally important, our approach will not lose sight of capital cost or long-term operational costs, while maintaining operator friendly and low maintenance treatment processes, which build upon the familiarity of the existing treatment system.

Treatment Approach

Carollo's design will cost-effectively expand the JWTP capacity while enhancing water quality, with a particular focus on taste and odor removal. Neither Option 1 or 2 described in the RFP will reliably achieve both objectives. Expanding filtration capacity with filters similar to the existing filters (option 1) is feasible, but presents challenges for constructability adjacent to the existing filters and clearwell. Mimicking the existing filter design does not leverage the advancements in gravity filtration that have been established over the past decade, with higher filter loading rates that will allow increased capacity within the existing site.

Membrane filtration has a wide range of applications and has been implemented in Colorado at several treatment plants. Carollo's team has experience with membrane filtration (option 2) and we understand the advantages and limitations of this approach for the Town. While membranes can address the capacity expansion needs of the plant, this approach will not achieve the Town's goals for water quality improvement.

Our approach builds upon the current treatment with gravity filtration, but would implement the latest technologies for high rate biological filtration, and equipment such as plastic filter underdrains, backwashing (with air scour), and media retaining backwash troughs.

Carollo's treatment approach cost-effectively provides new capacity, reliable taste and odor control, and easy expandability within the available site footprint.

After evaluating options for treatment processes and site layout, including Options 1 and 2 from the RFP, Carollo identified a path forward that cost-effectively expands capacity while addressing critical T&O issues and facilitates low-cost future expansions as the Town grows. The table below provides a summary of some of

the key features of the three treatment options, demonstrating the advantages of Carollo's proposed "Option 3." These advantages are further highlighted in the site layout shown below and in the pages that follow.

Option	Effective T&O control and TOC removal	Expandable to 20+ mgd within site footprint?	Simple & familiar filter O&M	Requires new intermediate pumping	Sole source O&M parts	Existing filters online through construction	Fouling from PAC carryover
1: Duplicate existing filters	No	No	Yes	No	No	Potential	Potential
2: Membranes	No	Yes	No	Yes	Yes	No	Yes
3 (Recommended): Ozone / Biofiltration / UV	Yes	Yes	Yes	No	No	Yes	N/A (no PAC)





Addressing immediate capacity expansion needs

RFP Option 1 is to add two additional filters which match the existing filters at the JWTP. This option is a logical approach to expanding the capacity while maintaining the same treatment that the operations staff is accustomed to. Considerations for the location of the new filter and clearwell must take into account the limited space around the existing filter building, which impacts constructability and maintaining plant hydraulics. More importantly, while additional filters and an expanded clearwell may accomplish the immediate need for capacity expansion, this option will not address some of the additional critical success factors we have identified for the project such as additional TOC and T&O removal, nor will it provide a stepping stone for future capacity expansion beyond the current phase.

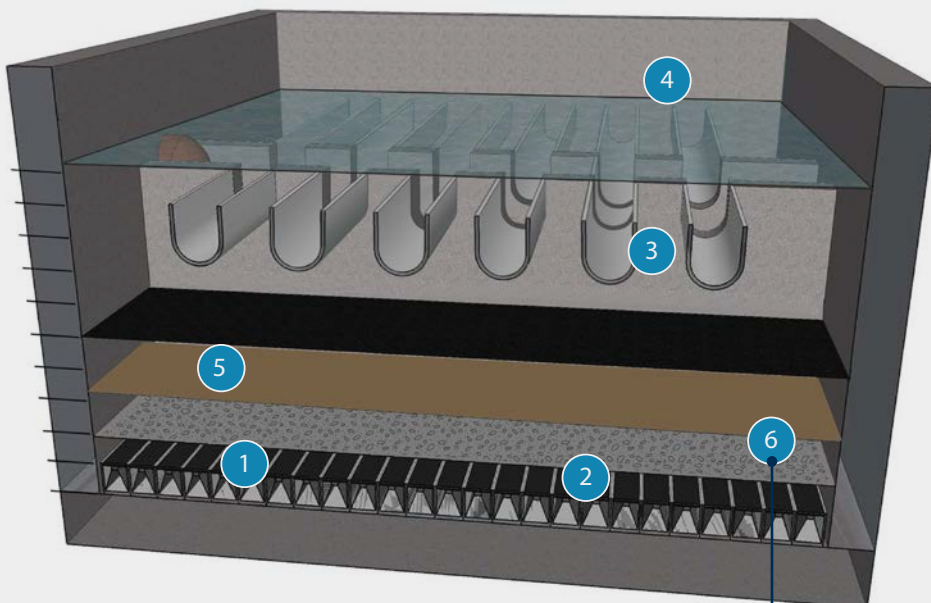
The pre-treatment at the JWTP is designed for 10 mgd and has proven itself capable of achieving this flow. While we agree that gravity filters are the best approach for expanding the capacity of the JWTP, matching the existing filter design does not leverage the numerous advancements in gravity filters that have been



Expanding the existing filter building requires extensive modifications to the backwash holding pond or a clarifier.

proven in the last 10-15 years. Carollo's concept for providing immediate filter capacity in a new filter building; the existing filters would provide supplemental capacity in the near-term and then repurposed as GAC contractors to augment T&O control after the new filters are re-rated at higher loading rates and the existing filters are no longer needed.

Cutting-edge considerations for gravity filtration.



- 1 Plastic block underdrains allow for air scour and biological filtration. These underdrains are cost effective (compared to stainless steel or nozzle/plenum), easy to install, and require no maintenance.
- 2 Air scour is much more effective and water-efficient means of backwashing than surface wash.
- 3 Media retaining troughs allow for more rapid and efficient backwashing.
- 4 Instrumentation such as EchoSmarts, measure backwash turbidity and media expansion to further reduce the time and water required for backwashing.
- 5 Rinse-to-waste can provide low startup turbidity without capital expenditures and minimizes filter-to-waste time (and volume).
- 6 Deep bed filters allow for higher loading rates and longer filter runs.

Membranes offer a rapid and seemingly cost-effective solution to immediate capacity expansion, but beware of hidden costs and operational complexity

RFP Option 2 is to implement membranes as a filtration alternative. There are several ways which microfiltration or ultrafiltration membranes could be implemented at the JWTP. Membranes provide a robust protozoa (*Cryptosporidium* and *Giardia*) barrier, allowing the chlorine contact to focus on virus inactivation within the existing clearwell and finished water tanks. Although membranes offer the advantage of consistently low turbidity filtrate in a highly automated system, membranes are typically not effective as a barrier for TOC or T&O compounds.



Pressure membranes are often designed in vertical racks, which require an intermediate pump station to provide the necessary inlet pressure to drive the water through the strainers and membranes. In this configuration, a new slab on grade structure, as described in the RFP, would be constructed. An alternative approach to implementing membranes would be to retrofit the existing filters with submerged membranes. This approach has been used at other locations with either vacuum pumping or low pressure (gravity) applications. The lower the available pressure, the lower the flux that the membrane can operate at. Lower flux (analogous to filter loading rate) translates to more membrane area required and thus more equipment (higher capital cost, expected to be several millions of dollars for 10-12 mgd of capacity).



Typical membrane racks can provide significant treatment capacity in a compact footprint but will require significant valves, instruments, and ancillary equipment.



Carollo has worked with the City of Thornton over the past several years to improve the reliability of the operation of the initially challenging submersible membrane system at the Wes Brown WTP.

Membranes also present challenges that should be taken into account when considering this option. In particular:

- Significant change for operators.
- Intermediate pumping.
- Submersible gravity membranes will require additional equipment and higher capital cost for equipment.
- Recurring cost for membrane replacement (typically every 5-10 years) translate to recurring costs of approximately \$2-3M.
- Reliance on a single vendor.
- Routine maintenance cleanings which require additional chemicals (sodium hypochlorite, citric acid, and/or sodium hydroxide), which must be stored on site and will be discharged to the WWTP on a regular basis in high concentration slugs.

- **Does not provide a barrier for TOC and T&O.**
- **Could be rapidly (and potentially irreversibly) fouled by PAC carryover.**

Raw water pumping and conveyance is key to expanding JWTP capacity

A solid understanding of the two raw water sources and the Town's needs and project drivers is critical to delivering smart raw water expansion solutions that align with long-term planning goals. While significantly more remote, the Lone Tree reservoir has a higher water quality and serves as the Town's primary raw water source. The Johnstown Reservoir is much closer in proximity, but has lower water quality contributing to taste and odor complaints, and is therefore used as a secondary peaking source during high demand periods.

With the planned JWTP improvements, it may be possible to reconsider source water usage and blending of the two sources to take advantage of existing raw water capacities. With new treatment options to address taste and odor at the JWTP, it may be possible to increase the blending percentage of Johnstown Reservoir, and defer some of the planned capacity improvements for the Lone Tree pumping and conveyance system.

Carollo will meet with plant and system operators early in the project to determine drivers for Lone Tree capacity expansion. Our approach will be to evaluate options that account for the key project success factors relevant to raw water expansion, including conveyance capacity, water quality, system operability, and fiscal alignment with other project priorities.

Carollo has developed some initial concepts and options for expansion of the raw water system.

Expand Lone Tree Reservoir conveyance capacity

This option would include expansion of the Lone Tree Reservoir pump station and conveyance pipeline, concurrent with the JWTP expansion. It would be implemented if blending with a higher percentage from Johnstown Reservoir would not result in an acceptable raw water source blend at the JWTP.

Expanded conveyance capacity could be done by paralleling the existing 10.6 mile, 16-inch pipeline, or direct removal and replacement of the existing line in the same alignment. Removal and replacement would add demolition and disposal cost to the project, but would not require acquisition of additional space for a parallel pipeline. This option would be considered if land acquisition and/or existing roadway right-of-way space were not available for a parallel pipeline.

Construction of a parallel pipeline would provide the Town with a new asset capable of meeting conveyance capacity within the planning horizon. In addition, the Town would retain the existing pipeline as an asset that could be rehabilitated. The existing pipeline could serve 2 purposes:

- Operable parallel conveyance pipeline to supplement and reduce the required size of the new parallel pipeline.
- Backup, redundant pipeline to be used during new pipeline maintenance or outages.

Pumping expansion will be also be required at the Lone Tree Reservoir. The existing pump station is a buried package station, equipped with three vertical turbine pumps with a predicted maximum capacity of 4.7 mgd.

Pipeline routing will take into consideration existing pipeline condition, removal & replacement versus paralleling, and available corridor space with consideration to land acquisition needs.



The pump station is subjected to relatively harsh environmental conditions, including high heat and humidity, which impacted mechanical and electrical equipment longevity. Ideally, the buried pump station would be replaced entirely with an above grade pump station, designed to meet near-term capacity requirements, with proper configuration for inexpensive, phased expansions to keep pace with growth. A new pump station would also implement hydraulically efficient design to minimize long-term energy usage. The benefits of implementing an energy efficient design could be evaluated in a present worth analysis to determine the pay-back period of capital cost versus energy savings.

In addition to long-term energy savings realized from an energy efficient design, Carollo will look into the potential to take advantage of available power company energy rebates. Rebates may be available for power saving projects that result in a demonstrable power saving and return on investment. For Centennial Water & Sanitation District's new Zone 4C Pump Station, Carollo coordinated with Xcel to obtain a pre-approved rebate of approximately \$220,000, in addition to an estimated \$125,000 in annual energy cost savings. Carollo's design approach incorporated a number of energy efficient design elements to maximize pump station efficiency. The Contract Documents for bidding included Net Present Value (NPV) requirements and energy efficiency guarantees. These provisions assured that the Owner could receive the Xcel energy rebate and the return on investment over the 25-year NPV period. Carollo has proven and successfully implemented this design approach, and we are ready to do the same for Johnstown.

Defer Lone Tree conveyance and pumping capacity

It is possible expansion of the Lone Tree raw water infrastructure could be deferred by increasing usage of Johnstown Reservoir source during high demands. With the planned treatment improvements at the JWTP, particularly taste and odor treatment, it may be feasible to significantly increase the blending percentage from Johnstown Reservoir. The current capacities of the Lone Tree and Johnstown pump stations are 4.7-mgd and 6.7-mgd, respectively, resulting in a maximum raw water capacity of 11.4-mgd. If a larger portion of the Johnstown Reservoir source can be used during peak summer months, this could present a short-term solution that allows the Town to defer this significant capital investment.

If deferment is deemed an acceptable solution, the Town may consider phasing Lone Tree raw water expansion, with construction of some elements concurrent with the JWTP improvements, and deferment of other elements. For example, if the existing pipeline is determined to be in suitable condition, the Town may opt to construct a new Lone Tree pump station to replace the buried package station. The new pump station could be equipped with pumps to meet near-term capacities, and expanded in the future when conveyance capacity is increased with a new pipeline.

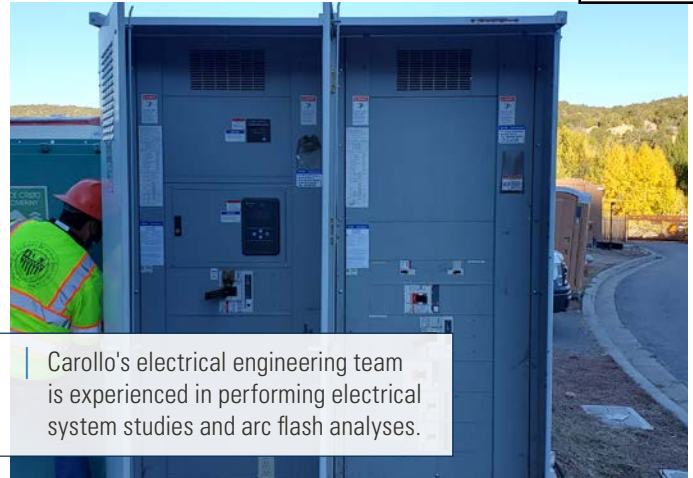
There are a number of phasing combinations if raw water expansion deferment is deemed a feasible option. Carollo is prepared to discuss all options with Town staff to determine a solution that meets Town goals and key success factors.

Energy efficient pump station layout results in long term energy savings and potential energy credits if offered by the power company.



Additional considerations to address immediate capacity expansion

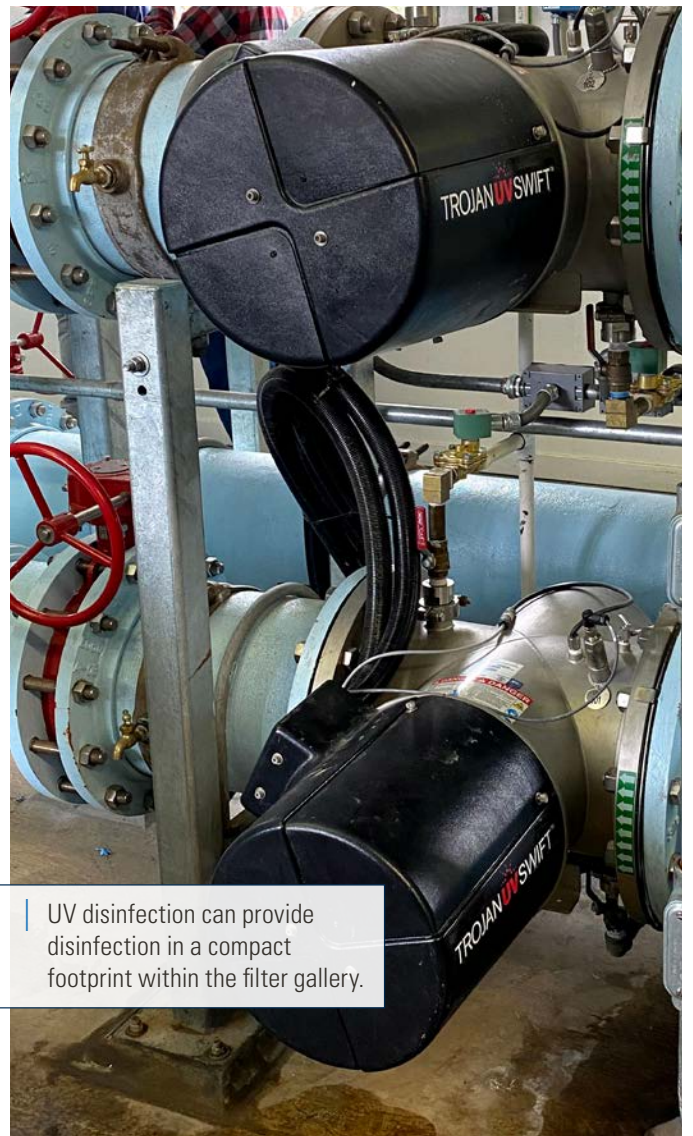
The Town indicated that the electrical system at the JWTP may require additional analysis during the design for the plant expansion. Carollo's electrical and I&C engineering hub is in the Denver area. This team not only supports design projects throughout the country, it also has specific expertise in electrical system analyses and arc flash studies. We are prepared to include an electrical system study as part of the preliminary design to evaluate how the electrical system can accommodate current and future plant expansion.



Carollo's electrical engineering team is experienced in performing electrical system studies and arc flash analyses.

Expanding disinfection capacity without increasing footprint

Providing additional CT for chlorine disinfection by expanding the clearwell or modifying/replacing the above ground tanks will require complicated and costly construction. A simple and cost effective approach to providing disinfection for the expanded capacity at the JWTP is with UV disinfection. Leveraging the combination of UV and free chlorine disinfection optimizes the benefits of both disinfection processes. UV is a robust and efficient barrier for Cryptosporidium and Giardia while chlorine is highly effective at virus inactivation. Either individual or combined filter effluent UV can be implemented efficiently within the filter building footprint. Carollo's team has extensive experience analyzing and implementing both UV and chlorine disinfection systems. A recent disinfection evaluation project in Colorado included the design of a 12 mgd UV system. Budgetary quotes for the two 12-mgd UV reactors (1 duty and 1 standby) ranged from \$200,000 to \$300,000 and included both medium pressure and low pressure high output options to balance power and maintenance considerations. The system was designed to provide 0.5 log Giardia inactivation with as little as 2 lamps per reactor and a maximum connected load per reactor of 22 kW, which is equivalent to a 30 hp motor.



UV disinfection can provide disinfection in a compact footprint within the filter gallery.



Biofiltration (TOC removal and distribution chlorine system stability)

Biofiltration provides multiple treatment benefits to the Town. Well-designed biofilters provide a robust treatment barrier for taste and odor compounds such as MIB and Geosmin and reduction of TOC without compromising the fundamental treatment goal of turbidity and particle removal.

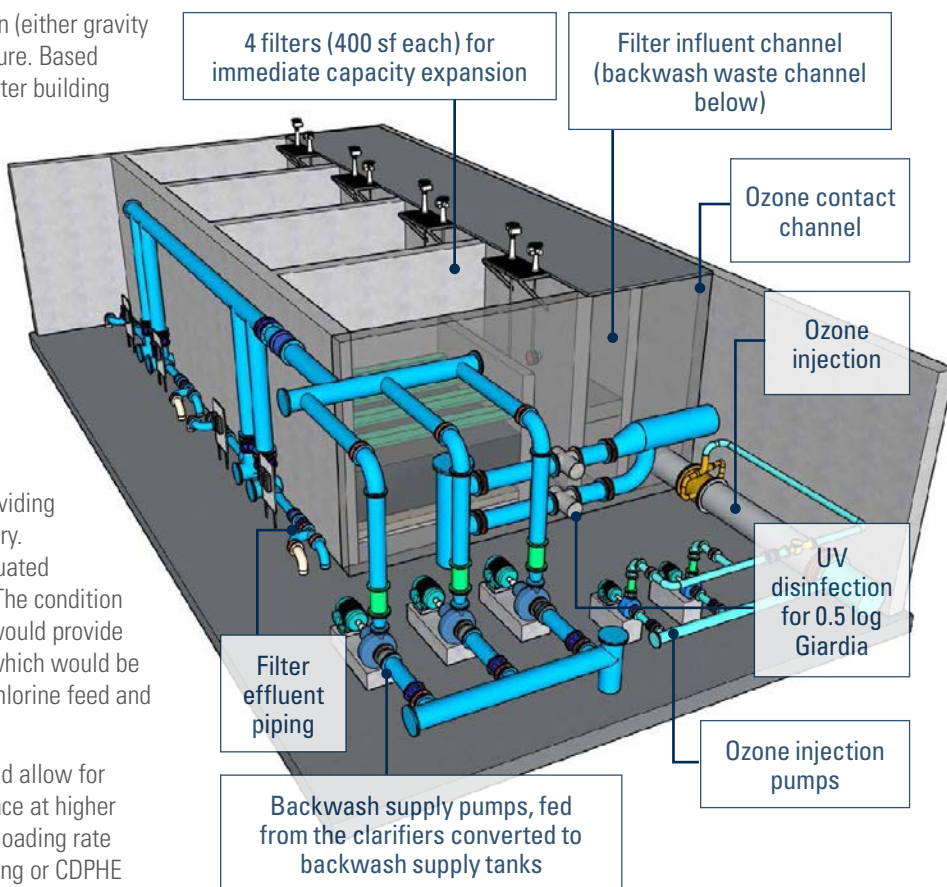
For any plant capacity expansion, additional filtration (either gravity filters or membranes) requires additional infrastructure. Based on our preliminary analysis of your system, a new filter building housing four new filters would provide a process able to reliably treat flows in excess of 12.5 mgd with flexibility to treat higher flows without additional infrastructure. An initial conceptual layout is presented with four filters, each 400 square feet in surface area.

These filters would be designed to operate at various loading rates to achieve near term treatment capacity objectives, expandability without additional infrastructure, and future additions to reach ultimate capacity goals.

In order to support the migration to biofiltration, providing a supply of unchlorinated backwash will be necessary. Repurposing the abandoned clarifiers, which are situated close to the new filter building may be the answer. The condition of the structures is unknown, however the volume would provide operational flexibility for backwash supply volume which would be independent of the clearwell and does not impact chlorine feed and disinfection.

To satisfy the rapid system growth, this design would allow for additional capacity based on proven filter performance at higher loading rates. Phase 1 is based on the current filter loading rate of 5 gpm/sf, which does not require additional piloting or CDPHE approval. The filters would be designed to operate at higher loading rates (7 gpm/sf or possibly higher), which could be proven by full-scale demonstration testing after the new filters have been commissioned (Phase 2). This allows the Town to address immediate capacity challenges, while allowing for additional capacity/growth without adding additional infrastructure. Phase 3 would add up to two additional filters to give the JWTP a firm filtration capacity (with one filter out of service) of at least 20 mgd.

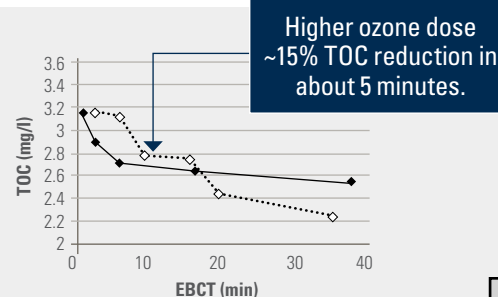
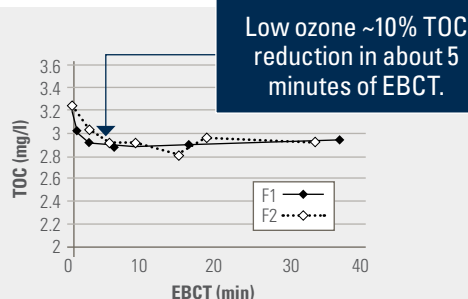
Carollo has implemented a similar filter design at the Colorado Springs Utilities Bailey WTP and other facilities across the country. Biofilters operate identically to conventional gravity filters, so this approach will be much more consistent with current operations compared to the membrane filtration approach options.



Carollo's initial concept for a new ozone, filtration, and UV disinfection facility.

TOC removal can challenge the existing DAF system, at times. Based on raw water TOC ranging from 3 to 4.6 mg/L, the ranges of TOC removal required is 15% to 35%, depending on alkalinity, to achieve the EPA's D/DBP Rule. Biological filtration provides a robust and consistent TOC removal barrier which can serve as a backstop for TOC removal through the DAF. There is a wide body of research and full scale biofiltration systems that demonstrates that an empty bed contact time of 5-10 minutes can provide 10-20% TOC reduction. Oxidation (i.e., ozone) upstream of the biofilters will further enhance the TOC removal through the biofilters.

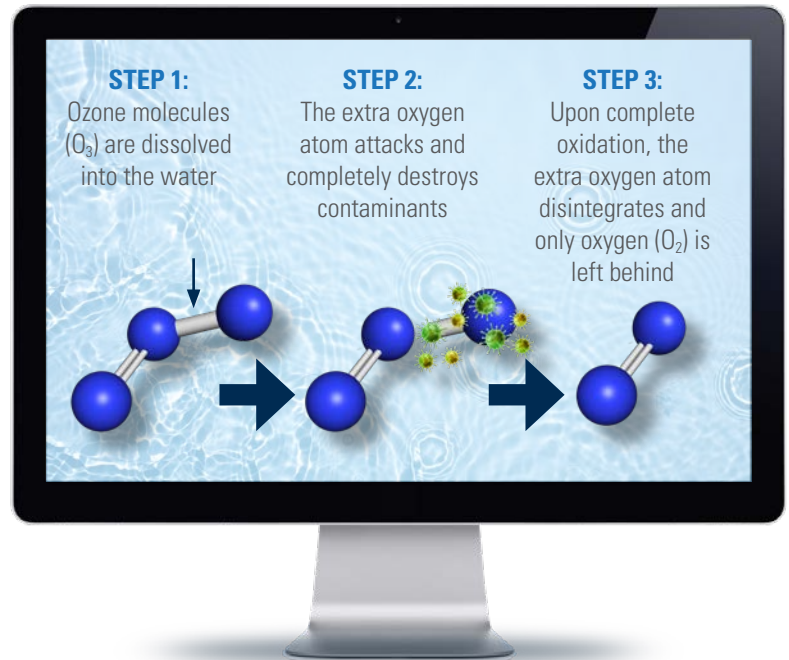
TOC Removal profiles in biofilters with low and high ozone dose (Melin and Odegaard, 2006) demonstrate effective TOC removal.



Ozone provides several water quality benefits and can be easily implemented to mitigate T&O and promote biofiltration

Raw water quality suggests a 2.0 log (99%) reduction of taste and odor compounds is necessary—this is not achievable with PAC alone. To address a variety of water quality and treatment challenges, we recommend considering ozone. Ozone is a strong oxidant that is highly effective at eliminating taste and odor events and will reduce residuals by eliminating the use of PAC. Combined ozone/peroxide systems can further enhance taste and odor oxidation in an even smaller contact basin footprint. Thornton's WTP (online) and Greeley's Boyd Lake WTP (in construction) utilize this approach, which ultimately reduced the size of their contact basins. We have designed many projects with ozone that have proven to provide an array of water quality benefits including:

- Oxidation of algal toxins (cyanotoxins, and microcystin).
- Oxidation of taste and odor compounds (Geosmin and methylisoborneol (MIB)).
- Oxidation of manganese.
- Reduction in color.
- Breakdown of natural organic matter—transformation of organic carbon (particularly recalcitrant organics) into assimilable organic carbon is beneficial for biological filtration. When dosed at sub-residual concentrations, it can provide effective oxidation with minimal to no byproduct formation (bromate) and no additional treatment solids/residuals that require dewatering and disposal. Carollo can conduct ozone and ozone/peroxide demand and decay testing as well as byproduct formation testing at our Water Applied Research Center (ARC®).



Schematic representation of how ozone attacks contaminants and organics.

The fundamental chemical used in an ozone system is liquid oxygen (LOX). LOX is a very inexpensive and readily available chemical with numerous suppliers across the Front Range. Comparing the annual cost of treatment between ozone and PAC, ozone is significantly less expensive when looking at overall chemical and power costs.

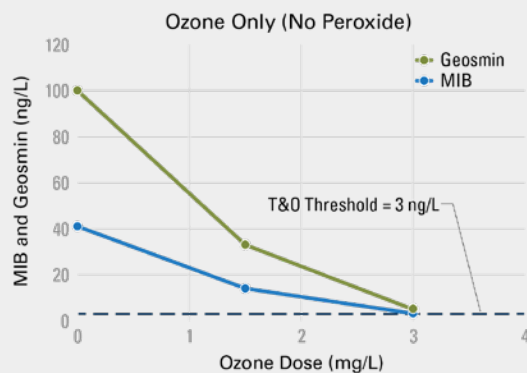
Outdoor LOX Tank installation at the Colorado Springs Utilities Bailey (SDS) WTP.



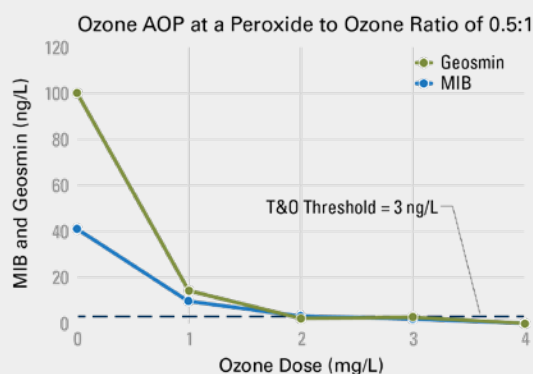
Parameter	Ozone	PAC	Notes
Cost per lb	\$0.04	\$1.00	PAC costs range from \$0.80 to \$1.20 per lb
Annual Chemical Cost	\$10,100	\$240,000	Assumes an ozone dose of 2 mg/L and PAC dose of 20 mg/l
Annual Power Cost	\$10,700	\$15,900	Assume \$0.10/kWh
Total O&M Cost	\$95,800	\$263,500	Assume 8 mgd for 180 days/year
Capital Cost	\$1,500,000	\$0 (assumed to be existing as of 2021)	LOX Tank and Ozone equipment only, ozone to be included in new filter building
Total Present Worth Cost	\$1,810,000	\$3,960,000	Based on 20 year life cycle cost at 3% interest rate

Factoring in capital costs and life-cycle costs, an ozone system will improve chemical handling and will be less expensive than operating PAC, with a return on investment of ~10 years.

At Greeley, ozone by itself required a dose greater than 3 mg/L to reach the T&O threshold.



By adding 0.75 to 1 mg/L of peroxide, the ozone dose for Greeley was reduced to 2 mg/L.



Optimizing the ozone system design provides cost-effective, robust treatment

As previously stated, ozone is a strong oxidant and it will serve the Town well for improving water quality, treatment reliability by producing a more filterable water, and residuals by eliminating the use of PAC (reducing plant O&M costs). While ozone alone has benefits, there are proven approaches that achieve water quality goals for this project.

Combined ozone/peroxide systems can further enhance taste and odor oxidation in an even smaller contact volume compared to ozone alone. Both Thornton and Greeley utilized this approach at their new facilities, which ultimately reduced their required ozone doses for T&O treatment by greater than 50 percent and shortened the required contact chamber detention time from 15 minutes to 5 minutes.

We have proven this concept with bench-scale testing at Carollo's industry-exclusive Water Applied Research Center (Water ARC®) facility at three Front Range utilities in the past three years. The ozone demand characteristics are unique for each water source and bench testing can be quickly completed to determine the right size of the new facility, such as ozone demand, dose optimization for taste and odor compound destruction, optimal peroxide-to-ozone ratios, and impacts on potential bromate formation. Based on our recent testing, ozone/peroxide is not only a more efficient taste and odor approach, but it effectively mitigates bromate formation compared to ozone only systems.

Recent bench testing we did for the City of Greeley and Centennial Water and Sanitation District showed that ozone by itself was less effective at oxidizing T&O compounds compared to ozone and hydrogen peroxide. The production of free radicals effectively and efficiently treats MIB and geosmin.



Capacity expansion and master planning the site is critical for near-term and long-term success

The Town is growing, and the added capacity of the current project will soon be outpaced by demand, requiring additional plant expansion. The current project must consider near-term and long-term capacity to address system demands with reliable treatment and provisions to make the next phase of expansion less costly and more efficient. Carollo has devised an approach that will support near term expansion of treatment capacity by adding a new filter facility which sets the Town up for flexible plant capacity increases. Incrementally, the first phase includes the addition of four new filters, which can be initially permitted at 5 gpm/sf, streamlining the regulatory approval process. The stand-alone new filter building would also allow for

construction to occur with minimal disruption to plant operations. Full scale demonstration testing (as our team successfully conducted for Longmont's Nelson Flanders WTP) can provide additional filter capacity without additional infrastructure.

To meet the ultimate plant capacity of approximately 20 to 24 mgd, new pretreatment would be required with two additional filters. To fully master plan the site, we have also included considerations for a new chemical facility, however this is not something that would need to be included in the near-term. Our initial concept for the JWTP site is shown on the following page.

Parameter	Phase 1*	Phase 2	Phase 3
Total Number of Filters	4	4	6
Loading Rate (gpm/sf)	5	7	7
Flow per Filter (mgd)	2.9	4	4
Total Filter Capacity (mgd)	11.5	16	24
Empty Bed Contact Time (minutes)	8.2	5.9	5.9

*The existing filters could be maintained to supplement available filter capacity prior to rerating of the new filters in Phase 2.

Our approach includes addressing immediate plant capacity expansion and includes provisions for future expansions, when the time is right



Proposed concept for new biofilters. This all-in-one facility would include a new ozone system, biofilters, UV disinfection, and backwash supply pumps.

Confidence in cost estimating supports decision making and planning

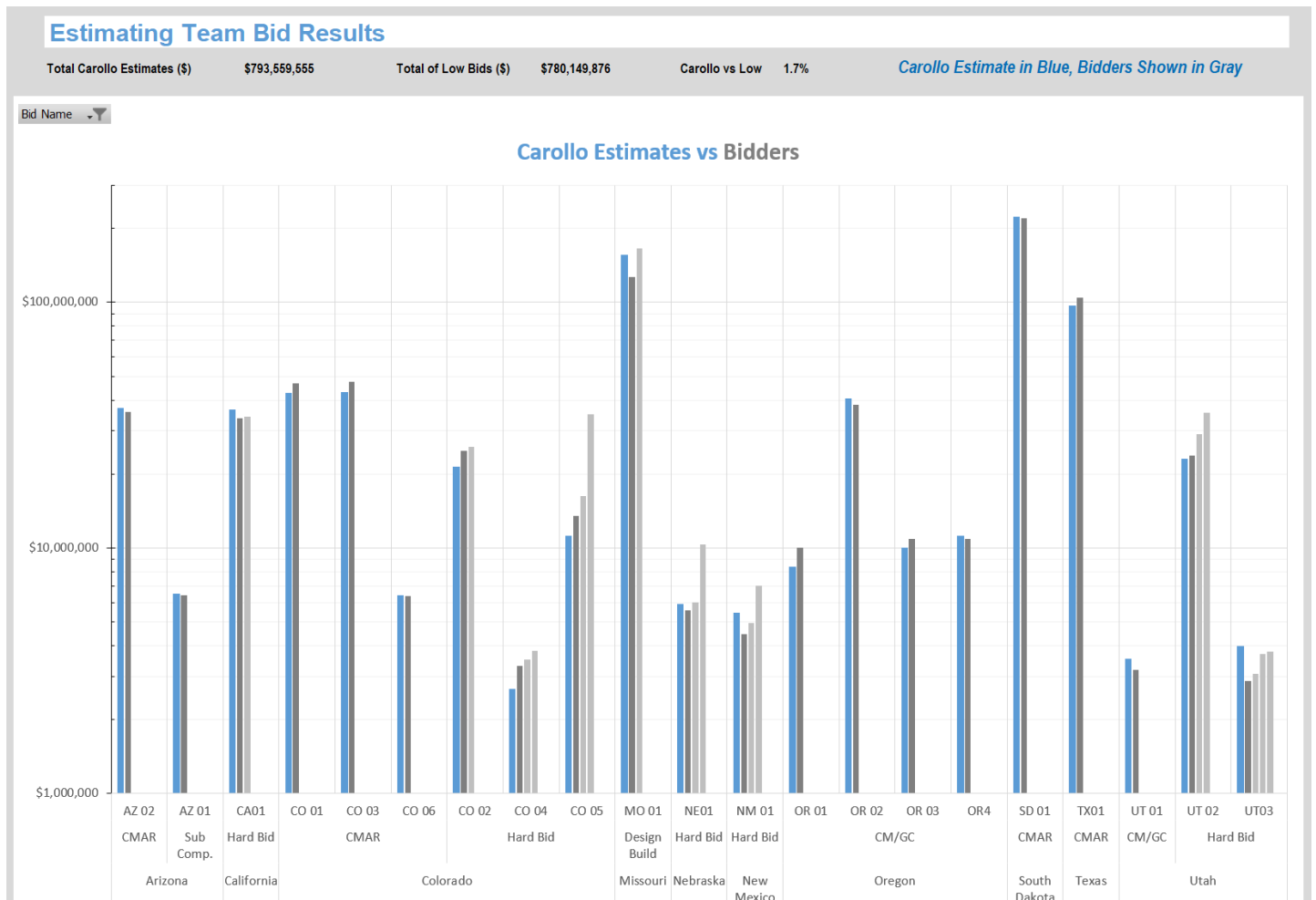
Expansion of the JWTP includes many components that will likely exceed the project budget envisioned in the 2015 master plan. Early cost certainty will allow the Town to plan for and acquire project funding.

Carollo's approach to cost estimating is specifically designed to replicate the pricing methods used by general contractors. We estimate costs with confidence thanks to the establishment of a dedicated team of full-time estimators in our Broomfield office who have all gained the majority of their professional experience working for general contractors or specialty subcontractors that focus on the water/wastewater market. This experience allows our team to not only anticipate the proper level of effort based on the complexity of the work, but anticipates a contractor's procurement strategy, both of which are critical to predicting project costs. Our team also

understands the importance of early cost certainty and works to not only price what is shown in the preliminary engineering documents but also what experience tells us will be required to construct the intent of the design.

Our team has implemented the use of industry-standard estimating software (Sage Estimating) and other quantity surveying tools that add quality and consistency to the cost estimating process. These tools allow us to more accurately identify project cost drivers and prioritize budgetary pricing requests from the market. Experience has shown that this approach is superior to relying on published pricing manuals created for the general construction industry. Carollo offers unique, construction-based cost estimating resources based in our Broomfield office that can provide you with reliable estimates that reduce bid day stress.

Recent estimates by our Broomfield-based estimating team have been right in line with bids on bid day or CMAR pricing



Carollo's local team can provide the Town with early certainty and project funding alternatives

Early Cost Certainty

We understand there is limited funding as this project was not foreseen. Our team's commitment is to establish cost certainty early in the project. To achieve this we will:

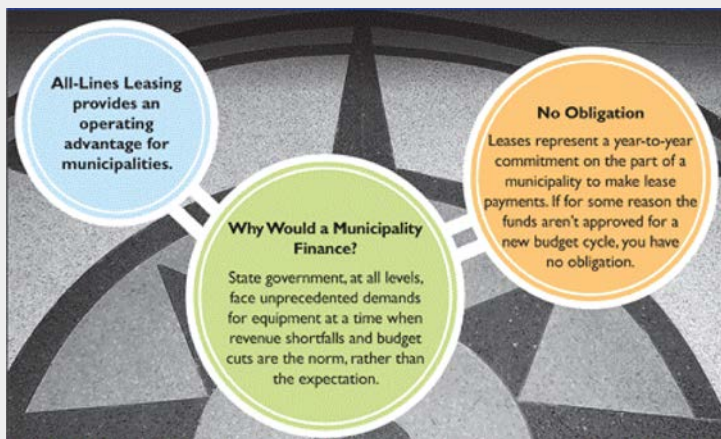
- 1 Provide Transparent Estimating – The Carollo Team embraces a true “open-book” cost process that develops a baseline early in planning, and documents any deviations. You will always know the budget, allowing you to make informed decisions on adding or deducting as needed. The most recent project costs are always at your fingertips!
- 2 Procure Equipment Early – Procuring the long-lead equipment with performance specifications following the process selection establishes equipment costs and allows design team to be more efficient.

Financing Approach

We will evaluate with you and document in the Basis of Design Report, the potential financial strategies to reduce or eliminate your up-front capital investments. Our team has established partnerships with a variety of funding providers and options for your considerations:

- 1 Private Equity Funding – Carollo has recent partnerships with Graham Financial and the Carlyle Group to provide private equity funding as needed. We realize this may be an opportunity for you to off-set the capital costs of the project. In our experience this type of financing adds a 15 to 25 percent premium to the long-term costs of the project.
- 2 Tax-Exempt Financing – Carollo has worked with David Clamage at Saulsbury Hill in evaluating tax-exempt financing options for Colorado projects. Outside of SRF funding or self-funded, this will be the least expensive option for financing the project.
- 3 Short-term equipment leasing – Depending on the technology evaluation, the equipment providers may have short-term leasing arrangements that could be considered.

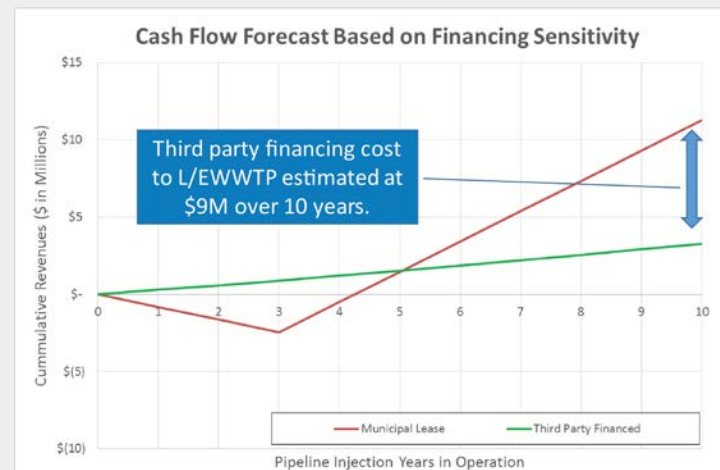
Multiple Lease Financing Provides Best Value Solution With Optimal Risk Profile



- Common financing tool
- State of Colorado
- No upfront capital \$
- Annual lease payments
- Risk managed
- Termination w/o penalty

Saulsbury Hill and Carollo recommended tax-exempt financing to Englewood's South Platte Renew Treatment Facility to finance their \$8 million dollar Biogas Project. Saulsbury Hill Financial is a finance company specializing in municipal leasing and energy performance contracting for Colorado municipalities.

Third Party Financing Reduces Financial Benefit And Requires Long-Term Agreement



Project delivery approach matters, and Carollo is prepared to guide the Town on alternative delivery options

Time is off the essence and Carollo's team has the necessary experience to collaborate with and advise the Town on deciding how to best delivery this project with an accelerated schedule. The 2015 master plan under-predicted the rapid growth the Town has experienced over the past couple of years. The implementation of plant capacity expansion must happen as quickly as possible, without losing sight of the important treatment considerations such as taste and odor, and TOC removal. Design-bid-build (DBB) is the typical project delivery approach, which relies on a close working relationship between the Town's project team and the engineer/designer. The owner maintains ultimate control in design decisions throughout the process and although this is the best way for the Town to maintain competitive bid-pricing for the project, it comes at a cost—the schedule. The DBB delivery approach takes the longest to complete from start of design to completing construction. Not only is there more time required during design, but there is also several months allocated for bidding and award.

Carollo understands that the Town is also considering ways to accelerate the implementation of the expansion project. Construction Manager-At-Risk (CMAR) is an alternative project delivery approach that is commonly implemented by many Front Range utilities. Our team has recently worked on CMAR projects for Greeley, South Adams County Water and Sanitation District, and Denver Water. This delivery approach provides the most benefit to the Owner when the project requires complicated retrofits of existing facilities where sequencing and constructability are critical success factors. Without

Jason's Experience

Design-Bid-Build	Aurora's Binney WPF (\$192 million) Santa Fe's Canyon Rd. WTP (\$15 million) – Process Lead or Project Manager for numerous projects in the past 10 years
CMAR	Greeley's Boyd Lake WTP Upgrades (\$16 million) – Project Manager Denver Water's Northwater Treatment Plant (through 30%) (\$475 million) – Process Lead for floc/sed and chemical facility
Fixed Price DB	Buckman Direct Diversion WTP (\$230 million) – Treatment Plant Operator Davis-Woodland WTP (\$230 million) – Process Lead
CMGC	Denver Water's Foothills CCB and Chemicals Improvement Project (\$35 million) – Process Lead

Throughout his career, Jason has gained experience in different project delivery models. In addition to many design-bid-build projects he has most recently worked with the City of Greeley on the Boyd Lake WTP Process Improvements project, which is being delivered as a CMAR.

Combined, your team leads, Jason Assouline and Vincent Hart, have experience in every type of delivery model. This kind of expertise and experience will benefit the Town in selecting the right delivery model for your needs.

active cost review oversight, this delivery approach may result in non-competitive pricing, challenges your ability to influence the design, and typically results in total project cost that is 5-7% higher than DBB. With the Town selecting an engineer at the onset of the project, this alternative approach would be the most straightforward option to pursue should you decide to accelerate the project schedule.

Design-Build (DB) and Progressive Design Build (PDB) are most commonly associated with alternative delivery and Carollo is also well versed in the many flavors of DB. Carollo has the in-house capability to lead a DB team on this project, should the Town decide at a later date to implement this approach (presumably in the PDB model). Fixed price DB is likely not a viable delivery option for this project since the scope of the project is not specifically defined. Fixed-price DB also does not offer the Town with the level of design input that you are interested in providing for the JWTP improvements.

Vinnie's Experience

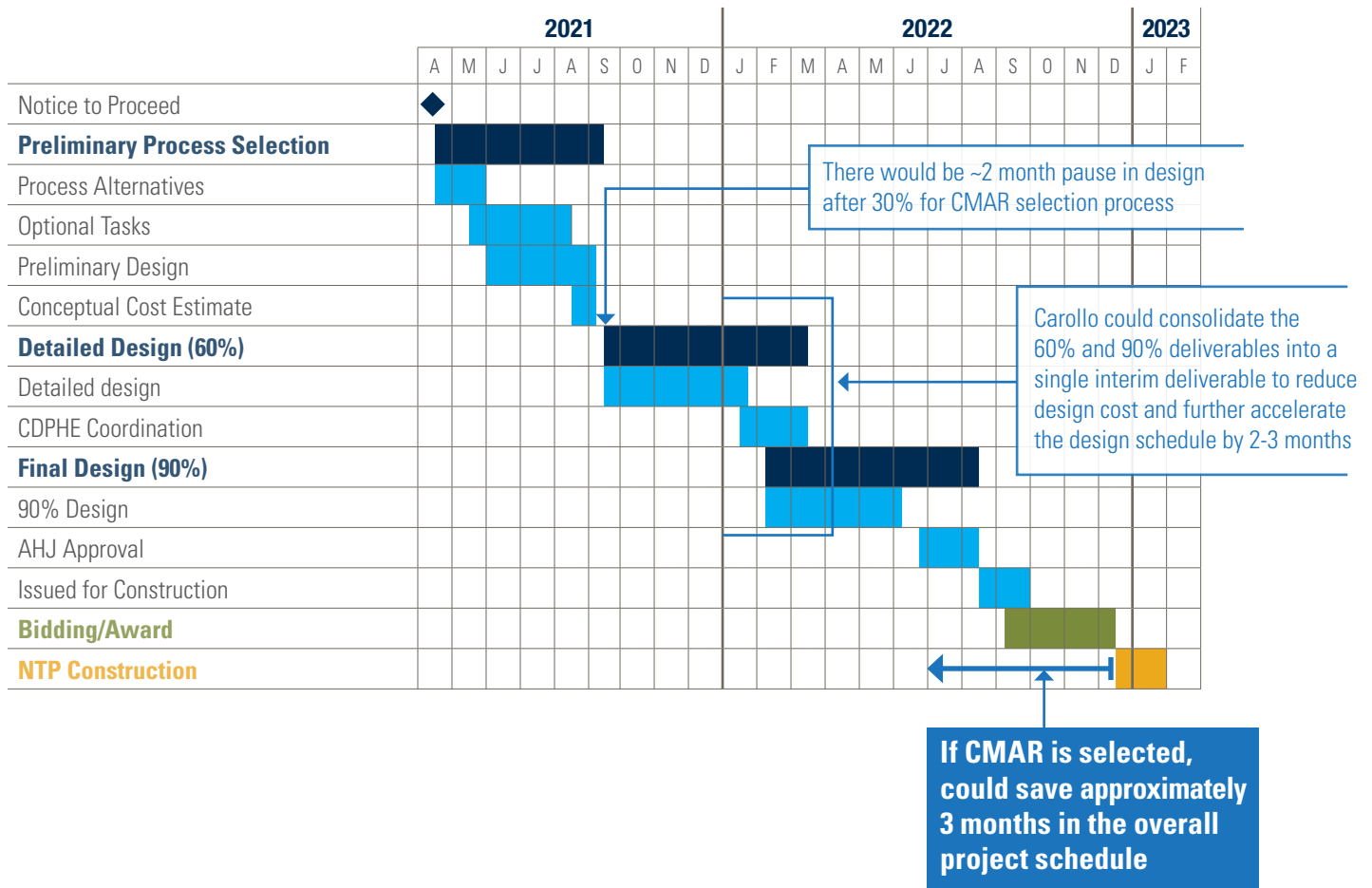
Design-Bid-Build	Project Manager on more than \$250 million in construction in the past 10 years
CMAR	South Adams Water and Sanitation District Pellet Softening Project (\$42 million) – Project Manager
Fixed Price DB	City of Westminster Northwest WTP (\$22 million) – Project Engineer with another firm
Engineer Led Fixed Price DB	Pinellas County, FL FOG Project (\$1 million) – Project Manager
30% GMP Progressive DB	City of Olathe, KS Northwest WTP (\$22 million) – Project Manager
60% GMP Progressive DB	Clifton Water District, CO Microfiltration Project (\$15.5 million) – Project Manager
100% GMP Progressive DB	Colorado Springs, CO Bailey (SDS) WTP (\$124 million) – Project Manager
Owner's Advisor	City of Houston, TX Northeast WTP (\$1,600 million) City of Thornton, CO Thornton WTP (\$100 million) East Cherry Creek Valley, CO North WTP Phase 2 Expansion (\$34 million)

Vinnie has been project manager on more than \$200 million in alternative delivery projects that cover the range of delivery mechanisms. He can provide the Town with details of each type of project delivery allowing you to pick a mechanism that best meets your needs.

Project Schedule Considerations

Developing a realistic schedule is another important project consideration. We understand the urgency in implementing solutions that can expand the treatment capacity of the JWTP, however promising a schedule that does not fully account for feasibility to design solutions that will meet all of the Town's needs could ultimately lead to higher overall project costs, unanticipated delays, and a system that simply does not work. Below is our initially

proposed schedule which sets the course for the project with rapid initial coordination and process selection with the Town. By the end of the summer, we could have a well thought out preliminary design and reliable cost estimate from which the Town can decide how to best proceed with the project (design-bid-build, accelerated design, or CMAR). Our team is flexible and prepared to support the Town in deciding how to best deliver the project.



SECTION

3

Management Approach

A Proactive Approach to Project Management

It All Starts with a Good Plan

In every project there are numerous details to address and decisions to be made. It's our job to deliver key information based on sound planning and analysis principles in accordance with the project schedule. By so doing, we put the entire project team—Johnstown and our Carollo Team—in the best position to finalize the details and make credible, defensible decisions for the WTP Expansion Project.

Managing a project is a lot easier when everyone works as a team, and the team works best when everyone understands the “game plan.” To make sure that everyone knows the “game plan”, the team works together at the onset of a project to develop a Project

Management Plan (PMP). The PMP sets goals and expectations for the project, as well as defines assignments and responsibilities to Johnstown and Carollo project team members.

The PMP not only sets roles and responsibilities for the team, but also establishes the control measures to manage cost, schedule, and scope. The benefit to the Town is that everyone knows who, what, when, and the level of effort anticipated for each deliverable. The PMP will serve as our guide to develop the project on schedule, within budget, in a quality manner, and consistent with your goals and objectives.

1 Monitoring, Tracking, and Communicating Project Scope, Schedule Cost, and Progress

We bear the responsibility and accountability to Johnstown to ensure that our team's scope, budget, and schedule are effectively managed for this project. We understand that schedule and cost management begin from the first day of project initiation in order to make sure the team member's tasks are aligned with the approved budget. Carollo utilizes earned value management analytical methods to accurately assess project budget and schedule status, as well as monitor progress and take appropriate corrective action, if required.

We develop a monthly report with our invoice that includes:

- **Scope Report.** A progress report of accomplishments, problems encountered or anticipated, a project decision log, and work scheduled for the next reporting period.
- **Cost Report.** A report with information on the current period and accumulated expenditures to date, approved not-to-exceed fee, estimated cost for completion, and a comparison of the latter two to show any variation. This will include design or task percent complete versus project area as tracked by task order.
- **Schedule Report.** A report confirming actual progress to planned performance. The report will include a description of known or possible impacts on the schedule and a presentation of deliverable submittal dates.

Our monthly progress report includes detailed scope, budget, and schedule updates using PMI and best management practices.



November 24, 2020
11253A.10

City of Greeley
1001 11th Street, 2nd Floor
Greeley, CO 80631

Attention: Mr. Peter Champion, PE

Subject: Progress Report
Boyd Lake WTP Improvements

Dear Mr. Champion:

The monthly progress report is presented in three sections: Scope Report, Budget Report, and Schedule Report. The invoice, corresponding to the scope, schedule, and budget described in this report is enclosed for your review and approval. This Progress Report, and related invoice, represents work completed through October 2014.

SCOPE REPORT

Work performed during this period is summarized below.

ACTIVITIES PERFORMED DURING OCTOBER 2014

Boyd Lake WTP Improvements

Task 1 - Project Management

- Team coordination and monthly progress tracking.

Task 2 - System Hydraulic Analysis

- Split Pressure Zone Evaluation Meeting.
- Team Meeting.
- Additional Hydraulic Analysis.

Task 3 - Survey and Geotechnical Investigations

- No work performed.

Task 4 - Design of Boyd Lake WTP Facilities Improvements

- Continued 60% design activities.
- Preparation of 60% design documents.

City of Greeley
Page 3

The following table further summarizes the budget status by task.

Description	Contract Limit	Current Invoice	Total Invoice	%	Remaining
Task 1 - Project Management	\$27,500.00	\$1,100.00	\$10,800.00	28.2%	\$27,542.33
Task 2 - System Hydraulic Analysis	\$34,400.00	\$1,817.50	\$19,460.00	56.0%	\$14,993.50
Task 3 - Survey and Geotechnical Investigations	\$10,416.00	\$0.00	\$3,207.00	30.8%	\$7,098.96
Task 4 - Design of Boyd Lake Facilities Improvements	\$245,045.00	\$51,856.88	\$148,823.42	43.1%	\$196,221.58
PROJECT TOTAL	\$407,466.00	\$54,774.31	\$182,179.74	42.6%	\$245,686.26

BUDGET/SCHEDULE REPORT

None.

Please contact us if you have any questions on this project.

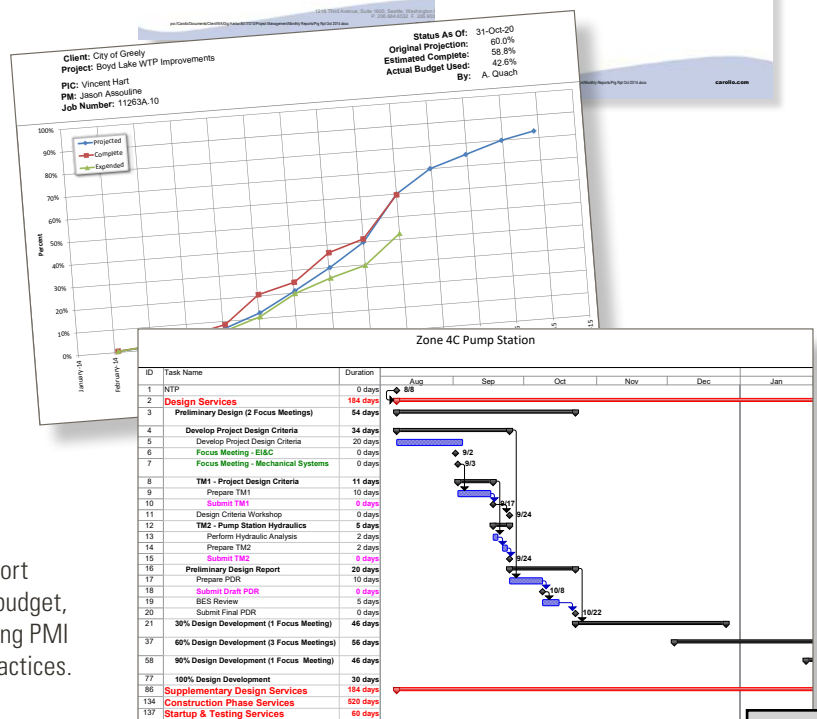
Sincerely,

CAROLLO ENGINEERS, INC.

Wayne Olson, P.E.

Enclosures: Invoice No. 138341

S-curve



2 Monitoring, Tracking, and Resolving Issues and Concerns in a Timely Manner

Similar to the tracking, documenting, and resolution of scope, schedule, and budget concerns, tracking and resolving project issues in a timely manner will be critical to the overall success of this project. We will accomplish this effort by effectively using action, issue, and decision logs to track those elements that affect the progress of the project and will communicate any issues to Johnstown as part of our monthly status reporting.

3 Ensuring accuracy of Project Status Reports

Our team believes in the importance of quality project status reports and deliverables, particularly as they relate to the large proportion of work being completed by a diverse team of specialists. Our approach to quality is based on defining our Quality Management (QM) expectations upfront and applying the right reviews at the right time to ensure that the project starts off correctly and ends successfully. We have defined our quality management goals as:

- Minimizing errors and omissions in all work products.
- Controlling design and construction costs by “doing it right the first time.”
- Maintaining schedule and permit compliance through efficient delivery.

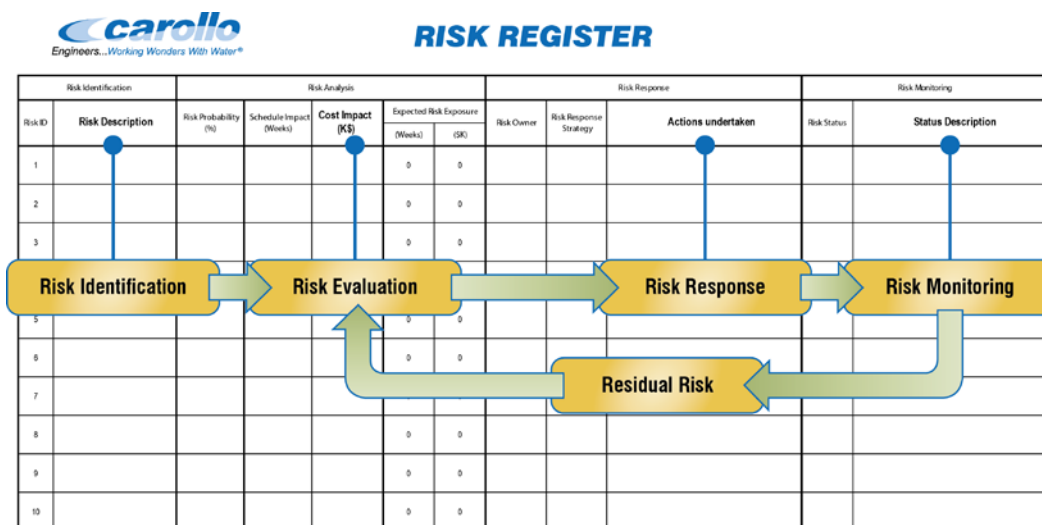
To achieve these goals and to meet our own quality expectations, we will regularly report in our project status report the status of the specific deliverables from each task, a log of review comments, changes made, and supporting documentation.

The image shows three overlapping project logs. The top log is the 'City of Greeley Boyd Lake WTP Improvements ACTION ITEM LOG' with columns for Number, Action Item, Added By, Date Added, Responsible Party, Resolution or Comments, and Resolution Date. The middle log is the 'City of Greeley Boyd Lake WTP Improvements DECISION LOG' with columns for Number, Decision, and Date Added. The bottom log is a detailed 'Boyd Lake WTP Improvements' log with columns for Item, Description, Status, and Date. All logs include a 'Carryover from Programming Phase' section.

4 Managing and Communicating Risks to Johnstown

The PMP will include a Risk Management Plan that describes the risk management processes and approach we will use for this project. This guidance documentation is essential to proactively facilitate the resolution of challenges that need direction from Johnstown and the project team to control cost and provide schedule compliance. It will be accompanied by a collaboratively developed Risk Register that identifies and describes each risk, scores them for likelihood and consequence, and shows planned mitigation, avoidance, and monitoring measures.

Our approach will seek to identify and obtain consensus by project stakeholders on critical decisions at the earliest possible date. Throughout the project, the Carollo Team will continue to identify and evaluate the individual project risks associated with cost, schedule, quality, and/or safety.



5 Communication Plan – Ensuring Team Members Interact Effectively

Our communication plan is centered on avoiding surprises through effective communication. Carollo knows the value of listening to our clients and the community and recognizes that successful projects result from our staff working as an extension of your staff. This commitment to listening and valuing client input is the cornerstone of Carollo's 88 years of success. We take pride in the large number of clients with whom we have maintained continuing relationships. We have worked with some clients for over eight decades—validating the quality of our work, cost control, and ability to meet schedules.

Quality Control Procedures

Carollo's quality process begins at project initiation and continues through successful completion. Following task award, Carollo drafts a project-specific Quality Assurance/Quality Control (QA/QC) Plan and makes sure all project staff fully understand it, and in agreement with regard to implementation.

Adherence to QC checklists in our quality plan helps ensure that any non-conformances and deficiencies are identified, documented, corrected, and do not reoccur. In addition to review of work by senior engineers and professionals, our construction managers review and verify that the project team's construction documents are according to the requirements set forth in the contract and that construction constraints and sequencing is well defined.

Qualified specialists conduct routine internal audits on our project delivery. The audit process evaluates adherence to the QA/QC Plan and includes a review of how our staff and subconsultants are performing. They work with our project managers and technical leads to develop mentoring plans and/or provide more oversight when needed to improve quality.

Carollo's QA/QC process covers each phase of your project

The flowchart below summarizes key aspects of Carollo's QA/QC approach for each phase of the project.

PROJECTS START

- PM reviews Carollo's quality management manual
- PM reviews appropriate project flowchart
- PM prepares project management plan
- PM reports QA/QC milestones to quality manager

REPORT PHASE

- Technical experts perform baseline peer review
- PM reviews applicable past project examples
- PM reviews Carollo's guidelines for reports
- PEs and reviewers conduct reviews using checklists

DESIGN PHASE

- Technical experts perform peer review
- PM updates Carollo project management plan
- PM reviews Carollo's final design checking procedure prior to final check
- Quality manager performs 30%, 60%, and 90% checks and constructability check

CONSTRUCTION PHASE

- Quality Manager assigns staff to review submittal and RFI responses, as well as any design changes
- Design team performs walkthroughs of constructed facilities
- Process experts assist with start-up and commissioning

SECTION

4

Staff Qualifications

Staff Qualifications

The key driver behind any successful project is the project team. Our team comes equipped with the right design and alternate delivery experience and process expertise necessary for the Johnstown WTP Expansion Project. More importantly, our team understands the importance of open and interactive collaboration regardless of the project delivery approach selected, and will keep that as a top priority from day one.



🔑 Key Team Member

Subconsultants

1- Short and Brennan Architects

2- Lithos Engineering

3- Precision Surveying & Mapping



Vincent Hart, PE 

**Principal-in-Charge
Technical Advisor**

Broomfield, CO

With Vinnie as your principal-in-charge and the project's technical advisor, you are getting someone who has your best interest in mind from day one, and has the expertise and experience to help guide the team on the right solutions for your needs. He is known throughout the industry for his innovative and collaborative approach to cost-effective water treatment design solutions. If you tour facilities that Vinnie has supported and managed, you will notice something, they are all different and tailored to the client's needs—not a cookie-cutter design that is pulled off the shelf and recycled at different utilities. Vinnie brings 27 years of experience in the planning, design, and expansion of water supply, water treatment, and water distribution facilities. His areas of expertise include WTP design and operation, ozone and chemical feed, taste and odor, dual media filtration (including biological filtration) for drinking water, and Colorado regulations.

Relevant Experience

- Project director for 50-mgd Edward W. Bailey WTP Design – Colorado Springs Utilities, CO
- Project manager for the Boyd Lake 40-mgd WTP Process Improvements Design – City of Greeley, CO
- Technical advisor for the 44-mgd Joseph Blake WTP Phase I Improvements Design Services – South Adams County Water and Sanitation District, CO
- Quality reviewer for the CDPHE Technical Guidance Manual on CFD Modeling of Chlorine Contact Basins (Carollo prepared document).
- Owner's advisor technical expert for pre-treatment for the 320-mgd Northeast Water Purification Plant – City of Houston, TX

Professional Engineer

CO – PE.0034164

Also licensed in: KS, MO, MN, NC, NJ, TN

Certification

LEED Accredited Professional

Client References

Peter Bong | Water/Wastewater Superintendent
Centennial Water & Sanitation District
P | 303.791.0430 E | pbong@cwsdhrmd.org
Worked on the MGWWTP Phase I Improvements and JBWTP Phase I Improvement Projects

Peter Champion, PE | Water Systems Engineer
City of Greeley
P | 970.350.9319 E | peter.champion@greeleygov.com
Project manager for the Boyd Lake WTP Improvements and Boyd and Bellvue Residuals Study

Dan Dilts | Operations Superintendent
Colorado Springs Utilities
P | 719.668.4511 E | ddilts@csu.org
Worked on the Edward W. Bailey Southern Delivery System Water Treatment Plant Design-Build



Jason Assouline, PE 

Project Manager

Broomfield, CO

Jason brings 17 years of experience and is a well-respected water treatment process engineer. With Jason as your project manager, you are getting someone who has the expertise and experience to help guide the team on the right solutions for your needs. He has particular expertise in the evaluation, design, and operation of flocculation/sedimentation, filtration, chemical systems, and solids handling systems, as well as advanced treatment for taste and odor and disinfection, including UV. Jason also brings invaluable experience relative to construction start-up and support, having served many roles on projects at Aurora's Binney Water Purification Facility (WPF) and Denver Water Foothills Treatment Plant.

Relevant Experience

- Design Manager and Technical Lead for the Boyd Lake 40-mgd WTP Process Improvements Design – City of Greeley, CO
- Project manager for the 44-mgd Joseph Blake WTP Phase I Improvements Design Services – Centennial Water and Sanitation District, CO
- Project manager and process lead for numerous design projects at the 80-mgd Wemlinger WPF, 80-mgd Griswold WPF, and 50-mgd Binney WPF – City of Aurora, CO

Professional Engineer

CO – PE.0041631

Also licensed in: FL, NM

Client References

Frank Alfone | General Manager
Mt. Werner Water and Sanitation District
P | 970.879.2424 E | falfone@mwwater.com
Worked on numerous projects for the District.

Kevin Linder | Treatment Plant Supervisor
City of Aurora
P | 303.739.6750 E | klinder@auroragov.org
Worked on numerous projects at the Binney Water Purification Facility and other City of Aurora projects

Peter Bong | Water/Wastewater Superintendent
Centennial Water & Sanitation District
P | 303.791.0430 E | pbong@cwsdhrmd.org
Worked on the MGWWTP Phase I Improvements and JBWTP Phase I Improvement Projects



Professional Engineer

CO – PE.0054939
Also licensed in: FL

Tony Actis, PE

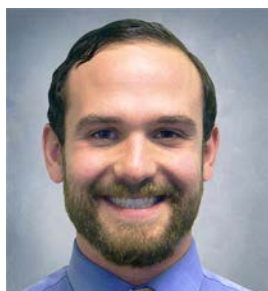
Design and Quality Lead

Broomfield, CO

Anthony has nine years of versatile industry experience, with a primary focus on process and project engineering in water treatment. He has excellent communication skills and has adaptable technical aptitude. Anthony has acted as a project and process engineer on many water-focused projects. He also spent time working on process and facilities engineering and operations. He has demonstrated the ability to maintain positive working relationships with internal team members, clients, vendors, and construction subcontractors.

Relevant Experience

- Design manager/QC reviewer for the Red Mountain WTP Improvements – City of Glenwood Springs, CO
- Design manager for the 44-mgd Joseph Blake WTP Phase I Improvements Design Services – Centennial Water and Sanitation District, CO
- Project engineer and design manager for the Solids Separation Lagoon Improvements Study – Ute Water Conservancy District, CO



Professional Engineer

CO – PE.0057176

John Meyer, PE

Project Engineer

Broomfield, CO

John has worked on water treatment planning studies, benchtop and pilot testing, water treatment system designs, construction oversight, and treatment plant start-up and commissioning. John has recently served as process design engineer for the City of Greeley, Boyd Lake WTP Improvements project and brings a holistic understanding of facilities operation. As the project engineer, he will be responsible for the detailed design of all aspects of the project. He will work closely with Jason and the Carollo team to provide reliable, operations focused solutions.

Relevant Experience

- Project engineer for the Boyd Lake WTP Improvements – City of Greeley, CO.
- Project engineer for 50-mgd Edward W. Bailey WTP Design – Colorado Springs Utilities, CO
- Project engineer for the WTP Replacement – City of Thornton, CO



Jim Kriss, PE

Pipeline Lead

Broomfield, CO

Jim brings 28 years of infrastructure-related experience managing large pipeline design projects. He recently served as project manager for the \$45 million Kings River Pipeline project for the City of Fresno, California, which consisted of 13 miles of 72-inch gravity flow pipeline through rural and urban

areas. Jim also served as the design engineer for the Ute Water Conservancy District's Plateau Creek Pipeline Replacement near Clifton, involving 15 miles of 48/54 inch steel raw water pipeline along highway 65 and Plateau Creek. His experience includes more than 100 miles of pipeline design, all of which he helped guide the various permitting agencies and regulatory authorities to understand the nature of the project and potential impacts to the public and traffic control. Much of his experience has been right here in Colorado.

Relevant Experience

- Project manager for Eagle Bend Metropolitan District's Gun Club Raw Water Expansion.
- Project manager for Aurora's Segment 1E Interceptor Design.
- Project manager for Arapahoe County Water and Wastewater Authority's (ACWWA) Connecting Main and Control Vault Project.

Professional Engineer

CO – PE.0033808
Also licensed in: AZ, KS, NM

Client References

Denise Denslow | Project Manager
Eagle Bend Metropolitan District, CO
P| 303.903.9760 E| denise.denslow@claconnect.com
Worked on the Gun Club Raw Water Expansion Project

Kevin McBrien | Senior Project Manager
Arapahoe County Water and Wastewater Authority, CO
P| 303.790.4830 E| mcmbrien@arapahowater.org
Worked on the Connecting Main and Control Vault Project

Chad Sell | Operations Superintendent
Colorado Springs Utilities, CO
P| 719.668.6504 E| csell@csu.org
Worked on the Edward W. Bailey Southern Delivery System Water Treatment Plant Design-Build



Steve Lindemann

Alternative Delivery Lead

Littleton, CO

Steve Lindemann is a knowledgeable and focused water professional who has been praised for his commitment to quality and efficiency. He has 30 years of experience with construction of water projects and more than 20 years of experience on design-build water projects throughout the United States and Canada. He brings a broad base of experience in all phases of project delivery.

Relevant Experience

- Superintendent for the Columbine (Wes Brown) WTP Renovation – City of Thornton, CO
- Deputy design-build manager for the Northern Treatment Plant – Metro Wastewater Reclamation District, CO
- Project engineer for the Marston WTP Filtration Improvements – Denver Water, CO



Professional Engineer

CO – PE.0043662
Also licensed in: CA

Bart Giles, PE

Raw Water/Finished Water Pump Station Lead

Broomfield, CO

Bart brings more than 15 years of experience in water and wastewater conveyance and treatment projects. His experience in various infrastructure planning and design is broad, including pipelines, lift and pump stations, and storage reservoirs. Bart is known for his hands-on, collaborative approach to project management. He has served on a number of small and large infrastructure projects across the Front Range for clients such as Aurora, CSU, Metro Wastewater Reclamation District (MWRD), and Centennial Water and Sanitation District.

Relevant Experience

- Project manager for the Zone 4C Pump Station – Centennial Water and Sanitation District, CO
- Project manager for the 80-mgd Wemlinger WPF CT Chamber Design – City of Aurora, CO
- Assistant project manager and lead civil engineer on the progressive design-build team for the Southern Delivery System Water Treatment Plant and Finished Water Pump Station – Colorado Springs Utilities, CO



Professional Engineer

CO – PE.0035713

Jason Rozgony, PE

Cost Estimating

Broomfield, CO

Jason has 25 years of experience in the water and wastewater industry, the majority of which has been full-time cost estimating for design, CMAR, design-build, and hard bid projects. He has been responsible for the development of corporate estimating standards, and has managed estimating staff across the United States. Jason has prepared discipline-level estimates and has led complete estimates for more than 150 design and fixed price construction projects requiring collaboration with design engineers, vendors, and subcontractor from preliminary through final design.

Relevant Experience

- Extensive resume of projects including lead estimator on 132 projects in the last three years.



Professional Engineer

CO – PE.0042211
Also licensed in: AZ,
CA, FL, HI, IL, ME, NY,
OH, OR

Monte Richard, PE

Electrical/I&C Lead

Broomfield, CO

Monte brings 17 years of experience in electrical and control system engineering and design. His focus is in electrical distribution systems, process control, and industrial instrumentation for water and wastewater facilities and infrastructure. Monte brings particular expertise in designing medium and low voltage power distribution, lighting, grounding, and electrical controls, as well as design of control systems. He works on a company-wide basis with plant operations and managers to test, start-up, optimize, and troubleshoot water treatment plants in Colorado and beyond. Monte was the project manager for the City of Aurora PLC conversion projects for the Griswold, Wemlinger, and Sand Creek facilities and played a primary roles in rewriting all of the process control narratives for these facilities.

Relevant Experience

- Lead electrical engineer for Denver Water's Northwater Treatment Plant (EI&C, Design Package 3), CO.
- Project manager for Aurora's Wemlinger WPF, Griswold WPF, and Sand Creek WRF PLC Replacement and Improvements Projects, CO.



Stephanie Riley, PhD

Process Support – Biofiltration

Broomfield, CO

Stephanie earned her Ph.D. in Environmental Engineering Science from the Colorado School of Mines. Her area of focus is ozone and biofiltration applied to drinking water and reuse with expertise in pilot operation and research studies. She currently serves as a technologist assisting in water, reuse, and wastewater projects.

Relevant Experience

- Investigator for the Water Research Foundation project 4719: A biofiltration Guidance Manual for Rapid-rate Filtration Facilities
- Investigator for ozone, biofiltration, and granular activated carbon pilot testing for Water Research Foundation project 4833: Understanding the Impacts of Wastewater Treatment Performance on Advanced Water Treatment Processes and Finished Water Quality.
- Investigator for WRF project 4958: New Techniques, Tools, and Validation Protocols for Achieving Log Removal Credit Across Nanofiltration (NF) and Reverse Osmosis (RO) Membranes.



Certifications

Certified Construction Manager

Eric Gilmore, CCM

Construction Support

Broomfield, CO

Eric is an advisor and construction manager with more than 28 years of experience building water and wastewater conveyance, storage, and treatment facilities. His responsibilities include all aspects of program management, construction management, and contract administration on behalf of the Owner. This includes oversight of contractors, issue resolution, change order review, and overall safety and quality assurance.

Relevant Experience

- Construction manager for the Bermuda 2538 Zone Pumping Station – Las Vegas Valley Water District, NV
- Construction oversight manager for the Northern Treatment Plant Progressive Design-Build Project – Metro Wastewater Reclamation District - Denver, CO
- Program construction manager for Southwest Water Reclamation Facility Project – City of Henderson, NV



Professional Engineer

CO – PE.0042976
Also licensed in: AZ,
CA, TX

Certifications

LEED Accredited
Professional

Carter Biesemeyer, PhD

HVAC/Building Mechanical

Broomfield, CO

Carter is a mechanical engineer with more than 17 years of experience in design of mechanical systems for water and wastewater projects. His background focuses on equipment facilities spanning the drinking water process from surface and ground water systems, to drinking WTPs up to 160 mgd. He also serves as Carollo's quality management lead for the Midwest region, putting him at the forefront of quality management procedures and coordination efforts. His HVAC design efforts on the Wemlinger WPF HVAC Improvements project, combined with his keen eye for quality and sound design deliverables, will set this project up for success from day one. Carter is located in Broomfield, Colorado.

Relevant Experience

- Project manager for Aurora's Wemlinger WPF HVAC Improvements project, CO
- Mechanical engineer/HVAC lead during start-up for Colorado Springs Utilities' (CSU) 50-mgd Bailey (SDS) WTP project, CO
- Mechanical engineer/HVAC for Eagle River Water and Sanitation District's Avon WWTP Upgrades, CO



Cody Berg

Project Funding

Littleton, CO

Cody is an associate vice president with Carollo with 14 years of extensive experience in municipal finance. As a consultant and former employee at Denver Water, Cody understands both sides of the utility business. He routinely conducts multi-year financial planning, impact fee, bond feasibility, and cost of service rate, and charge studies throughout the Western U.S. He is currently active in industry associations, including the American Water Works Association (AWWA) National Rates and Charges Committee.

Relevant Experience

- Financial lead for the Business Plan and Importation Study – Central Iron County Water Conservancy District, UT
- Project manager for the Water, Sewer, and Stormwater Financial Plan and Rate and Tap Fee Study – Dominion Water and Sanitation District, CO
- Project manager for the Cost of Service Study – Colorado City, CO



Professional Engineer

CO – PE.0034300
Also licensed in: AR,
ID, MN, MO, NE, ND,
OK, OR

Mark Keller, PE

Structural Lead

Broomfield, CO

Mark has more than 26 years as a structural engineer with experience in project management, planning and execution of design, detailing, and construction phase services of large projects. Past work includes condition assessments for master plans and feasibility studies for preliminary design direction.

Relevant Experience

- Quality manager for structural improvements at the Boyd Lake Water Treatment Plant – City of Greeley, CO
- Structural engineer for the Pellet Softening Disinfection Improvements Project – South Adams County Water and Sanitation District, CO
- Structural engineer for the McCullough Filter Rehabilitation – Colorado Springs Utilities, CO



Licensed Architect

CO – ARC.00400008

Certifications

AIA, LEED AP, PMP

Greg Short

Architectural

Denver, CO

Greg is a principal with Short & Brennan, bringing more than 21 years of experience in architectural planning and design. He has developed countless architectural plans and designs for water and wastewater facilities. He and Carollo have a successful history working together from his involvement on Carollo-led projects including CSU's Bailey SDS plant and most recently, South Adams County Water and Sanitation District's Pellet Softening Design, Centennial W&SD Phase 1 Improvements, and Greeley's Boyd Lake WTP Process Improvements project.

Relevant Experience

- Architect for Greeley's Boyd Lake WTP Process Improvements Project, CO.
- Architect for South Adams County Water and Sanitation District's Pellet Softening Design, CO.



Professional Land Surveyor

CO – PLS.0031158

Chris Juliana, PLS

Surveying

Denver, CO

Chris is the President and founder of Precision Survey & Mapping, Inc., and is a licensed Colorado Professional Land Surveyor and has been surveying professionally since 1986. Chris' experience is vast and solid and includes many aspects of the surveying profession including large civil mapping projects, boundary surveys, hydrographic surveying, high definition surveying, and many types of utility projects. He has worked on countless Front Range projects—many of those with Carollo and will bring invaluable Front Range survey expertise to this project.

Chris understands that most of our projects include referencing previous old drawing sets, and he helps us with datum conversions on every project (Aurora's Wemlinger project was challenging in terms of datum shift).

Relevant Experience

- Survey lead for Thornton's Wes Brown WTP Improvements project, CO.
- Survey lead for CSU's 50-mgd Bailey (SDS) WTP Design-Build project, CO.



Professional Engineer

CO – PE.0024369

Steve Kuehr, PE

Geotechnical

Denver, CO

Steve is trusted geotechnical expert along the Front Range, bringing more than 38 years of experience. He specializes in geotechnical and tunnel engineering as it relates to water supply, sewerage, water resources, commercial, industrial, highway, bridge and land development projects. He has technical expertise in tunnel engineering, foundation engineering, slope stability, expansive soils, ground modification, retaining walls, landslide evaluation and repair, embankment dam design and groundwater collection trenches and cutoffs constructed by the slurry trench method. His in-depth understanding of Front Range soils and applicable geotechnical considerations will be invaluable on this project.

Steve has been our geotechnical engineer on more than 95 percent Carollo's Front Range projects. Our mutual understanding of how we do work lends itself to a very efficient relationship focused on our client's needs.

Relevant Experience

- Geotechnical lead for CWSD's Zone 4C Pump Station, CO.
- Geotechnical lead for Greeley's Boyd Lake WTP Improvements Project, CO.

This local project team is solely based in Colorado and has been instrumental along the Front Range helping utilities solve unique water challenges. We are dedicated to this project through every phase, providing continuity and efficiency. Equally important, we bring established and successful working relationships with our subconsultants, enabling seamless project coordination and delivery.

SECTION

5

Related Project Experience

Relevant Experience

Carollo “walks the talk” when it comes to collaborating with our clients on their projects. We consider ourselves an extension of your staff—with you in the driver’s seat.

The following pages provide just a sampling of Carollo’s local experience with water treatment design challenges similar to the Town of Johnstown. Our team’s relevant experience in the last 10 years, both inside and outside of the region, is extensive. All five of these projects are relevant to Johnstown and involve WTP improvements and associated pipeline infrastructure. We invite you to contact these references so they can attest to the value and level of service that we consistently provide.



ACCOMPLISHMENTS

- Relevant processes (pre-treatment, ozone, biofiltration, and finished water pumping).
- Delivered the engineering plans and specifications in one year.
- Team provided performance guarantees for the project including finished water quality.
- CDPHE review process had minimal comments
- Consolidated project approach that saved \$35 million (compared to the original 30% design).
- 67 mgd of finished water pumping and 2,600 ft of 42-inch, and 2,300 ft of 60-inch transmission piping.

RELEVANCE TO JOHNSTOWN

Ozone/Biofiltration, Accelerated Alternate Delivery, High-Rate Filtration, Pump Stations

Edward W. Bailey Southern Delivery System Water Treatment Plant Design-Build

Colorado Springs Utilities, CO

Carollo Engineers was the designer, as part of the DB team, on a progressive design-build (PDB) project for the Colorado Springs Utilities 50-mgd Bailey Water Treatment Plant and Finished Water Pump Station.

The plant receives and treats surface water from Pueblo Reservoir to meet Colorado Springs Utilities’ growing potable water needs and to provide resiliency. The fast-track DB project required significant planning and coordination between the design team and contractor to meet the schedule demands (including potential liquidated damages on engineering) and integrate with related raw and finished water conveyance projects.

Project Details

The treatment process included rapid mix, vertical flocculators, parallel plate sedimentation with hoseless solids collection, side-stream ozonation with an innovative ozone contactor design (minimizing footprint and maximizing contact time), deep-bed high-rate (10 gpm/ft²) biofiltration, unchlorinated backwash water, and a 7 million gallon finished water tank.

The chemical feed facility included coagulant, sodium hypochlorite, hydrogen peroxide, phosphoric acid, polymers, sulfuric acid, and a softened water system (for chemical dilution). The finished water pump station includes four 700-hp pumps, three 400-hp pumps, and two 350-hp backwash pumps. Design included surge mitigation measures, a major highway crossing, and temporary discharge facilities. Carollo provided startup and commissioning services and operated the plant for six months.

Client Reference

Dan Dilts, Operations Superintendent
P. 719.640.0807

Capacity of Project:

50 mgd

Completion Date:

April 2016

Design and Construction Cost:

Contract Value - \$11.35M
Construction Cost - \$124M

Firm’s Role:

Design Engineer for final design and construction

Team Involvement

Vinnie Hart – Design Manager
Bart Giles – Project Engineer
Carter Biesemeyer – HVAC & Plumbing
Steve Kuehr – Geotechnical
Chris Juliana – Surveyor
John Meyer – Start up Assistance



Boyd Lake WTP Process Improvements Design

City of Greeley, CO

Through a collaborative CMAR process with the City of Greeley and Hydro Construction, Carollo has developed process improvements that address the numerous project goals by implementing a source water aeration system, advanced oxidation with ozone and hydrogen peroxide, and conversion of conventional filters to biofiltration at this 40-mgd facility.

Extensive jar testing was conducted both at the Boyd Lake WTP as well as at Carollo's Water ARC® bench testing facility. Water ARC® performed ozone, ozone + peroxide, and disinfection byproduct testing to confirm the selected process modifications would achieve the project goals.

Project Details

Carollo designed a new chemical facility to eliminate chlorine gas, improve operational safety and increase storage capacity for new and existing chemicals. The new chemical facility includes hydrogen peroxide for the advanced oxidation process, sodium hydroxide to replace the existing (outdoor) system, and sodium hypochlorite to replace the existing chlorine gas cylinder system. Modifications to the existing alum (outdoor) system was also included to improve the safety and increase storage capacity of the process-critical chemical.

The Boyd Lake WTP Process Improvements is a CMAR project with Hydro Construction. Carollo has completed the design and construction began in early 2020. Carollo delivered the project in close coordination and collaboration with both the City of Greeley and Hydro to incorporate input from all project participants. Carollo conducted evaluations of various process alternatives such as bulk sodium hypochlorite or on-site sodium hypochlorite generation and layout/siting options for the new facilities to best plan for future expansion and flexibility for future unknowns.

ACCOMPLISHMENTS

- Use of ozone/hydrogen peroxide reduced costs (compared to ozone only) and reduced ozone generator capacity by 50 percent.
- Achieved T&O reduction from MLB and Geosmin from 100 ng/L to 3 ng/L with an ozone dose of 2 mg/L and a hydrogen peroxide dose of 1 mg/L.
- New chemical building will eliminate chlorine gas and alleviate the current sodium hydroxide storage and feed issues.

RELEVANCE TO JOHNSTOWN

Ozone+H₂O₂, eliminate 30 mg/L of PAC, Conversion to biofiltration, CMAR

**Innovative Project
to Address SOURCE
WATER without PAC,
Ozone Oxidation of
Taste and Odor, and
New Chemical Facility**

\$16M
(phase funded)

Client Reference

Peter Champion, PE
Water Systems Engineer / Project Manager
P. 970.350.9319

Capacity of Project:

40 mgd

Completion Date:

Design completed in 2019, construction is ongoing.

Design and Construction Cost:

Design and SDC fee - \$2.1M
Construction cost - \$16M

Firm's Role:

Design Engineering

Team Involvement

Vinnie Hart – Project Manager
Jason Assouline – Design Manager/
Technical Lead
John Meyer – Project Engineer
Bart Giles – Civil Lead
Jason Till – Structural Lead
Steve Kuehr – Geotechnical Lead
Greg Short – Architect



UNIQUE PROJECT REQUIREMENTS

- Narrative developed to maintain 12 alluvial wells to minimize surge to the pellet reactors which are sensitive to flow changes.
- Custom and constant head box to eliminate risk of underdrain blow-out.
- Cross-connection prevention with minimal backflow preventers (using air gaps).
- Largest pellet softening plant in the United States

RELEVANCE TO JOHNSTOWN

Filtration, CMAR project delivery, Expandability

Pellet Softening Design

South Adams County Water and Sanitation District, CO

Carollo was the design engineer for the \$44.5 million dollar Construction Manager at-Risk South Adams County Water and Sanitation District's (SACWSD) Pellet Softening Design Project at the Klein Water Treatment Facility (KWTF). SACWSD's primary water source is a group of 12 alluvial wells with significant hardness in the water, which has caused customers to endure costs of frequent plumbing and water heater replacement as well as the addition of in-home water softeners. Carollo successfully pilot tested and designed pelletized softening and filtration. The project consists of pellet softening with sodium hydroxide, stabilization with carbon dioxide, chlorine contact for virus inactivation, dual media filtration. The building layouts were designed to include addition space for more pellet reactors and filters and the chemical feed and stabilization basin was designed for 18 mgd. The pellet softening system includes pellet reactors each with a diameter of 10 feet and an allowable flow range of 4 to 4.67 mgd.

This successful design project led to the construction of the 14 mgd pellet softening system, which is a full-scale, centralized process that is capable of treating up to 14 mgd to reduce calcium hardness in SACWSD's water supply. The project includes modifications to the existing plant as well as construction of new facilities.

Client Reference

Kipp Scott, Project Manager
7400 Quebec Street
Commerce City, CO 80037
P: 303.288.2646

Capacity of Project:

14 mgd (expandable to 18 mgd)

Completion Date:

Substantial completion - 3/10/2021

Design and Construction Cost:

Design & ESDC Costs - \$6,966,000
Construction Costs - \$44,525,000

Firm's Role:

Design and Construction Engineer

Team Involvement

Vinnie Hart – Project Manager
Jim Kriss – Civil
Jason Rozgony – Cost Estimating
Stephanie Riley – Startup & Commissioning
Carter Biesemeyer – HVAC/Building Mechanical
John Meyer – Piloting/Plumbing
Steve Kuehr – Geotechnical
Chris Juliana – Surveying
Greg Short – Architectural



Carollo designed horizontal directional drill crossings to minimize impacts to environmentally sensitive Piney Creek.

RELEVANCE TO JOHNSTOWN

- Planning, preliminary design, final design, and construction management.
- Pipeline routing analysis, design, permitting, and construction.
- Existing pump station improvements including pumps, valves, and transient control design
- Hydraulic modeling
- AACE Class 1 cost estimate.

Gun Club Raw Water Expansion Eagle Bend Metropolitan District, CO

Carollo developed final design documents to expand the City of Aurora's raw water system to serve the Eagle Bend Metropolitan District's Heritage Eagle Bend Golf course. The new raw water source represents a renewable water supply for the golf course, eliminating its reliance on deep non-renewable groundwater sources. The raw water system expansion increased the maximum system capacity from about 800-gpm to 1,200-gpm, and required improvements to two significant conveyance elements: the Gun Club Pump Station and the raw water transmission pipeline.

Aurora's Gun Club pump station was equipped with two existing 50-HP pumps on across the line starters. These pumps were replaced with larger capacity 100-HP pumps, equipped with soft starters to help manage transients during pump startup and power failure. In addition, new pump control valves were programmed with slow opening and closing features to reduce pressure surges from rapid valve closure. Lastly, a surge anticipator valve was added from the pump discharge to suction side as a third pressure transient control measure.

The existing transmission pipeline delivers water to the City's Saddle Rock Golf Course. A new transmission pipeline and flow split vault was designed to split flow to also convey raw water to the Heritage Eagle Bend Golf Course. The new transmission pipeline designed as 12-inch PVC pipe, 8,200 feet in length, and included, two horizontal directional drills, pressure reducing and flow control vaults, and significant permitting including Aurora, Arapahoe County, E-470, and US Army Corps of Engineers.

Client Reference

John Bruneau
Project Manager
P: 303.328.7303

Capacity of Project:

1.73 mgd

Completion Date:

July 2020

Design and Construction Cost:

\$584,000 Design & ESDC; \$3.3M
Construction

Firm's Role:

Planning, Preliminary Design, Design, and
Construction Management

Team Involvement

Jim Kriss – Project Manager
Bart Giles – Project Engineer
Jason Rozgony – Cost Estimator
Steve Kuehr – Geotech



RELEVANCE TO THIS PROJECT

- Finished water pump station
- Variable frequency drives specifically designed for energy efficiency (rebate from Xcel received)
- 16 mgd capacity
- Less than 1% change orders

\$7.7M
CONSTRUCTION

Zone 4C Pump Station

Centennial Water and Sanitation District, CO

Carollo performed a potable water distribution study for the District which recommended the installation of the Zone 4C Booster Pump Station. The station provides critical additional capacity to distribution zones 4, 5, and 6. When compared to similar stations within the District's system, the Zone 4C pump station increased efficiency by decreasing pump station headloss by over 90 percent. The efficiency of the new pump station qualified the District for large rebates from Xcel Energy, which provided significant offsets toward the capital construction cost as well as low long-term operating costs. As part of the study, a surge analysis was conducted for the pump station and distribution system. Based on the recommendations of the study, the District competitively procured design and construction management services and selected Carollo. The station was equipped with four (4) 350 HP horizontal split case pumps, steel pump manifolds (150 psi pressure rating), a surge tank for surge mitigation, and an emergency generator sized to power the entire pump station.

To achieve energy efficiency and minimize minor losses, Surge Buster tilted disc check valves and flow meters were installed on the discharge of each pump. The check valves rapidly close in the event of a power failure minimizing surge pressures as well. Individual pump discharge flow meters allow operators to periodically perform tests of each pump to determine installed curves and optimize pump efficiency without impacting pump station operation. The suction and discharge headers were designed to keep minor losses to a minimum and facilitate proper operation of the pumps for an energy-efficient design.

Client Reference

Ryan Edwards, Project Manager
62 W. Plaza Drive
Highlands Ranch, Colorado 80129
P: 303.791.0430 X: 4907

Capacity of Project:

16 mgd firm capacity

Completion Date:

Contract dates 2014 - 2016

Design and Construction Cost:

Design and ESOC costs - \$1,327,000
Construction costs - \$7,710,315

Firm's Role:

Prime Consultant for design

Team Involvement

Vinnie Hart – Project Manager (preliminary design) and Principal-in-Charge (design and construction)
Bart Giles – Project Manager (design and Construction)
Jason Assouline – Construction Support
Jim Kriss – QA/QC
Steve Kuehr – Geotechnical
Carter Biesemeyer – HVAC/Building Mechanical



Education

MS Hydrologic Science and Engineering, Colorado School of Mines, 2016

BS Chemical Engineering, Colorado School of Mines, 2011

Licenses

Professional Engineer, Florida

Professional Engineer, Colorado

Professional Affiliations

American Institute of Chemical Engineers

American Water Works Association

Anthony M. Actis, P.E.

Anthony Actis, a motivated and results-driven engineering professional, has nine years of versatile industry experience, with a primary focus on process and project engineering in water treatment. He has excellent communication skills and has adaptable technical aptitude. Prior to joining Carollo Engineers, Inc., Mr. Actis acted as a project and process engineer on many water-focused projects. He also spent time working on process and facilities engineering and operations, and has experience as a project engineer and field engineer for a variety of oil and gas projects. He has demonstrated the ability to maintain positive working relationships with internal team members, clients, vendors, and construction subcontractors.

Relevant Experience

→ Project engineer for the City of Greenwood Springs, Colorado, Red Mountain Water Treatment Plant Improvements. This project was an emergency fast-tracked design in response to the Grizzly Creek wildfire event of 2020. The design provided additional plant capacity and contingency unit processes to address increased turbidity and sediment removal from the Roaring Fork Source, No Name Creek, and Grizzly Creek. Additional design improvements included modernized and automated process equipment and controls to augment plant operations and ability to reach treatment objectives in emergency scenarios. Mr. Actis managed design team efforts and discipline coordination, designed and developed equipment configuration, developed technical specifications and contract documents, and coordinated vendor efforts. The overall design schedule for the project was limited to six weeks due to client schedule constraints; Mr. Actis led multiple internal QC review periods ensuring that design packages exceeded client expectations.

→ Project engineer for the Centennial Water and Sanitation District, Colorado, Joseph Blake Water Treatment Facility Phase I Design Services. This project entailed the evaluation and design of the replacement for rapid mix, flocculation, and sedimentation equipment, as well as a new chemical storage and feed facility. Mr. Actis served as design manager and coordinated design efforts across disciplines.

→ Project engineer and manager for Ute Water Conservancy District, Colorado, Solids Separation Lagoon Improvements Study. The goals of this project included assessing deficiencies and aging infrastructure associ-

ated with the District's earthen lagoons 1, 2 and 3, and examine retrofit options for lagoons 4 and 5 to allow for winter operation. Responsibilities included evaluation of historic plant data and record drawings to assess solids separation performance, investigate regulatory requirements for solids waste, and recommend plant infrastructure improvements and alternatives to improve plant operations.

→ Project engineer for the City of Tampa, Florida, David L. Tippin Water Treatment Facility (DLTWTF) Chemical System Improvements Progressive Design-Build. This project includes a new on-site sodium hypochlorite production facility, pipe/utility trench systems upgrades and additions, and a replacement ammonia system. Mr. Actis's responsibilities included design of a 300,000-gal sodium hypochlorite storage tank farm with 300+ gpm pressure loop to dose at multiple application points for plant production up to 140 mgd. His efforts included design team coordination between disciplines and management of storage and metering areas of the design. Mr. Actis developed hydraulic piping models for all systems; he sized and designed facility and equipment layout; and led specification and control narrative development for these systems.

→ Project engineer, task manager, and chemical systems design lead for the East Cherry Creek Valley Water, Colorado, Northern Treatment Plant Phase 2 Expansion. This project was an expansion of a 10 MGD 4-stage desalination drinking water treatment plant to 25 MGD. Mr. Actis was responsible for determining storage volumes and feed rates for a single facility that will also provide flexibility for additional fu-

Anthony M. Actis, P.E.

ture RO process phases. He led design efforts for the chemical systems and facility which included identifying design criteria and sizing equipment, drafting design reports for client submittals, equipment RFQ's and vendor communications, cross-discipline design coordination, specification writing, managing drafting efforts to create and revise PFD's, P&ID's, and mechanical sheets from conceptual design through 100% submittals and early construction. Mr. Actis coordinated chemical system design preferences and objectives at client meetings to ensure buy-in on design. He served as Resident Engineer through construction, which included submittal and RFI review, as well as construction oversight and inspection on behalf of the owner.

→ Project engineer and chemical systems discipline lead for the East Cherry Creek Valley Water, Colorado, 4-Stage RO Pilot System. This project was a RO pilot system in preparation for East Cherry Creek Valley's plant expansion from 10 MGD to 25 MGD. Mr. Actis was responsible for coordination of operations with plant operators, was regularly on-site to operate and troubleshoot the pilot system, and processed all operations data. Additionally, he drafted periodic status reports and provided successful recommendations for East Cherry Creek Valley to modify their full-size plant's chemical portfolio based on data analysis from the pilot system.

→ Project engineer and task manager for the City of San Jose, California, Bureau of Reclamation's Santa Teresa Water Treatment Plant's Raw Water Ozonation Alternative – 30-percent Design. This project entailed a 30-percent design of a raw water ozonation system at the Santa Teresa WTP. Mr. Actis was responsible for identifying unit processes, RFQ's and vendor communications, comparison of process equipment, and making recommendations to the project team. Additionally, he developed PFD's and P&ID's, as well as facility and site layouts, that integrated raw water ozonation into the existing treatment plant. He identified design criteria and sized equipment for chemical pumps, liquid oxygen storage and vaporizing units, ozone generators and

power supplies, cooling water systems, and ozone contactor basins.



Jason Assouline, P.E.

Jason Assouline has more than 16 years of experience in drinking water and reuse treatment. His experience spans water treatment, reuse, and wastewater projects with expertise in large greenfield treatment plant design, design of upgrades to existing facilities, pilot plant operation, small scale package plant evaluation, full-scale operation, and engineering services during construction.

Education

MS Environmental Engineering, University of Iowa, 2004

BS Civil Engineering, University of Iowa, 2002

Licenses

Professional Engineer, Colorado, New Mexico

Professional Affiliations

American Water Works Association (member since 2004)

Water for People (member since 2005, committee chair from 2008-2010)

WaterReuse Colorado (member since 2011, Board member in various positions since 2016)

Water Experience

→ Design manager and process lead for the City of Greeley, Colorado, Boyd Lake Water Treatment Plant Process Improvements Project. This project included a new chemical facility and ozone improvements at a 40 mgd conventional treatment facility.

→ Start-up and commissioning support for the Centennial Water and Sanitation District, Colorado, Zone 4C Pump Station. Major elements of the project included four 350-horsepower horizontal split-case pumps, 1250-kW standby generator, two-story open pump room with bridge crane, and high to low pressure zone bypass line.

→ Project manager and process lead for the City of Greeley, Colorado, Residuals Improvements Project. This project analysis of the residuals systems at both the Bellvue and Boyd Lake Water Treatment Plants. Evaluated the current system at each facility, and developed alternatives and recommendations to improve and optimize the solids handling approaches.

→ Project manager for the Centennial Water and Sanitation District, Colorado, Joseph Blake Water Treatment Plant Phase I improvements project. The project entailed evaluation and design of replacement of all rapid mix, flocculation, and sedimentation equipment as well as a new chemical storage and feed facility. Bench top testing was also conducted for taste and odor mitigation with ozone. The bench testing was conducted at Carollo's Water ARC® lab.

→ Project manager and process lead for the City of Aurora, Colorado, Wemlinger Water Purification Facility (WPF) Chemical Study. The project included a detailed analysis of all chemical systems and a conceptual layout for a new flocculation and sedimentation facility to support long term site planning. Also included in the project was

extensive jar testing of various source water blending scenarios to assess the impact on coagulation chemistry (and how that related to chemical doses and storage quantities required).

→ Process engineer for the City of Aurora, Colorado, Wemlinger WPF PLC Conversion and Improvements project. Project entailed complete replacement of the entire control and SCADA systems for this 80 mgd direct filtration water treatment plant. As the process lead, was responsible for guiding workshops with the operational staff to determine the preferred approach for each process to develop detailed control narratives.

→ Process lead for Denver Water, Colorado, NorthWater Treatment Plant, Denver, Colorado. Responsible for leading the flocculation/sedimentation, disinfection (combination of UV and free chlorine), as well as the chemical facilities for this greenfield 150-mgd water treatment facility.

→ Design manager for the City of Aurora, Colorado, Binney Water Purification Facility Solids Dewatering and Filter Additions project. Led the design effort for a \$12 million project which included the addition of four biofilters, new chemical storage and feed, gravity thickener and pump station, and the conversion from lagoons to solids drying beds. Responsibilities included coordination of a multi-discipline team, as well as all process design for all components except the gravity thickener and pump station.

→ Design and construction manager for the City of Aurora, Colorado, Reservoir Aeration Project. Led the design for this \$1 million project which included the addition of a LOX storage and feed system and linear diffuser in the reservoir. Responsibilities included coordination of a multi-discipline team, as well as all process design. The fast-tracked design was completed in 4 months

Jason Assouline, P.E.

to allow for construction to be completed before winter 2015. Led construction activities including inspection, submittals, RFIs, and contract modifications.

→ Project manager for Mt. Werner Water and Sanitation District/City of Steamboat Springs water projects. Led the treatment evaluation as part of the watershed wildfire protection plan to examine the impacts of a potential wildfire in the Fish Creek watershed and treatment mitigation strategies. Managed and led the technical evaluation for a corrosion control study (compliant with CDPHE and EPA guidance) and a facility master plan. The corrosion control study included a desktop analysis as well as pipe loop testing. The Facility Master Plan builds upon the recommendations in the wildfire plan and corrosion control study and also included a comprehensive evaluation and recommendations for near term and long range improvement projects at both the Fish Creek Filter Plant and the Yampa River Wells Filtration Plant. Conceptual improvements were developed and ranked based, and extensive cost estimating was conducted to support the capital outlay for the District and the City.

→ Project manager and process lead for the City of Santa Fe, New Mexico, Canyon Road Water Treatment Plant Improvements. The project included a comprehensive performance evaluation of all processes at the 8 mgd conventional water treatment plant. Detailed design included a hypolimnetic aeration system to control source water manganese and a new flocculation and sedimentation facility.

→ Project manager and lead engineer for the Arapahoe County Water and Wastewater Authority, Colorado, Joint Water Purification Plant (JWPP) Treatment Alternatives Study. Project entailed conceptual design of three treatment alternatives for the existing JWPP. This treatment facility currently has the ability to treat up to 4 mgd of alluvial groundwater through microfiltration membrane process. The alternatives analysis entails comparing restoration of the RO process currently on site (not used) which requires selenium treatment of the RO concentrate (2

alternative treatment options) as well as a pellet softening option.

→ Process lead for the City of Park City, Utah, 3Kings Water Treatment Facility. Lead engineer for the filtration and adsorption treatment processes for the new 4.3-mgd potable water treatment facility. The source water is a combination of various mine tunnel discharges and the treatment process focuses on metals removal through pyrolytic filters and titanium oxide adsorption.

→ Project manager for the City of Aurora, Colorado, Binney Water Purification Facility UVAOP Chemical Cleaning System. Responsible for the evaluation, design, and construction of a chemical cleaning system for one of the largest UVAOP systems in the world.

→ Project manager for the City of Aurora, Colorado, Griswold WPF Disinfection and DBP Reduction Study. Responsible for the evaluation of chlorine and chlorine dioxide application at this 60-mgd facility to reduce/optimize the chemical doses and disinfection byproduct concentration in the facility.

→ Project manager for Denver Water, Colorado, Marston Treatment Plant Flocculation and Sludge Collection project. Served as project manager for the inter-disciplinary design team. Coordinated schedule, budget, and all activities related to the electrical and I&C design of the flocculation and sludge collection equipment replacement at this 210 mgd facility.

→ Project manager for Denver Water, Colorado, Foothills Treatment Plant Filter Building and Pump Station Lighting Improvements. Responsible for schedule, budget, and all activities related to the design of the lighting system modifications at this facility.



Education

MS Finance, University of Colorado at Denver, 2010

BS Business Administration, Regis University, 2006

Professional Affiliations

American Water Works Association (AWWA)

Water Environment Federation (WEF)

Cody Berg

Cody Berg is an associate vice president with Carollo with 14 years of extensive experience in municipal finance. As a consultant and former employee at Denver Water, Cody understands both sides of the utility business. He routinely conducts multi-year financial planning, impact fee, bond feasibility, and cost of service, rate, and charge studies throughout the Western U.S. He is currently active in industry associations including the American Water Works Association (AWWA) National Rates and Charges Committee.

Relevant Experience

→ Financial lead for the Business Plan and Importation Study for the Central Iron County Water Conservancy District, Utah. Project considered the financial impacts of a large water supply project to the District and other regional stakeholders. The Carollo team prepared a model to facilitate the analysis of multiple scenarios, including capital and operating costs and funding alternatives. The analysis projected cash flows for all stakeholder agencies, under multiple scenarios, to estimate the associated rate increases necessary for financial viability.

→ Project manager for the Water, Sewer, and Stormwater Financial Plan and Rate and Tap Fee Study for Dominion Water and Sanitation District (Colorado). He determined annual revenue requirements for 10-year period, cost of service by customer class, and recommended alternative rate structures. Study included full customer billing analysis, development of cost of service rate model, and presentations to elected officials and public stakeholders.

→ Quality review for the Inland Empire Utilities Agency, California Wastewater and One Water Rate and Fee Study. He is leading comprehensive rate and fee update encompassing potable, recycled, and recharge water service rates, and wastewater service rates, as well as wastewater and one-water connection fees.. He also leads the creation and delivery of presentations and workshops for an extensive outreach program aimed at garnering buy-in and support from the member agencies, builders association, and other stakeholders.

→ Financial lead for the City of Houston's evaluation of repairing and rehabilitating

their existing plant versus utilizing the reserve capacity of the Northeastern Water Purification Plant Expansion. Managed a study that evaluated and compared the costs between the two alternatives, including multiple scenario analysis of each alternative.

→ Financial lead for the Chlorine Analysis Study, City of Odessa, Texas. Reviewed financial results of the Chlorine analysis and cost of potential processes to ensure accurate use of assumptions and calculations of net-present value.

→ Financial lead for the third-party review of Financial Planning and Cost of Service Study for San Diego County Sanitation District, California. Carollo reviewed the revenue requirement, allocations and unit costs to ensure appropriate industry cost of service and rate making standards were used in development of the financial model. Prepared a Technical Memorandum summarizing findings and recommendations for presentation to District staff.

→ Financial lead for the Wastewater Service Scenario Analysis Study for the Town of Sahuarita, Arizona. Developed a decision matrix to assist Town in identifying important considerations for Wastewater Service scenarios. Produced financial model evaluating unit costs for identified scenarios, ultimately leading the Town to a determination of best option for wastewater service.

→ Project manager for the Water and Wastewater Financial Planning Study for the City of Surprise, Arizona. Developed an interactive and dynamic model which provided the City with the ability to run multiple scenario analysis in real-time. Delivered model to client including a written

Cody Berg

manual and hands on training workshops with staff.

→ Project manager for the Wastewater Financial Planning, Cost of Service and Rate Design Study for the Town of Ruidoso, New Mexico. Conducted a comprehensive 10-year financial plan to meet EPA mandate requiring the town to upgrade its wastewater treatment plant due to its discharging of effluent flows into a river containing endangered Trout species. Through a combination of grants, state funds, and bonds, the Town successfully implemented rates sufficient to upgrade the plant, meeting the mandate.

→ Project manager for the Water and Wastewater Financial Planning, Cost of Service and Rate Design Study for Security Water and Sanitation District, Colorado. Developed a comprehensive financial plan that consistently met financial objectives and policies and successfully implemented annual increases which were unanimously approved by the Board of Directors. Transitioned to Cost of Service based rates over a three year period while ensuring enterprise funds were financially viable and self-sufficient. Conducted in depth analysis of customer billing data to assist the District in analyzing the existing rate structure and its ability to meet its objectives, which ultimately resulted in a rate structure change.

→ Project manager for the Water and Wastewater Rate Study for Benbrook Water Authority, Texas. Responsible for leading comprehensive rate and fee update encompassing potable, recycled, and recharge water service rates, and wastewater service rates, as well as wastewater and one-water connection fees. Also responsible for creation and delivery of presentations and workshops for an extensive outreach program aimed at garnering buy-in and support from other member agencies, builders association, and other stakeholders.

→ Project manager for the Wholesale Water Rate Study for Baytown Area Water Authority, Texas. He determined annual revenue requirements for 10-year period,

cost of service by customer class, and recommended alternative rate structures. The Authority also provided water service to the City of Baytown and several other wholesale customers. Study included full customer billing analysis, development of cost of service rate model, and presentations to elected officials and public stakeholders.

→ Project manager for the Cost of Service Study for Colorado City, Colorado. Developed a comprehensive financial plan that assisted the City's financial advisor in issuing additional debt to pay for water and wastewater system capacity expansion. This study extracted the City's objectives and policies and resulted in successful implementation of proposed revenue increases which were unanimously approved by City Council.

→ Project manager for the Water and Wastewater Financial Planning, Cost of Service and Rate Design Study for the Town of Erie, Colorado. Developed a comprehensive financial plan that consistently met financial objectives and policies and successfully implemented annual increases which were unanimously approved by the Board of Directors. Implemented Cost of Service based rates which ensured enterprise funds were financially viable and self-sufficient. Conducted in depth analysis of customer billing data to assist the Town in analyzing the existing rate structure and its ability to meet its objectives, which ultimately resulted in a rate structure change.

→ Financial lead for the Cost of Service study for the City of Aspen, Colorado. Successfully implemented wholesale water rates that required modifications due to an extension of the City's airport runway. Study garnered City and staff support and resulted in rates that were unanimously approved by City Council. The runway extension also allowed the City to increase tourism and produce additional income for the City.



Education

BS Mechanical Engineer,
University of Colorado,
Denver, 2002

Licenses

Mechanical Engineer,
Arizona, California

Professional Engineer,
Texas, Colorado,
Washington

Certification

LEED Accredited
Professional, Green
Building Certification
Institute, 2009

Professional Affiliations

American Society of
Mechanical Engineers

American Water Works
Association

Tau Beta Pi

Carter P. Biesemeyer, P.E., LEED

Carter Biesemeyer is a mechanical engineer with 16 years' experience in design, construction management, and regulatory compliance for water and wastewater projects up to 300 mgd. Carter has experience with a variety of clients including private and municipal water/wastewater utilities and the U.S. Army Corps of Engineers (USACE). Design and construction management experience for water and wastewater treatment processes includes process air blower facilities, chemical storage and feed facilities, headworks facilities, arsenic treatment facilities, odor control facilities and pump stations. Non-process design and construction management experience includes HVAC, plumbing and compressed air systems. Areas of regulatory familiarity include hazardous material management planning, construction permitting, and surface water discharge permitting.

Relevant Experience

→ Mechanical engineer for the Colorado Springs Utilities, Colorado, progressive design-build of the Southern Delivery System Water Treatment Plant and the associated Transmission Mains. Recognized as the largest water project in decades in Colorado, the plant receives and treats surface water from Pueblo Reservoir to help meet Colorado Springs' growing potable water needs, with an initial capacity of 50 mgd and an ultimate build out capacity of 150 mgd. Responsibilities included engineering services during construction focused on HVAC and control systems coordination.

→ Mechanical engineer for the Arapahoe County Water and Wastewater Authority, Colorado, Connecting Main project. Services provided included mechanical design of HVAC systems, response to submittals and requests for information, field inspection of construction, and retrofit of a hypochlorite booster system consisting of a 300 gal tank and metering pumps into an existing control valve vault.

→ Mechanical engineer for the Centennial Water and Sanitation District, Colorado, Zone 4C Pump Station project. The pump station provides an interconnection between pressure zones in the District's drinking water distribution system pressure zones. The pump station is a 16 mgd firm capacity below grade structure with full standby power provided by a fixed diesel generator. Carter provided quality review of design documentation including HVAC systems.

→ Lead mechanical engineer for the City of Aurora, Colorado, Cherry Creek Well Field Controls Rehabilitation. The controls rehabilitation includes removal of back pressure valves and implementation of variable frequency drives for 6 alluvial well pumps in the well field. The purpose of the project was to allow automatic control of all the pumps in the well field and to save energy by lowering the pressure at which the well field operates. Energy savings are predicted to exceed \$50,000 annually. Carter created a pumping system performance and control simulation model incorporating variable speed pump performance curves, and conveyance system hydraulic models. The performance and controls model was used to establish allowable pump speed ranges and on/off sequencing required to achieve any operator input flow set point over the entire flow capacity of the well field (from 1.0 mgd up to 10.1 mgd). The model allowed simulation of performance for the system of 6 different pumps operating at variable speeds singly and in any combination. The model outputs included allowable pump speed ranges correlated to the well field flow capacity. The allowable speeds were input directly into the SCADA programming to ensure pumps operate safely within the recommended flow and head range at all times. The model also tuned the operating speed versus flow capacity to maintain each pump near its' best efficiency point regardless of the combination of pumps running.

→ Mechanical engineer for the Metro Wastewater Reclamation District, Colorado, PAR 1088 Northern Treatment Plant - ESDC,

Carter P. Biesemeyer, P.E., LEED

This was a new 24-mgd (60 mgd ultimate capacity) regional facility. Responsibilities included pump station and hydraulic RFI assistance and HVAC construction coordination.

→ Mechanical engineer for the Clifton Water District, Colorado, Microfiltration / Ultrafiltration Water Treatment Plant project. Carter led the HVAC design including the retrofit of the existing building, which was repurposed to house new micro- and ultra-filtration equipment. This ENR award winning project included retrofitting the existing building with high-efficiency condensing gas-fired heaters, reducing fuel usage and providing a conditioned environment to protect the new water treatment equipment. While the high-efficiency equipment was more expensive than other options, the calculated payback period based on energy/fuel savings was less than three years.

→ Mechanical engineer for the Eagle River Water and Sanitation District, Colorado, Wastewater Treatment Plant Master Plan. Project includes evaluation of portfolios of different combinations of improvements for the District's three water reclamation facilities as part of a watershed-based approach to planning. The condition assessment comprised a multi-discipline investigation of existing wastewater process facilities including mechanical, electrical, instrumentation and structural components. Carter performed condition observations for mechanical and HVAC equipment, assessed facility compliance with NFPA 820, and created a condition assessment observation tracking system that captured in-situ commentary, photos, and equipment data on a personal tablet. The data collected was electronically imported into four discipline specific reports – structural, mechanical, HVAC, and electrical/controls – for each process facility at the three wastewater treatment plants.

→ Mechanical engineer for the City of Fort Collins, Colorado, Digester Building HVAC Replacement project. The project includes improvements needed in the Digester Building Control Room to accommodate new cogeneration facility equipment and

controls. Carter's responsibilities included NFPA 820 requirements assessment, HVAC design, room layout modifications, and coordinating with regulatory authorities. Carter prepared a technical memorandum comparing the latest version of NFPA 820 requirements to the existing conditions and coordinated design with the authority having jurisdiction to implement improvements that maintain safety in the space that houses the new cogeneration electrical and controls equipment.

→ Mechanical engineer for the Colorado Springs Utilities, Colorado, \$124 million Edward W. Bailey (SDS) Water Treatment Plant. The SDS has a non-proprietary control scheme for HVAC that allows direct control of HVAC equipment from the plant SCADA system including HVAC related set-points, monitoring, alarms, and emergency shut-downs. Carter provided engineering services during construction to coordinate HVAC installation, controls troubleshooting, and startup / commissioning. Carter wrote a narrative encompassing a comprehensive component-by-component functional matrix and controls description for evaporative coolers, air handling units, air makeup units, unit heaters, energy recovery units, variable volume fan-coils, and hydronic heating systems.

→ Mechanical engineer for the Clifton Water District, Colorado, Microfiltration / Ultrafiltration Water Treatment Plant project. The ENR award winning project included retrofitting the existing building with high-efficiency condensing gas-fired heaters, reducing fuel usage and providing a conditioned environment to protect the new water treatment equipment. Carter led the HVAC design including the retrofit of the existing building, which was repurposed to house new micro- and ultra-filtration equipment. While the high-efficiency equipment was more expensive than other options, the calculated payback period based on energy/fuel savings was less than three years.



Bart Giles, P.E.

Bart Giles experience includes the planning and design of water and wastewater pipelines, pump stations, storage reservoirs, infrastructure, and wastewater treatment. Some of his recent projects include:

Relevant Experience

→ Project manager for design of the Centennial Water and Sanitation District, Colorado, Zone 4C Pump Station. Led the design team that included structural, electrical, instrumentation and controls, mechanical, HVAC, architectural, and CAD disciplines for the 16-mgd potable water pump station. The pump station building was given architectural treatments to appear like a barn in order to minimize visual impact to surrounding neighborhoods. Major elements of the project included four 350-horsepower horizontal split-case pumps, 1250-kW standby generator, two-story open pump room with bridge crane, and high to low pressure zone bypass line.

→ Assistant project manager and lead civil engineer on the progressive design-build team for the Colorado Springs Utilities, Colorado, Southern Delivery System Water Treatment Plant and Finished Water Pump Station. This project included consolidating the original 30 percent design from 19 different structures into one main process building. This approach reduced the project cost from \$160 million to \$124 million. The project included a 200-gpm cationic exchange system, two 12-ton salt saturators, design of a pump mix rapid mixing system, vertical mixer flocculation, parallel plate sedimentation, side-stream ozone, and engineered biofiltration. The project also included a 10-MG raw water tank, 7.5-MG finished water tank, and finished water pump station to two different pressure zones. The original design of the finished water pump station was overhauled to provide a conservative design that was also energy efficient. The preliminary/final design was completed in 365 days. The design also included sequencing of the raw water pumping system during off-peak hours to reduce the overall operating costs of the system and leverage the 10-MG raw water tank.

→ Project manager for the City of Aurora, Colorado, 80-mgd Wemlinger WPF CT Chamber Design project. The project consisted of a 2.5 mg buried concrete disinfection chamber with a serpentine channel and a baffling factor of 0.80 outside of the treated water reservoir at the Wemlinger WPF. The chamber is designed to operate at two water surface levels. The low level will minimize volume and associated disinfection by products at low flows, as well as maximize the allowable filter headloss. The high level allows a maximum depth during high flows when the filters can be operated at lower headloss. The design included chlorine and ammonia dosing and flash mixing to produce chloramines at both the beginning and the end of the CT Chamber, sodium hydroxide dosing to adjust pH, chlorine, ammonia, pH monitoring, and turbidity monitoring, and a supplemental chlorine boosting location part way through the CT chamber. Additional design elements included flow metering, pumped CT-to-waste to enable quick draining of the CT chamber, and the ability to bypass the treated water reservoir to two different pressure zones in order to allow the treated water reservoir to be maintained without taking the water treatment plant offline.

→ Design and cost estimating for the City of Fresno, California, \$45 million Kings River Pipeline. The City of Fresno is currently designing a new 80 mgd surface water treatment and conveyance facilities as part of a decades long Metro Water Plan whose goal is to replace groundwater sources that have been experiencing over draft since the 1950s. The Kings River pipeline will convey raw water from the Kings River and associated irrigation canals to the surface water treatment and potable distribution. The design consists of 66,000 linear feet of 72-inch welded steel pipeline, a check structure and turnout to divert raw water to the pipeline, a flow meter vault, access manways, CAVs, blow-offs, and all

Education

MS Civil Engineering,
Utah State University,
2003

BS Civil and
Environmental
Engineering, Utah State
University, 2003

Licenses

Civil Engineer, California
Professional Engineer,
Colorado

Bart Giles, P.E.

associated electrical and instrumentation design.

→ Project engineer for the City of Aurora, Colorado, Wemlinger Treated Water Reservoir Rehabilitation. The project involves replacing roof access hatches; adding vents; demolishing piping and appurtenances inside and connecting to the existing 10-MG concrete treated water reservoir; installing multiple sections of piping, including tie-ins to existing piping; adding a valve to the reservoir drain pipe; and miscellaneous treated water reservoir concrete penetrations and repairs associated with piping and demolition. The bid price for the project was \$2.5 million, and the fast-track project needed to be constructed during the winter/spring of 2017. The project was staged to prevent shutdown of the Wemlinger Water Purification Facility during construction of the disinfection contact basin.



Provided detailed design for 3,100 feet of high-pressure, 36-inch and 42-inch water transmission main; 3,700 feet of 36-inch to 84-inch water transmission main; three large-diameter and three small-diameter trenchless crossings; and more than four miles total of plant process and yard piping ranging in size from 4 to 72 inches. Coordinated permitting through multiple agencies including county, city, airport, and Colorado Department of Transportation. Calculated plant hydraulics for the new 50-mgd water treatment plant to allow gravity flow of the process from the raw water tank through the finished water tank. Provided startup assistance, including running the treatment plant and pump station, troubleshooting mechanical and automated programming issues, and testing installed systems to verify proper performance.

→ Project engineer for the Thornton City of Thornton, CO, Water Project – Segment B Pipeline. The project involves designing 15 miles of 48-inch steel raw water transmission pipeline through 4 different municipalities, as part of an overall 70-mile pipeline that is being designed and constructed in phases. The alignment

includes 16 tunneled crossings of irrigation ditches, roads, and water bodies. Additional design responsibilities are obtaining permits from multiple agencies, land owner easement coordination, air valve and blowoff design, and filling/draining sequencing with high volume PRV and blowoff structures.

→ Project engineer for preliminary design of the Passaic Valley Water Commission, New Jersey, Water Storage Improvements. Responsible for preliminary sizing and layout of two 20-MG, two 15-MG, and two 5-MG aboveground prestressed concrete water tanks, more than three miles of 10 to 48-inch water piping, and corresponding site improvements.

→ Design reviewer for the City of Manhattan, Kansas, Water Treatment Plant and Wellfield Expansion. Checked and reviewed plans for the expansion, which included approximately 13,000 feet of 30 and 24-inch raw water pipeline, as well as for new 1,800-gpm vertical wells. The project also included a new 4.2-mgd transfer pump and new 5-mgd high service pump. All of the motors in the high service pump station were replaced, and two new variable frequency drives were added to the project.

→ Project engineer for design and construction of the Contra Costa Water District, California, Elderwood Reservoir Rehabilitation. The project involved evaluating and rehabilitating an above-ground steel water storage tank for seismic reliability and improved water quality mixing, including a new water quality mixing system within the tank.

→ Project engineer for the California Department of Corrections and Rehabilitation, California, Men's Colony Water Distribution Replacement. The project included hydraulic modeling to identify capacity and pressure deficiencies, consideration of water quality issues, and design for replacement of more than 112,000 feet of distribution piping, improvements, two booster pump stations, reservoir modifications, and well replacement.



Education

BS Geological Engineering, New Mexico State University, 1992

Licenses

Certified Construction Manager, Construction Manager Certification Institute, 07/01/04

Certification

Certified, Environmental Compliance Assessment, Training, and Tracking System (ECATTS), International Center for Leadership Development, 2016

Professional Affiliations

Construction Management Association of America

A. Eric Gilmore, CCM

Eric Gilmore is an advisor and construction manager with more than 26 years of experience building water and wastewater conveyance, storage, and treatment facilities. His responsibilities include all aspects of program management, construction management, and contract administration on behalf of the Owner. This includes oversight of contractors, issue resolution, change order review, and overall safety and quality assurance.

Relevant Experience

→ Construction manager for the Las Vegas Valley Water District, Nevada, Bermuda 2538 Zone Pumping Station. The project consisted of the installation of six constant speed potable water pumps with a design capacity of 5,200 gpm each, at 143 feet total dynamic head, approximately 1,400 feet of 72-inch and 1,200 feet of 48-inch water pipeline, cathodic protection, a radio telemetry survey, technical drainage study, surge analysis, computational fluid dynamics (CFD) modeling, architectural rendering, geotechnical investigation, permitting support, and construction services.

→ Construction oversight manager for Metro Wastewater Reclamation District, Denver, Colorado, Northern Treatment Plant. This \$475 million project was a progressive design-build project. Eric managed the construction oversight team with staff comprised of Carollo, sub-consultants, and the Owner for the construction of a 24-mgd (60-mgd ultimate buildout capacity) greenfield facility and regional interceptor system.

→ Program construction manager for the City of Henderson, Nevada, Southwest Water Reclamation Facility (SWRF). This project was a key element of the phased \$160M improvements program to the City of Henderson reclaimed water storage and delivery system. The other program phases included site readiness contracts and effluent delivery facility contracts developed and administered before and after the SWRF construction period. The City selected Eric and team as a third party to lead a bidability and constructability Review of the 90 percent contract documents. This review included participation of the designer, city engineering and operations staff, and Carollo subject matter experts with a formal report presenting findings and

recommendations for making the nearly complete design for the entire treatment, storage, and delivery system more bid-able and constructible.

→ Owner's advisor for the City of Houston, Texas, Northeast Water Purification Plant Expansion. This project includes planning, preparation, and preliminary construction of a \$1.8 billion program. Eric was an advisor for the City's Project Management Team and the Project Advisor – Technical Consultant (PMT/PATC) team establishing project administration, safety & quality assurance, work flows, organizational approach, team roles & responsibilities, sub-consultant management, and communication. He also assisted in establishing formal protocol and technique in daily, weekly, and monthly coverage and reporting of the design-builder's work for the PMT/PATC team.

→ Construction oversight manager for Metro Wastewater Reclamation District, Denver, Colorado, PAR 1225 South Headworks and Grease Processing Improvements. The \$53 million improvements project included addition and modification of all headworks components including screening, screening handling, grit removal and grit handling and replacement of the grease processing building with state-of-the-art equipment.

→ Construction manager for the Clark County Water Reclamation District, Nevada, Central Plant South Secondary Treatment Facility Phase 2, Site Preloading, Security Fencing, and Site Improvements Project. This project was one of three bid packages for the Phase 2 project which included site preloading for 40-mgd capacity of activated sludge and miscellaneous site improvements.

A. Eric Gilmore, CCM

→ Construction manager for the City of Las Vegas, Nevada, Lone Mountain Sewer Lift Station Modifications project. The project consisted of removal of the two existing pumps, electrical and controls, adding an electrical room, installation of three new 1,350 gpm pumps, power, controls, a standby generator, increasing wet well capacity, and 2,100 LF of 14-inch force main.

→ Project engineer for the City of Henderson, Nevada, On-Call Services. Services included plan reviews, and engineering services for design and construction support for public works projects.

→ Design engineer the City of Henderson, Nevada, for Sewer Lift Station Improvements to Armillaria, South Valley, and Stephanie Sewer Lift Stations. Project included preparation of plans for improvements as part of the On-Call Services for the City. Project included odor control facilities, site improvements, and piping modifications.

→ Process engineer for the Southern Nevada Water Authority, Nevada, Facility Operations Manual (FOM) Preparation for the South Valley Lateral Rate of Flow Control Stations (ROFCS). The FOM provides information on all of the valves, equipment and controls at the ROFCS, along with details on all of the modes of operation and control. The manuals are written for operating staff, first responders, maintenance staff, engineers, and information systems staff. They are designed as road maps to information through links to databases. They will also be used for training and development purposes.

→ Construction manager for numerous contracts for the Southern Nevada Water Authority, Nevada, \$2.2 billion Capital Improvements Program, including:

- Construction manager for the IPS-2 to Alfred Merritt Smith Water Treatment Facility Bypass Pipeline, a \$14 Million Design-Build Project consisting of 2,400 ft. of large diameter pipeline and an associated rate of flow control station to provide 365 million gpd of emergency

by-pass ability from one of two intake pumping stations to the ozone facility at the water treatment plant.

- Construction manager for the East Valley Lateral, a \$37 million fast track project consisting of two 150 ft. shafts and 1,400 ft. tunnel with 7 miles of 78 inch pipeline.
- Construction manager for the Raw Water Pumping System Project, a \$109.4 million project constructing three major pumping stations and a series of large diameter pipelines including an emergency by-pass for the ozone contactor of the existing Alfred Merritt Smith Water Treatment ozone facility designed to move 385 million gallons of raw water per day from Lake Mead to a new water treatment plant on the southeast side of the Las Vegas Valley.

→ Acting construction manager for the Southern Nevada Water Authority, Nevada, Public Works Project - Lake Mead Intake No. 2. Project included final design stages, addendum drafting, bidding process, and start up activities.

→ Resident construction engineer for the Southern Nevada Water Authority, Nevada, System Facility Improvements Project - River Mountain Tunnel No. 2. \$20 million project consisted of construction of a 4 mile 12 ft. diameter concrete lined tunnel.



Vincent S. Hart, P.E., ENV SP, LEED

Vincent Hart, an executive vice president with Carollo, has 27 years of experience in planning, design, and expansion of water supply, water treatment, and water distribution facilities. He has been involved with multiple bench and pilot studies involving design and expansion of water treatment facilities and has written various publications and given presentations on the subject. Mr. Hart has served as water supply engineer for design and operation of pilot plant facilities and water treatment plant expansion projects. His areas of expertise include flocculation and sedimentation of challenging to treat waters.

Education

MS Environmental Engineering, Virginia Polytechnic Institute, and State University, 1994

BS Environmental Engineering, Syracuse University, New York, 1992

Licenses

Professional Engineer, Colorado, Missouri, Minnesota, Kansas, New Jersey, North Carolina, Tennessee

Certifications

LEED Accredited Professional, Green Building Certification Institute, 04/18/2009

Envision Sustainability Professional, Institute for Sustainable Infrastructure, 12/2/18

Professional Affiliations

American Water Works Association

Water Environment Federation

American Society of Civil Engineers

National Association of Corrosion Engineers

Relevant Experience

→ Design manager for the Colorado Springs Utilities, Colorado, Southern Delivery Water Treatment Plant and Pump Station. The project included design of side-stream ozone, pump mix rapid mixing system, vertical mixer flocculation, parallel plate sedimentation, and engineered Biofiltration. The ozone system utilizes injection equipment to dissolve up to 650 pounds per day of ozone into a small side-stream flow of settled water that is then flash mixed into the overall process stream.

→ Technical advisor for the City of Greeley, Colorado, Boyd Lake Water Treatment Plant Process Improvements project. The project included ozone, coagulant, hydrogen peroxide, sodium hypochlorite (including an evaluation of onsite versus bulk hypo) and sodium hydroxide chemical feed systems.

→ Project manager for the South Adams County Water and Sanitation District, Colorado, Pellet Softening Disinfection Improvements Project. The project consisted of the design of a full-scale pellet softening system at the Klein WTF for the removal of calcium hardness. This included a series of pellet reactors, a stabilization basin of pH adjustment, anthracite over sand filters for turbidity removal, a new chemical storage building, and all of the associated facilities required to implement the system. Also included in this project is the design of a temporary sodium hypochlorite feed system which allowed the District to continue operating the facility during construction after the existing chlorine system was demolished.

→ Technical advisor for the Centennial Water and Sanitation District, Colorado, Zone 4C Pump Station. Design team included structural, electrical,

instrumentation and controls, mechanical, HVAC, architectural, and CAD disciplines for the 16-mgd potable water pump station. The pump station building was given architectural treatments to appear like a barn in order to minimize visual impact to surrounding neighborhoods. Major elements of the project included four 350-horsepower horizontal split-case pumps, 1250-kW standby generator, two story open pump room with bridge crane, and high to low pressure zone bypass line.

→ Project manager for the City of Aurora, Colorado, 80-mgd Griswold Water Purification Facility (WPF) Solids Study and Predesign and the 80-mgd Wemlinger WPF Chem Feed Study and CT Basin Design. This project included the planning of the conversion from direct filtration to flocculation/sedimentation with parallel plates (Wemlinger).

→ Project engineer for the City of Thornton, Colorado, Water Treatment Plant Replacement Owner's Advisor Services. The City elected to replace the 20-mgd Water Treatment Plant with a new 20-mgd plant through a design-build (DB) contract. Responsible for preparation of a Treatment Technology Study, which reviews historical raw water quality for three potential water sources, reviews current and anticipated drinking water regulations, and develops and evaluates treatment process alternatives. Upon selection of the preferred treatment process alternative, conceptual documents were developed for solicitation of the DB contract. Assistance with quality management during the design stage of the DB contract is ongoing.

→ Pretreatment process lead in the owner's advisor roles for the City of Houston, Texas, Northeast Water Treatment Plant (NEWTP)

Vincent S. Hart, P.E., ENV SP, LEED

320-mgd Expansion. Mr. Hart was responsible for helping establish the design criteria for the flocculation and sedimentation processes. This included a thorough investigation of plate loading rates and diurnal thermal effects on plate operation. Mr. Hart also served as a technical advisor for the pilot plant project, provided mechanical condition assessment of the existing NEWTP, and was the project engineer for the original treatability study, which included a finished water quality evaluation. This study recognized potential issues associated with finished

→ Project manager for the City of Aurora, Colorado, Wemlinger Water Purification Facility Improvements. The project involved \$15 million of improvements to the existing 80-mgd facility, including chemical feed improvements, solids handling facilities, and emergency generators. The project construction timeframe corresponded to off-peak season for the treatment facility.

→ Project manager for the City of Aurora, Colorado, 80-mgd Wemlinger Water Purification Facility (WPF) Improvements. The \$24.9 million project included construction of four new sand drying beds and a reclaim washwater pump station to return clarified water back to the Wemlinger WPF inlet, among other improvements. The project achieved 75 percent solids in 61 days of drying.

→ Project manager for the City of Thornton, Colorado, Alternative Coagulant and Ammonia Injection Relocation Study at the 50-mgd Wes Brown Water Treatment Plant. The project included identification, testing, analysis, and recommendation of alternative primary coagulants to reduce fouling on the plant's existing membranes, as well as evaluation of relocating the ammonia dosing further downstream in the existing clearwell and discontinuing pre-chlorination for primary disinfection.

→ Facilitator for the East Bay Municipal Water District, California, \$30 million Sobrante and Upper San Leandro Ozone System Improvements. The project replaces aging ozone equipment with a new high-efficiency system providing increased

reliability, redundancy, and safety at two 60-mgd surface water treatment plants.

→ Technical advisor for the Central Lake County Joint Action Water Agency, Illinois, Ozone System Upgrades Predesign. The project entailed an upgrade/replacement of a 50-mgd, 21-year-old ozone system.

→ Project engineer for the City of Oklahoma City, Oklahoma, Lake Stanley Draper Water Treatment Plant Expansion and Improvements. The project expanded the treatment capacity from 90 mgd to 150 mgd without the need for additional treatment basins or filtration facilities. The \$35 million project involved redesign of the existing rapid mix, flocculation, and sedimentation basins to incorporate a pump mix system (first of its kind in the State of Oklahoma), walking beam flocculation equipment, and FRP baffle walls and concrete ported walls to promote a plug flow effect. The project also included a carbon dioxide and hydrated lime system for supplemental alkalinity addition due to historically low finished water alkalinity and associated red water complaints.

→ Process engineer for the City of Houston, Texas, 320-mgd North East Water Purification Plant Expansion Pilot Testing. This phase of the project involved 16 months of pilot testing to evaluate the effectiveness of alternative approaches to coagulation, plate settling, ozonation, biological filtration, and chlorine dioxide. Piloting was conducted to confirm that the new facilities can reliably and consistently treat a challenging raw water supply, demonstrate the effectiveness of ozone for disinfection and taste and odor control, and confirm that filter rates up to 8 gpm/sf could effectively treat the water.

→ Technical advisor for the Colorado Springs Utilities, Colorado, 80-mgd McCullough WTP Flocculation and Filters Evaluation. The project found that the flocculation baffle walls did not provide adequate head losses to get good distribution through the flocculation basins, plate loading rate was too high for the floc quality, and filter boxes could be retrofit to provide better filter performance.



Mark A. Keller, P.E.

Mark Keller has more than 25 years as a structural engineer with experience in project management, planning and execution of design, detailing, and construction phase services of large projects. Past work includes condition assessments for master plans and feasibility studies for preliminary design direction. Recent projects include:

Education

MSCE Structural Engineering, Auburn University, 1994

BSCE Structural Engineering, The Citadel, 1992

Licenses

Professional Engineer, Colorado, North Dakota, Oklahoma, Arkansas, Missouri, Minnesota, Oregon

Civil Engineer, Nebraska

Structural Engineer, Oklahoma

Professional Affiliations

American Concrete Institute – National and Rocky Mountain Chapters

American Society of Civil Engineers

Relevant Projects

→ Structural Engineer for the South Adams County Water and Sanitation District, Colorado, Pellet Softening Disinfection Improvements Project. The primary process building included numerous reactor and filter tankage, extensive associated access platforms, and two 200-ton pellet hoppers in a truck bay all housed in a pre-engineered metal building. Secondary facilities included a cast-in-place concrete stabilization basin for pH adjustment and a new chemical storage building.

→ Responsible for quality management of the structural improvements to the Boyd Lake Water Treatment Plant in Greeley, Colorado. The project includes alterations to the flocculation/sedimentation basins, adaptive reuse of a portion of the basins for conversion to a ozone facility, and new chemical storage and feed facilities.

→ Lead structural engineer for the Zone 4 Pump Station in Centennial, Colorado. The project included four 350-hp pumps and surge tank in a two-story open pump room with a bridge crane. Challenges included siting the project at a location prominently within the public view requiring the facility to be disguised as a barn.

→ Structural engineer responsible for the repair and rehabilitation of an ozone contactor at the David L. Tippin Water Treatment Facility in Tampa, Florida.

→ Lead structural engineer for new 1.2 MG AWWA D110 wire-wound, prestressed concrete clearwell at the Columbia Water Treatment Plant in Columbia, Idaho.

→ Provided assessment of structures at Ozark Point Water Treatment Plant in Little Rock, Arkansas. The assessment was performed to evaluate the condition of basins constructed in the 1880's through the 1930's to determine the feasibility of reuse for continued service as part of a forthcoming plant modernization.

→ Lead structural engineer for the City of Norman, Oklahoma, Water Treatment Plant Improvements Project. The scope includes design and construction of new ultraviolet (UV) building, ozone generation building, ozone contactor/destruct facility, and a new chemical storage and feed facility. Challenges included structures founded on soils consisting of deep, unconsolidated fills.

→ Structural engineer for the Colorado Springs Utilities McCullough Filter Rehabilitation, Colorado Springs, Colorado. Evaluated leaking filter basins at a water treatment plant. Leakage was observed at numerous locations, including at backwash troughs, through walls to adjacent gallery spaces, and at pipe penetrations. Alternative repair options were evaluated and formal recommendations were presented to the client.

→ Completed technical specifications for the procurement of a new, multi-legged, 400,000 gallon elevated storage tank for the City of Shelton, Washington. Work included development of specifications for the structural design criteria, design and detailing of foundations for bidding the work.

→ Performed a condition assessment of eleven, covered potable water storage reservoirs, totaling more than 25 million gallons of storage capacity, for the City of Westminster, Colorado. The tanks included one prestressed, concrete reservoir, two elevated, welded steel storage tanks, and eight ground-supported, welded steel storage tanks.

→ Project structural engineer for the Altamont Tank Repairs for the City of Livermore, California. Developed technical specifications and provided engineering services during construction for repairs to a 3 million gallon, ground-supported potable water storage tank that had deteriorated due to corrosion of the roof structure. In

Mark A. Keller, P.E.

addition to the repairs, the City elected to upgrade the tank with the replacement of the roof vent with a vandal-deterrent style vent and installation of a sample tap and new cathodic protection system. The previously applied bituminous-based lining was removed and a new two-part, high-solids epoxy lining was applied.

→ Project manager and structural engineer for the Repairs and Improvements to the Northwest Water Treatment Facility clearwell for the City of Westminster, Colorado. Developed detailed bid documents and provided full construction management services for the restoration and rehabilitation of the 2 million gallon clearwell for the City's Northwest Water Treatment Facility. The tank, constructed only 11 years earlier, suffered from premature lining failure and corrosion. In addition to the bid documents, the tank was removed from service and a vertical survey was conducted to determine if foundation settlement had occurred.

→ Lead structural engineer for the design of a new sewer lift station with grit settling basins and screening channels in Omaha, Nebraska. The project is located entirely within the critical zone of the Missouri River levee system under the jurisdiction of the Corp of Engineers and includes deep excavation in an area of poor soils and requiring driven piles.

→ Developed bid documents and provided construction management services for restoration and modifications to a 2 million gallon fluted shroud, elevated water storage tank (Hydropillar) in Westminster, Colorado.

→ Provided an out-of-service evaluation of two, 2 million gallon ground supported water storage tanks (Gregory Hill) for the City of Westminster, Colorado. The work consisted of both visual inspection and non-destructive testing, including magnetic flux leakage testing of the floor plates and mapping of the roof framing for reconstruction.

→ Lead structural engineer and project manager for the Repairs and Improvements to the Wandering View Tanks project for the City of Westminster, Colorado. The project

consisted of improvements to a 3 million gallon and a 5 million gallon, welded-steel, potable water storage reservoirs. Repairs involved removal and replacement of structural elements damaged due to corrosion. Improvements included replacement of manways in the tank shells, improvements to overflow weirs and piping, installation of new check valves, and application of new interior linings and exterior coatings.

→ Performed a condition assessment of eleven, covered potable water storage reservoirs, totaling more than 25 million gallons of storage capacity, for the City of Westminster, Colorado. The tanks included one prestressed, concrete reservoir, two elevated, welded steel storage tanks, and eight ground-supported, welded steel storage tanks.

→ Lead structural engineer for the Second Creek Interceptor Segment IE Design, City of Aurora, Colorado. The pipeline is saving Aurora \$14 million that would have otherwise been invested in a temporary increase to their lift station. The project includes 5,000 linear feet of 36-inch pipe, and involves trenchless technologies.

→ Structural engineer for the Colorado Springs Utilities McCullough Filter Rehabilitation, Colorado Springs, Colorado. Evaluated leaking filter basins at a water treatment plant. Leakage was observed at numerous locations, including at backwash troughs, through walls to adjacent gallery spaces, and at pipe penetrations. Alternative repair options were evaluated and formal recommendations were presented to the client.

→ Project manager and structural engineer for the Repairs and Improvements to the Northwest Water Treatment Facility clearwell for the City of Westminster, Colorado. Developed detailed bid documents and provided full construction management services for the restoration and rehabilitation of the 2 million gallon clearwell for the City's Northwest Water Treatment Facility. The tank, constructed only 11 years earlier, suffered from premature lining failure and corrosion.



Education

BS Geological Engineering, Colorado School of Mines, 1992

MS Engineering Systems, Colorado School of Mines, 1998

Licenses

Professional Engineer, Colorado, Kansas

Professional Affiliations

American Society of Civil Engineers

National American Society for Trenchless Technology

James J. Kriss, P.E.

Jim Kriss has 27 years of experience in infrastructure and environmental engineering and has served as both project manager and project engineer on a wide variety of projects. Project delivery for various designs has included traditional design bid build and alternate deliveries including both design build and CM at risk. Mr. Kriss' design and construction experience includes mechanical pumping and piping systems, raw and potable pipelines, sanitary and storm sewer pipelines, sanitary forcemains, hydraulic design and modeling, general civil site development, disinfection and dechlorination systems, geomembrane liner systems for primary and secondary containment, and solid waste permitting and design.

Pipeline and Pump Station Design

→ Project manager for the City of Aurora, Colorado, Gun Club Raw Water Expansion. The project involved design and construction of raw water system improvements to expand the City's existing raw water deliveries to Heritage Eagle Bend golf course. The existing raw water pumps were undersized for the expanded service, and replaced with higher capacity pumps, including soft starters, pump control valves, and surge anticipator valves for transient control. A new 1.6-mile, 12-inch raw water transmission pipeline was designed to tie into the existing raw water pipeline for conveyance to Heritage Eagle Bend. The new pipeline alignment is routed through both urban and open space areas and includes environmentally sensitive areas in the floodplain, wetlands construction, and two horizontal directional drill sections. In addition, a very complex flow split and flow control system was designed to deliver raw water to the two end users at varying flow rates.

→ Project manager for the Arapahoe County Water and Wastewater Authority, Colorado, Chambers Reservoir Connection Pipeline. Managed the raw water transmission pipeline connecting a raw water storage reservoir pump station to the Authority's reuse distribution system. The pipeline design consisted of approximately 4,400 lf of 24-inch PVC pipe. Multiple routes were evaluated to minimize impacts to landowners' developable properties and to minimize the cost of a required tunneled crossing for the E-470 Public Highway Authority. The tunnel crossing consisted of approximately 435 lf of 42-inch steel casing and was designed to meet E-470 crossing requirements. The project was permitted

through the State Engineers Office, E-470, Town of Parker and Douglas County jurisdictions, which included a grading, erosion, and sediment control (GESCC) permit, Douglas County Location and Extent public hearing process, Douglas County floodplain permit, and Town of Parker Use by Special Review public hearing process.

→ Project engineer for the East Cherry Creek Valley Water and Sanitation District (ECCV), Colorado, Western Water Transmission Pipeline and Pump Station. The project included construction of a new 14-mile 48/54-inch steel water transmission pipeline and 15 trenchless crossings totaling 3,493 lf, including highways (C-470, E-470, and I-70) and various roadways. In addition, a 30-mgd pump station was designed to convey potable water to ECCV's existing water storage reservoirs. The pump station was designed for an initial operating flow of 15 mgd, expandable to 30 mgd, and included sodium hypochlorite disinfection systems. Specific tasks included pipeline design, tunneled crossings of various roadways, and multiple stream crossings. Mr. Kriss was responsible for hydraulic analyses, pipeline alignment, thrust analysis, wall thickness design, and tunnel casing design. Also responsible for pump station process piping design, pump station layout, and civil/site development.

→ Project manager for the City of Fresno, California, \$45 million Kings River Pipeline. The City of Fresno is currently designing a new 80 mgd surface water treatment and conveyance facilities as part of a decades long Metro Water Plan whose goal is to replace groundwater sources that have been experiencing over draft since the 1950s. The Kings River pipeline will convey

James J. Kriss, P.E.

raw water from the Kings River and associated irrigation canals to the surface water treatment and potable distribution. The design consists of 66,000 linear feet of 72-inch welded steel pipeline, a check structure and turnout to divert raw water to the pipeline, a flow meter vault, access manways, CAVs, blow-offs, and all associated electrical and instrumentation design. Preliminary design included routing analysis, hydraulic evaluations, development design and operating criteria, traffic control analysis, utility potholing, geotechnical investigation, and corrosion investigation and design.

→ Project manager for the East Cherry Creek Valley Water and Sanitation District (ECCV), Colorado, Northern Water Supply project. Served as project manager for design of the District's Northern Water Supply Project Water Transmission Pipeline, involving 31 miles of 48-inch steel pipeline and 15 trenchless crossings totaling 2,000 lf, including highways (E-470 and I-70), railroads (BNSF and UPRR), and various roadways. Project delivery was CM at Risk with a guaranteed maximum price contract. Multiple procurement packages were assembled to expedite construction, including pipeline materials, valves, tunnel installation contractor, and pipeline installation contractor. Various alternatives were evaluated during design, including a phased approach with two pipelines. Each alternative was designed in sufficient detail to provide accurate cost estimating along with power consumption and present worth evaluations to allow the District to make prudent decisions on final system configuration. Ultimately, a single 48-inch pipeline was designed and constructed. Also functioned as a technical advisor and design engineer for two 9-mgd booster pump stations, performing hydraulic evaluations and pump selection along with preliminary pump station layout. Specific tasks included managing multiple subconsultants including geotechnical, surveying, cathodic protection design, and land acquisition; managing multiple design tasks including pipeline alignment routing, system hydraulic analysis, power consumption and present worth evaluation, pipeline design,

material/equipment selection, tunnel design, appurtenance selection and sizing, pump selection, and pump station layout; procurement of materials and equipment including pipeline, valves, pumps, and tunneling contractor; and coordination with multiple jurisdictions across five cities and three counties.

→ Design engineer for the Ute Water Conservancy District, Colorado, Plateau Creek Pipeline Replacement Preliminary and Final Design. The project involved replacement of an existing 15-mile, 24-inch diameter raw water RCCP pipeline with a 48- and 54-inch welded steel pipeline to convey raw water from the District's surface water reservoirs to their water treatment plant. The existing pipeline alignment followed the environmentally sensitive Plateau Creek, and a parallel replacement alignment was not possible for most reaches. The new alignment included 2.5 miles of hard rock tunneling to allow the existing pipeline to remain in service during construction of the new pipeline. Responsible for pipeline alignment, pipeline wall thickness and thrust analysis, downstream flow control and valving facilities, air and vacuum protection, blowoff and surge control valve configurations, and hydraulic analyses.

→ Design engineer for the Tucson Water, Arizona, Treated Water Transmission Main. Performed preliminary alignment design for the Northeast "D" Zone treated water transmission main. The project involved 5.9 miles of 30- and 24-inch ductile iron pipe. Alignment routing was established to minimize crossings of existing utilities and reducing impacts to traffic and associated traffic control to the extent possible. Survey information was available for planimetric features and surface evident of underground utilities. Final design would be developed using supplemental utility survey information to establish vertical control. The horizontal alignment was designed using station and offset relative to an alignment control line.



Steven P. Lindemann

Steve Lindemann, is a knowledgeable and focused water professional who has been praised for his commitment to quality and efficiency. He has 30 years of experience with construction of water resource projects and more than 20 years of experience on design-build water resource projects throughout the United States and Canada. He brings a broad base of experience in all phases of project delivery.

Education

B.S. (Hons) Construction Technology, North Dakota State University, 1990

AAS Architectural Drafting, North Dakota State College of Science, 1987

Certifications

Board of Certified Safety Professionals

Relevant Experience

→ Deputy design-build manager for the Metro Wastewater Reclamation District, Colorado, Northern Treatment Plant. The Northern Treatment Plant is a 24-mgd greenfield wastewater treatment plant that encompasses primary, secondary and tertiary treatment processes, along with solids handling, gas conditioning, cogeneration, and odor control. Mr. Lindemann was the lead for all construction project engineering and was directly responsible for process equipment, including procurement assistance and scope definition, submittal review, delivery and installation of equipment, submittal of operation and maintenance information. He also interfaced with the commissioning team for equipment startup. The process equipment for the Metro NTP project included 77 separate packages, with a total cost of \$28 million.

→ Construction manager for the Colorado Springs Utilities, Colorado, Fountain Creek Recovery Project. This project consisted of the construction of an 18.5 million gallon spill pond, an exchange pond, creek diversion and intake structure, and a pump station. Mr. Lindemann developed a project budget and schedule along with tools for tracking self-perform crew production and unit costs. Mr. Lindemann was also responsible for the procurement of equipment, materials and leasing of earthmoving equipment. He assisted with sub-contractor management, and implementation of the safety program.

→ Superintendent for the City of Thornton, Colorado, Columbine (Wes Brown) WTP Renovation. This was a WTP remodeling and expansion project to convert from conventional filtration to submerged membrane treatment for potable water. The project also included construction of a high service pump station, chemical building, administration building, vehicle storage fa-

cility, and water quality testing laboratories. Mr. Lindemann supervised construction of the administration building, vehicle storage facility, and water quality testing laboratories. He was responsible for manpower, equipment and material planning, and execution of self-perform and subcontractor work. He delivered the administration building, vehicle storage facility, and water quality testing laboratories four weeks ahead of schedule and with zero recordable or lost time injuries.

→ Construction manager for the City of Longmont, Colorado, Longmont WWTP Digester Rehabilitation and Odor Control Improvement. This project consisted of an anaerobic digester remodeling project that included replacement of two digester covers, sludge heating and mixing system replacement, and digester gas scrubbing. The project also included odor control system improvements in solids handling processes and construction of a biofilter. Mr. Lindemann was responsible for client communication, schedule development and progress tracking. He oversaw budgeting to ensure the scope of work was delivered in accordance with the guaranteed maximum price agreement. Mr. Lindemann also procured all equipment and wrote and negotiated all subcontractor scopes of work. He jointly managed contingency assignments with the City of Longmont and returned over \$40,000 in shared savings to the City of Longmont.

→ Project engineer for Denver Water, Colorado, Marston WTP Filtration Improvements. This project consisted of filtration facility demolition, and a replacement project that also included backwash system replacement, chemical facility upgrades, and construction of a new administration building. Mr. Lindemann was responsible for the procurement of equipment and materials, shop drawing review, delivery of material to

Steven P. Lindemann

meet the construction schedule, self-perform crew management, and implementation of the safety program. He also developed equipment and process system startup plans. Mr. Lindemann received commendation from Denver Water inspection group for commitment to quality.

→ Design-build manager for the City of Midland, Texas, Midland Water Pollution Control Plant Upgrades. The \$136M project includes design, permitting, construction, and commissioning of new secondary treatment, tertiary treatment, dewatering facilities, and a SCADA system for an existing wastewater plant. The project also includes extensive upgrades to existing primary treatment facilities. Responsibilities included project management during design preconstruction and construction. Design phase management focused on alignment between the engineering team, client, and stakeholders to ensure project performance requirements, budget, and schedule could be met. Preconstruction phase project management included building the site construction team, budget development, schedule development, bidding and award, safety planning, and detailed client cash flow analysis.

→ Project engineering manager for the City of Santa Fe, New Mexico, Buckman Direct Diversion (BDD) Project. The BDD project consisted of the construction of a raw water intake structure, raw water pump stations, an advanced water treatment plant, and 27 miles of raw water and finish water pipelines. Mr. Lindemann was responsible for procurement and installation of mechanical equipment and systems, startup and commissioning of mechanical systems including micro filtration, granular activated carbon, ozone, and pumping equipment. He developed a membrane module installation plan that contributed to saving three weeks on the schedule and allowed system testing and production of potable water to occur.

→ Project engineer for the City of Fort Bliss, Texas, Temporary Unit of Action and Underground Utilities. This project was for the installation of 27 miles of underground utilities (water, sanitary sewer and storm sewer) as part of a Temporary Unit of Action pro-

gram on the Fort Bliss Army Base. Also included, were two sewage pump stations, installation of a 3-million gallon above ground storage tank, and a booster pump station. Mr. Lindemann was responsible for procurement of equipment and materials, self-perform crew management, and implementation of the safety program. The CH2M Hill Engineers team included six underground utility crews and 85 craft personnel.

→ Commissioning engineer for the City of Hamilton, Ontario, Woodward Avenue WWTP Biogas Enhancement and Digester Upgrade Project. The project consisted of construction of a new sludge thickening facility, upgrades to an existing digester facility, installation of a new bio filter odor control system, and installation of a gas conditioning system for purifying digester gas and introducing it into the municipal natural gas grid. Mr. Lindemann was responsible for development of commissioning plans and startup, and commissioning of mechanical equipment, treatment processes, and instrumentation systems. He operated the sludge thickening facility during acceptance testing period. He also completed acceptance testing for the project without significant interruption to any system and turned over the facility to the client three weeks ahead of the contractually required date.



Education

MS Civil Engineering,
University of Colorado,
Boulder, 2016

BS Environmental
Engineering, University of
Colorado, Boulder, 2014

Licenses

Professional Engineer,
Colorado

Professional Affiliations

American Water Works
Association

Engineers Without
Borders-USA, Rocky
Mountain Professional
Chapter

John A. Meyer, P.E.

John Meyer joined Carollo in 2016 and has experience working on both water and wastewater treatment projects. He has worked on water treatment planning studies, benchtop and pilot testing, water treatment system designs, construction oversight, and treatment plant start-up and commissioning.

Water

→ Project engineer for the City of Greeley, Colorado, Boyd Lake WTP Improvements project. Served as the primary design process design engineer for a new chemical storage and feed facility to house caustic soda, hydrogen peroxide, and sodium hypochlorite equipment. Also provides design support for the conversion of an existing sedimentation basin into an intermediate ozone facility, and the addition of a liquid oxygen system for hypolimnetic lake aeration of the facility's source water body.

→ Project engineer for the South Adams County Water and Sanitation District, Colorado, Pellet Softening Disinfection Improvements. The project consisted of the design of a full-scale pellet softening system at the Klein WTF for the removal of calcium hardness. This included a series a pellet reactors, a stabilization basin of pH adjustment, anthracite over sand filters for turbidity removal, a new chemical storage building, and all of the associated facilities required to implement the system. Also included in this project is the design of a temporary sodium hypochlorite feed system which allowed the District to continue operating the facility during construction after the existing chlorine system was demolished. Preliminary design work for the layout of the facility was completed using Sketchup modeling.

→ Project engineer for the City of Aurora, Colorado, Griswold Water Purification Facility Solids Study and Preliminary Design. Developed hydraulic models of the facility's backwash, filter-to-waste, and washwater recycle systems. Performed bench scale tests to characterize residual sludge and the condition of the existing lagoon sand. Responsibilities also included analyzing solids dewatering alternatives including engineered lagoons, sand drying beds, and mechanical dewatering systems. Developed

two Blue Plan-it® models to evaluate the various solids handling alternatives. The first was a dynamic model which simulated solids drying in a lagoon or sand drying bed to evaluate how lagoon size and loading rate impacted long term operations and cost. The second model was used to evaluate how different solids handling alternatives would be impacted by operational changes, energy consumption, drying time, and disposal cost.

→ Project engineer for the City of Thornton, Colorado, Water Treatment Plant Replacement Owner's Advisor. The City elected to replace the 20-mgd Water Treatment Plant with a new 20-mgd plant through a design-build (DB) contract. Assisted in the development of a conceptual design for a new treatment plant to replace the existing Thornton Water Treatment Plant. Evaluated historical data to establish treatment process design criteria and goals.

→ Project engineer for the City of Aurora, Colorado, Wemlinger Treated Water Reservoir Rehabilitation. The project involves replacing roof access hatches; adding vents; demolishing piping and appurtenances inside and connecting to the existing 10-MG concrete treated water reservoir; installing multiple sections of piping, including tie-ins to existing piping; adding a valve to the reservoir drain pipe; and miscellaneous treated water reservoir concrete penetrations and repairs associated with piping and demolition. The bid price for the project was \$2.5 million, and the fast-track project needed to be constructed during the winter/spring of 2017. The project was staged to prevent shutdown of the Wemlinger Water Purification Facility during construction of the disinfection contact basin.

→ Project engineer for the Willmar Municipal Utilities, Minnesota, Master Plan and Preliminary Design Report for Conversion to Biofiltration. Researched and

John A. Meyer, P.E.

Awards

Distinguished Senior in Environmental Engineering, University of Colorado, College of Engineering and Applied Science, 2014

Best Student Paper Award, "Assessing Population Weighted Risk Reduction Implications for Centralized vs. Distribution System-Based DBP Control Strategies." AWWA Water Quality Technology Conference, 2016. Indianapolis, Indiana.

Other Accomplishments

Open for Quote

evaluated several alternative treatment plant and point-of-use technologies to reduce salty discharges from domestic water softeners to the wastewater treatment system. Developed hydraulic models for the Northeast Water Treatment Plant and Southwest Water Treatment Plant which incorporated process changes from green sand filtration to Biofiltration. Estimated project construction, operations, and maintenance costs.

→ Project engineer for the City Aurora, Colorado, 80-mgd Wemlinger WPF CT Chamber Design. The project consisted of a 2.5 mg buried concrete disinfection chamber with a serpentine channel and a baffling factor of 0.80 outside of the treated water reservoir at the Wemlinger WPF. The design included chlorine and ammonia dosing and flash mixing to produce chloramines at both the beginning and the end of the CT Chamber, sodium hydroxide dosing to adjust pH, chlorine, ammonia, pH monitoring, and turbidity monitoring, and a supplemental chlorine boosting location part way through the CT chamber. Additional design elements included flow metering, pumped CT-to-waste to enable quick draining of the CT chamber, and the ability to bypass the treated water reservoir to two different pressure zones in order to allow the treated water reservoir to be maintained without taking the water treatment plant offline. The preliminary design work through the 30 percent deliverable for this project was completed using Sketchup modeling to develop an initial layout of the CT Chamber and the associated pipe galleries.

→ Project engineer for the City of Greeley, Colorado, Boyd Lake WTP and Bellvue WTP Solids Study. Evaluated the existing solids handling systems for the City's two water treatment plants. Developed conceptual designs for several alternatives at each facility to improve those systems in order to produce better recycled water quality and enhance solids dewatering. Provided cost estimates for the preferred alternatives and made recommendations to the City on which technologies would be best suited to meet their unique needs.

→ Project engineer for the South Adams County Water and Sanitation District, Colorado, Pellet Softening Study. This project consisted of a month-long pilot skid operation to evaluate the feasibility of pellet softening as a viable hardness removal strategy at the Klein Water Treatment Facility. During this study, various testing was conducted to determine the impact of adjusting pH, reactor loading rate, source water wells, and seed bed characteristics to determine the optimal operating parameters required to achieve the District's hardness removal goals. The results of this pilot study were used to develop alternative treatment schemes, site layouts, and cost estimates for various full-scale pellet softening systems which would potentially be implemented at the site.

→ Project engineer for the City of Aurora, Colorado, Wemlinger Water Purification Facility Disinfection Evaluation and Alternatives Analysis. Evaluated computational fluid dynamics data and historical water quality data to create several alternatives for improving disinfection contact time at the facility. Developed cost estimates for each of the proposed alternatives and created a preliminary design and 3D model of the preferred CT Chamber alternative.

→ Project engineer for Colorado Springs Utilities, Colorado, Edward W. Bailey Water Treatment Plant Water Quality Testing. Performed bench scale experiments to help optimize coagulation and flocculation processes upon plant start-up. Investigated water quality monitoring issues related to manganese.

→ Project engineer for the City of Thornton, Colorado, Wes Brown Water Treatment Plant Alternative Coagulants and Ammonia Injection Relocation Study. Responsibilities included analyzing data from bench and pilot scale experiments with different coagulants to determine the most viable approaches for increasing membrane production rates. Assisted in developing process train modifications, which could be implemented at full scale to enhance treatment capacity while achieving established water quality goals.



Monte K. Richard, P.E.

Monte Richard brings more than 17 years of experience in electrical and control system engineering and design. His focus is in electrical distribution systems, process control, and industrial instrumentation for water and wastewater facilities and infrastructure. He works on a company wide basis with plant operations and managers to test, start-up, optimize and troubleshoot water and wastewater treatment plants. His experience includes:

Education

MS Electrical Engineering,
Colorado School of
Mines, 2009

BS Electrical Engineering,
Colorado School of
Mines, 2003

Licenses

Professional Engineer,
Colorado, Hawaii,
Oregon, Washington,
Illinois, Florida, Ohio,
New York, Maine

Electrical Engineer,
Arizona, California

Professional Affiliations

Institute of Electrical and
Electronic Engineers

Illuminating Engineering
Society of North America

Relevant Experience

→ Lead electrical and instrumentation design engineer for the Arapahoe County Water & Wastewater Authority (ACWWA), Colorado, flow connecting main. This project involved the design of the control and instrumentation for a new metering vault. Strict coordination with ACWWA's radio and communications standards was followed in order to establish communications with the overall distribution SCADA network. The control system allowed for automated flow control based on operations selection of either set point flow or set point level in distribution tanks.

→ Project manager and lead electrical and instrumentation engineer responsible for providing electrical upgrades at the City of Aurora, Colorado, Griswold Water Purification Facility. The project included the design of a new service entrance medium voltage switchgear, replacement of the existing faulty Automatic Transfer Controller, and generator breaker trip unit modification to reduce arc flash incident energy.

→ Project engineer responsible for providing a Flow Control Center for the City of Aurora, Colorado. The project included the design for the relocation of the City of Aurora Flow Control Center. Design included 3D modeling of room layout options, SCADA console development, and network routing required to provide desired monitoring and control to the Flow Control Center Staff.

→ Lead electrical and instrumentation design engineer for the City of Boulder, Colorado, Betasso Water Treatment Plant improvements. The project included various upgrades to the water treatment plant including flash mix, sludge-drying beds, and a new powdered activated carbon system design.

→ Performed electrical and instrumentation condition assessment reports for the City of Boulder, Colorado, Betasso Water Treatment Plant and the 75th Street Wastewater Treatment Plant. The project included site investigations and a condition assessment report. The condition assessment report addressed the timeline and cost for asset replacement/ rehabilitation. The purpose of the report was to provide guidance for asset management planning over a 20-year period.

→ Project manager and lead electrical and instrumentation design engineer for various projects for the City of Fort Collins, Colorado. This series of design-build projects required on-site construction services and a close working relationship with the contractor. The projects included the design and construction of a new chemical storage facility, pump station, fluoride mag, and polymer chemical feed system, emergency generator, powder activated carbon system improvements, an odor control system, septage receiving, several motor control center replacements, uninterruptible power supply (UPS) support systems, and several other plant improvements.

→ Project manager and lead engineer responsible for providing an Electrical Master Plan to the City of Fort Collins, Colorado, Water Treatment Facility. The plan detailed the electrical distribution system along with vulnerability studies and suggested improvements. An improvement plan was provided to assist the client in budgeting construction and improvement efforts.

→ Lead instrumentation design engineer for the City of Ute, Colorado, Ute Water Treatment Plant Filter Upgrades project. This design-build project included an addition of four media filters and the rehabilitation of four existing filters. The project involved upgrades to the existing supervisory control

Monte K. Richard, P.E.

and data acquisition (SCADA) and programmable logic controller network, as well as a new plant fiber optic backbone. In order to give flexibility during a backwash, a new automated control strategy was implemented, allowing operators to select an automated filter-to-waste, scour wash, rinse-to-waste, and filter resting.

→ Lead electrical and instrumentation design engineer for a new diversion structure and metering vault for the City of Fresno, California, King's River Pipeline. This project included an evaluation of communication options, a technical memorandum was delivered comparing radio versus fiber. This design project required working in conjunction with the general contractor to provide efficient design and on-site construction services. The project included the design of the diversion structure Rubicon automated gates and associated control as well as the control and instrumentation for a new metering vault. The project required interconnection with the City's existing SCADA network, security network, as well as the Fresno Irrigation District SCADA network. Virtual path studies were performed to prove feasibility of radio paths during design.

→ Project manager and electrical, instrumentation, and control design engineer for the City of Aurora, Colorado, Prairie Waters Pump Station No. 1, No. 2, and No. 3 relay improvements. The project included the study and design for the replacement of 9 protective relays in existing medium voltage switchgear. The project also included the update of the electrical system study including updating the protective relay settings.

→ Project engineer responsible for providing a system wide Uninterruptable Power Supply (UPS) study and recommendation for the City of Aurora, Colorado. The project included the investigation, analysis, cost estimate, and recommendation for replacement of over 200 UPS systems located throughout the City's water treatment and transmission and distribution systems.

→ Electrical and instrument design engineer for the Metropolitan Water District of Salt Lake and Sandy, Utah, Point of the

Mountain Water Treatment Plant. This project involved the implementation of a new filtration plant and raw water pumping station. The pumping station required medium-voltage variable frequency drives to run 1,250- and 2,000-horsepower motors.

→ Lead electrical and design engineer for a new nanofiltration (NF) plant for Miami Dade County, Florida. The project included the electrical, instrumentation, and control design for 20 trains of NF skids, clean-in-place, various chemical feed systems, and ultraviolet disinfection reactors. The project involved implementing various electrical safety by design concepts including arc-flash-resistant gear, remote breaker control and racking, and reducing transformer sizes to limit the arc flash energy. The design included the addition of a distributed programmable logic controller and supervisory control and data acquisition (SCADA) network with a redundant fiber optic communication backbone. The control network included the implementation of communications with 15 remote well sites using Ethernet radio.

→ Lead instrumentation design engineer for the filter plant expansion for the Kern County Water Agency, California, Henry C. Garnett Water Purification Plant expansion. The project involved doubling the filter plant capacity by designing a second treatment train including a raw water and treated water pump station, filters, flocculation and sedimentation basins, various metering vaults, and chemical systems. The project included the design of a new plant-wide supervisory control and data acquisition (SCADA) system, programmable logic controller system, and redundant fiber communications backbone. Electrical, instrumentation, and control construction management services were provided. Start-up and control optimization services were provided for all plant processes.



Stephanie M. Riley, Ph.D.

Stephanie M. Riley earned her Ph.D. in Environmental Engineering Science from the Colorado School of Mines. Her area of focus is water reuse with expertise in pilot operation and research studies. She currently serves as a technologist assisting in water, reuse, and wastewater projects.

Education

Ph.D. Environmental Engineering Science, Colorado School of Mines, 2018

MS Environmental Engineering Science, Colorado School of Mines, 2015

BS Biology, Newman University, 2013

Relevant Experience

→ Lead investigator for Water Research Foundation (WRF) project 4833:

Understanding the Impacts of Wastewater Treatment Performance on Advanced Water Treatment Processes and Finished Water Quality. Led ozone (O₃), biofiltration (BAF), and granular activated carbon (GAC) pilot testing to investigate removal of per- and polyfluoroalkyl substances (PFAS) and contaminants of emerging concern (CECs).

→ Lead investigator for WRF project 4958: *New Techniques, Tools, and Validation Protocols for Achieving Log Removal Credit Across Nanofiltration (NF) and Reverse Osmosis (RO) Membranes.* Project included evaluation and testing of membrane integrity methods on nanofiltration (NF) and reverse osmosis (RO) systems. Led coordination and preparation of pilot testing.

→ Lead investigator for Bureau of Reclamation Desalination and Water Purification Research Project: (BOR DWPR): *Evaluation of Novel Integrity Tests for Reverse Osmosis and Nanofiltration and Performance Comparison to Non-membrane-based Systems for Potable Reuse.* Developed test plan to investigate novel surrogates and tracers (e.g., conductivity modeling, charged aerosol detection, sucralose) for online monitoring of membrane integrity (i.e., log removal).

→ Lead investigator for WRF project 4719: *A Biofiltration Guidance Manual for Rapid-rate Filtration Facilities.* Project included the development of operator toolkits, checklists, and chapters in the published manual.

→ Lead investigator for WRF/California State Water Board Direct Potable Reuse Grant #4 (DPR-4): *Treatment for Averaging Potential Chemical Peaks (Experimentation to Address Knowledge Gaps).* Led the experimental plan and round-robin study at California utilities and total organic carbon

(TOC) manufacturers to evaluate the ability of TOC meters to detect volatile organic compounds (VOCs).

→ Co-investigator for the City of Ventura, California, DPR Pilot Testing. Led rapid bench-scale testing of O₃/BAF/UF/RO and UF/RO process trains to assess the toxicity of RO brine.

Publications/Presentations

→ Verdugo, E. M., Kumar, P.S., Riley, S.M., Gifford, M., Glover, C., Dickenson, E.R.V. "Removal of Disinfection Byproducts and Trace Organic Contaminants in Treated Wastewater using Pilot-scale Ozonation, Biofiltration, and Granular Activated Carbon." *Environmental Science: Water Research & Technology*, 2019.

→ Vatanikhah, H., Riley, S.M., Murray, C.C., Quinones, O., Steirer, K.X., Dickenson, E.R.V., Bellona, C. "Simultaneous Ozone and Granular Activated Carbon Treatment of Micropollutants During Potable Reuse of Municipal Wastewater Effluent." *Chemosphere*, 234, 845-854, 2019.

→ Riley, S.M., Ahoor, D.C., Cath, T.Y. "Enhanced Biofiltration of O&G Produced Water Comparing Granular Activated Carbon and Nutrients." *Science of the Total Environment*, 640, 419-428, 2018.

→ Riley, S.M., Verdugo, E., Dickenson, E.R.V. "Assessment of Ozone, Biofiltration, and GAC Pilot Studies for Removal of Trace Organic Contaminants and DBP Precursors." Proceedings of the Water Quality Technology Conference (WQTC), Dallas, TX, Nov. 3 – 7, 2019.

→ Riley, S.M., Verdugo, E., Dickenson, E.R.V. "Pilot Demonstration of Ozonation, Biofiltration, and Activated Carbon Systems." Proceedings of the 34th Annual WaterReuse Symposium, San Diego, CA, Sept. 8 – 11, 2019.



Education

BS Civil Engineering,
South Dakota School of
Mines and Technology,
1995

Licenses

Professional Engineer,
Colorado

Professional Affiliations

Invited Member of the
Sage Timberline Industry
Advisory Board

Jason Rozgony, P.E.

Jason Rozgony has more than 24 years of experience in the water and wastewater industry, the majority of which has been full-time cost estimating for engineering projects and "at-risk", CMAR, design-build, and hard bid projects. He has been responsible for the development of corporate estimating standards, and has managed estimating staff across the United States. Jason has prepared discipline-level estimates and has led complete estimates for more than 250 design and fixed price construction projects requiring collaboration with design engineers, vendors, and subcontractors from preliminary through final design.

Relevant Experience

- Estimator for the Pellet Softening, Disinfection, and Facility Improvements Project, South Adams County Water and Sanitation District, Colorado, \$42 million.
- Cost estimator for the City of Westminster, Colorado, North Huron Interceptor. Jason was responsible for AACE cost estimating consistent with design level submittals for the detailed design and routing of the under-capacity sections of sewer interceptor, resulting in approximately 7,400 linear feet of new interceptor piping.
- Estimator for the Water Quality Improvements – Phase III, City of Odessa, Texas, \$154 million.
- Estimator for the Northwood Water Treatment Plant – Phase II Improvements, City of North Miami Beach, Florida, \$30 million.
- Estimator for the Wemlinger CT Chamber Project, City of Aurora, Colorado, \$19 million.
- Estimator for the City of Sunnyvale, California, Water Pollution Control Plant Secondary Treatment Facilities Design.
- Estimator for the City of Richmond, California, Veolia Wastewater Treatment Plant Critical improvement project.
- Estimator for the Avon Wastewater Treatment Facility Nutrient Upgrades, Eagle River Water and Sanitation District, Colorado, \$43 million.
- Estimator for the Blue River Wastewater Treatment Plant Biosolids Upgrades, City of Kansas City Water, Missouri, \$215 million.
- Estimator for the Treasure Island Wastewater Treatment Plant, San Francisco Public Utilities Commission, California, \$139 million.
- Estimator for the Northeast Water Purification Plant Expansion Owner's Advisor Services, City of Houston, Texas. As part of the project advisory task, Jason provided estimates for the design-build project. His primary responsibilities included reviewing GMPs from the other program consultants, McCarthy and Balfour Beatty.
- Estimator for the South Mesquite Regional Wastewater Treatment Plant Solids Handling Improvements, North Texas Municipal Water District, \$20 million.
- Estimator for the Filtration Building Improvements, City of Las Vegas, Nevada, \$20 million.
- Estimator for the City of Cape Coral, Florida, Southwest Water Reclamation Facility Biosolids Facility. Project included the construction of a Biosolids Thermal Drying Facility at the Southwest Water Reclamation Facility (WRF). Responsibilities included cost estimate development, subcontractor and vendor solicitation and evaluation, and final project cost determination.
- Lead estimator for the City of West Palm Beach, Florida, South Florida Water Management District L-8 Pump Station and Reservoir Project. Responsible for estimating the cost of the work and evaluation of subcontractor and vendor bids in preparation of the fixed price bid.
- Cost estimator for the City of Salem, Oregon, Geren Island WTP Improvements. Provided cost estimating for a \$39 million project delivered through a CM/GC method to construct a new ozone facility.

Jason Rozgony, P.E.

- Water Treatment Facility Expansion, Town of Eagle, Colorado, \$23 million. CMAR project.
- Hillcrest Reservoirs and Pump Station, Denver Water, Colorado, \$100 million. CMAR project.
- PAR 1225 South Headworks and Grease Processing Improvements, Metro Wastewater Reclamation District, Colorado, \$52 million.
- Wastewater Treatment Plant Expansion, City of Louisville, Colorado, \$27 million.
- Estimator for the Water Reclamation Facility Improvements, City of Niles, Ohio, \$51 million.
- Estimator for the Lancaster Water Reclamation Plant Expansion – Phase I, County Sanitation Districts of Los Angeles County, California, \$120 million.
- Estimator for the West Seattle and Maple Leaf Reservoirs, Seattle Public Utilities, Washington, \$66 million.
- Estimator for the Peace River Reservoir Expansion, Peace River Manasota Regional Water Supply Authority, Florida, \$45 million.
- Estimator for the Point of the Mountain Water Treatment Plant, Metropolitan Water District of Salt Lake and Sandy, Utah, \$81 million.
- Ft. Polk North and South Wastewater Treatment Plants, American Water, Florida, \$64 million. Design-Build project.
- Rio Tinto Holden Mine Reclamation and Water Treatment Facility, Washington, \$23 million. Design-Build project.
- Water Reuse Facility, Pueblo of Santa Ana, New Mexico, \$17 million. Design-Build project.
- Central Treatment Plant Upgrade and Expansion, City of Tacoma Department of Public Works, Washington, \$74 million. Design-Build project.
- Lead estimator for the Berl L. Handcox, Sr. Water Treatment Plant (formerly Water Treatment Plan No. 4), City of Austin, Texas. While with a previous firm, Jason served as the lead construction cost estimator for the \$150 million project located in located in Austin, Texas. Major elements of work included construction of clarifiers, gravity filters, sludge facilities, maintenance and administration buildings, pump stations, and clearwells. Jason collaborated with procurement staff to prepare the subcontractor scopes of work and solicitation documents, led the internal estimating effort, and completed all of the bid evaluations and GMP development. CMAR project.
- Southeast Treatment Plant Biosolids Improvements, San Francisco Public Utilities, California, \$1.1 billion. CMAR project.
- Next Level Treatment, City Spokane, Washington, \$126 million. CMAR project.
- Wastewater Pollution Control Center, City of Fremont, Ohio, \$57 million. CMAR project.
- Phase A Expansion, Upper Blackstone Water Pollution Abatement District, Massachusetts, \$23 million. CMAR project.
- Estimator for the Thomas P. Smith Water Reclamation Facility Expansion, City of Tallahassee, Florida, \$170 million. Responsibilities included managing the estimating team during the internal cost estimates preparation for the all of the work and completing subcontractor and vendor bid analysis, risk analysis, and other pricing reviews. In addition to traditional estimating, prepared Value Engineering (VE) estimates at multiple locations throughout the facility. Several of the VE concepts were actualized resulting in a significant savings to the overall project costs. CMAR project.
- Wastewater Treatment Plant Expansion, North Davis Sewer District, Utah, \$90 million. CMAR project. Hard-Bid project.
- Wastewater Treatment Facility, Trinity River Water Authority, Texas, \$196 million. Hard-Bid project.
- Lake Texoma Water Treatment Plant Expansion, City of Sherman, Texas, \$24 million. Hard-Bid project.
- Water Storage Improvements, City of Avon Lake, Ohio, \$23 million. Hard-Bid project.

STEVEN C KUEHR, PE

SENIOR CONSULTANT



Years of Experience: 40

Education

MS, Civil Engineering, Purdue University, 1985

BS, Civil Engineering, Purdue University, 1980

Professional Registration

Professional Engineer:

CO (0024369) & CA

Professional Societies

American Water Works Association

American Society of Civil Engineers

Colorado Association of Geotechnical Engineers

Rocky Mountain Water and Environment Association

Colorado Stone, Sand and Gravel Association

Mr. Kuehr is a Senior Consultant at Lithos Engineering. Mr. Kuehr specializes in geotechnical and tunnel engineering as it relates to water supply, sewerage, water resources, aggregate mining, roadway and bridge projects. He has technical expertise in tunnel engineering, foundation engineering, slope stability, expansive soils, ground modification, retaining walls, landslide evaluation and repair, embankment dam design and groundwater collection trenches and cutoffs constructed by the slurry trench method. He has 40 years of progressive engineering experience. He has performed and managed geotechnical engineering investigations for storm drain outfall projects, treatment plants, interceptor sewers, water transmission pipelines, water storage reservoirs, intake structures and pump stations.

RELEVANT PROJECTS

Griswold WPF Raw Water Structure – Phase 2, Aurora, Colorado

Principal-in-Charge and Project Manager for the new raw water vault at the Griswold Water Purification Facility. The subsurface conditions consist of eolian deposits and claystone/siltstone bedrock. Due to the presence of swelling claystone, a minimum 5 feet deep overexcavation with select fill backfill was recommended for the lower portions of the vault. There was a 72-inch raw water line adjacent to the vault. Provided geotechnical consultation including specification language and instrumentation recommendations regarding this issue. Reviewed Contractor's submittals for shoring and instrumentation.

Wemlinger WPF Sediment Drying Beds, Aurora, CO

Served as Principal-in-Charge and Project Manager. This project involved replacing the existing sediment drying beds with new, engineered sediment drying beds. The new concrete lagoons were constructed within the same footprint of the existing earthen lagoons. Provided recommendations for a permanent dewatering system which will operate as the water levels in nearby Quincy Reservoir approach the high-water level. Also provided foundation design recommendations for various structures and considerations for a tunneled waterline crossing beneath Quincy Avenue.

Colorado Springs Utilities SDS Water Treatment Plant, Colorado Springs, CO

Principal-In-Charge for Colorado Springs Utilities (CSU) Southern Delivery System's (SDS) 50 mgd water treatment plant and finished water pump station. The surface geology in the project area consists primarily of eolian soils extending to depths as

much of 60-ft below existing ground surface. The eolian soils are hydro-collapsible and exhibit a collapse potential up to 6.3 percent. Design, construction and operation measures were necessary to mitigate the potential for water to collect below grade or to pond above grade. To mitigate the collapsible soils, the design-build team implemented Deep Dynamic Compaction techniques for ground improvement.

East Cherry Creek Valley Water & Sanitation District (ECCVWSD) Northern Water Supply Project, Reverse Osmosis Treatment Plant and Booster Pump Stations, Adams, Denver and Arapahoe Counties, CO

The ECCV Northern Supply Project includes a Reverse Osmosis Treatment Plant, High Service Pump Station, and North and South Booster Pump Stations and a 35-mile transmission line. The treatment plant, which includes a water storage tank, is located in the Beebe Draw geographic area which contains thick and soft clayey soils; a condition that is unusual for the Denver area. Consolidation testing and settlement analyses indicated that approximately six inches of settlement could occur beneath the heavily loaded storage tank. Designed a temporary site surcharge to preload the tank area; this will preconsolidate the site such that settlement under the plant will be minimal. The surcharge consisted of compacted soil constructed to a height of 20-ft and included settlement monitoring platforms. Settlement monitoring indicates that settlement is occurring. The surcharge will be removed when settlement is complete so that the tank can be constructed.

Bellvue Water Treatment Plant Residuals Handling Facility, Bellvue, CO

the Firm performed subsurface geotechnical investigations and provided design recommendations for this project, which involved rehabilitation of existing sedimentation basins, construction of a thickening tank, a new pump station, and a new flow-equalization basin. Site conditions consisted of saturated fine- and coarse-grained alluvium overlying siltstone and sandstone bedrock. Mr. Kuehr served as Project Manager for this project.

Public Wholesale Water Supply Project Water Treatment Plant and Pipeline, Ellis and Russell Counties, KS

Performed geotechnical investigations and provided design recommendations for construction of a new water treatment facility in Russell County, Kansas. The proposed facility consisted of tanks and structures for administration, treatment, and pump housing, and residuals handling ponds. Mr. Kuehr evaluated the potential for collapse or dissolution within soils with high calcium carbonate content. He also provided recommendations for the residuals handling pond liners and for the on-site proposed pavements. Evaluated subsurface conditions and identified potential high groundwater and soft soils along the proposed pipeline alignment. Mr. Kuehr provided recommendations for trenchless and open cut crossings of streams and local drainages, paved county roads, highways, and existing active railroad. He also performed in-situ resistivity testing during site investigation to provide the corrosion engineer with design parameters.

87th Avenue and Wadsworth Boulevard Lift Station, Westminster, CO

Provided geotechnical engineering recommendations for a lift station, overflow storage tank and for several trenchless roadway crossings. The lift station required a deep excavation in a congested urban environment. Recommendations included over-excavation and replacement of expansive bedrock. Trenchless engineering recommendations were provided for the roadway crossings.



Christopher P. Juliana, PLS
Precision Survey & Mapping, Inc.
Colorado PLS No. 31158

Professional Experience

Precision Survey & Mapping, Inc.

7/1997 to Present

9145 E. Kenyon Ave., Suite 101

Denver, CO 80237

Position: Principal, Professional Land Surveyor

Mr. Juliana is the founder and Principal of Precision Survey & Mapping, Inc. He has a wide breadth of experience covering many types of land surveying projects. His responsibilities include oversight and management of all surveying efforts at PSM. He is experienced in the determination of boundary lines, the preparation of GPS control networks, property descriptions for the acquisition of real property and easements, ground control for aerial photogrammetry projects, ground surveys in support of civil engineering design projects including field cross-sections, utility and improvement locations. He is responsible for developing, training and implementing standards and processes for PSM's LiDAR Surveying Methodology.

Key points include:

- Responsible for Business Development
- Estimating and Bidding of Projects
- QA/QC
- Project Oversight and Project Management
- Survey Office Technician
- Field Crew Chief

Work History

- 10 years with other firms

Education

- Mercer County Community College, Trenton, New Jersey
A.A.S., Concentration in Civil Engineering/Surveying

Qualifications

- Registered Professional Land Surveyor, State of Colorado-PLS No. 31158
- 31 years of experience in the Land Surveying Profession.

Professional Affiliations

- Member Professional Land Surveyors of Colorado-Central Chapter

Additional Proficiencies

- Proficient with Mobile/UAV LiDAR Data Collection and Post Processing

Commercial Drone Pilot

- FAA Part 107 Drone Pilot Certification

**GREGORY SHORT, AIA, LEED AP, PMP****PRINCIPAL****Recent Design
Experience** **WATER****City of Greeley, Boyd Lake WTP Process Improvements**

New and expanded treatment facilities at the existing plant including a new chemical building storing hazardous chemicals, retrofitting existing exterior chemical tanks to be enclosed, and repurposing portions of an existing wet well to contain ozone operations. New structures are constructed of pre-engineered metal buildings for economy and efficiency.

South Adams County Water and Sanitation District, Pellet Softening Water Treatment Plant

New treatment and support spaces at the existing Klein Water Treatment Plant in Commerce City, including process facilities, control room, office space and training room. Pellet reactors and filters, designed to provide softened water to the district's customers, along with electrical and mechanical rooms, are housed in a 23,000 SF process building. Adjacent to this is the 3,500 SF administrative area. A separate building contains the hazardous chemicals. Site layout includes vehicle circulation, parking, transformers and generator.

City of Westminster, Big Dry Creek WWTP Dewatering Facility

New dewatering facility at the existing Big Dry Creek treatment plant. Two story building contains centrifuges and truck bays for the processing and removal of solids via semi-truck. Additional space is provided for chemical storage. Another feature of the facility is an elevator for ease of personnel movement. A control area, small open office area, and lockers are also provided for the staff.

Metro Wastewater Reclamation District, Biosolids Dewatering and Storage Facility

A large new treatment facility at the Robert W. Hite plant, this four-story dewatering and storage building includes 12 centrifuges and four hoppers feeding into semi-trucks in one of four truck bays. Stair towers and a freight elevator provide access throughout the building. A mezzanine level provides access to the top of the hoppers. In addition to the process areas, several electrical and mechanical rooms are interspersed through the building. A control room is located at the top floor and, due to the proximity to gas and oil production, is designed as a shelter-in-place room. Large expanses of translucent panels on either end of the hoppers provide diffuse natural daylight to enhance staff performance and safety.

City of Black Hawk, Colorado, Dory Hill Water Treatment Plant

New water treatment facilities for a historic mining town in the Colorado mountains, including new and upgraded structures for process, maintenance, administration and staff support. This challenging project made use of existing concrete water basins as the foundation for a new superstructure, containing treatment equipment and office areas. Architecture of the buildings emulates historic mining structures found nearby.

Colorado Springs Utilities, Southern Delivery System Raw Water Pump Stations

Responsible for 30% Design through Construction Administration of Bradley Pump Station, Williams Creek Pump Station, and Juniper Pump Station. As components of the Southern Delivery System the Raw Water Pump Stations move water 1,500 feet in elevation from Pueblo Dam to El Paso County. Major materials include brick veneer, metal wall panels, and translucent wall panels.

City of Boulder, 75th Street Wastewater Treatment Plant Upgrades

New and expanded treatment and support facilities at the existing plant included office space and lab. The design of these new structures matches the original plant's architectural vocabulary.

City of Longmont, Nelson Flanders Water Treatment Plant

Multi-structure plant located on a historic rural farm site adjacent to neighboring park and farm land, with wildlife corridors, public access to trail heads and historic structures. One of the goals of the design of the plant is to use siting, forms and materials to integrate the plant into the landscape. The Plant includes structures to house filters, chemical storage, pump stations, maintenance bays and administration and staff support facilities.

Arapahoe County Water and Wastewater Authority, Lone Tree Creek Water Reuse Facility

Design of five new structures at the existing plant's site. Design of the expansion unifies and upgrades the



plant's architecture and better integrates it into the developed residential and commercial neighborhood. New structures include Headworks, Blower, RAS, AWT, and Dewatering Buildings.

Denver Water, Williams Fork Reservoir Small Hydro/Outlet Works Building

Design of an outlet works structure addition housing a turbine for power generation. New construction blends with the historic structure while accommodating current operational needs, such as a bridge crane, monorail and vehicle bay, and the function of the turbine and associated piping. Design of a maintenance and office facility for the site

Metro Wastewater Reclamation District, Northern Treatment Plant Design Definition

As the architect on the Owner's Advisor team, headed by Carollo Engineers and in cooperation with process and civil engineers and landscape architects, we developed drawings and renderings to a 30% level in order to provide design definition for the project. Spearheading the programming effort on the Visitors' Center and Facilities Support Building, we conducted workshops and coordinated with staff to establish schematic design requirements. One of the design goals for the plant was to use building locations, grading and materials to integrate the plant into the landscape, working with existing topography and vegetation, rather than imposing the facilities on the site.

PUBLIC

Bureau of Land Management Fire Facilities

Site analysis, master planning and architectural design for several fire and hotshot facilities throughout the Western states. Campus designs include living quarters, maintenance and operations buildings, staff support and recreation facilities. Buildings designed using LEED guidelines.

Bureau of Land Management, Kanab Office Building

Overall design combines numerous functions from public facilities to office, laboratory and warehouse uses, as well as pedestrian and vehicular circulation, storage and other site amenities such as parking, landscaping and recreational areas. The public and administrative components are located in the 16,000 SF office building while the laboratory and warehouse components have been combined into the 5,000 SF warehouse building.

Professional Experience

Short and Brennan Architects, Principal, Project Manager, Designer

As Principal, Greg's responsibilities include project management and design, client coordination, project planning and budget analysis, selection of project team, technical information and code conformance, and other necessary tasks depending upon each individual project.

Licensed Architect: States of Colorado, Arizona, NCARB Certificate

Years at Short and Brennan: 19

Years of Professional Experience: 20

Education: Master of Architecture, University of Wisconsin-Milwaukee

Awards

Gold Hard Hat Award 2009 - SILVER, Outstanding Higher Education / Research Project: Sun Microsystems Data Center and Laboratory Conversion

Design-Build Institute of America - 2006 National Design-Build Awards - Best Project, Water Over \$15 M: Nelson-Flanders Water Treatment Plant, Longmont, Colorado

Professional Organizations

American Institute of Architects, Colorado Chapter

LEED Accredited Professional

Project Management Institute



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carollo.com



Johnstown WTP Expansion from 5 to 10 MGD

2/5/2021

	Principal John P. McGee		Quality Assurance / Quality Control Lead Josh J. McGibbon		Project Manager Andrew C. Sparn		Lead Process Engineer Melissa L. Rhodes		Project Engineer Leah C. Opitz		Design Engineer Ryan Wienpahl		Structural Engineer Adam J. Teunissen		Senior Designer Jon C. Driggers		Administrative Victoria C. Austin		SUBTOTAL LABOR COSTS		EXPENSES					TOTAL COSTS (Rounded to Nearest 100)	
	\$184/hour		\$200/hour		\$152/hour		\$140/hour		\$124/hour		\$116/hour		\$156/hour		\$136/hour		\$104/hour		HRS	\$	PRINT	TRAVEL	SUB-CONSULTANTS	EXPENSE SUBTOTAL	LINE ITEM		
DESCRIPTION OF SERVICES	HRS	SUBTOTAL	HRS	SUBTOTAL	HRS	SUBTOTAL	HRS	SUBTOTAL	HRS	SUBTOTAL	HRS	SUBTOTAL	HRS	SUBTOTAL	HRS	SUBTOTAL	HRS	SUBTOTAL									
Project Initiation and Site Investigations																											
■ Kickoff Meeting and Facility Insepction	6	\$1,104	8	\$1,600	8	\$1,216	8	\$1,120	4	\$496	10	\$1,160	6	\$936	4	\$544	2	\$208	56	\$8,384		\$250		\$250	\$8,634		
■ Geotechnical Site Investigation and Report	2	\$368	1	\$200	1	\$152	2	\$280	1	\$124			6	\$936					13	\$2,060			\$13,070	\$14,377	\$16,437		
■ WTP Site Survey	1	\$184																	1	\$184			\$6,300	\$6,930	\$7,114		
SUBTOTAL	9	\$1,656	9	\$1,800	9	\$1,368	10	\$1,400	5	\$620	10	\$1,160	12	\$1,872	4	\$544	2	\$208	70	\$10,628		\$250	\$19,370	\$21,557		\$32,200	
Concept Design Phase																											
■ Task 1 - Filtration Evaluation and Selection for Expansion	6	\$1,104	6	\$1,200	16	\$2,432	24	\$3,360	32	\$3,968	60	\$6,960	16	\$2,496	40	\$5,440	4	\$416	204	\$27,376		\$400		\$400	\$27,776		
■ Tasks 2 & 3 - CT and Finished Water Pumping	2	\$368	2	\$400	16	\$2,432	18	\$2,520	24	\$2,976	36	\$4,176	4	\$624	6	\$816	2	\$208	110	\$14,520					\$14,520		
■ Tasks 4, 5 & 6 - Building Add, HVAC, and Electrical / Controls	2	\$368	2	\$400	12	\$1,824	6	\$840	8	\$992	8	\$928	20	\$3,120	12	\$1,632	2	\$208	72	\$10,312			\$5,500	\$6,050	\$16,362		
■ Task 8 - Code Compliance and Safety	1	\$184	1	\$200	4	\$608	4	\$560	4	\$496	6	\$696	4	\$624	2	\$272	2	\$208	28	\$3,848			\$2,100	\$2,310	\$6,158		
■ Task 9 - Value Added Ideas	4	\$736	2	\$400	8	\$1,216	12	\$1,680	14	\$1,736	18	\$2,088	4	\$624	4	\$544			66	\$9,024					\$9,024		
■ Weekly Conference Calls and Workshops	6	\$1,104	4	\$800	16	\$2,432	12	\$1,680	12	\$1,488	12	\$1,392	6	\$936	2	\$272	4	\$416	74	\$10,520			\$1,100	\$1,210	\$11,730		
SUBTOTAL	21	\$3,864	17	\$3,400	72	\$10,944	76	\$10,640	94	\$11,656	140	\$16,240	54	\$8,424	66	\$8,976	14	\$1,456	554	\$75,600		\$400	\$8,700	\$9,970		\$85,600	
30 Percent Preliminary Design Phase / CMAR Selection																											
■ 30% Percent Design Documents	4	\$736	4	\$800	40	\$6,080	60	\$8,400	70	\$8,680	80	\$9,280	50	\$7,800	120	\$16,320	4	\$416	432	\$58,512				\$12,900	\$14,190	\$72,702	
■ Weekly Conference Calls and Workshops	2	\$368	2	\$400	8	\$1,216	12	\$1,680	8	\$992	8	\$928	4	\$624					44	\$6,208				\$2,200	\$2,420	\$8,628	
SUBTOTAL	6	\$1,104	6	\$1,200	48	\$7,296	72	\$10,080	78	\$9,672	88	\$10,208	54	\$8,424	120	\$16,320	4	\$416	476	\$64,720				\$15,100	\$16,610		\$81,300
60 Percent Design Phase and BDR																											
■ 60 Percent Design Documents	8	\$1,472	8	\$1,600	40	\$6,080	90	\$12,600	110	\$13,640	140	\$16,240	90	\$14,040	140	\$19,040	2	\$208	628	\$84,920		\$120	\$14,400	\$15,960	\$100,880		
■ Basis of Design Report	2	\$368	2	\$400	12	\$1,824	8	\$1,120	40	\$4,960	40	\$4,640					2	\$208	106	\$13,520					\$13,520		
■ Responses to CDPHE RFIs	1	\$184	2	\$400	3	\$456	12	\$1,680	52	\$6,448	60	\$6,960					2	\$208	132	\$16,336					\$16,336		
■ Technical Specifications	2	\$368	4	\$800	16	\$2,432	32	\$4,480	40	\$4,960	48	\$5,568	16	\$2,496			2	\$208	160	\$21,312			\$2,200	\$2,420	\$23,732		
■ Design Workshops	8	\$1,472	4	\$800	10	\$1,520	8	\$1,120	8	\$992	6	\$696					3	\$312	47	\$6,912		\$220		\$220	\$7,132		
■ OPC	2	\$368	2	\$400	6	\$912	6	\$840	4	\$496	2	\$232	8	\$1,248			2	\$208	32	\$4,704					\$4,704		
SUBTOTAL	23	\$4,232	22	\$4,400	87	\$13,224	156	\$21,840	254	\$31,496	296	\$34,336	114	\$17,784	140	\$19,040	13	\$1,352	1105	\$147,704		\$340	\$16,600	\$18,600		\$166,300	
CMAR Selection, VE/GMP, and Construction Documents																											
■ CMAR RFQ ad Contractor Selection	8	\$1,472	8	\$1,600	24	\$3,648	16	\$2,240	16	\$1,984	20	\$2,320	12	\$1,872			4	\$416	108	\$15,552			\$3,500	\$3,850	\$19,402		
■ 100% Construction Drawings	7	\$1,288	6	\$1,200	40	\$6,080	70	\$9,800	96	\$11,904	132	\$15,312	94	\$14,664	180	\$24,480	2	\$208	627	\$84,936		\$120	\$3,500	\$3,970	\$88,906		
■ 100% Construction Specifications	4	\$736	2	\$400	10	\$1,520	24	\$3,360	32	\$3,968	48	\$5,568	36	\$5,616			2	\$208	158	\$21,376			\$1,500	\$1,650	\$23,026		
■ Finalize GMP and Design Workshops	4	\$736	2	\$400	4	\$608	4	\$560	6	\$744	4	\$464	4	\$624	2	\$272	2	\$208	32	\$4,616			\$16,500	\$18,150	\$22,766		
SUBTOTAL	23	\$4,232	18	\$3,600	78	\$11,856	114	\$15,960	150	\$18,600	204	\$23,664	146	\$22,776	182	\$24,752	10	\$1,040	925	\$126,480		\$120	\$25,000	\$27,620		\$154,100	
Construction Administration - Office																											
■ Submittals, Pay Apps, RFIs, WCDs,	8	\$1,472	2	\$400	40	\$6,080	64	\$8,960	100	\$12,400	150	\$17,400	80	\$12,480	44	\$5,984	6	\$624	494	\$65,800		\$4,400	\$3,500	\$8,250	\$74,050		
■ Record Drawings	3	\$552	4	\$800	10	\$1,520	40	\$5,600	16	\$1,984	40	\$4,640	16	\$2,496	78	\$10,608			207	\$28,200			\$1,500	\$1,650	\$29,850		
SUBTOTAL	11	\$2,024	6	\$1,200	50	\$7,600	104	\$14,560	116	\$14,384	190	\$22,040	96	\$14,976	122	\$16,592	6	\$624	701	\$94,000		\$4,400	\$5,000	\$9,900		\$103,900	
Construction Administration - Field																											
■ Site Observations	12	\$2,208	12	\$2,400	80	\$12,160	100	\$14,000	100	\$12,400	240	\$27,840	80	\$12,480	24	\$3,264			648	\$86,752			\$16,000	\$17,600	\$104,352		
■ Progress Meetings	4	\$736	4	\$800	60	\$9,120	60	\$8,400	48	\$5,952	64	\$7,424	40	\$6,240					280	\$38,672					\$38,672		
■ Start-up, Training and Warranty	2	\$368	2	\$400	40	\$6,080	34	\$4,760	24	\$2,976	44	\$5,104						146	\$19,688		\$3,400	\$8,000	\$12,200	\$31,888			
SUBTOTAL	18	\$3,312	18	\$3,600	180	\$27,360	194	\$27,160	172	\$21,328	348	\$40,368	120	\$18,720	24	\$3,264			1074	\$145,112			\$24,000	\$29,800		\$174,900	
TOTAL																										\$798,300	

- Notes:
- 1

Fee is based on a construction budget of \$8.0M and CMAR Delivery
- 2

Scope and fee based on Selection of either Alt #1 - GFM or Alt #2 Mixed Meida Filter Expansion
- 3

Construction Administration Fees based on 14 month construction schedule and once per week site visits and periodic rebar inspections
- 4

Exclusions: LTR Raw Water Pipeline Design and Construction, geotechnical and material testing during construction

Johnstown, Colorado Water Treatment Plant Expansion Design

February 5, 2021





February 5, 2021

Mr. Marco Carani, Director of Public Works
Town of Johnstown
450 South Parish
Johnstown, CO 80534

www.jvajva.com

RE: Proposal for the Professional Engineering Services for the Expansion of the Johnstown Water Treatment Plant

Dear Mr. Carani and Selection Committee Members:

JVA, Incorporated (JVA) appreciates the opportunity to provide our response to the Town of Johnstown (Town) Request for Proposal for the Expansion Design of the Johnstown Water Treatment Plant (JWTP) project. JVA has reviewed the RFP, addendums, and attended the preproposal meeting and site walk for this project. We have assembled a team of qualified and experienced engineers to assist the Town in meeting its goals and objectives for the expansion to 10 million gallons per day (MGD) firm capacity. JVA's key staff committed to the success of this project are primarily based in our Fort Collins and Denver offices. To provide the Town the most qualified services, JVA has teamed with Browns Hill Electrical & Controls, Inc. (BHEC) for the design expansion. Charles Page of BHEC is on the project team and is currently working with the Town on upgrading the SCADA system and very familiar with the JWTP electrical and control systems. In addition, JVA has teamed with Northern Colorado local firms for geotechnical engineering (Lithos) and survey (King Surveyors) who have experience working with both JVA and the Town.

Since this project will be accomplished within the tight confines of the existing treatment facility and there is much to know about site constraints and constructability issues, we believe this project is an excellent example of how the Construction Manager at Risk (CMAR) delivery process will benefit the Town. Having the contractor involved in the design from the 30 percent level through final design will help to confirm the assumptions we have made and give us all an accurate price confirmation including a Guaranteed Maximum Price (GMP) before the design is completed. This delivery method removes the bid day surprise, and develops a strong team of owner, engineer and contractor that will carry into the construction phase of the project. JVA is considered experts in the CMAR delivery method, and we are proud of the successes we have had in delivering these projects for many of our clients on similar water treatment plant expansions. Our expertise not only lies in our ability to provide solutions and work as a team, but in our skill to foresee and mitigate potential conflicts and challenges. The numerous CMAR projects we have completed to date has given us the experience and understanding of how to best implement this project delivery method to meet the Town's objectives.

The JVA team is very qualified for this project based on our past work experience with design upgrades and expansion to existing WTP filtration processes including mixed media and membranes (pressure and submerged). Over the last 5 years JVA has designed and upgraded several WTPs that required filter expansion / rehabilitation or conversion to membrane filtration throughout Colorado including projects for North Table Mountain W&SD, Town of Berthoud, Town of Crested Butte, Mount Crested Butte W&SD, City of Grand Junction, and Woodmoor W&SD to name a few and as described in our proposal to follow. John McGee will be the Principal-in-Charge for the project and located in the Fort Collins office within a 25-minute drive to Johnstown. Andrew Sparn will be the project manager who is just coming off the North Table Mountain Filter Expansion project and will be dedicated to your project. Melissa Rhodes will lead the process team for JWTP expansion and is very experienced with both mixed media and membrane filtration design. She will be assisted by Leah Opitz and Ryan



Wienphal as project and design engineers. Leah was project engineer for the \$20.3 million Mt. Crested Butte WTP which partly consisted of abandoning a mixed media direct filtration system with ultrafiltration membranes and brings her experience and expertise to your project. recently joined JVA as a design engineer and was formerly employed with Ramey Environmental Compliance as a Class A licensed Operator for water treatment operations.

JVA has a very structured and detailed QA/ QC program to ensure that all deliverables are reviewed prior to submitting to the Town. Josh McGibbon will lead the QA/QC efforts for the project. Josh has been principal-in-charge or Technical Lead for the WTP filter expansion and rehabilitation projects referenced in our proposal. Adam Teunissen will be the lead structural engineer on the project who specializes in water and wastewater structural tank designs.

In addition to our design qualifications, JVA has extensive experience and skills to effectively coordinate the planning and permitting efforts with the Colorado Department of Public Health and Environment (CDPHE). Our staff has outstanding relationships with CDPHE personnel. JVA also has extensive experience and success in assisting municipalities with funding assistance, including both SRF and DOLA grants and loans.

Please review the attached proposal document and call any of the numerous references cited, and feel free to call me with any questions. In summary, we believe our team is uniquely qualified for completing the JWTP Expansion project to the Town's complete satisfaction. We are a local firm and are looking to build a long-term relationship with Johnstown. We take pride in our commitment to quality work, proactive communication, and highest levels of service and it would be our pleasure to work closely with Town staff for years to come.

Sincerely,
JVA, INCORPORATED

By:

A handwritten signature in black ink, appearing to read 'John P. McGee', is written over a horizontal line. Below the line, the text 'John P. McGee, P.E.' and 'Principal' are printed.

John P. McGee, P.E.
Principal

Attachments



Introduction

JVA, Inc. (JVA) appreciates the opportunity to present our team and qualifications for the Town of Johnstown Water Treatment Plant Expansion project. This proposal is based on the requirements outlined in the RFP issued on December 30, 2020. Our project team members have extensive experience in master planning, particularly with Colorado communities similar to Johnstown. We have a strong presence in the region, working on critical wastewater and water projects for the Towns of Berthoud, Mead, Platteville and the City of Greeley. We look forward to assisting the Town in expanding your water treatment plant.

Section 1: Identification of Proposer



JVA is a Civil, Environmental, and Structural consulting engineering firm headquartered in nearby Boulder, Colorado, with Front Range offices in Fort Collins and Denver, and

mountain offices in Winter Park and Glenwood Springs. JVA celebrates our 65th anniversary of engineering excellence, serving municipalities, special districts, and owners throughout Colorado. Our current staff size consists of 130 experienced engineers, designers, and administrative staff. We are committed to excellence in our service to all clients. As consulting engineers, we are dedicated to superior design, and understand the need to communicate, work as a team, and complete projects on time. JVA provides its clients with creative thinking, design sensitivity, and cost-effective engineering. We

Contact:

John P. McGee, P.E.
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Web: www.jvajva.com

recognize that true service to the client is more than quality engineering. Efficient use of the Town's resources, meeting project deadlines, and being sensitive to your needs are our primary goals.

This project will primarily be run out of our Fort Collins office, with John McGee as the Principal-in-Charge. Our team and subconsultant information can be found in Section 4 of our Proposal.

Section 2: Project Overview and Approach

Project Approach

JVA attended the pre-proposal meeting, attended the Johnstown Water Treatment Plant (JWTP) walk through and have read the RFP and supporting documents to fully understand the goals and objectives for the JWTP expansion. The JWTP is rated for a firm capacity of 5 MGD limited by filtration with one filter out of service. The original filter plant was constructed in 1966 and has been maintained by the Town with improvements over the 50 years. The most significant improvement was the addition of a 10 MGD Dissolved Air Flotation (DAF) system for pretreatment that replaced outdoor aged flocculator / clarifiers that remain abandoned today. Based on recent peak demands, the JWTP is not capable of meeting the Town's potable water needs

without use of the emergency interconnects from Greeley, Little Thompson Water District (LTWD) and Central Weld County Water District (CWCWD). The Town completed a raw water master plan in 2005 that describes the Town's water rights portfolio which includes 4,757 acre-feet of Consolidated Home Supply Ditch and Reservoir Company and 360 acre-feet of Consolidated Hillsborough Ditch Company for a total of 5,117 acre-feet. The Town also owns some Colorado Big Thompson (CBT) shares that can be delivered upon request to the Town through the Home Supply system. The Town also has a substantial portfolio of water rights for non-potable irrigation including numerous shares in Farmers, Hill and Brush, Greeley-Loveland, and Highland Ditch companies. The Town's municipal and irrigation water rights portfolio are adequate to meet the current and 10-year demands for domestic and irrigation uses. The Town has been proactive with residential and commercial developments encouraging non-potable irrigation as well as water conservation practices to reduce or flatten the curve of peak day demands at the JWTP.

The primary raw water source for the JWTP is the Lone Tree Reservoir (LTR) located approximately 10 miles east of the plant. The secondary raw water source for the JWTP is the Johnstown Reservoir located approximately $\frac{3}{4}$ mile east of the plant. Both raw water sources are pumped to the JWTP. Back in 2008, the Town constructed a new raw water pump station at the Johnstown Reservoir with a net pumping capacity of 6.7 MGD. The LTR pump station will not meet this next phased expansion of the JWTP and will need to be expanded to meet future demands. The existing 16-inch LTR raw water transmission line will need to be upgraded or another transmission line installed parallel to the existing 16-inch to meet future JWTP capacity needs. Over the last several years, the Town has implemented projects at both raw water pump stations and the JWTP to improve SCADA / HMI automation and communications of delivering raw water to the JWTP more reliably and less manual operation intervention. On-going improvements at these sites have also included replacing aged PLCs, raw water pump

VFDs, DAF saturator / compressor, and equipment repair and replacement (i.e. repair of LTR powered activated carbon (PAC) system, etc). On the finished water side, the Town has made numerous improvements to the Town's distribution system over recent years including upsizing, replacement and rehabilitation of watermain, installation of PRVs, water storage and booster station upgrades / expansions. The Town's intent is become less reliant on the emergency interconnects with Greeley, LTWD and CWCWD and continue to develop a more robust and reliable water distribution system throughout the year. Johnstown budget and prioritizes capital projects for the water distribution system every year for meeting current and future needs.

Based on JVA's understanding, review of the RFP documents (including addendums), and discussions with operation staff during the JWTP walk through, JVA has put together a task-by-task approach for this project. Each task outlined below will include a technical memorandum that will serve as the basis of design for the JWTP expansion.

- *Task 1* - 5 MGD to 10 / 12.4 MGD (one filter off-line / all in service) expansion of the existing JWTP with addition of a matching mixed-media filtration system or replacement of the mixed-media filtration system with an ultrafiltration membrane system.
- *Task 2* - Evaluate and expand (if necessary) the existing Clearwell to meet CT and compliance with DOVE (Policy 5)
- *Task 3* - Evaluate and expand (if necessary) the Finished Water Pumping system to meet new pumping demands
- *Task 4* - Design of a new building (if necessary) to house either the additional mixed media filters or membranes
- *Task 5* - HVAC and plumbing design for the existing filter building and any new buildings added for the expansion
- *Task 6* - Coordination with the Town's on-call system integrator (Browns Hill Engineering and Controls) for electrical, SCADA and controls

- *Task 7* - Design of a new raw water pipeline integrated with the existing LT Raw Water Pump Station from LT Reservoir to the JWTP
- *Task 8* - The JWTP Expansion shall include the design of safety devices required for staff to operate and maintain the treatment processes effectively and reliably
- *Task 9* – Value Added Ideas

Task 1 – Filter Expansion

JVA has developed three- (3) alternatives for expanding or replacing the JWTP mixed media filtration system. The three alternatives include:

- ✓ Alternative 1: Expand the existing filtration process / building
- ✓ Alternative 2: Replace existing filtration process with Membrane Gravity Filters (MGF)
- ✓ Alternative 3: Replace existing filtration process with Conventional Submerged Membranes

Alternative 1: Expand Existing Filtration Process:

This alternative will include expanding the existing filter building to the west to allow extension of the filter piping gallery and addition of the new filter boxes. A schematic of the filter building expansion is shown on Figure 1. The new filters will be the exact same size of the existing filters (12' x 18') to double the capacity of the existing plant. Some of the filter piping (i.e. filter effluent common header piping) will need to be expanded to handle the increased flow from each train. It is proposed to add the following improvements to the existing filters and to include the same for the new filters:

- Filter-to-waste piping and discharge
- Replace surface wash with air scour
- New Leopold underdrains and media
- PLC / SCADA / HMI integration for automated control

The challenges faced with this option will be maintaining treatment operations during construction of the new filters and rehabilitation of the existing. Sequencing construction with system demands will be a major challenge with this option. The Town has the option of utilizing their interconnects with Greeley, LTWD and NWCWD however, this is not a guaranteed reliance since the supply interconnect entities will serve their needs first prior to supply water to Johnstown. Historically the peak summer demand decline by late September / early October allowing an opportune time to begin the rehabilitation of the existing filters. The new filter building addition can be constructed throughout the year while the existing filters remain on-line to meet system demands. Once the new filters are constructed there will be a down time for each train when the new filter piping (backwash, filter effluent, drain, filter-to-waste) is integrated and upsized as necessary with the existing piping. A detailed structural analysis will be conducted of the southwest filter piping gallery wall to determine rehabilitation for cutting out a portion of the wall to extend the gallery and expose the influent piping from the DAF. Construction Manager at Risk (CMAR) delivery for expanding the existing filter process should be considered by the Town. Projects that involve major rehabilitation of existing water retaining structures, treatment processes, piping, and electrical / controls that require detailed scheduling, process shutdowns, operations coordination and contractor insight invites consideration of CMAR delivery.



Figure 1: Alt #1 - Expand Existing Filter 1

Alternative 2: Replace Existing Filtration Process with MGFs

JVA reached out to ultrafiltration membrane manufacturers to determine what systems that would be most adaptable to the existing infrastructure for minimizing additional tankage and buildings. One such system is Membrane Gravity Filters (MGFs) that function like gravity flow mixed media filters. MGFs can be installed inside the existing filter boxes with modifications to the influent, backwash, drain, and filter effluent piping. Addition of air scour would be required for backwash and cleaning the membranes. The compressors for air scour could be located on the main process floor or down in the pipe gallery. The existing backwash supply could be integrated with the MGFs with minor piping modifications. Pumps would be necessary for wasting the backwash and to drain down the MGF boxes. Shown on Figure 2 is a schematic of the MGFs retrofitted into the four existing filter boxes. A total of four converted MGF trains each with four membrane chains would be capable of producing 3.33 MGD per train for a total of 13.33 MGD with all trains operating and 10 MGD firm capacity with one train out of service. During construction, one side of the existing filters can be operated while the other side is gutted (underdrains, media, gullet, and backwash troughs removed) and retrofitted with the MGFs. The influent piping from the DAF will have to be modified for distribution to each filter train as well as the permeate and backwash supply piping. Again, a CMAR delivery for this project is highly recommended due to the down time and operation coordination required between the contractor, Town, and engineer. Like Alternative 1, the filter rehabilitation work would need to be conducted during the non-peak season (October to May) to minimize the use of interconnects.



Figure 2: Alt #2 – Convert Existing Filters to MGFs

Alternative 3: Construct New Membrane Filtration Facility – Abandoned Existing Filter Plant

This alternative would compare GSM (Alternative 2) retrofit with skid mounted membrane filtration (MF) facility. It is proposed that the new MF facility be constructed just west of the existing DAF building. The advantage of this alternative is that the existing filtration process can maintain treatment operations with very limited shutdowns and reliance on emergency interconnects during construction of the new MF facility. The existing filter building could be retrofitted for additional chlorine contact and / or finished water pumping improvements. The pipeline that exists between the DAF building and Filter building could be repurposed for conveyance between the two structures. The MF treatment process is a proven technology with many systems throughout Colorado. JVA has in-depth experience with MF design and retrofits of existing filter plants. The MF are slab skid mounted and arranged in multiple arrays and trains with dedicated influent pumps, clean-in-place (CIP), air scour and backwash processes. In contrast to GMFs, MFs required influent pumping to the membranes skids to pressurize the membranes for the filtration process. The primary disadvantages of this alternative compared to Alternatives 1 and 2 is the required pumping to feed the membranes and chemicals and storage needed for CIP.

Included in Appendix B is an example drawing set for installing Gravity Membrane Filters (GMFs) within the mixed media filter basins. Included in Appendix C are Site Drawings for Alternatives 1, 2 and 3



Figure 3: Alt #3 - Construct New Membrane Filtration System

Task 1 Deliverable

JVA will prepare a technical memorandum (memo) for evaluating Alternatives 1 through 3 and based on selected criterion prepare a recommendation for preliminary design of the selected alternative. The memo will include a feasibility analysis, cost evaluation, design criteria and concept design. This memo will serve as a basis for subsequent design tasks. *To avoid redundancy of this approach section, a technical memo will be prepared for all the tasks below to set the design parameters, criteria, and concepts for preliminary and final design phases.*

Task 2 - Evaluate Existing Clearwell and Chlorine Contact

For Alternative 1, the existing clearwell will need to be expanded for additional chlorine contact time (CT) to achieve adequate disinfection credit for viruses and giardia inactivation. For Alternatives 2 and 3, the existing clearwell may have enough volume for CT because membrane filtration has a pore size opening that prevents giardia from passing through which allows 3 log removal credit, thereby only needing to meet CT for virus inactivation. Existing filtered water quality data would have to be trended for pH, temperature, and chlorine residual to determine the required volume required to achieve adequate CT for virus inactivation at the new peak day design flow. It should be noted that assigned baffling factor will be an important design consideration for CT. JVA will discuss with the Town whether a Disinfection

Outreach and Verification Effort (DOVE) was conducted by CDPHE for the JWTP. If a DOVE was conducted, a baffling factor would have been assigned. If a DOVE was not conducted, JVA would calculate the baffling factor to determine CT required for giardia and virus inactivation. For any added clearwell volume, the tank would be baffled to achieve a minimum baffling factor of 0.7.

Task 3 - Evaluate Finished Water Pumping

The existing finished water pumping system consists of three vertical turbine pumps that pump finished water to the Town distribution system.

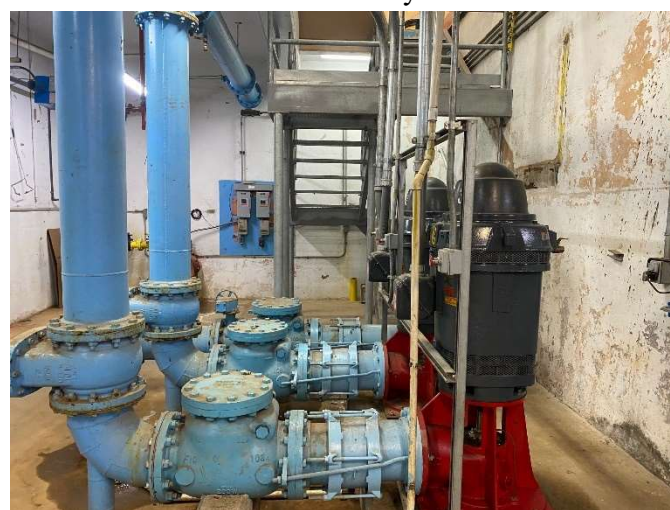


Photo: JWTP Finished Water Pumps

JVA will evaluate and prepare a condition assessment of the finished water pump system to determine what improvements and expansion would be required for meeting the new peak day demand of 12.4 MGD. If it is determined in Task 2 that more CT is required, it is proposed that additional clearwell volume is added, the new tankage would be connected to the existing pump station.

Task 4 - New Filter Building Addition (if necessary)

For Filtration Alternatives #1 and #3, would require a new building to house the new mixed media filters (Alt #1) and new MF facility (Alt #3). For Alternative #2, a new building for housing additional filters would not be required since there is enough filter train volume for GMF to achieve a peak day flow of 12.4 MGD (10 MGD firm). If a new filter building is

added, the building would match the existing material (CMU) and architectural style of the existing Filter and DAF buildings.



Photo: JWTP Existing Filter Pipe Gallery

JVA has architectural and structural team members in house that will design the filter building addition if Alternative #1 or #3 is selected for the filter expansion.

Task 5 - HVAC and Plumbing for Existing and New Filter Addition

The existing Filter building was constructed in 1966 and has aged HVAC and plumbing equipment that will need to be upgraded to improve heating, cooling and ventilation efficiency and reduce corrosion of piping and structures and extend the life of the Town's assets. For a new filter building addition, the HVAC and plumbing design will be prepared in accordance with the Town's adopted IBC code and NFPA code related to the selected processes and functionality of the building.

Task 6 – Electrical, Controls and SCADA Integration

JVA will subcontract with Browns Hill Electrical and Controls (BHEC) to conduct a condition assessment of the existing electrical infrastructure and evaluate the electrical upgrades / improvements for each the filtration alternatives and associated process improvements. JVA will also work with BHEC for integrating controls and SCADA with the recommended filtration alternative. The Town is

currently working with Charles Page with BHEC for on-going SCADA integration and improvements for both the water and wastewater facilities.

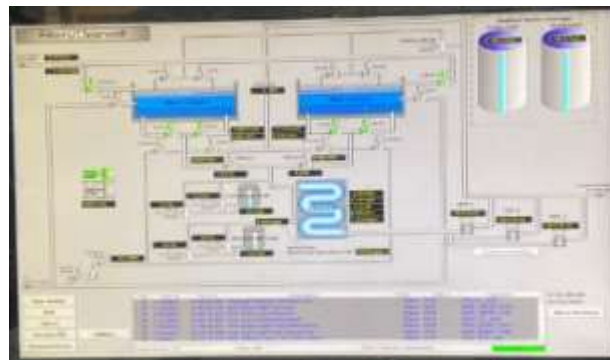


Photo: JWTP Filter / Clearwell SCADA Screen

It is likely that electrical improvements will be required for the existing Filter building along with the new buildings and expansion. The extent of electrical upgrades will depend on the filter expansion alternative selected.

Task 7 - Design of a New Raw Water Pipeline from Lone Tree

Based on Addendum #1 of the RFP, the Town decided to negotiate with the selected consultant the design of the new LTR raw water pipeline and associated improvements to the LTR pumping station. In preparation of the LTR pipeline design, JVA has teamed with Lithos and King Surveyor to conduct the survey, geotechnical testing and report, easement preparation and design of the trenchless crossings. Based on a preliminary alignment provided by Johnstown, we have identified at least five necessary tunnels (locations where third parties will not allow for open-cut construction) including Highway 287, Berthoud Parkway, I-25, State Highway 60, and the BNSF Railroad. Lithos has significant experience in designing geotechnical and tunnel specific components of pipeline projects.

To help manage construction risk for the proposed pipeline project, it is important Johnstown develop appropriate requirements and consider development of a Geotechnical Baseline Report (GBR). GBRs identify ground conditions to be encountered during tunnel construction, specify allowable tunnel means and methods for individual tunneled crossings, and

provide considerations for shaft and tunnel construction. A GBR is a unique geotechnical document that is directly incorporated into the contract for a project. We have extensive experience and understanding in available tunnel means and methods and how to couple these means and methods with ground conditions as identified through a prudent subsurface investigation. In addition, we have produced numerous multi-crossing GBRs for various project types. Appropriate specifications and tunnel detail drawings are an important consideration; our experience with tunnel construction have aided in the development of robust tunnel specifications and drawings.

A recent project, currently in design, where tunnel specific design documents were developed is the South Tank and Waterline Loop for Johnstown. This project will include roughly 10 tunneled crossings of county roads, irrigation ditches, the Little Thompson River, and railroad tracks. The project is currently in the final stages of design with anticipated bid in mid-2021. The Town's understanding of the critical nature of tunnel crossings and the need for specific construction documents addressing these components of construction will lead to the selection of qualified contractor(s) and appropriate risk allocation for the project team.

Once the scope for the LTR pipeline design is negotiated with the Town, the JVA team will prepare the LTR plan and profile drawings and specifications including details for open cut and trenchless pipeline design. A minimum of Level B Subsurface Utility Engineering (SUE) will be prepared for the entire alignment of the LTR pipeline design with Level A SUE for each conflicting utility crossing or interference. Level A SUE includes potholing to confirm both horizontal and vertical alignment of the conflicting utility.

Task 8 – Code Compliance for Reliable and Safe Operations

The filter expansion design will include compliance with all applicable codes, including the latest OSHA, NFPA, NEC and IBC requirements to provide safe

and reliable environment for the JWTP operation staff. Safety is of number one importance for treatment operations since operators are dealing with corrosive and hazardous chemicals, dust, and confined spaces. Proper ventilation and lighting in work areas is essential for safe access and to maintain and operate equipment or change out chemicals. All areas that contain chemicals will have spill protection and tempered emergency eye wash stations.

Task 9 – Value Added Ideas

In addition to the eight tasks described above, JVA has come up with several ideas the Town may want to consider for this project.

Repurposing of the Abandoned Clarifiers - for DAF solids storage and thickening or backwash recycling and / or for Powered Activated Carbon (PAC) or Ozone contact basins to mitigate taste and odor compounds in the raw water. The JVA team has a



significant amount of experience with both ozone and PAC treatment for reducing taste and odor in drinking water. There have been significant advances in on-site generation of ozone for use as an oxidant and for controlling taste and odor in raw water.

Converting existing Mixed Media Filters to GMFs - As presented in Task 1, converting the existing mixed media filters to GMFs would save the Town a significant amount of money avoiding or delaying the construction of additional filter trains and a building while still meeting the Town's objective for producing 12.4 MGD filtration capacity (10 MGD firm).

The Construction Manager at Risk (CMAR) approach - for project delivery has become much more popular over the last several years for the construction of water and wastewater treatment facilities. JVA recommends this approach for expansion of the LPWWTP. This approach includes a competitive process for selecting the CMAR which includes an RFP along with either 30 or 60 percent design documents. The selection process for the CMAR includes weighted qualitative and quantitative criteria evaluated by the Town and JVA to select the most qualified CMAR. For this project, JVA recommends preparing the CMAR RFP with 30 percent design documents for competitive selection. Post 30 percent design effort will include the CMAR with the design team to assist with constructability and valued savings for the project. The design team works together to produce construction documents and a guaranteed maximum price (GMP) for the project. The distinct advantages of the CMAR delivery versus the Design-Bid-Build delivery is that the Contractor has had time to provide input for constructability and sequencing to the work for the expansion and to reduce interruptions to operations during construction. The CMAR process has shown to be highly successful especially with rehabilitation of existing WWTPs that involve complex tie-ins, bypass pumping, shutdowns, and process improvements. Early involvement allows for the CMAR to plan and efficiently sequence the construction and methods employed and produce a high-quality product and Owner satisfaction.

Project Funding - JVA has a reputation for being creative when it comes to project funds. Often smaller communities do not have limitless, or even adequate, financial resources. JVA is well versed in the available State and Federal funding opportunities for infrastructure projects, and we will assist the Town in pursuing grant and/or loans to fund the necessary infrastructure improvements. We understand the importance of funding when working with small communities and do our best to even seek financing for the engineering services that we provide. The vast majority of our water projects involve State or Federal funding assistance. JVA generally takes the lead on the application process and meeting the

conditions of the grant/loan after the award. Listed below are some funding sources that JVA and our staff have assisted our municipal and Special District clients in obtaining for water infrastructure projects:

- ✓ ***DOLA Energy and Mineral Impact:*** With Johnstown located in Weld County, a County that has experienced significant impacts from the oil, gas and mineral development, the Town may qualify for the Energy and Mineral Impact Assistance Fund. This fund provides financial assistance for wastewater treatment and collection system projects. The assistance includes loans and/or grants for planning, design and construction. There are matching grants for projects between \$200,000 and \$2,000,000. Loans are also available, but other sources provide lower interest rates and have better terms. We have developed excellent relationships with DOLA staff. Contact Barry Cress at 303-866-2352 for a reference on JVA's level of service.
- ✓ ***CDPHE Planning Grants:*** JVA has recently been successful in assisting some communities in receiving planning grants for under \$50,000. These grants are obtained by writing a letter of request, and do not have a lengthy application process. The planning grants can be used for planning and preliminary design of infrastructure improvements.
- ✓ ***CDPHE State Revolving Fund:*** JVA has extensive experience assisting communities in obtaining State Revolving Fund (SRF) grants and loans. This funding source can be used for infrastructure planning, engineering and construction. Direct loans are available to the Town for up to \$2,500,000 and leveraged loans for larger amounts. Direct loans have an interest rate of 0.0 to 2.0 percent based on your MHI and a term of 20 years. JVA has worked extensively with CDPHE and the Colorado Water and Power Development Authority and will assist the Town with the application and loan processing.

Section 3: Management Approach

The JVA team will be managed to optimally balance quality, schedule, and costs on this project. Project management is a focus of our training at JVA. We utilize an outside consultant, Trever Renquist with Impact Management Systems, for individual trainings for key management staff. We also have a monthly in-house training program for all project engineers and managers. Here we focus on a variety of topics such as effective communications, delegation, time management and tools to make each of us more effective managers.

Managing the design and engineering process starts with the development of a detailed Work Plan. The Work Plan identifies the goals of the project, the team, roles, communication, deadlines, deliverables, and all other aspects of the project. The Work Plan will be shared with Town Staff and updated throughout the project. The Work Plan will also include a detailed workload breakdown including hours for each task and a schedule developed using Microsoft Project.

Our management team meets weekly where we discuss staffing needs, workload, and other department level topics. The JVA project managers also meet weekly to allocate staff, set deadlines, and assign projects. This is followed by a department level staff meeting where project tasks are assigned and coordinated, and deadlines are presented. Individual project team meetings occur as needed based on project size. We recommend weekly team meetings for this project. This level of internal communication is also promoted with our clients.

To manage cost, JVA incorporates cost reporting software into our project management, which allows us to monitor the project design budgets on a weekly basis or even daily if needed.

Our project success is a result of close coordination and communication with the owners, designers, contractors, and vendors, allowing us to serve you more effectively. Project progress is regularly

communicated through the design, review, construction, and inspection procedures on all projects. This careful attention to your needs creates projects that run smoothly and efficiently.

Specifically, for the JWTP Expansion JVA proposes to provide a work plan that will provide milestone dates for work-in-process deliverables as outlined in the RFP. The deliverables will include the 30, 60 and 100 percent design documents for Town review followed up by design progress meetings for each deliverable to obtain input prior to finalizing. All deliverables and milestones will be agreed with the Town at the project kick-off meeting. At the 30 percent design deliverable, JVA proposes to assist the Town with the CMAR selection, value engineering and GMP proposal reviews.

The JVA team is committed to excellence in our service to our clients. The JVA team recognizes that true service to the client is more than quality engineering. Quality in JVA projects is maintained by several important factors:

- Our similar work on past projects of similar scope promotes efficiency
- Work is reviewed internally for quality, possible value engineering benefits, and engineering excellence
- Our firm excels in building state and local regulatory relationships, and public outreach.

"I had the privilege of working closely with several engineers and managers from JVA following the Sept. 2013 flood. I can highly recommend JVA and the team I worked with, namely Mark Van Nostrand, Andrew Sparr, and Josh McGibbon. They were thorough, professional, and committed to bringing Lyons' residents home as quickly and safely as possible. Thanks, JVA!"

**—Sandy Banta, Former Board of Trustee
Town of Lyons**

Section 4: Staff Qualifications



John McGee, P.E.
Principal / Client Manager

John has over 32 years of experience with water treatment related projects and will serve as the Principal-in-Charge for the CLFP South Plant project. John's primary role of the project will be weekly check-ins with JVA staff members on project status, budget and schedule. John will represent JVA as the contract signatory and licensed engineer for stamped reports and drawings. As principal-in-charge, John will correspond directly with Town staff on the execution of the Town/JVA agreement, negotiated scope and fees, and any value-added services that may arise during the project. John is familiar with the Johnstown WTP from previous discussions with plant staff and attendance at the pre-proposal meeting. John brings in-depth experience with the rehabilitation of mixed media filters and expansion as technical lead for the Berthoud WTP expansion, Pueblo West Metro District (PWMD) WTP expansion, City of Loveland WTP expansion and North Table Mountain WTP expansion. Prior to joining JVA, John was the Water Treatment Manager and Project Manager for the City of Loveland. During his tenure at the City, John managed and prepared in-house designs for the rehabilitation of 16 mixed media filters, addition of a 12 MGD flocculation / sedimentation using plate settlers, and rehabilitation of a 30-year old flocculation and sedimentation process with the replacement of baffle walls, flocculation paddles and drives and tube settlers. John brings this experience and expertise for the JWTP expansion project and will share his in-depth experience with project team members and Town staff throughout the evaluation, design and construction stages.



Josh McGibbon, P.E.
Technical Lead and Funding Expert

Josh's role for this project will be the Technical Lead and Funding Expert. Josh will provide technical leadership to the team and draw on his past experience with similar projects to meet the Town's goals. Furthermore, Josh has spent the past 20 years working with the State's various funding agencies to make projects a reality by finding the necessary funding. Josh has significant amount of experience with both conventional filtration (mixed or dual media) and alternative filtration systems such as membranes. He will attend reviews and workshops with the client, commit project resources, and provide technical QA/QC to all design deliverables.



Andrew Sparn, P.E.
Project Manager

Andrew will be the project manager for the JWTP Expansion project. He will be the primary contact and manage the design teams for this project. Andrew is currently wrapping up as the project manager for the 16 MGD North Table Mountain Water & Sanitation District (NTM) expansion project. The CMAR delivery is on schedule to be completed on time and within the \$13.6M guaranteed maximum price. This project is very similar in size and scope to the JWTP expansion project including an 8 MGD filter addition and pretreatment expansion. With the NTM project winding down, Andrew will be committed to this project as your project manager and will spend the time needed with the project team and Town staff to produce a high-quality product delivered on time and within budget. Prior to joining JVA, Andrew worked for Aslan Construction as a Superintendent is familiar with water treatment plant construction and large pipeline construction. Andrew is the On-Call Engineer for the City of Lamar and has successfully completed multiple recent projects involving replacing, rehabilitation and upsizing water distribution and transmission pipelines. Andrew is

skilled in all facets of design, permitting, and construction management of water treatment and pipeline projects. He has extensive knowledge and experience in grant/loan funding for water and wastewater treatment facilities and water quality projects. Andrew excels in communication and project management to ensure projects stay on schedule and budget. Andrew has been with JVA for 10 years and has coupled his construction experience with a strong design and project management experience which aligns him very well to serve as Project Manager for the JWTP Expansion project.



**Leah Opitz, P.E.
Project Engineer**

Leah will be the project engineer for the JWTP Expansion project. Ms. Opitz is very familiar with mixed media filtration from past projects including Carter Lake Filter Plant Filters #14 and #15, Filter Media replacement for the Soldier Canyon Filter Plant and North Table Mountain WTP expansion. Leah has also been the lead design engineer for numerous membrane filtration projects including Tod Creek Metro District WTP improvements, Mount Crested Butte WTP expansion, Lochbuie WTP expansion, and the Town of Crested Butte WTP expansion. For this project, she will assist / coordinate with Melissa, Ryan and sub-consultants during the concept design / evaluation phase, preliminary / final design phases, and Basis of Design report for the JWTP expansion project.



**Ryan Wienpahl
Design Engineer**

Ryan Wienpahl is a design engineer based in the Boulder JVA office. He has four years of experience in the water and wastewater treatment field, including more than three years as a treatment plant operator. Through working for a contract operations company, Ryan had the opportunity to operate a wide variety of drinking water and wastewater treatment systems, allowing him to develop a strong foundation in water

treatment processes. He now brings this strength to bear in the design of new systems with JVA. Prior to turning his focus to water treatment, he worked for two years on water quality assessment projects with the U.S. Geological Survey, including the National Water Quality Assessment project. He has also volunteered for water-related non-profit organizations, including Water for People in the Denver area and El Porvenir in Nicaragua. Ryan received his M.S. degree in Civil Engineering from the University of Colorado at Boulder in 2016.



**Laurie Laos
Raw Water Pipeline Design**

Laurie Laos will lead the Raw Water Pipeline Design for the JWTP Expansion project. Laurie is a senior project engineer and certified floodplain manager that has been with JVA for 5 years, specializing in water distribution and conveyance. In addition to her work on infrastructure design and analysis projects and master planning, she assists the civil site teams on stormwater flood control and water quality design. Laurie is proficient in the preparation of utility design drawings and specifications. Laurie is well versed in modeling and design programs including the EPA Stormwater Management Model (SWMM), ArcGIS, WaterGEMS, and AutoCAD for developing base maps and drawings, and PCSWMM and Infoworks products.



**Adam Teunissen, P.E.
Structural and Architectural Lead**

Adam will be leading the structural design for this project. Adam has specialized in structural engineering and design for water and wastewater treatment facilities and pump stations for the last 17 years. His experience includes cast in place concrete basin and wet well designs as well as treatment buildings of several different building materials including masonry, precast concrete, steel, and wood. Adam has also performed several designs which

utilize pre-engineered metal building systems for water, wastewater, and commercial applications. Adam works extensively on just water and wastewater applications that involve structural engineering and is very familiar with all applicable ACI codes for water retaining structures. Adam has completed and actively involved with most the CMAR water and wastewater infrastructure projects with JVA, including North Table Mountain WTP, Mount Crested Butte WTP, Idaho Springs WWTP, Nederland WWTP, Crested Butte WTP to name a few.

Subconsultants

We supplemented our design team with subconsultants who have expertise in geotechnical engineering, survey, and mechanical. JVA has worked extensively with these team members. We know and trust them to provide the best possible service to the Town.



Browns Hill Electrical and Controls (BHEC)

BHEC is currently performing work for the Town at the JWTP including upgrading the SCADA system and is familiar with the existing electrical and control systems. JVA will team with BHEC staff Ted Willie, PE and Charles Page for the electrical and controls design of the JWTP Expansion. Both Charles and Ted will attend the kick-off meeting and conduct a thorough electrical and controls condition assessment to determine limiting factors of the JWTP. The limiting factors along with the selected filtration expansion alternative will set the stage for the electrical and controls design upgrades and improvements.

Established in April of 2000, Browns Hill Engineering and Controls LLC (BHEC) is an Electrical Engineering consulting firm located in Littleton, Colorado. Browns Hill and JVA have a relationship going back to 2000 and have worked together on numerous water and wastewater projects.

LITHOS

ENGINEERING

Lithos – Geotechnical

Lithos Engineering (Lithos) specializes in geotechnical evaluations for utility and water and wastewater plant construction and the evaluation and design of trenchless techniques such as pipe bursting, horizontal directional drilling (HDD), sliplining, and cured-in-place-pipe (CIPP).

For this project, Lithos will conduct the Geotechnical Investigation which will include the soil borings located at the proposed WTP site structures and pipelines, groundwater depth determination and soil testing. From the results of the investigation, Lithos will prepare the Geotechnical Investigation Report which will provide recommendations for foundation construction and compaction. As discussed earlier, Lithos will provide the geotechnical engineering and trenchless design for the LTR raw water pipeline and construction.

Lithos will be lead by **Lance Heyer, P.E.** and **Steven Kuehr, P.E.** Lance is is an associate and geotechnical engineer with Lithos Engineering and has 11 years of experience in the engineering industry. Mr. Heyer has over 7 years of specific experience designing and observing construction for water treatment plant related infrastructure. Steven a Senior Consultant at Lithos Engineering. Mr. Kuehr specializes in geotechnical and tunnel engineering as it relates to water supply, sewerage, water resources, aggregate mining, roadway and bridge projects.



King Surveyors – Survey

King Surveyors (King) has been serving municipalities in northern Colorado for over 30 years. Based in Windsor, CO, King is near Johnstown and

has provided survey services in the Johnstown area for many years.

King will prepare Design Topographic Exhibits, establish a job site benchmark tied to the Town GIS vertical datum, and data collect topographic site features, trees, surface evidence of utilities and type (including physical characteristics such as inverts or top of pipe), curbs, access and design features noting the ROW or property lines of each site. In addition to the visible location of the utilities, they will show the location of the utilities as they are noted on the maps from local municipalities and utility companies, and any utility flagging or paint markings existing at the time of fieldwork. King will include underground utility locator services with 811 call in to meet requirements of Senate Bill 18-167. To confirm the elevation and location of critical utility crossings for the sewer alignment, potholing services will be used in conjunction with survey. A potholing firm will be selected during pre-design based on potholing firm availability. Potholing will be performed in conjunction with survey to achieve quality level B design drawings.

Vladislav Skrejev, PLS will be the project manager for this project and will schedule the survey crew for

the work. Chad will also be reviewing all deliverables and will be the Professional Licensed Surveyor for the project.

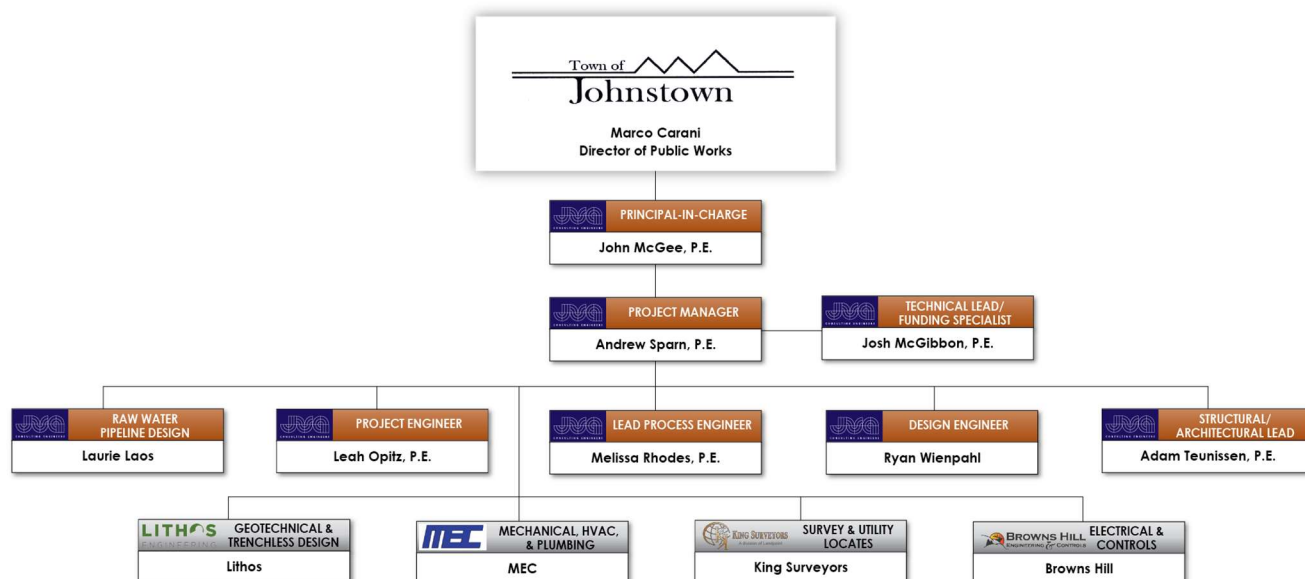


MEC – Mechanical Engineering

Based on Westminster, CO Moen Engineering Consultants, Inc (MEC) has been providing mechanical engineering services throughout Colorado and other states for over 16 years.

Bryan Moen, P.E. will be the lead mechanical engineer for the lift station design. Bryan has worked with JVA on several water treatment, wastewater treatment and lift station projects and have established a trustworthy and quality relationship. JVA and MEC brings this experience to this project. Bryan is very familiar with the applicable NFPA and mechanical building codes that will be required for this project. For the existing filter building and proposed building additions HVAC design critical for proper ventilation, energy efficiency and dust control.

Water Treatment Plant Expansion Design Organizational Chart



Section 5: Related Project Experience

Woodmoor WSD Water Treatment & Raw Water Pumping & Transmission Monument, CO

	Reference: Woodmoor Water and Sanitation District Jessie Shaffer, District Manager JessieS@WoodmoorWater.com 719-488-2525
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JVA has been serving as the District's On-Call Engineer since 2018 after delivering the design of the Well 21 project. We have implemented all water and wastewater capital improvement projects in the last two years. JVA has developed a close relationship with District staff, working weekly with staff engineers, management, and operators. We regularly attend Board meetings and assist in planning and annual budgets.

Well 21

JVA completed the design, permitting, and construction administration for the Well 21 project. The project included the drilling of a new 2,100 ft deep groundwater well, equipping the well with a pump, motor, pipe, and pitless adaptor. JVA permitted and designed a well house with air relief valve, sample station, flushing valve, VFD, pump controls, and instrumentation. JVA provided AutoCAD training and worked closely with the District Engineer to develop construction documents for the 5,300 ft raw water transmission line to tie the new well into the Central Water Treatment Plant.

Scrub Oaks Water Line Replacement

JVA designed the 2,000 LF Scrub Oaks water line replacement. The existing water line was experiencing frequent breaks and leaks. The design took into consideration maintaining service to numerous customers while replacing the waterline. The waterline was relocated within the County right-of-way to maintain separation from the existing sanitary sewer main. JVA received utility permits

from El Paso County. The project was bid with a pipe bursting alternative, allowing the District to compare costs for open trench versus pipe bursting and budget for future capital projects. The project was delivered under budget and within the desired schedule.

South Water Treatment Plant Improvements

JVA is designing the improvements to the SWTP which include replacing the on-site sodium hypochlorite generations system, relining an existing FRP tank, improving ventilation in the mechanical room, complying with CDPHE's Disinfection Outreach Verification Effort (DOVE), improving chemical feed systems, and modifying the raw water feed system to alleviate pressure surges and metering issues.

Central Water Treatment Plant Improvements

JVA is designing and permitting the improvements required to convert the CWTP from a groundwater treatment facility to a surface water treatment facility. This project includes replacing the clarifier and filter media; replacing the underdrains; adding air scour; recoating the filter units; adding filter-to-waste; complying with DOVE; optimizing pretreatment for iron, manganese, and radium; adding a raw water blending tank; and replacing instrumentation and controls. JVA is advising the District on complying with the draft TENORM regulation due to elevated levels of radionuclides in the raw water sources. JVA is performing a demonstration scale study in compliance with CDPHE for radium removal.

Lake pump Station

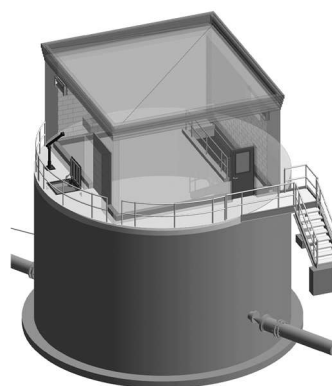
JVA is designing and permitting a new raw water pump station at Lake Woodmoor to feed the CWTP. The new pump station will be designed with redundant reservoir feed lines to draw water off the deepest levels of the reservoir. The pump station will also have the ability to pump to both the SWTP and the CWTP. The pump station alternatives and effects to the dam are being evaluated thru a Semi-Quantitative Risk Analysis (SQRA). The project includes 3,000 ft of new raw water transmission line to tie the pump station into the CWTP.

Evergreen WTP Improvements
Evergreen, CO



Reference:
 Evergreen Metro District
 Dave Lighthart, General Manager
 dlighthart@evergreenmetro.org
 303.674.4112

JVA was hired by Evergreen Metro District (District) in early 2019 to make improvements to the high service pump station (HSPS), site piping, membrane reject waste and recovery system, and chlorine contact basin. The project also included demolition of existing structures, drainage improvements, new automated security gate and entrance, and electrical and control upgrades. JVA prepared the Project Needs Assessment for the District to apply for State Revolving Fund (SRF) program and obtain low interest loans for construction of the project. The WTP processes include flocculation and sedimentation followed by submerged membrane filtration, and chlorine disinfection. The major focus of the design was replacing and aged high service pump station with a new HSPS which was designed within a repurposed abandoned clarifier and included a new HSPS building on top of the HSPS.



New High Service Pump Station

The WTP site was very constrained with limited room for expansion with an abundance of active and abandoned underground utilities. The District elected to utilize the CMAR delivery to construct the project. JVA assisted with the District with CMAR selection process at the 60 percent design document phase and

was awarded to Stanek Constructors. The construction documents and GMP was finalized in December 2020 and notice to proceed for construction January 2021. JVA has been retained by the District to begin water system modeling and master planning for 2021 and will be providing construction administration services for the WTP improvements.

Project Size: 4.5 MGD Capacity
Design Contract Amount: \$280,000
Construction Administration: \$120,000 million
Guaranteed Maximum Price: \$2.77 million
Project Completion: May 2022

Water Treatment Plant Filter Upgrades
Grand Junction, CO



Reference:
 John Eklund, Utility Engineer
 City of Grand Junction
 970.244.1558
 Approximate Total Project Cost:
 \$1,200,000
 Cost of JVA Services:
 \$143,000

JVA designed and permitted filter upgrades to the City of Grand Junction 16.0 MGD Water Treatment Plant. The project included replacing the existing filter underdrains and media as well as the addition of new blowers and air scour. The project was a fast track design with only 60 days to complete and submit to CDPHE. The design included converting the existing filters from surface wash to air scour. JVA working extensively with Leopold to pre-purchase the equipment to meet the aggressive schedule. The project was constructed by Moltz Construction on schedule and below budget.

Project Size: 16 MGD Capacity
Design Contract Amount: \$114,000
Construction Administration: \$29,000
Construction Price: \$900,000
Project Completion: June 2017

“JVA has been excellent. Their expertise has made our WTP Filter Retrofit project seem almost effortless. A few things stand out:

JVA makes sure our plans are going to work – Updating an old treatment plant to current standards is no small feat. JVA coordinated local and state design standards (including getting exemptions approved), equipment suppliers, and sub-consultants seamlessly to create a comprehensive project plan set in a mere 62 days.

JVA never seems busy (even though I know they are) – They always seem pleased to investigate the best solution or answer questions when I call. I never feel rushed or put off, and responses are always prompt and well thought out.

JVA has a full range of services at their fingertips – Whether structural, environmental or other, they can provide services and answers from within their company. Also, they provided structural inspection of our facility which has kept the contractor moving. It is much simpler than dealing with multiple subs, whether in design or construction. This is incredibly important when our project schedule is so short.

JVA is enjoyable to work with – Their resume speaks for itself. Their professionalism is paramount. However, the fact they are friendly and fun to be around is the icing on the cake.”

City of Grand Junction

Mt. Crested Butte Water & Sanitation District WTP Expansion

Mt. Crested Butte, CO



Reference:
Mike Fabbre, District Manager
Mt. Crested Butte Water &
Sanitation District
970.349.7575
mfabbre@mcbwsd.com

JVA designed and permitted the Mt. Crested Butte Water and Sanitation District (District) Water Treatment Plant (WTP) Expansion. The District’s WTP is a 1 MGD direct filtration water treatment

facility consisting of flocculation, sedimentation and filtration in packaged unit followed by chlorine disinfection. The WTP treats water from the East River, Malensik Ditch, and four springs. The project includes capacity expansion to 1.5 MGD firm capacity and changing to membrane filtration for the new water treatment plant and construction of a new East River raw water pump station. These improvements will provide adequate system redundancy during peak demands. The project also includes a new redundant raw waterline connecting the pump station to the water treatment plant. In addition to process improvements, the project includes repurposing the existing water treatment plant building and a new administration building with a water quality laboratory, operations room, kitchen, locker rooms, and operations offices. As part of the permitting process, JVA prepared a comprehensive Basis of Design Report (BDR) which analyzed current and projected full buildout peak demands to comply with CDPHE design criteria for potable water systems. The project is utilizing the Construction Manager and Risk (CMAR) project delivery method and will be funded by the State Revolving Fund. JVA is in the process of developing 90% construction drawings and specifications for the CMAR contractor to prepare their Guaranteed Maximum Price.

JVA has worked on numerous water and wastewater projects for the District and currently serves as their on-call engineer. Projects have included a new Disinfection Building, Process Building Improvements, Paradise Lift Station building, development review and construction observation services.

Project Size: 1.5 MGD Capacity

Design Contract Amount: \$1.2 million

Construction Administration: \$1.2 million

Guaranteed Maximum Price: \$20.3 million

Project Completion: March 2022

Town of Berthoud Water Treatment Plant Expansion, Berthoud, CO



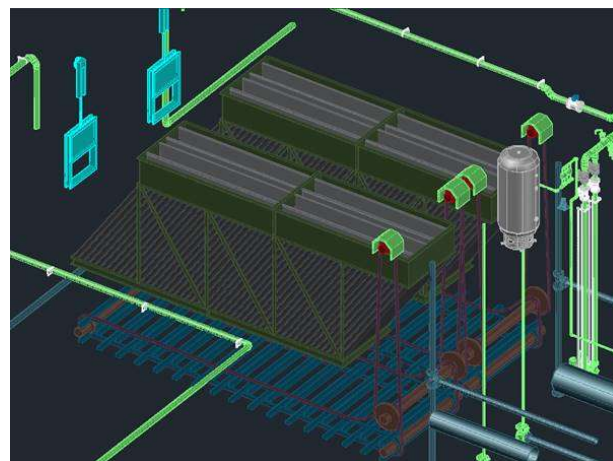
Reference:

Stephanie Brothers, P.E. Public Works
Director Town of Berthoud
970.532.2643
sbrothers@berthoud.org

JVA completed a water system Master Plan for the Town of Berthoud in 2011 and updated the Master Plan in 2017. A detailed Capital Improvement Plan for the WTP was developed based on findings during a Comprehensive Plant Evaluation (CPE) in the 2011 Master Plan. The improvements included a 2017 WTP expansion project to increase capacity from 2.2 MGD to 4.2 MGD. Other successful projects that have been completed as part of the Master Plan include distribution mains for new developments, storage mixing, a booster pump station for a new pressure zone, and distribution system interconnects with the Little Thompson Water District.

In 2017, JVA completed the planning, permitting and design of the Berthoud WTP Expansion and Improvements. The design included the demolition of the existing single basin flocculator / clarifier and conversion to a two-train pretreatment plate settler system and hoseless sludge vacuum track removal doubling the capacity within the same footprint along with the addition of a third flocculation stage. The pretreatment upgrade allows for the Town to take one basin off at a time without the need of shutting down

the entire plant for maintenance of the pretreatment process.



Plant 3D Modeling for Plate Settler System

The design also included doubling the capacity of the dual media filtration system, backwash waste basin improvements, new electrical service and standby generator, demolition of the old filter building, addition of a powder activated carbon (PAC) system, plant drain pump station upgrade, corrosion control improvements, and new clearwell overflow.

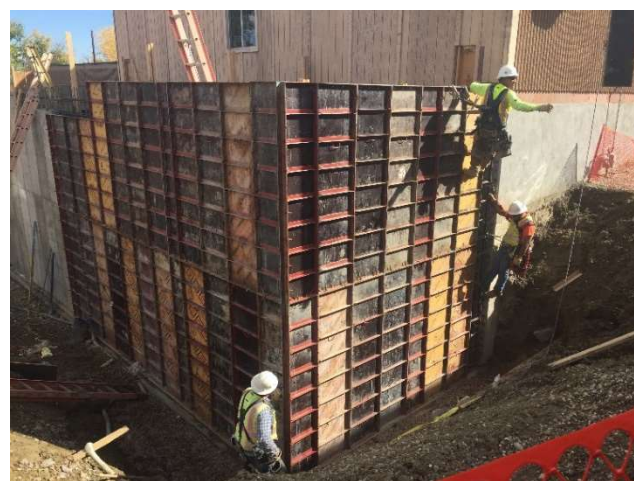


Photo: Construction of the New Filter Trains #3 and #4

JVA prepared the Basis of Design Report at the 60 percent design and submitted to CDPHE for approval. The Town elected to use the CMAR project delivery to construct the project. JVA prepared the RFP for the CMAR review and selection. Moltz Construction was awarded the CMAR design / constructability review contract and construction contract with a GMP of

\$3.44 million. The construction began late August 2017 and completed by August 2018.

JVA also performs on-call engineering services for the Town of Berthoud including WTP permitting, compliance and water quality assessments, hydraulic modeling, and development utility reviews.

Project Size: 4.2 MGD

Design Contract Amount: \$175,900

Construction Administration / Observation:
\$134,100

Construction GMP: \$3.44 million

Construction Completion Date: August 2018



JVA was retained from the conceptual design phase of the project to begin the preliminary and final design and permitting phases for the North Table Mountain Water and Sanitation District (NTM) Water Treatment Plant (WTP) Expansion. The NTM WTP is an 11 MGD conventional water treatment facility consisting of ballasted flocculation / sedimentation, filtration, and chlorine disinfection. The project includes capacity expansion to 16 MGD capacity, while providing adequate treatment redundancy during peak summer demand. Water treatment improvements included the upgrade and replacement of the first generation Actiflo™ ballasted flocculation / sedimentation with the latest generation ballasted floc / sed system (Actiflo Turbo). The ballasted floc / sed upgrade increased the pretreatment capacity from 11 MGD to 16 MGD within the existing basins with minimal structural improvements. The design also included multi-media filter expansion, baffling the chlorine contact basin to increase the baffling factor from 0.1 to 0.5 and achieve DOVE compliance, housewater pumping improvements, and complete revamping of the primary and electrical service, ATS and standby generator, and SCADA / HMI / controls.

In addition to process improvements, the project includes a chemical storage / feed facility and an administration building with a water quality laboratory, operations laboratory, training center, kitchen, locker rooms, and operations offices. JVA prepared the 30 percent, 60 percent, and 100 percent design phases along with an opinion of construction cost for each phase. There was a significant amount of collaboration and workshop sessions with the District to refine the design and specifications. At the 60 percent design phase, the Basis of Design Report (BDR) was submitted to CDPHE for review and was approved within two months. In addition, JVA prepared the RFP with the 60 percent design documents to solicit qualified contractors for review and selection of a Construction Manager at Risk (CMAR) project delivery. The successful CMAR was Aslan Construction from Berthoud, Colorado. Aslan was on the project team during the final design phases and assisted with constructability, creativity and cost savings to meet the construction budget. This collaborative effort resulted in a successful Guaranteed Maximum Price (GMP) for the project. JVA also assisted the District in the preparation of a Department of Local Affairs (DOLA) Energy Impact Assistance Grant (EAIG) application. The District was awarded a grant of \$1,000,000 partly due to an innovative hydrothermal HVAC heat pump design to reduce carbon fuels required to heat and cool the administrative / lab building (Green Energy). The project construction kicked off in March of 2020 and is anticipated to be substantially completed by August of 2021. JVA has been retained by the District for construction observation and construction administrative services. A summary of project costs for the engineering design and construction services and construction cost is provided below.

Project Size: 16 MGD Capacity

Design Contract Amount: \$644,000 (no change orders)

Construction Administration and Observation

Engineering Services Contract Amount: \$426,000

CMAR Guaranteed Maximum Price: \$12,800,000 (includes the \$1 million DOLA grant)

Date of Project Completion: August 2021

Town of Crested Butte Water Treatment Plant Improvement Project, Crested Butte, CO



Reference:

Town of Crested Butte
David Jelinek, Water System Manager
970.349.0885
DJelinek@crestedbutte-co.gov

JVA was hired by the Town of Crested Butte (Town) in 2018 to conduct a Project Needs Assessment in accordance with the State Revolving Fund (SRF) program to obtain low interest loan for expanding the Town's WTP. In 2018, the WTP had experienced peak day demand approaching the plant capacity of 1.25 MGD. The Town and JVA were successful in obtaining the loan along with a DOLA grant for expanding the WTP to 1.66 MGD sufficient for project demands for the next 10 years. The Town's WTP is an ultrafiltration membrane filtration water treatment plant. The expansion project featured an increase in the system capacity from 1.25 MGD to 1.66 MGD, redesigned chemical pretreatment system to optimize treatment efficiency and improve system hydraulics, and a building expansion to improve operability and access to process equipment. As part of this effort, funding from DOLA and SRF was facilitated to finance the construction. The project was designed on an expedited schedule and went from the planning stages of a comprehensive performance evaluation to 100% design and permitting in under one year.

Project Size: 1.66 MGD Capacity

Design Contract Amount: \$139,000

Construction Administration: \$139,000

Guaranteed Maximum Price: \$2.3 million

Project Completion: December 2019

Northglenn Water Treatment Plant Master Plan Northglenn, CO



Reference:

Mike Roman, Civil Engineer II
303.450.4079
mroman@northglenn.org

The City of Northglenn (City) operates a conventional water treatment facility (WTF) consisting of chemical addition, rapid mix, flocculation, sedimentation and mixed media filtration. Serving a population of about 40,000 people, the 14 million gallon per day (MGD) facility operates at about 60 percent capacity in the peak summer months. Build-out maximum day demands were projected at about 10 MGD. As part of the Water Treatment Plant Master Plan Update the treatment capacity, facility performance, and operations were evaluated and performance limiting factors (PLFs) were identified. Recommendations were made for treatment process improvements to address the identified PLFs. The highest prioritized recommendation was water treatment residual solids handling improvements. The current solids handling system consists of two recycle basins and a pump station. Filter backwash, clarifier blow-down and plant drains all feed the recycle basins and the combined product is pumped to the sanitary sewer without recycle to the front end of the WTF. Staff indicated that about 60 million gallons of water per year are wasted to the sewer that could be recycled.

JVA document potential comprehensive solutions to improve the residual solids handling process. The primary objectives for the improvements include backwash water recycling and solids dewatering. Several passive dewatering options were explored, however, due to property constraints, mechanical dewatering was preferred and documented in the Master Plan Update. It was recommended to replace the liner and solids removal system for the backwash recovery ponds with a new recycle pump station. The combined solids loading (backwash waste and clarifier blow-down) was projected at about 2,300 lbs/day, including the soon to be added filter to waste. A detailed description and cost estimate for the solids

handling and mechanical dewatering facility was provided in the Master Plan Update, including backwash recovery pond and recycle pump station improvements, solids handling basin, decant system, equalization and thickening, process building and plan for potential beneficial reuse. The Master Plan is

complete, and the City is using the document to develop a long-term CIP.

Project Size: 14 MGD Capacity

Design Contract Amount: \$64,300

Project Completion: April 2020

Section 6: Project Schedule

Project Milestones	2021										2022			
	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Project Initiation and Site Investigations	B		C											
Concept Design Phase	B			C										
Concept Design Phase Workshops			X											
30 Percent Preliminary Design Phase			B			C								
Preliminary Design Phase Workshops					X									
60 Percent Design Phase and BDR / CMAR Selection						B			C					
60 Percent Design Workshops								X						
CDPHE BDR Approval											X			
Construction Documents and GMP Phase										B		C		
Construction Documents Workshops											X			
Notice to Proceed Construction												B		
Construction Administration Phase												B		

B = Begin

C = Complete

Project Initiation and Site Investigation Phase

As shown in the Project Schedule, JVA will schedule a kick-off meeting and JWTP field visit with the Town and Operation staff. It is anticipated that the project will begin in the middle to late March 2021. All key team project team members including subs, will attend the kickoff meeting. Following the meeting, the project team will tour the JWTP and interview operation staff regarding plant operations and design features. JVA will prepare meeting / plant tour notes and distribute to the Town.

The geotechnical investigation and topographic survey and utility locates would be launched following the kickoff meeting. Lithos will conduct the Geotech investigation and develop a geotechnical

report for recommendations for structure foundation support and dewatering. The survey will include topo for the entire site along with critical tie in elevations and hydraulic elevations of existing piping and processes. The Project Initiation and Site Investigations will be completed by May 2021.

Concept Design Phase

The intent of this phase is to evaluate and prepare the design concept for each design task presented in the *Approach Section* of this proposal. JVA will prepare a technical memo for each design task that will set the design parameters for treatment processes and equipment, hydraulics, mechanical (i.e. HVAC), electrical and controls. JVA will schedule a half-day workshop review session with the Town and

operation staff to discuss the technical memos and respond to comments. It is anticipated that the Concept Design Phase will be completed by June 2021.

30 Percent Preliminary Design Phase

Once the concept design for the filter expansion is completed and agreed upon with the Town, JVA will kick into the 30 percent design phase. At this phase, the filtration alternative has been selected which will allow for an efficient schedule to complete the 30 percent design documents. The 30 percent design will include site plans, site piping plan, hydraulic profile, process & instrumentation diagrams, process plans and sections, and electrical one-lines drawings. JVA will prepare an opinion of cost (OPC) for the construction. During the final stages of the 30 percent design a half day workshop session will be Town to obtain feedback prior to finalizing the 30 percent design documents. It is anticipated that the 30 percent design documents will be completed by August 2021.

60 Percent Design Phase

JVA will produce 60 percent design documents which will include drawings and technical specifications (Divisions 1 through 16). JVA will prepare the Basis of Design Report (BDR) in accordance with CDPHE guidelines for submittal. The drawings will include general, civil, process, architectural, structural and electrical drawings. For specifications, the Construction Specification Institute (CSI) 5-digit Master Format will be used to create the technical specifications. JVA will communicate closely with the Town on specified process equipment, instruments, piping, valves, and building materials to ensure that these products meet the Town's standards and are compatible with existing equipment, instruments, and materials. JVA will prepare an RFP and draft contract documents to solicit qualified contractors for delivering the project using the Construction Management at Risk (CMAR) method. Once the CMAR proposals are received, JVA will assist the Town with review of the proposals and recommendation of Award. Once selected, the CMAR will be on board with the project team to

complete the final design phases of the project. Typically, the CMAR will have a separate contract with the Town for pre-construction design tasks. JVA will schedule with the Town and CMAR for review and schedule a half-day workshop to review the design and respond to comments and input from the Town and CMAR. It is anticipated that the 60 Percent Design Documents and CMAR selection will be completed by November 2021. It is anticipated that the BDR submittal to CDPHE will be completed by November 2021. From JVA's experience, CDPHE will take two to three months to review the BDR for approval.

Construction Documents and Guaranteed Maximum Price (GMP)

JVA will advance the design details and technical specifications to produce construction documents (CDs). During development of the construction documents, JVA will be working with the Town and CMAR to obtain review comments on constructability and design details. The advantage of having a CMAR on board allows for efficiency during the design process which includes input from the contractor throughout.

The documents will include the executed CMAR contract documents and final GMP. The final GMP is a result of a collaborative effort between the Town, JVA and Contractor during the design reviews and coordination with sub-contractors, suppliers, and equipment sales representatives to arrive at the most competitive contract price. JVA will submit the 100 percent design documents to the Town for review and schedule a half-day workshop to review the design and respond to comments and input from the Town. It is anticipated that the CDs, GMP, and execution of the CMAR contract will be by February 2022.

Construction Administration Phase

Based on the project schedule shown above, the notice to proceed (NTP) for the CMAR will be March 2022. JVA will assist the Town with providing in-office and field construction administration services. We have estimated for a project of this size (not including the LTR pipeline construction) a

construction timeline of 18 months. JVA will provide the following construction administration services:

- Attend pre-construction meeting – prepare meeting minutes
- Review of pay applications, shop drawing submittals, O&M manuals, Request for Information (RFIs), and Work Change Directives (WCDs)
- Attend weekly construction progress meetings
- Provide part-time onsite inspection and prepare observation reports (we have assumed weekly 4-hour visits for a duration of 18-months)
- Prepare record drawings (CAD and PDF)

Section 7: Work Breakdown Schedule and Estimated Fee

Please see the sealed envelope attached for a detailed work breakdown structure (WBS) for this project with hourly rates and a total estimated fee for JVA’s design and bidding services for the Johnstown Water Treatment Plant Expansion Project. Our estimated fees are based on an estimated total construction cost of \$8 million. There will be opportunities to reduce costs through the CMAR process and the collaborative approach presented in this proposal.

“You and your team have delivered every bit of what you said you would and more. We are very pleased to have gone with JVA for this project.”

—Brian G. Prunty, Public Works Director
City of Rifle

RESUMES



Laurie A. Laos

Senior Project Engineer, Environmental and Civil Engineering

Education

M.S. Civil Engineering,
Colorado State University, 2014

B.S. Environmental
Engineering, University of
Wisconsin-Platteville, 2008

Registrations

Certified Floodplain Manager

Professional Organizations

AWWA



Project Experience

Design and Project Engineer for the following projects:

Town of Berthoud I-25 Water Distribution and Wastewater Collection Systems, Berthoud, CO.

Design Engineer for design and construction of 4,250 linear feet of a 16-inch PVC water transmission main and 8,000 linear feet of 15-inch and 12-inch PVC sanitary sewer main with connection to the Berthoud Regional Wastewater Treatment Facility (WWTF). Project included coordination and dual design of the water and sanitary sewer. Design included three crossing of I-25 via a boring. An interconnect with Little Thompson Water district required detailed understanding of their system and design standards for the connection to occur. Project included open cut river crossings which required floodplain and wetland analyses and an Army Corp permit.

Town of Windsor Water Transmission Main Rehabilitation, Windsor, CO.

Provided design and GIS support for the analysis and rehabilitation recommendation for 2,800 linear feet of an existing 16-inch diameter pipe. Completed an alternative analysis on the appropriate repair option of slip-lining or replacement using available information including working with Town staff to understand the current system condition and determined that the best course of action for the project was a waterline replacement. Design Engineer for the design and construction of the water main replacement.

Prospect Mountain Water Distribution System Improvements, Town of Estes Park, CO.

Senior Project Engineer responsible for the design of water main distribution system replacement for the Prospect Mountain service area in the Town of Estes Park. Responsible for organizing and directing four design engineers used to complete the design of 30,000 LF of water distribution mains. Worked with available existing Town GIS data to develop preliminary design of the waterline and finalizing the design with the topographic survey. Developed easement figures for the legal descriptions. Coordinated with Town Staff for the preferred alignments and discussed best options for the alignment of the new waterline to provide service to all customers while considering all design constraints that are inherent with installation of a new waterline in an area that is already built out.

Hidden Valley Water District Connection to Evergreen Metropolitan District, Evergreen CO.

Senior Project Engineer responsible for the design of a new water main distribution system to connect the Hidden Valley Water District (HVWD) to Evergreen Metropolitan District (EMD). Design included 2,325 LF of 6-inch DIP with a flow meter vault, a backflow preventor vault, and an altitude valve vault. The connection required a bore under Highway 74 with several utilities, private owner concerns, and elevation difference that challenged the design and construction. The EMD waterline could not be shut down for the connection and required a wet tap of the 14-inch line. The project also included the replacement of 1,780 LF of the existing 2-inch and 4-inch water service line parallel to the 6-inch distribution line and the reconnection of 13 services.

Woodmoor Water Sanitation District Scrub Oaks Waterline Replacement, El Paso County, CO.

Project and design engineer for the design of the replacement of 980 LF of 6-inch DIP waterline that is located between two blocks in a residential subdivision. Initial design considerations included slip-lining of the existing waterline, but further analysis of the existing utility locations and available space determined that realigning the waterline was a better option. The design was completed in a condensed schedule due to construction timing and funding.

Town of Wellington Storm Sewer Design and Water Line Replacement, Wellington CO.

Design Engineer for the drainage analysis of 1,500 linear feet of 36 and 42-inch RCP storm sewer pipe within a residential roadway. The analysis included delineating storm runoff basins, creating a Stormwater Management Model (SWMM), designing the storm sewer system including a railroad crossing. In conjunction with the storm sewer design, design was completed for the replacement of the existing 8" AC water line that parallels the designed storm system and installing two new sanitary sewer mains. Worked with Town staff to determine the location of the pipe and precautions to be taken while working with the AC pipe.

John P. McGee

Principal, Environmental Engineering

Education

M.S., Civil/Environmental Engineering, West Virginia University, 1988

B.S., Civil Engineering, West Virginia University, 1986

Registration

Professional Engineer:
Maryland, Indiana, Colorado

Professional Organizations

Water Environment Federation (WEF)

American Water Works Association (AWWA)



Instructor/Trainer

Colorado State University – Part Time Instructor for teaching the Spring Semester, 3 credit hour class CIVE 437 – Wastewater Treatment Process Design

Water Projects

Principal, Project Manager, Technical Advisor or Engineer of Record for the following Facilities:

14 MGD Northglenn, CO Water Treatment Master Plan Update – Principal in Charge for the Northglenn water treatment master plan update. The project included a comprehensive performance and capacity evaluation of the treatment and solids processes and identification of performance limiting factors (PLFs). To address the PLFs, recommendations were included along with a 10-year capital improvement plan with opinions of probable costs. The master plan update was completed in May 2020 and the City will begin implementing recommended capital improvements later 2020.

45 MGD Soldier Canyon Filter Plant, Fort Collins, CO – Project Manager for the design to improve the backwash recycle and supply pumping improvements at the SCFP. The project began in July 2015 and was completed in December 2016. The project involved replacing and 20-year old pumps with a larger and more efficient pumps to provide a higher level of service and redundancy during peak filter backwash demands and increase recycle flows.

16 MGD North Table Mountain Water & Sanitation District WTP Improvements, Golden, CO – Project Manager for the Preliminary Design Improvements to the District's WTP. The Preliminary Design included a new administration / laboratory building, addition of new filters and building, addition of a second 8 MGD Actiflo Pretreatment process and building, disinfection improvements, backwash pond recovery improvements, demolition of the old filter / administration building, raw water valve vault improvements, and associated electrical, mechanical and plant process control upgrades

50 MGD Carter Lake Filter Plant, Berthoud, CO – Project Manager for the evaluation, development and permitting of a beneficial use plan to apply water treatment residuals on land areas for reclamation. The project also involved the permitting of the discharge of backwash water to surface water.

4.2 MGD WTP, Town of Berthoud, CO – Project Manager for the master planning, preliminary design and final design of 2.0 MGD expansion project to the Town of Berthoud water treatment facility. The project involved rehabilitation of existing clarifiers using plate settlers, addition of new filters new backwash waste pump station, future sludge drying area for clarifier sludge, corrosion control improvements, backwash recycle, new standby generator, and plant drain pump station.

38 MGD WTP, City of Loveland, CO – Project Manager with JVA for completing water treatment projects for transitioning the new water treatment manager that took the position that Mr. McGee held previous. The projects included final design review of the 38 MGD Water Treatment Plant Expansion, floc / sed rehabilitation / expansion with tube settlers and plate settlers, backwash and sludge ponds expansion / improvements, beneficial reuse of treatment residuals permitting on the grounds of the WTP, on-going Glade Reservoir and Big Thompson River water quality monitoring program.

2 MGD Water Treatment Plant, Mount Crested Butte Water and Sanitation District, CO – Technical Lead for the planning, design and permitting for a new membrane ultrafiltration plant replacing a 30 year old direct filtration plant. The project began construction in June 2020 and is being constructed adjacent to the existing WTP. The existing WTP will be repurposed for vehicle storage, backwash recovery and recycle (converting chlorine contact tank), and fuel storage. The project also includes construction of a new raw water pump station and intake structure for pumping raw water from East River to the pre-sedimentation basin.

City of Loveland, CO – Water Treatment Manager overseeing all personnel for water treatment operations, water quality and industrial pretreatment. In addition, functioned as project manager for all minor and major capital projects for the Loveland WWTP and WTP. John was involved with the preparation and implementation annual, 5- and 10-year CIP budgets and operation and maintenance budgets. John managed in-house designs and approval for the rehabilitation of sixteen (16) 2 MGD high-rate filters with new underdrains, air scour and media



Josh J. McGibbon

Vice President, Environmental Engineering

Education

B.S. Montana State University,
Civil Engineering, 2000

Registration

Professional Engineer:
Colorado, 2006

Professional Organizations

Water Environment Federation

Rocky Mountain Water
Environment Association –
Executive Committee

American Water Works
Association



Project Experience

Principal, Project Manager or Engineer of Record for the following Facilities:

North Table Mountain Water and Sanitation District Water Treatment Plant Expansion, Arvada, CO
Principal-in-Charge for the design of a water treatment plant expansion. The project included preliminary design, followed by a 60 percent design package and assistance with the Construction Manager at Risk (CMAR) procurement for the expansion. The project includes a new administrative building, metering vault improvements, expansion of the ballasted flocculation pretreatment process, new conventional filters, chemical system improvements, clearwell baffling, a new valve vault, backwash automation, new onsite wastewater treatment system (OWTS), heating ventilation and cooling (HVAC) upgrades, and electrical and controls upgrades.

Town of Erie Water Treatment Plant Solids Handling Facility, Erie, CO. Principal-in-Charge for the Design Build of the Town of Erie WTP Solids Handling Project. Performed pretreatment optimization of plate settler system. The WTP site has space constraints so mechanical dewatering will be utilized. The project includes solids storage tanks, dewatering equipment, PAC relocation and the addition of sodium permanganate as a preoxidant. The new equipment will be housed in a new building over the old WTP tanks that will be reconfigured for solids storage. The solids handling facility will be designed to handle the current 10 MGD capacity with expansion to 17 MGD.

Woodmoor Water and Sanitation District 2021 Water Capital Improvement Projects, Monument CO.
Principal-in-Charge for the design of the improvements to South Water Treatment Plant (SWTP), Central Water Treatment Plant (CWTP) expansion, and new Lake Pump Station, and new Well No. 21. The SWTP and CWTP are designed with oxidation and filtration for iron and manganese and both surface water and groundwater compliance. Each plant is designed to be converted seasonally from groundwater only to surface water. The projects included a new well and building, pretreatment building, filter replacement, chemical feed modifications and a new pump station.

Parker Water and Sanitation District Rueter-Hess Water Purification Facility Residuals Ponds Expansion, Parker CO. Principal-in-Charge for the water treatment residuals project. Project included the preparation of a technical residuals analysis for the treatment system including ballasted flocculation pretreatment and ceramic membrane filtration. Quantified the solids quantity and types to size the pond expansion project. Prepared design drawings and CDPHE and BDR.

Berthoud Water Treatment Plant Expansion, Berthoud, CO. Engineer of Record for the design and permitting of a 2.0 MGD expansion of the water treatment facility to 4.2 MGD firm capacity. Process upgrades include coagulation (chemical feed/dispersion), decreasing gradation of flocculation, two-train inclined plate settlers, two dual media filters with air scour, high service pump, and caustic corrosion control treatment prior to distribution. Improvements to the solids handling and backwash recovery system includes retrofitting an existing clarifier to a gravity thickener and upgrading a backwash holding basin to a residuals drying bed.

Pueblo West Metropolitan District Water Treatment Plant Expansion, Pueblo West, CO. Engineer of Record for the design of a 5.0 MGD expansion of the water treatment facility which will assure the District will have additional water supply capacity for current peak water demands. The water treatment expansion includes upgrades to filtration, disinfection, chemical feed, backwash basins, and backwash solids drying beds. The new facility will have a total capacity of 21 MGD.

Grand Junction Water Treatment Plant Improvements, Grand Junction, CO. Engineer of Record for the design and permitting of a filter upgrade to 16 MGD water treatment plant. The project includes replacement of existing filter underdrains and media as well as the addition of new blowers and air scour.

City of Idaho Springs Water Treatment Plant Improvements, Idaho Springs, CO. Principal-in-Charge for design and construction administration of numerous improvements to the existing 2.0 MGD microfiltration water plant. Project included improvements to the Clean in Place (CIP) system such as chemical dosing, piping, and automation and dedicated sewer system. Chlorine gas disinfection system was replaced with sodium hypochlorite feed and remote fill system. Automated coagulant dosing system for TOC reduction was installed.

Town of Crested Butte Water Treatment Plant Improvement Project, Crested Butte, CO QA/QC Manager for the design of a treatment plant expansion project for the Town's existing membrane filtration water treatment plant. The expansion project featured an increase in the system capacity from 1.25 MGD to 1.66 MGD, redesigned chemical pretreatment system to optimize treatment efficiency and improve system hydraulics, and a building expansion to improve operability and access to process equipment. As part of this effort, funding from DOLA and SRF was facilitated to finance the construction. The project was designed on an expedited schedule and went from the planning stages of a comprehensive performance evaluation to 100% design and permitting in under one year.

Leah C. Opitz, P.E.

Project Engineer, Environmental Engineering

Education

B.S. Colorado State University,
Civil and Environmental
Engineering course work,
2014-2016

B.S. University of Maryland,
Microbiology, 2009

Registration

Professional Engineer
Colorado, 2020



Project Experience

Project Engineer for the following Facilities and Utilities:

Carter Lake Filtration Plant, Berthoud, CO – Design Engineer for the Carter Lake Filter (CLFP) Backwash Irrigation Beneficial Use Plan (BUP) Project. The CLFP consists of two plants with a combined capacity of 50 MGD. The CLFP has historically stockpiled WTP residuals on-site. Leah prepared a beneficial use plan (BUP) and permit for the use of CLFP water treatment residuals as well as use of the filter backwash water for irrigation. The BUP was prepared in accordance with CDPHE criteria and the permit for use was recently approved by the CDPHE. As a result, the residuals can be used for land reclamation and construction fill at designated areas. In addition, the CLFP has minimized discharges to surface water from their backwash water ponds.

North Table Mountain Water and Sanitation District Water Treatment Plant Expansion, Arvada, CO –Design Engineer for the design of a water treatment plant expansion. The project included preliminary design, followed by a 60 percent design package and assistance with the Construction Manager at Risk (CMAR) procurement for the expansion. The project includes a new administrative building, metering vault improvements, expansion of the ballasted flocculation pretreatment process, new conventional filters, chemical system improvements, clearwell baffling, a new valve vault, backwash automation, new onsite wastewater treatment system (OWTS), heating ventilation and cooling (HVAC) upgrades, electrical and controls upgrades, and an evaluation of their sludge drying beds and residuals handling practices..

Water Treatment Plant Master Plan, City of Northglenn, CO – Project Engineer for the water treatment plant master plan for the City of Northglenn. The master plan included an evaluation of water quality and raw water resources and evaluation of existing infrastructure, which included analysis of treatment capacities for pretreatment, filtration, disinfection, chlorine contact, chemical systems and pumping systems. Improvements and operational modifications were estimated and cost estimates were developed for each capital improvement project for the next 10 years.

Soldier Canyon Filtration Plant, Fort Collins, CO – JVA was hired by SCFP to evaluate backwash supply (BWS) pumping to provide a higher level of service and redundancy during the peak water production periods. Currently the SCFP operates two (2) BWS pumps; the larger of the pumps used primarily during higher production periods and the smaller pump during lower production periods. During the peak production periods there is no backwash pump supply redundancy in a situation when the larger pump fails. The smaller BWS pump is unable to keep up with the backwashing demands required by the filters. JVA was tasked with designing a redundant pump that would replace the smaller pump to meet peak BWS demands and minimize electric demand charges of BWS pumping during the lower production periods. JVA conducted a detailed site visit to collect data for the existing process equipment and electrical service and controls. Following this phase, JVA prepared a hydraulic model based on the current peak day.

Solids Handling Facility, Town of Erie, CO – Design Engineer for a new solids thickening and dewatering process at the Town's microfiltration water treatment plant. The process is designed for ultimate WTP buildout of 16.65 MGD and an estimated 4,600 pounds of solids per day. The existing solids settling and pretreatment sedimentation processes were evaluated and improvements recommended to improve the concentration and consistency of solids from the vacuum systems. Design included a new gravity thickener, yard piping and vaults, 60,000 pound powder activated carbon silo and feed system, sodium permanganate system, centrifuge, site improvements, and a new building. The project was a Design/Build alternative delivery.

Berthoud Estates Wastewater Treatment Facility, Berthoud, Colorado – JVA completed a preliminary engineering report, site application, and wastewater utility plan based on ammonia discharge limits for an existing lagoon wastewater treatment plant. Alternatives evaluated included lagoon improvements, a new mechanical wastewater treatment plant, and several options for connecting to the Town of Berthoud sanitary sewer collection system. The recommended alternative was to construct a new mechanical facility, and Berthoud Estates has secured State Revolving Fund (SRF) to commence design. The design phase will include a hydraulic profile of the WWTF that will remain within the existing constraints from the stationary collection system and discharge location elevations.



Melissa L. Rhodes

Senior Engineer, Environmental Engineering

Education

M.S. Colorado School of Mines,
Environmental Science and
Engineering, 2010

B.S. Colorado School of Mines,
Environmental Engineering,
2010

Registration

Professional Engineer:
Colorado, 2015

Professional Organizations

RMWEA Industrial Pretreatment
Committee

Water Environment Federation
(WEF)



Project Experience

Senior Engineer for the following Facilities:

Town of Crested Butte Water Treatment Plant Improvement Project, Crested Butte, CO – Project engineer for the design of a treatment plant expansion project for the Town's existing membrane filtration water treatment plant. The expansion project featured an increase in the system capacity from 1.25 MGD to 1.66 MGD, redesigned chemical pretreatment system to optimize treatment efficiency and improve system hydraulics, and a building expansion to improve operability and access to process equipment. As part of this effort, funding from DOLA and SRF was facilitated to finance the construction. The project was designed on an expedited schedule and went from the planning stages of a comprehensive performance evaluation to 100% design and permitting in under one year.

North Table Mountain Water and Sanitation District Water Treatment Plant Expansion, Arvada, CO – Project engineer for the design and construction of a water treatment plant expansion. The project included preliminary design, followed by a 60 percent design package and assistance with the Construction Manager at Risk (CMAR) procurement for the expansion. The project includes a new administrative building, metering vault improvements, expansion of the ballasted flocculation pretreatment process, new conventional filters, chemical system improvements, clearwell baffling, a new valve vault, backwash automation, new onsite wastewater treatment system (OWTS), heating ventilation and cooling (HVAC) upgrades, and electrical and controls upgrades.

Berthoud Water Treatment Plant Expansion, Berthoud, CO – Project engineer for the design and permitting of a 2.0 MGD expansion of the water treatment facility to 4.2 MGD firm capacity. Process upgrades include coagulation (chemical feed/dispersion), decreasing gradation of flocculation, two-train inclined plate sedimentation, two dual media filters with air scour, high service pump, and caustic corrosion control treatment prior to distribution. Improvements to the solids handling and backwash recovery system includes retrofitting an existing clarifier to a gravity thickener and upgrading a backwash holding basin to a residuals drying bed. Personal responsibility also included corrosion control analysis of the finished water quality and mitigation recommendations by utilizing bench-scale testing and water chemistry modeling.

Town of Crested Butte Water Treatment Plant OCCTR Project, Crested Butte, CO – Project engineer for the design and permitting of an optimal corrosion control treatment evaluation. Project included water chemistry modeling to determine the best corrosion control approach.

Town of Erie Water Treatment Plant Solids Handling Facility, Erie, CO – Project engineer for the Design Build of the Town of Erie WTP Solids Handling Project. The Town of Erie has historically discharged WTP solids to the sanitary sewer system which caused issues with the biosolids handling at the WWTP due to PAC and other chemicals found in the residuals. The WTP site has space constraints so mechanical dewatering will be utilized. The project includes solids storage tanks, dewatering equipment, PAC relocation and the addition of sodium permanganate as a preoxidant. The new equipment will be housed in a new building over the old WTP tanks that will be reconfigured for solids storage. The solids handling facility will be designed to handle the current 10 MGD capacity with expansion to 17 MGD.

Confidential Client, Idaho – Project/process engineer for evaluation of alternatives, bench testing, and basic engineering for a mine site in Idaho undergoing remediation under CERCLA. An alternatives analysis was done to select between ballasted sand flocculation, the high density sludge (HDS) process, and microfiltration. Alternatives were developed for flows up to 2,900 gpm for the removal of arsenic, copper and cobalt. After the alternatives analysis was completed a Basic Engineering Report and ±20% cost estimate was provided.

Andrew C. Sparn

Project Manager, Environmental Engineering

Education

B.S. Civil Engineering,
Columbia University, School of
Engineering and Applied
Science, New York, NY, 2008

B.S. Physics, University of
Puget Sound, Tacoma, WA,
2006

Registration

Professional Engineer
Colorado (2015)

Professional Organizations

American Water Works
Association (AWWA)

Water Environment Federation
(WEF)



Project Experience

North Table Mountain Water Treatment Plant Expansion, Golden, CO Project Manager responsible for design, permitting, and construction administration of the NTM WTP expansion project. The existing 11 MGD WTP was designed and permitted for a capacity of 16 MGD. Water treatment improvements included the upgrade and replacement of the first generation Actiflo™ ballasted flocculation / sedimentation with the latest generation ballasted floc / sed system (Actiflo Turbo). The design also included multi-media filter expansion, baffling the chlorine contact basin to increase the baffling factor from 0.1 to 0.7 and achieve DOVE compliance, backwash recycle pumping improvements, and complete revamping of the primary and electrical service, ATS and standby generator, and SCADA / HMI / controls. In addition to process improvements, the project includes a chemical storage facility and an administration building with state certified water quality laboratory, operations laboratory, training center, kitchen, locker rooms, and operations offices. In addition, JVA prepared the RFP along at the 60 percent design documents to solicit qualified contractors for review and selection of a Construction Manager at Risk (CMAR) project delivery. JVA also assisted NTM in the preparation of a Department of Local Affairs (DOLA) Energy Impact Assistance Grant (EAIG) application. The District was awarded a grant of \$1,000,000 partly due to an innovative hydrothermal HVAC heat pump design to reduce carbon fuels required to heat and cool the administrative / lab building (Green Energy).

NTM Water Treatment Plant Evaluation and Capital Improvement Plan, Golden, CO Project Manager for a comprehensive performance evaluation and design to expand the District's WTP to a firm 16 MGD capacity. The CPE included assessing the condition and performance of each process, including raw water supply, pretreatment, chemicals, conventional filtration, clearwell/disinfection, and high service pumping. Capital improvements were identified and prioritized into a phased plan. The selected improvements include expanding the existing pretreatment process, constructing four new dual media filters, constructing a new chemical system building, baffling the clearwell, a new gravity to distribution option, and a new administration building with a state certified water quality control laboratory, operations lab, kitchen, offices and locker room.

Berthoud Water Treatment Plant Expansion, Berthoud, CO Project Manager responsible for the design and permitting of a 2.0 MGD expansion of the water treatment facility to 4.2 MGD firm capacity. Project work includes preliminary design and final design with bidding and construction anticipated for 2016 and 2017. Process equipment addition includes coagulation (chemical feed/dispersion), decreasing gradation of flocculation, two-train inclined plate sedimentation, two dual media filters with air scour, high service pump, and caustic corrosion control treatment prior to distribution. Improvements to the solids handling and backwash recovery system includes retrofitting an existing clarifier to a gravity thickener and upgrading a backwash holding basin to a residuals drying bed.

City of Lamar Main Street Potable Water Distribution, Lamar CO Project Manager for the design and construction administration for replacement of the potable water distribution system within the Main Street Corridor. The project included approximately 12,000 ft of 6", 8", and 12" PVC C900 distribution piping. Work also includes replacing the existing lead services with HDPE services to the businesses and residents along Main Street as well as transmission isolation valves, fire hydrants, and ground hydrants to facilitate the watering of the flower pots bordering Main Street. Main Street is also CO Highway 287 and the project was delivered in partnership with the City and CDOT. Project funding included a DWRP loan and DOLA EIAF grant. Phase 1 and Phase 2 were recently completed, and Phase 3 is anticipated to commence construction in Spring of 2021.

Pueblo West Metropolitan District Water Treatment Plant Expansion, Pueblo West, CO Project Engineer responsible for the design and construction administration of a 5.0 MGD expansion of the water treatment facility. Project work includes preliminary design, final design, and construction administration services. Process equipment includes prepackaged treatment units, a vertical turbine high service pump, surge anticipator valve, primary and secondary polymer chemical feed systems, chlorine gas disinfection system. The water treatment facility expansion incorporated modifications to the of the facility's filtration, chlorine gas, polymer chemical feeds, backwash waste handling process, and high service pump station expansion to meet future peak water demand of the District.

Zone 2 PRV Replacement Project, Westminster, CO Project Manager for the design of improvements to 11 existing pressure reducing valve vaults along 5 pressure zones. The project included abandoning or replacing potable water pipelines up to 30-inches diameter with pressures up to 165 psi. Pipeline materials included steel, ductile iron, PVC, and asbestos cement. Generated construction documents to demo four existing pressure reducing valve vaults, install two new pressure reducing valve and one air/vac release combination valve vaults, retrofit one pressure reducing valve vault, several direct bury valves, and ancillary potable water distribution pipeline improvements. Ancillary concrete flat work and asphalt was necessary.

Town of Lochbuie Water Treatment Plant Expansion, Lochbuie CO Project Manager responsible for master planning, permitting, and design for the Lochbuie water treatment facility. Project included expansion to 2.47 MGD peak capacity. The expansion includes two new RO skids and associated chemical feed systems, corrosion control caustic system, new chemical storage building for bulk storage and delivery of chlorine and caustic, new building exterior walls and roof to match the recently constructed Town Hall. The project is currently being solicited for CMAR delivery to qualified contractors.

City of Lamar Raw Water Transmission Line, Lamar, CO Project Manager for the design of 35,000 ft of 12" C-900 and 16" C-905 PVC raw water transmission line. Responsible for hydraulic calculations, pipeline alignment, tie-in details, and construction documents. Performed construction administration for the duration of the project, reviewing submittals, field engineering for below grade unforeseen conditions, and weekly construction meetings. Provided oversight for final commissioning, including tie-in and switchover, flushing, pressure testing and disinfection.

Todd Creek Metropolitan District Water Treatment Plant Expansion, Brighton, CO Project Manager for permitting, design, and preparation of construction documents for the expansion of the water treatment facility to 0.85 MGD. This project is ongoing and includes addition of a low pressure ultrafiltration and large capacity RO skid. Additional considerations include RO brine discharge permit, disinfection capacity evaluation and expansion, corrosion control, and potassium permanganate pre-treatment system. Andrew also managed the CMAR project delivery with the District and Contractor. Alternative delivery was needed to accelerate schedule and conform to a tight budget.

Idaho Springs Water Treatment Plant Upgrades, Idaho Springs, CO Project Engineer responsible for design and submittal of a Drinking Water Engineering Report for municipal drinking water treatment facility upgrades focused on increased membrane performance and compliance with disinfection byproduct regulations.

Rocky Ford Water Treatment Plant, City of Rocky Ford, CO. Project Superintendent for the Rocky Ford WTP funded by USDA Rural Development. Responsible for project submittals, scheduling, and day-to-day operations to complete the WTP within budget and on-time. Project included demolition of the piping, filters, and associated processes for the existing WTP. Construction of a new masonry building to house the two UV vessels capable of disinfecting 3.0 MGD. Constructed new multimedia filters, including filter underdrain blocks, air scour blower and appurtenances, control valves, filter media, FRP wash water troughs, filter controls and field instrumentation. Installed 10 stainless steel inclined plate settlers and collection troughs and supports. Installed a filter-to-waste pump, sampling system, chemical feed system and associated piping, electrical instrumentation and controls. Rehabilitated flash mix system, clarifiers and baffling system in the clear well.



Adam J. Teunissen, PE

Senior Project Manager, Structural Engineering

Education

B.S. Civil Engineering,
University of Wisconsin -
Platteville, 2003

Registrations

Professional Engineer:
Colorado
Wisconsin
Minnesota
Indiana

Professional Organizations

Structural Engineers
Association of Colorado
American Concrete Institute
Committee 350 Member

Awards

2011 ACEC Minnesota
Engineering Excellence Honor
Award, Structural Engineer:
New Wastewater Treatment
Facility at Willmar, Minnesota



Project Experience

Project Manager or Engineer of Record for the following representative projects:

North Table Mountain Water Treatment Facility, Golden, Colorado. Project Manager for the structural design of an expansion to the existing water treatment facility. Additions include the design of new administration space, new filter tanks, chemical and electrical building additions, and expansion to the secondary treatment process.

Idaho Springs Water Resource Reclamation Facility Design, Idaho Springs, Colorado. Project Manager for a new facility consisting of two 41 foot by 50 foot digester tanks and attached two story building for the headworks and dewatering processes. The first floor of the building is constructed of concrete walls and a concrete structural slab above supporting the 22 foot by 80 foot pre-engineered metal building on the second story.

Town of Milliken Water Treatment Building, Milliken, Colorado. Project Manager for the Structural design of a 62 foot by 58 foot treatment building and 18 foot by 21 foot by 13 foot deep concrete tank. The treatment building design consisted of a pre-engineered metal building over shallow concrete foundations. The tank is a cast-in-place concrete design covered with fiberglass plank grating supported by fiberglass beams.

Pueblo West States Avenue Lift Station (LS3), Pueblo West, Colorado. Lead structural engineer for the design of a 20 foot by 30 foot lift station and building. The structure consists of a 8 foot diameter precast concrete wet well, cast in place concrete foundations supported on drilled piers and a pre-engineered metal building.

Lochbuie Water Treatment Plant, Lochbuie, Colorado. Lead Structural Engineer for a small addition to the water treatment plant. The 13 foot by 20 addition expanded the existing pre-engineered metal building and was designed for chemical storage.

Hayden Water Treatment Plant, Hayden, Colorado. Lead Structural Engineer for a retrofit for new filters into and existing clarifier structure.

Berthoud Water Treatment Facility, Berthoud, Colorado. Lead Structural Engineer for an addition and remodel at the facility. Remodel work included the construction of new settling basins and flocculation tanks within the footprint of an existing clarifier. A 15 foot by 30 foot addition was added to the existing filter building to provide 2 additional filter tanks and associated pipe gallery.

Erie Water Treatment Plant, Erie, Colorado. Lead Structural Engineer for solids handling project. The project included the reuse of an existing concrete building foundation to support a new pre-engineered metal building. The completed building measured approximately 31 feet by 98 feet. Several structural modifications were made the existing structure to accommodate the pre-engineered metal building and it new purpose. In addition to the new building a 30-0" diameter cast-in-place concrete gravity thickener tank was designed. JVA teamed with Fischer Construction for this design build project.

Water Treatment Plant Improvements, Town of Rye, Colorado. Lead Structural Engineer for a small addition to and existing treatment building. The new addition (16 feet by 12 feet) was constructed of single wythe masonry walls and prefabricated roof trusses to match existing building construction.

Mt Crested Butte Wastewater Treatment Facility, Mt Crested Butte, Colorado. Lead structural engineer for addition of a new pre-engineered metal building (43 feet by 29 feet) over an existing UV treatment process. New cast-in-place foundations were designed to work with existing pipes and other existing interferences.



Ryan P. Wienpahl

Design Engineer, Environmental Engineering

Education

B.A. Anthropology/Spanish
University of New Mexico
Albuquerque, NM
2011

M.S. Civil Engineering
University of Colorado
Boulder, CO
2016

Registrations

Colorado CWP:
Class A Wastewater Operator
Class A Water Operator
Class A Ind. WW Operator
Class 3 Collect. Sys. Operator
Class 3 Dist. Sys. Operator

Professional Organizations

Rocky Mountain Water
Environment Association



Project Experience

Design Engineer for the following projects/facilities:

DoubleRL Ranch Water Treatment Systems Improvements, Ridgway, CO – Design Engineer for the design of a new water treatment system for a private ranch designed to meet a specific finished water quality profile. Responsible for process design, defining design criteria, equipment selection, project manual development, and drafting coordination. Also assisted in construction administration of the project, including facilitating the bidding process, coordinating with the contractor and equipment supplier, observing construction progress, and reviewing submittals.

Pueblo West Metro District Wastewater Treatment Plant Improvements, Pueblo West, CO – Assisted with construction administration for a project that involved installing a not-potable water reuse system in the PWMD wastewater treatment facility.

Town of Mead Wastewater Treatment Facility Improvements, Mead, CO – Design Engineer for the replacement of the existing grit pump and aerobic digester aeration grid. Responsible for equipment selection and design for replacement of the existing vertical, vacuum-primed grit pump with a horizontal, self-priming pump and for the replacement of the digester aeration grid.

Town of Winter Park LIFT Public Transit Operations Facility, Winter Park, CO – The Town of Winter Park is installing a new transit operations facility that will include a bus washing system for the public transportation buses of Fraser county. The installation will include the development of a new drinking water well and the inclusion of an Onsite Wastewater Treatment System. Design Engineer for the design of the water treatment system for the facility. Responsible for drafting the Basis of Design Report and the Technical, Managerial, and Financial Capacity Assessment, and other CDPHE permitting requirements for public water systems.

Idaho Springs WWTP Expansion, Idaho Springs, CO – Design Engineer assisting with construction administration of phase 2 of the project. The project involves retrofitting the existing two-tank Sequencing Batch Reactor with an AquaNereda Aerated Granular Sludge bioreactor from Aqua Aerobics. Responsibilities included site observations, payment application reviews, contractor coordination, and operator training.

Rifle Utility Maintenance, Capital, and Rate Study, Rifle, CO – Participated the development of a water and wastewater master plan and rate study. Specifically, assisted with the existing facilities evaluations, TDS mitigation research, and identification of priority projects for the Capital Improvement Plan.

Camp IdRaHaJe Preliminary Engineering Report, Baily, CO – Evaluated the existing utilities and helped prepare a Preliminary Engineering Report to communicate recommendations for wastewater treatment system improvements. The improvements were intended to address past CDPHE compliance excursions and more stringent impending permit limitations. Responsible for assessing potential treatment processes associated with CDPHE groundwater discharge permits to be recommended as alternatives for meeting compliance limitations.

Next Big Crop Greenhouse Modifications, Boulder County, CO – Design Engineer for the design of a greenhouse floor drain and drain water storage tank. The new design includes hauling offsite for disposal. Responsible for system design and coordinating sampling for use in identifying a hauler and wastewater treatment facility to receive the captured water from the greenhouse operation.

Pueblo West Metro District Platteville Boulevard Waterline Design, Pueblo West, CO – Design Engineer for the design and construction administration of a roughly 4,500-foot-long water distribution alignment along a section of Platteville Boulevard between N. Iliff Dr. and N. Canvas Dr. in Pueblo West. The project included hydrants, tie-ins, and appurtenances. Responsibilities included system design, site visits, coordination with other water districts and the Bureau of Reclamation for the crossing of sensitive utilities, submittal reviews, and payment application reviews.

Mt. Crested Butte Water and Sanitation District Hunter Ridge Annexation, Crested Butte, CO – Assisted with EPA Storm Water Management Model to develop design basis for re-routing segments of the Mt. Crested Butte sewer system away from a snow accumulation area so that year-round access to the manholes can be maintained.



Years of Experience: 11

Education

M.S., Colorado State University, 2012
Civil Engineering

B.S. Colorado State University, 2009

Major: Civil Engineering
Minor: Business Administration

Professional Registration

Professional Engineer, CO (#49500)
Professional Engineer, WY (#15481)
Professional Engineer, TX (#132228)

Professional Societies

American Society of Civil Engineers (ASCE)

Colorado Association of Geotechnical Engineers

North American Society of Trenchless Technologies

Certifications

OSHA 40-hr Health & Safety Training
MSHA 20-hr New Miner Training
Nuclear Density Gauge Certification

Lance Heyer is an associate and geotechnical engineer with Lithos Engineering and has 11 years of experience in the engineering industry. Mr. Heyer has over 7 years of specific experience designing and observing construction for water treatment plant related infrastructure.

PROJECT EXPERIENCE

Soldier Canyon Treatment Plant Expansion (Fort Collins, Colorado)

The Soldier Canyon Treatment Plant completed an approximately \$30M expansion throughout 2019 and 2020 to provide increased capacity up to 50 MGD. The expansion included the following specific infrastructure: flocculation and sedimentation building, chlorine contact tank building, soda ash silo and building, and associated piping. Lithos Engineering provided a geotechnical investigation and recommendations for the project. The treatment plant is located immediately west of Horsetooth Reservoir and extends onto the hillside or hogback geologic feature. The location of the plant creates unique geologic conditions where shallow bedrock consists of interbedded hard sandstones to softer, expansive claystones. Behavior of soil and bedrock conditions after completion of the improvements were considered in recommending foundation approaches for the various infrastructure. Mr. Heyer served as the project manager for the project and was the geotechnical engineer of record.

Chlorine Contact Basin (Fort Collins, Colorado)

In the fall of 2017, the City of Fort Collins completed construction of a new chlorine contact basin (CCB) at the water treatment facility. The basin was originally situated in a location requiring excavating an existing hogback, part of which was found to contain expansive bedrock. Lithos helped the City identify an alternative location that required little excavation and limited the risk of differential movement due to expansive bedrock substantially. In addition, the foundation for the CCB at the selected location was nontraditional and utilized an existing unreinforced concrete slab and approximately 3 feet of imported structural fill to provide adequate separation from expansive bedrock. Lithos' efforts in identifying the alternative site and considering various foundation alternatives saved the City approximately one million dollars on the approximately eight-million-dollar project. Mr. Heyer functioned as the project manager and engineer.

UV Building at the Drake Water Reclamation Facility (Fort Collins, Colorado)

The City of Fort Collins has decided to begin treating wastewater with UV light as opposed to chlorine due to recent difficulties in chlorine transportation. As part of the treatment upgrade, a UV building will be constructed partially over the existing Chlorine Contact Basin (CCB) at the Drake Water Reclamation Facility. For the project, Lithos provided a subsurface investigation and a geotechnical engineering report. Foundation recommendations considered the portion of the building situated over the existing foundation of the CCB and the need to extend the UV building outside of the existing CCB footprint. Although outdated by the current standard of practice, Lithos recommended the extensions of the building match the existing CCB foundation: drilled shafts extending a minimum of 5 feet into unweathered, expansive bedrock.

Aeration Basin at Drake Water Reclamation Facility (Fort Collins, Colorado)

Due to more stringent water treatment standards set by the state of Colorado, Fort Collins utilities decided to construct new a new aeration basin to exceed the current requirements. The project included demolishing two existing but unused clarifiers and extending two aeration basins further to the

north. Mr Heyer was the project manager for the project with tasks including direct communication with the client, overseeing and coordinating the subsurface investigation, providing a geotechnical engineering report for subsequent structural design, and attending project design and construction meetings. In addition, due to the proximity of expansive bedrock to the base of the proposed basin and the integral nature of the basins southern wall to existing infrastructure, a deep foundation drilled shaft a structural floor approach was selected. Mr. Heyer provided geotechnical recommendations for drilled shaft design, and managed the geotechnical construction oversight program during drilled shaft installation.

Cogeneration Building at Drake Water Reclamation Facility (Fort Collins, Colorado)

In 2020, the City of Fort Collins completed construction of a Cogeneration Plant, a power generation system converting waste gas from the DWRf digesters into electricity. The main component of the plant was constructed as a slab-on-grade with a footprint of approximately 60- by 30-feet. A series of four generators located directly west of the plant required four separate slabs-on-grade with footprints of approximately 18- by 12-feet. Lithos Engineering provided a geotechnical investigation and design and construction recommendations for the project. Mr Heyer was the project manager for the project.

Pleasant Valley Forebay Sedimentation Facility (Larimer Country, Colorado)

The High Park Fire devastated the foothills immediately west of Fort Collins, CO. In order to limit suspended solids to acceptable levels, the City of Fort Collins Utilities and Northern Water proposed a sedimentation basin near eastern boundary of the Cache la Poudre River canyon. The basin is approximately 300 by 80 ft by 12 ft deep, includes a 36-in. high knee wall connected to a slab on grade system, a diversion structure, a baffle wall used to separate high- and low-sediment water, and a 40-mil thick geomembrane placed over a sloped (2H:1V) embankment. The basin will be emptied as needed to collect and dispose of deposited sediment. Mr. Heyer worked as a geotechnical engineer for the project, providing a design report and recommendations for geotechnical slope stability and seepage and for structural infrastructure and earthen embankment side slopes. The entire project, from planning through final construction, was completed in less than 5 months.

Boyd Water Treatment Plant Crane Pick Analysis (Loveland, Colorado)

During renovations for Loveland's Boyd Water Treatment Plant, the general contractor utilized a crane to lift various demolished aeration basin pieces. The crane was situated near the top of the existing below-grade basin walls. The basin was to be updated and as part of the larger renovations therefore basin wall integrity was to be maintained during and post construction. Mr Heyer worked with the general contractor to provide outrigger offsets and maximum pick weights to maintain existing basin wall stability.

Water Quality Lab (Loveland, Colorado)

Lithos Engineering provided a geotechnical investigation and geotechnical design and construction recommendations for an approximately 100' x 50' water quality lab at the Boyd Water Treatment Plant. The investigation included two test pits and two geotechnical borings. The foundation for the structure was designed and constructed as spread footings with an interior slab on grade. During construction, extensive fill with deleterious material was discovered immediately under the foundation footprint. Mr Heyer directed the removal of fill and recompaction of suitable material beneath foundations. Mr Heyer was the project manager for the project.

Storage Building (Loveland, Colorado)

Lithos Engineering provided geotechnical and structural engineering design services for a storage building at Loveland's water treatment plant. The storage building will be used to house equipment and contain a lab testing area. The geotechnical investigation provided information for the foundation conditions and utility trenches. Lithos engineering designed a foundation system consisting of shallow drilled piers and an internal building slab for the future pole barn structure. Mr Heyer was the project manager and engineer of record for the geotechnical and foundation components of the project.

STEVEN C KUEHR, PE

SENIOR CONSULTANT



Years of Experience: 40

Education

MS, Civil Engineering, Purdue University, 1985

BS, Civil Engineering, Purdue University, 1980

Professional Registration

Professional Engineer:

CO (0024369) & CA

Professional Societies

American Water Works Association

American Society of Civil Engineers

Colorado Association of Geotechnical Engineers

Rocky Mountain Water and Environment Association

Colorado Stone, Sand and Gravel Association

Mr. Kuehr is a Senior Consultant at Lithos Engineering. Mr. Kuehr specializes in geotechnical and tunnel engineering as it relates to water supply, sewerage, water resources, aggregate mining, roadway and bridge projects. He has technical expertise in tunnel engineering, foundation engineering, slope stability, expansive soils, ground modification, retaining walls, landslide evaluation and repair, embankment dam design and groundwater collection trenches and cutoffs constructed by the slurry trench method. He has 40 years of progressive engineering experience. He has performed and managed geotechnical engineering investigations for storm drain outfall projects, treatment plants, interceptor sewers, water transmission pipelines, water storage reservoirs, intake structures and pump stations.

RELEVANT PROJECTS

Griswold WPF Raw Water Structure – Phase 2, Aurora, Colorado

Principal-in-Charge and Project Manager for the new raw water vault at the Griswold Water Purification Facility. The subsurface conditions consist of eolian deposits and claystone/siltstone bedrock. Due to the presence of swelling claystone, a minimum 5 feet deep overexcavation with select fill backfill was recommended for the lower portions of the vault. There was a 72-inch raw water line adjacent to the vault. Provided geotechnical consultation including specification language and instrumentation recommendations regarding this issue. Reviewed Contractor's submittals for shoring and instrumentation.

Wemlinger WPF Sediment Drying Beds, Aurora, CO

Served as Principal-in-Charge and Project Manager. This project involved replacing the existing sediment drying beds with new, engineered sediment drying beds. The new concrete lagoons were constructed within the same footprint of the existing earthen lagoons. Provided recommendations for a permanent dewatering system which will operate as the water levels in nearby Quincy Reservoir approach the high-water level. Also provided foundation design recommendations for various structures and considerations for a tunneled waterline crossing beneath Quincy Avenue.

Colorado Springs Utilities SDS Water Treatment Plant, Colorado Springs, CO

Principal-In-Charge for Colorado Springs Utilities (CSU) Southern Delivery System's (SDS) 50 mgd water treatment plant and finished water pump station. The surface geology in the project area consists primarily of eolian soils extending to depths as much of 60-ft below existing ground surface. The eolian soils are hydro-collapsible and exhibit a collapse potential up to 6.3 percent. Design, construction and operation measures were necessary to mitigate the potential for water to collect below grade or to pond above grade. To mitigate the collapsible soils, the design-build team implemented Deep Dynamic Compaction techniques for ground improvement.

East Cherry Creek Valley Water & Sanitation District (ECCVWSD) Northern Water Supply Project, Reverse Osmosis Treatment Plant and Booster Pump Stations, Adams, Denver and Arapahoe Counties, CO

The ECCV Northern Supply Project includes a Reverse Osmosis Treatment Plant, High Service Pump Station, and North and South Booster Pump Stations and a 35-mile transmission line. The treatment plant, which includes a water storage tank, is located in the Beebe Draw geographic

area which contains thick and soft clayey soils; a condition that is unusual for the Denver area. Consolidation testing and settlement analyses indicated that approximately six inches of settlement could occur beneath the heavily loaded storage tank. Designed a temporary site surcharge to preload the tank area; this will preconsolidate the site such that settlement under the plant will be minimal. The surcharge consisted of compacted soil constructed to a height of 20-ft and included settlement monitoring platforms. Settlement monitoring indicates that settlement is occurring. The surcharge will be removed when settlement is complete so that the tank can be constructed.

Bellvue Water Treatment Plant Residuals Handling Facility, Bellvue, CO

Lithos staff performed subsurface geotechnical investigations and provided design recommendations for this project, which involved rehabilitation of existing sedimentation basins, construction of a thickening tank, a new pump station, and a new flow-equalization basin. Site conditions consisted of saturated fine- and coarse-grained alluvium overlying siltstone and sandstone bedrock. Mr. Kuehr served as Project Manager for this project.

Public Wholesale Water Supply Project Water Treatment Plant and Pipeline, Ellis and Russell Counties, KS

Performed geotechnical investigations and provided design recommendations for construction of a new water treatment facility in Russell County, Kansas. The proposed facility consisted of tanks and structures for administration, treatment, and pump housing, and residuals handling ponds. Mr. Kuehr evaluated the potential for collapse or dissolution within soils with high calcium carbonate content. He also provided recommendations for the residuals handling pond liners and for the on-site proposed pavements. Evaluated subsurface conditions and identified potential high groundwater and soft soils along the proposed pipeline alignment. Mr. Kuehr provided recommendations for trenchless and open cut crossings of streams and local drainages, paved county roads, highways, and existing active railroad. He also performed in-situ resistivity testing during site investigation to provide the corrosion engineer with design parameters.

87th Avenue and Wadsworth Boulevard Lift Station, Westminster, CO

Provided geotechnical engineering recommendations for a lift station, overflow storage tank and for several trenchless roadway crossings. The lift station required a deep excavation in a congested urban environment. Recommendations included over-excavation and replacement of expansive bedrock. Trenchless engineering recommendations were provided for the roadway crossings.

WWTP Headworks Improvements, Longmont, CO

The plant improvements included a new headworks building, a dry well pump station and grit chamber, a new influent flume with bottom, a new influent pumping station, a new Splitter Box and Control Valves structure and a new biofilter. the Firm performed three geotechnical borings and conducted geotechnical laboratory testing to supplement previous investigations at the site. We also performed field and laboratory corrosivity tests. Although some of the deeper structures were founded within claystone bedrock, we were able to demonstrate with appropriate laboratory testing that the bedrock had a low swell potential and that standard shallow foundations could be utilized.

Wemlinger Water Treatment Plant, Aurora, CO

Served as Principal-in-Charge and Project Manager. This project involved replacing the existing sediment drying beds with new engineered sediment drying beds. The new concrete lagoons will be constructed within the same footprint of the existing earthen lagoons. Provided recommendations for a permanent dewatering system which will operate as the water levels in nearby Quincy Reservoir approach the high water level. Also provided foundation design recommendations and considerations for a tunneled waterline crossing beneath Quincy Avenue.

EXAMPLE DRAWING SET: GRAVITY FLOW MEMBRANES



TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.X	+/- 0.5°
.XX +/- 0.5	FRAC
.XXX	+/- 1/2

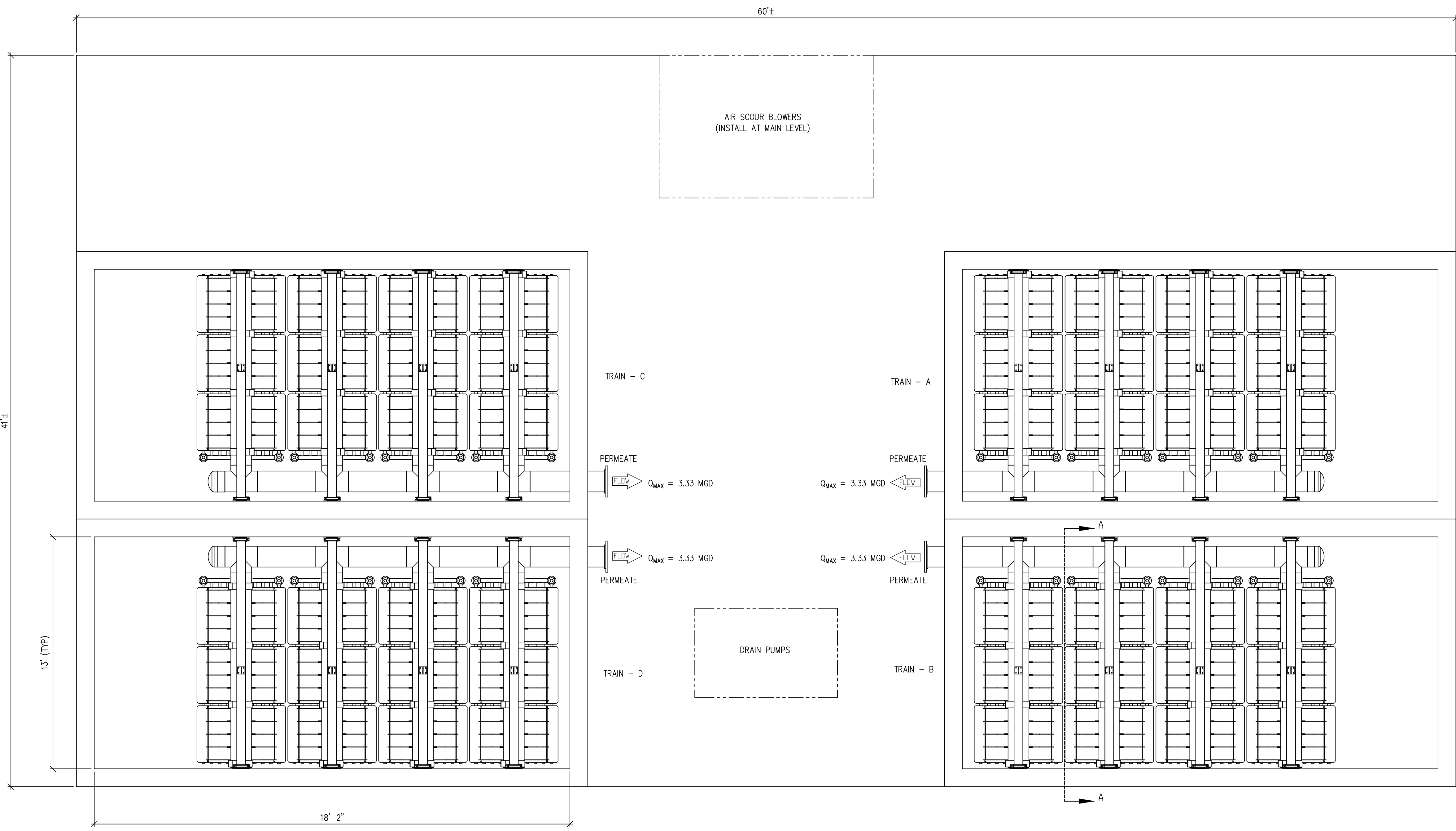
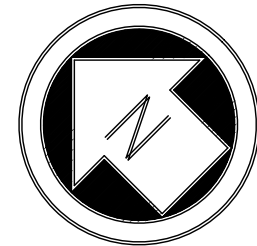
Technical drawing showing a shaft and a tapered bush. The shaft is shown in cross-section with a central hole. The bush is shown in side view with a tapered profile. A dimension line with arrows points to the hole in the shaft, labeled with the number 1.

JOHNSTOWN WATER FILTER
RETROFIT

DRAWING NUMBER

441632-AG-01

677



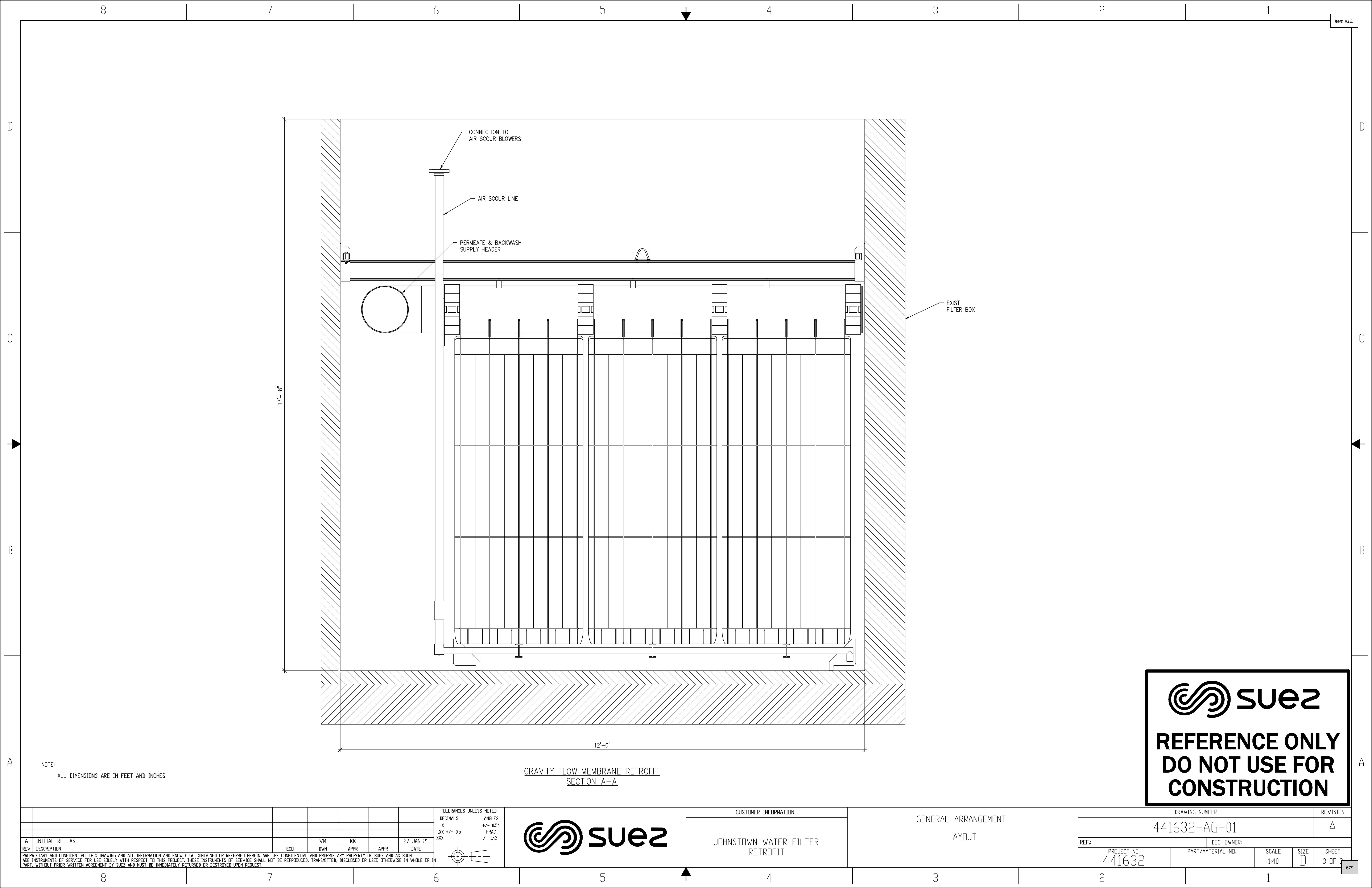
GRAVITY FLOW MEMBRANE RETROFIT
PLAN VIEW

NOTE:
ALL DIMENSIONS ARE IN FEET AND INCHES.



**REFERENCE ONLY
DO NOT USE FOR
CONSTRUCTION**

										TOLERANCES UNLESS NOTED		CUSTOMER INFORMATION		GENERAL ARRANGEMENT		DRAWING NUMBER		REVISION			
										DECIMALS						ANGLES		441632-AG-01		A	
										.X						+/- 0.5°					
										.XX +/- 0.5		FRAC									
										.XXX		+/- 1/2									



NOTE:
ALL DIMENSIONS ARE IN FEET AND INCHES.

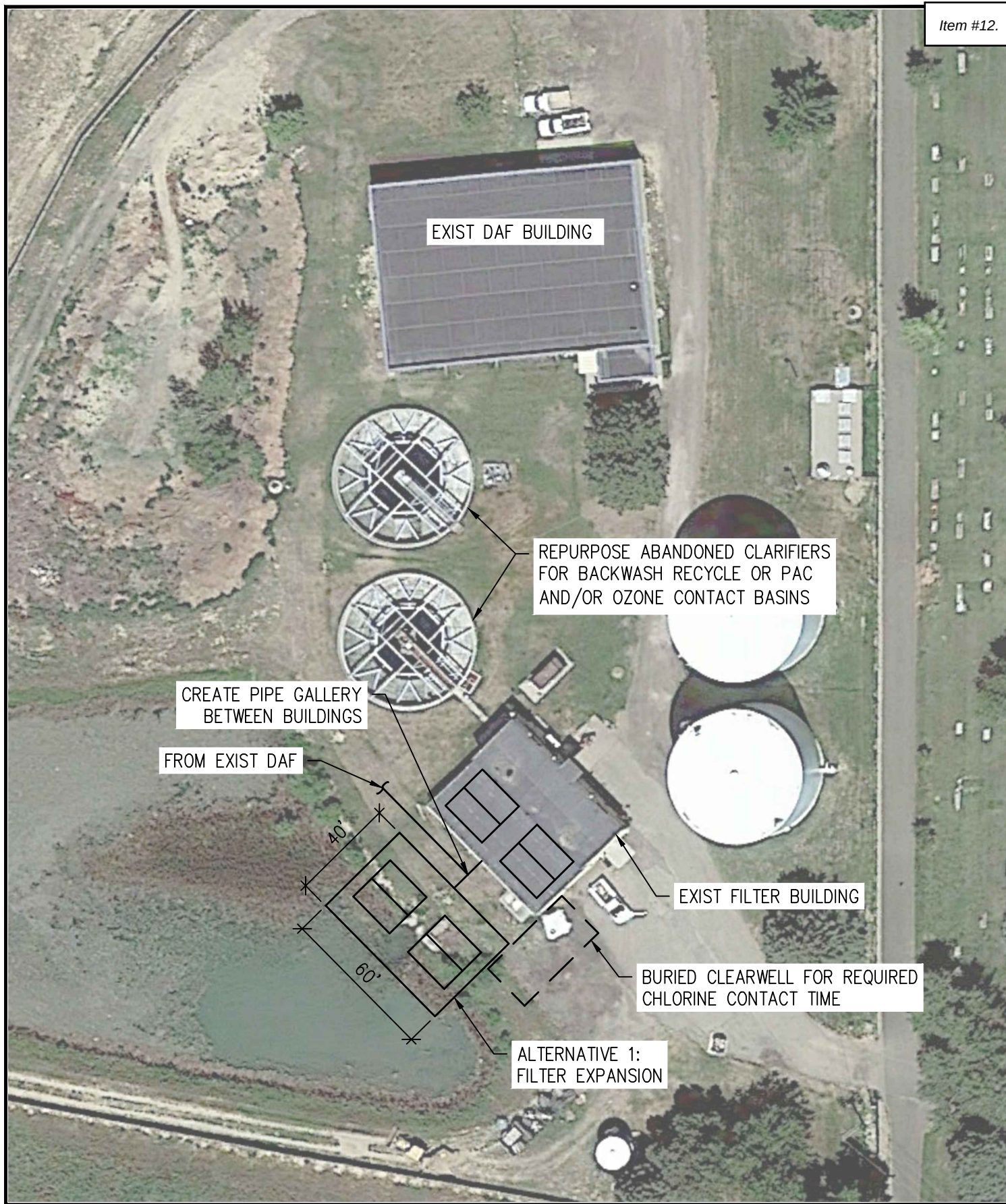
GRAVITY FLOW MEMBRANE RETROFIT
SECTION A-A



**REFERENCE ONLY
DO NOT USE FOR
CONSTRUCTION**

						TOLERANCES UNLESS NOTED		CUSTOMER INFORMATION		GENERAL ARRANGEMENT		DRAWING NUMBER		REVISION	
						DECIMALS	ANGLES	JOHNSTOWN WATER FILTER		LAYOUT		441632-AG-01		A	
						.X	+/- 0.5°	RETROFIT				REF.:		DOC. OWNER:	
						.XX	+/- 0.5					PROJECT NO.		PART/MATERIAL NO.	
						.XXX	+/- 1/2					441632		SCALE	
												1:40		SIZE	
												D		SHEET	
												3 OF 3		679	

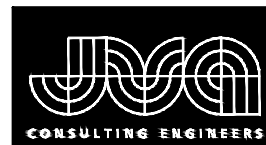
SITE LAYOUTS FOR FILTER ALTERNATIVES 1, 2, AND 3



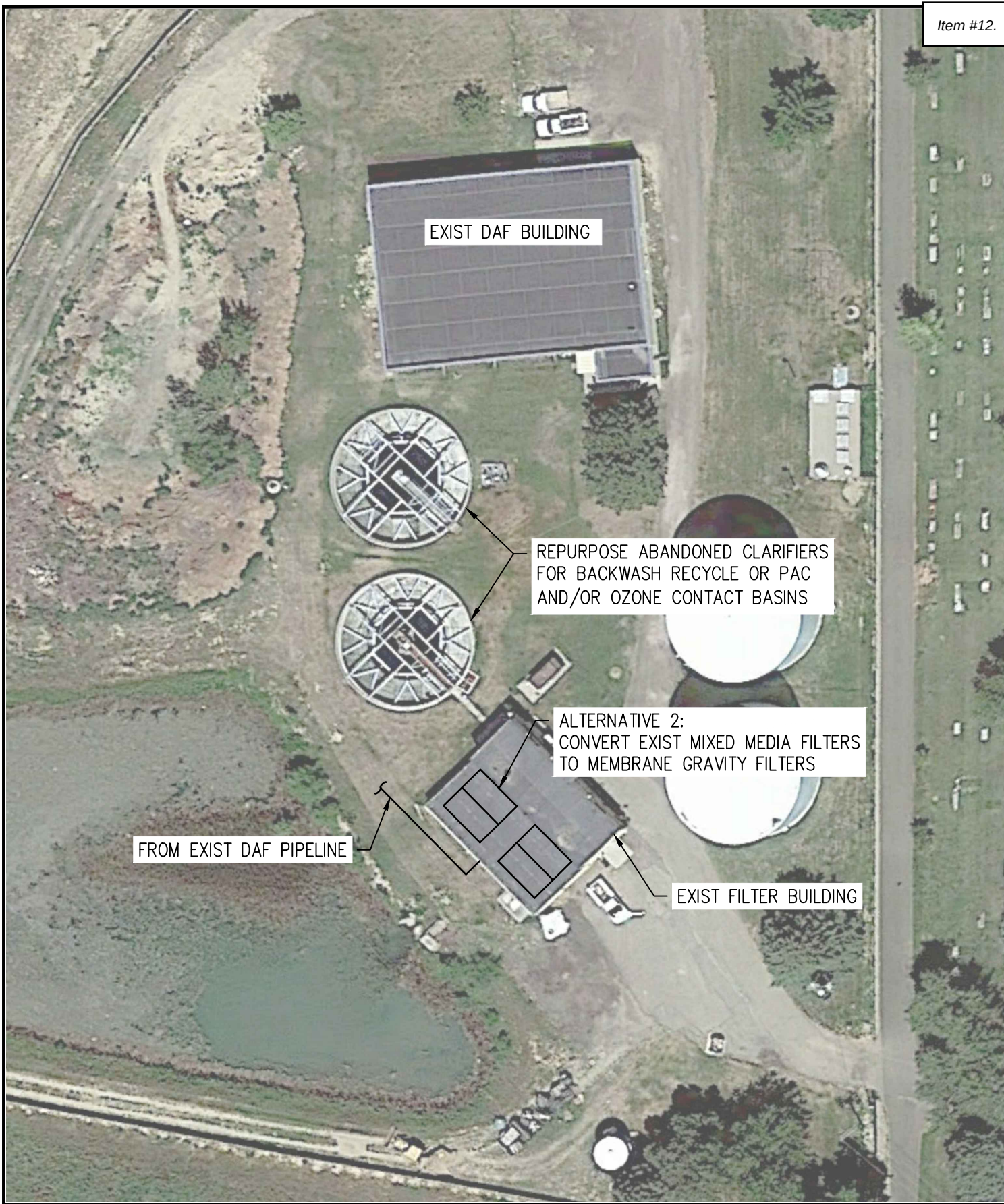
ALTERNATIVE 1

JOHNSTOWN WTP

FEB 2021



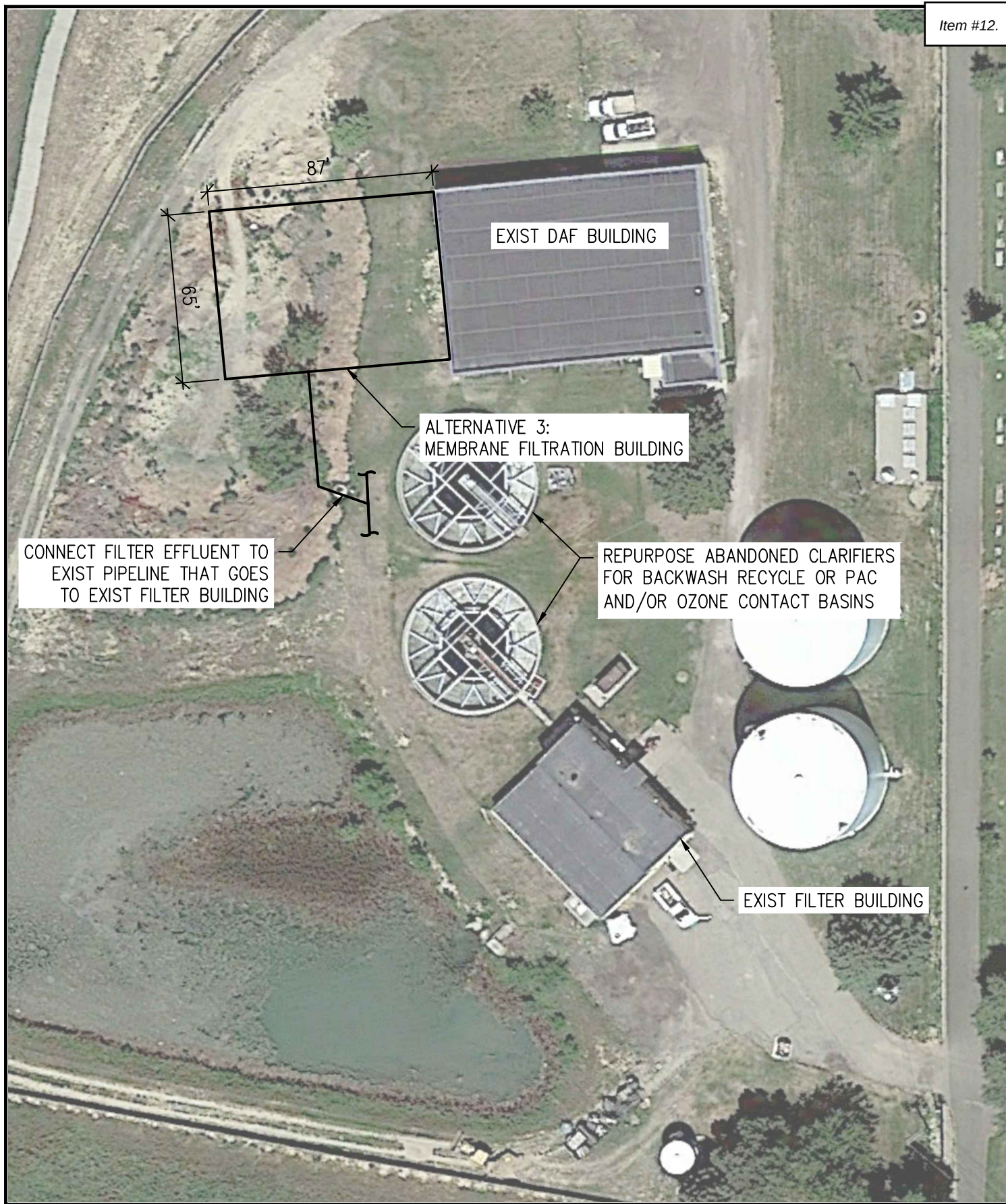
JVA, Inc.
 1319 Spruce Street
 Boulder, CO 80302
 303.444.1951
www.jvajva.com
 Boulder • Fort Collins • Wint
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ALTERNATIVE 2 **JOHNSTOWN WTP** **FEB 2021**



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ALTERNATIVE 3

JOHNSTOWN WTP

FEB 2021



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Town of Johnstown

TOWN COUNCIL AGENDA COMMUNICATIONS

AGENDA DATE: September 8, 2021

SUBJECT: Dam Repair Contract for Johnstown Reservoir

ACTION PROPOSED: Consider Awarding Dam Repair for Johnstown Reservoir To J-2 Contracting

ATTACHMENTS:

1. Bid Tabulation
2. Drawings
3. Project Manual
4. Design Report sent to State
5. J&T Consulting Design Cost/Contract
6. J&T Consulting Construction Observation Cost
7. J&T agreement for design
8. Letter from State Dam Inspector

PRESENTED BY: Marco Carani, Public Works Director

AGENDA ITEM DESCRIPTION:

Enclosed for Councils review and consideration is a request to:

1. Award the selection of J-2 Contracting for the repairs of Dam at the Johnstown reservoir.
2. Authorize the Town Manager to sign a Contract between J-2 Contracting and the Town of Johnstown.

As Council may recall, J&T Consulting was hired by the Town in November of 2020 to start design of the Dam repair at the Johnstown reservoir. It was reported last fall by the State Dam Inspector John Batka of a breach to the east side of the dam. After much investigation it was found to be the 16" clay drain line had collapsed and the headgate was not holding. Town Staff with State approval did a temporary repair to stop the water at that time and built a clay buttress early this year to contain the water as the need to fill the reservoir for summer demands was approaching. Design has been completed for the repairs and were sent to the State for final approval.

This project will be completed in two phases. Phase one will be the bulk of the work installing headgates, concrete structures, manholes and piping. Phase two will be earth work, riprap and gravel. We developed a list of five potential Contractors with experience in Dam repair and construction that have appropriate the experience for this project. The bid was by invitation only and provided to the five pre-qualified bidders. ZAK Dirt, ESCO, SEMA, J-2 Contracting and NCC. Only four out of the five turned in bids.

Company	Phase 1	Phase 2	TOTAL
Zak Dirt	\$854,305	\$264,685	\$1,118,990
ESCO	\$995,900	\$353,600	\$1,349,500
SEMA	\$946,780	\$251,710	\$1,198,490
J-2 Consulting	\$707,680	\$240,795	\$948,475

The Community That Cares

www.TownofJohnstown.com

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141

After review of bids, staff narrowed it down to the lowest bidder. Town staff along with J&T Consulting agreed that J-2 Contracting gives the Town the best opportunity for a successful project. Staff is also requesting to hire J&T Consulting for Construction Observation and service. J&T has been involved with many dam and reservoirs in the northern Colorado region and we feel they would add value for Construction observation. Their cost for these services is \$70,870.

Originally \$425,000 was budgeted for this project. Approximately \$66,150 has been expended in 2021 for the design services. This leaves a remaining balance of approximately \$358,850 to begin work during the fall on this project. We anticipate completing the first phase by the end of the calendar year which will cost an estimated \$765,000 (\$707,680 construction and \$57,320 for construction management). This project will necessitate a budget amendment to complete the work totaling \$406,150. Phase II of the project will be requested in the FY 2022 appropriation request.

LEGAL ADVICE:

The contract has been reviewed by the Town Attorney.

FINANCIAL ADVICE:

Assuming completion of Phase I, a budget amendment appropriating funds may be necessary in the amount of \$406,150 in FY 2021. Additional funds will need to be appropriated and approved in the 2022 fiscal year budget to complete Phase II of this project.

RECOMMENDED ACTION: Recommending approval of award.

SUGGESTED MOTIONS:

For Approval:

Staff Recommends to approve and award the Johnstown Dam project to J-2 Contracting in the amount not to exceed \$948,475 as well as award J&T consultants \$70,870.00 for construction observation for this project. Staff is also recommending that Town Council authorize the Town Manager to sign the contract upon its complete review and approval by the Town Attorney and Town Manager.

For Denial:

Staff recommends that we deny the award as presented and solicit formal bids again

Reviewed and Approved for Presentation:



Town Manager



J&T Consulting, Inc.

Bid Tabulation

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Town of Johnstown

Johnstown Reservoir Repair

7/28/2021

				SEMA Construction		Zak Dirt		J-2 Contracting, Co.		ESCO	
Item Number	Description	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price

PHASE 1 ITEMS

General Items											
1	Project Mobilization/Demobilization	1	LS	\$94,000	\$94,000	\$100,000	\$100,000	\$50,000	\$50,000	\$85,110	\$85,110
2	Erosion Control	1	LS	\$18,000	\$18,000	\$45,000	\$45,000	\$6,500	\$6,500	\$44,000	\$44,000
3	Dewatering Required to Complete the Project	1	LS	\$63,000	\$63,000	\$98,000	\$98,000	\$30,000	\$30,000	\$80,000	\$80,000
4	Construction Staking	1	LS	\$36,000	\$36,000	\$28,000	\$28,000	\$14,000	\$14,000	\$49,800	\$49,800
5	Clearing, Grubbing, Striping/Stockpiling/Replacing Topsoil	1	LS	\$23,000	\$23,000	\$42,000	\$42,000	\$18,000	\$18,000	\$18,900	\$18,900
6	Site Restoration of all Disturbed Areas (final grading, seeding, mulching)	1	LS	\$6,000	\$6,000	\$15,000	\$15,000	\$20,000	\$20,000	\$1,700	\$1,700
Phase 1 General Items Subtotal					\$240,000		\$328,000		\$138,500		\$279,510
Reservoir Infrastructure											
7	Embankment Excavation	4,115	CYD	\$12	\$49,380	\$10	\$41,150	\$9	\$37,035	\$24	\$98,760
8	Embankment Backfill	3,935	CYD	\$14	\$55,090	\$32	\$125,920	\$17	\$66,895	\$22	\$86,570
9	Remove and Dispose of Existing 16 in Clay Outlet Pipe and Concrete Vault	1	LS	\$16,000	\$16,000	\$11,500	\$11,500	\$3,800	\$3,800	\$17,400	\$17,400
10	Concrete Outlet Tower Structure, Including Sluice Gate, Steel Grate, Trash Screens	1	LS	\$252,000	\$252,000	\$109,000	\$109,000	\$105,000	\$105,000	\$175,000	\$175,000
11	40ft Precast Concrete Bridge, Including Footer, Connections and Appurtenances	1	LS	\$40,000	\$40,000	\$35,000	\$35,000	\$60,000	\$60,000	\$56,900	\$56,900
12	1-1/2 in Diameter Galvanized Steel Handrail, Including all Appurtenances	99	LF	\$300	\$29,700	\$165	\$16,335	\$200	\$19,800	\$231	\$22,869
13	Concrete Mud Mat	6	CYD	\$350	\$2,100	\$1,200	\$7,200	\$1,500	\$9,000	\$1,561	\$9,366
14	24 in Restrained Joint, Concrete Encased, Ductile Iron Class 250 Outlet Pipe	91	LF	\$2,000	\$182,000	\$1,050	\$95,550	\$2,000	\$182,000	\$1,600	\$145,600
15	4ft Diameter Concrete Flat-Top Manhole, Including Connection to Perforated Toe Drain Pipe.	1	LS	\$5,600	\$5,600	\$8,500	\$8,500	\$13,000	\$13,000	\$8,775	\$8,775
16	4 ft Diameter Concrete Flat-Top Manhole, Including Connection to Existing RCP Pipe	1	LS	\$5,600	\$5,600	\$7,500	\$7,500	\$13,000	\$13,000	\$9,628	\$9,628
17	Fill Around Manhole	33	CYD	\$70	\$2,310	\$50	\$1,650	\$50	\$1,650	\$34	\$1,122
18	Remove and Replace Existing Toe Drain with 8" Contech A-2000 Perforated Toe Drain Pipe, Including No 8 or No 89 Aggregate Filter Gravel, and ASTM C-33 Concrete Sand Bedding	200	LF	\$110	\$22,000	\$110	\$22,000	\$65	\$13,000	\$197	\$39,400
19	Utility Conflicts/Contingency - Additional requirements for modifying utilities not identified in drawings and/or for utility repair. Contractor to provide schedule of values and breakdown of required materials and labor for installation for review and approval before this allowance will be used.	1		\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000
Phase 1 Reservoir Infrastructure Subtotal					\$706,780		\$526,305		\$569,180		\$716,390
Phase 1 Subtotal					\$946,780		\$854,305		\$707,680		\$995,900

JT J&T Consulting, Inc.				Town of Johnstown							
Bid Tabulation				Johnstown Reservoir Repair							
© 2021 J&T Consulting, Inc.				SEMA Construction		Zak Dirt		J-2 Contracting, Co.		ESCO	
Item Number	Description	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price

PHASE 2 ITEMS

General Items											
1	Project Mobilization/Demobilization	1	LS	\$25,000	\$25,000	\$5,500	\$5,500	\$9,500	\$9,500	\$24,300	\$24,300
2	Erosion Control	1	LS	\$24,000	\$24,000	\$15,000	\$15,000	\$18,000	\$18,000	\$15,800	\$15,800
3	Construction Staking	1	LS	\$10,000	\$10,000	\$3,500	\$3,500	\$6,000	\$6,000	\$12,500	\$12,500
4	Clearing, Grubbing, Striping/Stockpiling/Replacing Topsoil	1	LS	\$8,000	\$8,000	\$25,000	\$25,000	\$15,000	\$15,000	\$21,800	\$21,800
5	Site Restoration of all Disturbed Areas (final grading, seeding, mulching)	1	LS	\$6,000	\$6,000	\$12,000	\$12,000	\$24,000	\$24,000	\$9,800	\$9,800
Phase 2 General Items Subtotal					\$73,000		\$61,000		\$72,500		\$84,200
Reservoir Infrastructure											
6	Crest and Slope Fill, Bring Crest to Minimum 4986 Elevation All Around Reservoir	805	CYD	\$28	\$22,540	\$52	\$41,860	\$30	\$24,150	\$60	\$48,300
7	6" Thick CDOT Class 6 Roadbase on Reservoir Crest	1,510	CYD	\$52	\$78,520	\$70	\$105,700	\$42	\$63,420	\$95	\$143,450
8	18" Thick D50 = 9" Type L Soil Riprap on Emergency Spillway	615	CYD	\$110	\$67,650	\$75	\$46,125	\$115	\$70,725	\$110	\$67,650
9	Utility Conflicts/Contingency - Additional requirements for modifying utilities not identified in drawings and/or for utility repair. Contractor to provide schedule of values and breakdown of required materials and labor for installation for review and approval before this allowance will be used.	1		\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Phase 2 Reservoir Infrastructure Subtotal					\$178,710		\$203,685		\$168,295		\$269,400
Phase 2 Subtotal					\$251,710		\$264,685		\$240,795		\$353,600

GENERAL NOTES:

3. THESE CONSTRUCTION PLANS ARE TO BE USED IN CONJUNCTION WITH THE SPECIFICATIONS PREPARED BY J&T CONSULTING, INC., AND GEOTECHNICAL INVESTIGATION AND ENGINEERING DESIGN RECOMMENDATIONS PREPARED BY Cesare, INC.
2. COMPLY WITH ALL REQUIREMENTS OF OWNER OBTAINED PROJECT PERMITS: INCLUDING, BUT NOT LIMITED TO PERMITS FROM THE U.S. ARMY CORPS OF ENGINEERS AND COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT. CONTRACTOR SHALL OBTAIN ALL OTHER PERMITS NECESSARY FOR CONSTRUCTION OF THE WORK.
3. PROTECT ALL EXISTING WETLANDS.
4. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.
5. ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH THE STATE OF COLORADO PERMITTING PROCESS FOR "STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY." FOR INFORMATION, PLEASE CONTACT THE COLORADO DEPARTMENT OF HEALTH, WATER QUALITY CONTROL DIVISION, 4300 CHERRY DRIVE SOUTH, DENVER, COLORADO 80246-1530. ATTENTION: PERMITS SECTION. PHONE 303-692-3500.
6. IF DEWATERING IS REQUIRED, A STATE CONSTRUCTION DEWATERING DISCHARGE PERMIT IS REQUIRED FOR DISCHARGES TO A STORM SEWER, CHANNEL, IRRIGATION DITCH, ANY STREET THAT IS TRIBUTARY TO THE AFOREMENTIONED FACILITIES, OR ANY WATER OF THE UNITED STATES.
7. PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT ALL UTILITIES TO COORDINATE SCHEDULES.
8. THE CONTRACTOR SHALL REGULARLY PATROL THE PUBLIC LANDS ADJACENT TO THE PROJECT, REMOVE CONSTRUCTION DEBRIS AND KEEP AREAS CLEAN AND SAFE.
9. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING A SEQUENCE AND SCHEDULE FOR COMPLETION OF THE WORK IN ACCORDANCE WITH APPLICABLE PROVISIONS OF THE CONTRACT DOCUMENTS.
10. READ THOROUGHLY AND BECOME FAMILIAR WITH THE SPECIFICATIONS AND INSTALLATION DETAILS FOR THIS RELATED WORK PRIOR TO CONSTRUCTION.
11. VERIFY SITE ELEVATIONS PRIOR TO CONSTRUCTION.
12. THE CONTRACTOR SHALL PROCURE ALL PERMITS AND LICENSES, PAY ALL CHARGES AND FEES INCLUDING, BUT NOT LIMITED TO, ALL INSPECTION CHARGES OF AGENCIES HAVING APPROPRIATE JURISDICTION.
13. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS OF ENTIRE PROJECT, AS SPECIFIED, UPON FINAL COMPLETION OF PROJECT.



A horizontal scale bar with alternating black and white segments. Above the bar, the numbers 1000, 500, 0, and 1000 are marked from left to right. Below the bar, the text "SCALE IN FEET" is centered.

VICINITY MAP

SCALE 1" = 1000'

**OWNER**

TOWN OF JOHNSTOWN
450 S. Parish Avenue
JOHNSTOWN, CO 80534
970-587-4664

SURVEYOR

American West Land Surveying Co.
331 South 4th Avenue
P.O. Box 129
Brighton, CO 80601
303-659-1532

ENGINEER

J&T Consulting, Inc.
J.C. York
305 Denver Ave., Ste. D
Fort Lupton, CO 80621
303-857-6222
Fax: 303-857-6224

GEOTECHNICAL/SOIL INVESTIGATIONS

CESARE, INC.
7108 SOUTH ALTON WAY, BLDG. B
CENTENNIAL, CO 80112
303-220-0300



Know what's below.
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SEE SHEET INDEX - SHEET 2

APPROVAL:

Approved on the _____ day of _____, 20____

State Engineer

By: William McCormick III, P.E.
Chief, Colorado Dam Safety
CO P.E. #29127

CERTIFICATION:

I hereby certify these plans for the Johnstown Reservoir Repair were prepared by me or under my direct supervision for the owner, The Town of Johnstown.

James C. York, P.E.
Colorado Registration No. 36846

I hereby certify these plans for the Johnstown Reservoir Repair represent the PRELIMINARY conditions to the best of our knowledge and judgement, based in part on information furnished by others as of _____ day of _____, 20_____.

James C. York, P.E.
Colorado Registration No. 36846

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Johnstown Reservoir Repair

Town Of Johnstown



J&T Consulting, Inc.

305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.j-tconsulting.com

Cover Sheet

15

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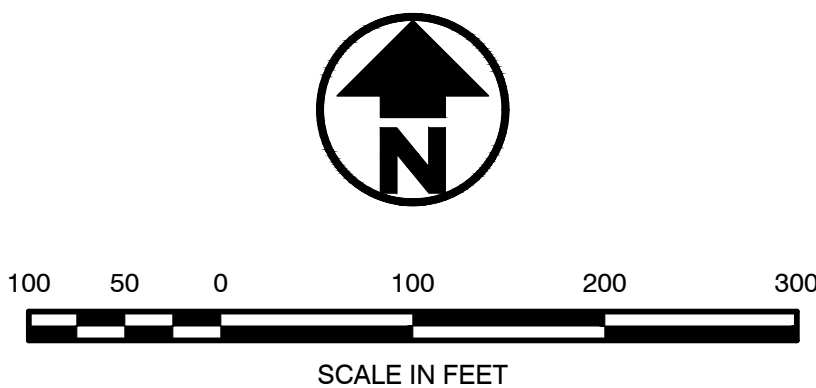
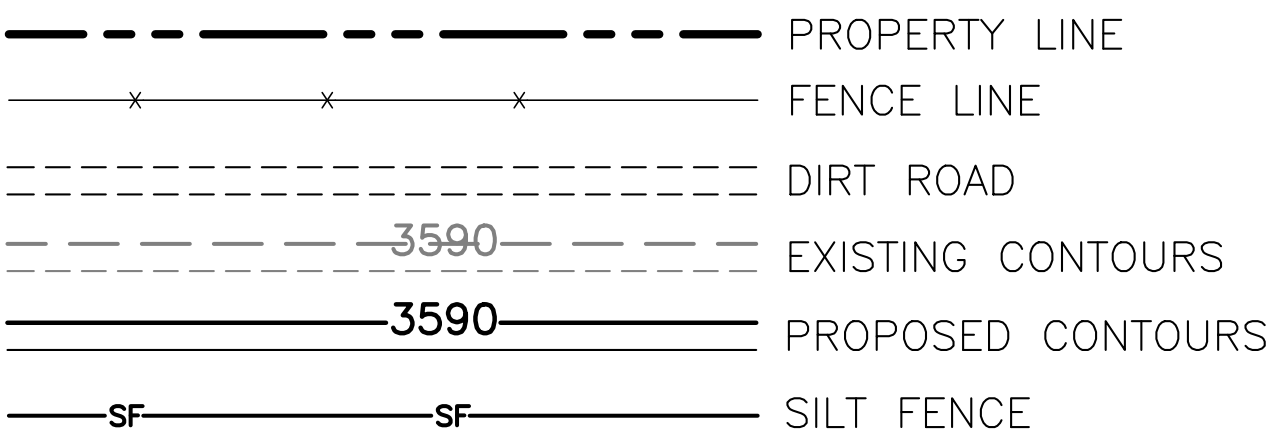
- 1) HORIZONTAL COORDINATES SHOWN HEREON ARE BASED UPON THE COLORADO STATE PLANE COORDINATE SYSTEM, NORTH ZONE (0501) AND HAVE BEEN MODIFIED TO GROUND BY A COMBINED FACTOR OF 1.000277647 / 0.99972243.
- 2) ALL ELEVATIONS SHOWN HEREON ARE BASED UPON STATIC GPS OBSERVATIONS POST PROCESSED THROUGH THE JAVAD DATA PROCESSING ONLINE SERVICE (DPOS) RESULTING IN CONTROL POINT NO. 496 HAVING AN ELEVATION OF 4984.36 NAVD 88 (GEOID 12B).
- ALL CONTROUS SHOWN HEREON ARE AT ONE-FOOT INTERVALS WITH INDEX CONTOURS SHOWN AT FIVE-FOOT INTERVALS.
- 3) ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTIONS BASED UPON A DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
- 4) THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY AMERICAN WEST LAND SURVEYING CO. TO DETERMINE OWNERSHIP OR EASEMENTS OF RECORD.
- 5) ALL DISTANCES SHOWN HEREON ARE MEASURED GROUND DISTANCES REPORTED IN U.S. SURVEY FEET.

PROJECT CONTROL COORDINATE TABLE				
PT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
218	1366217.16	3150535.04	4984.43	1/2" REBAR WITH YELLOW PLASTIC CAP, PLS 12374
351	1367166.30	3150529.22	4985.31	80d NAIL
1217	1366364.21	3150695.16	4986.71	1/2" REBAR WITH YELLOW PLASTIC CAP, PLS 12374

SHEET INDEX

- | | |
|-------|--------------------------------------|
| 1 | Cover Sheet |
| 2 | Existing Conditions Plan |
| 3 | Excavation Plan |
| 4 | Grading & Erosion Control Plan |
| 5 | Emergency Spillway Plan |
| 6 | Emergency Spillway Details |
| 7 | Outlet Plan and Profile |
| 8 | Excavation & Pipe Encasement Details |
| 9 | Toe Drain Plan and Profile |
| 10 | Toe Drain Details |
| 11-13 | Outlet Tower Details |
| 14-15 | Bridge Details |

LEGEND:



ISSUED FOR BID

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Job #	20225
Date	7.1.21
Drawn By	KJS
Designed By	KJS
Checked By	JCY
File	JT-Johnstown Reservoir
Scale	As Shown

Sheet: **2** Of: **15**

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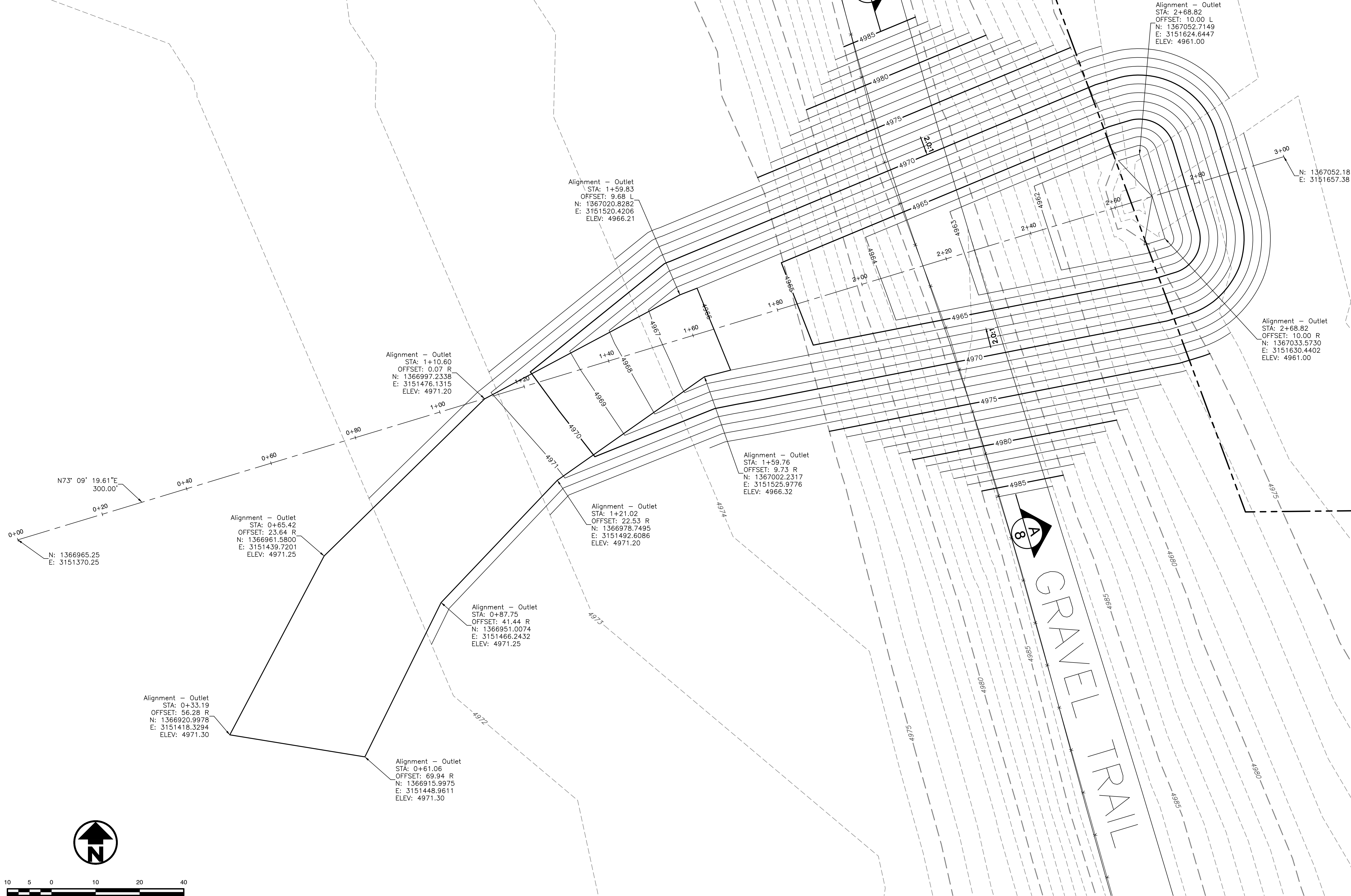
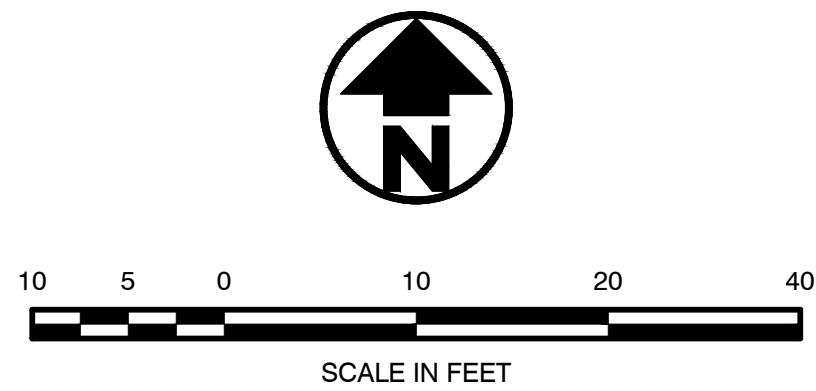
Johnstown Reservoir Repair

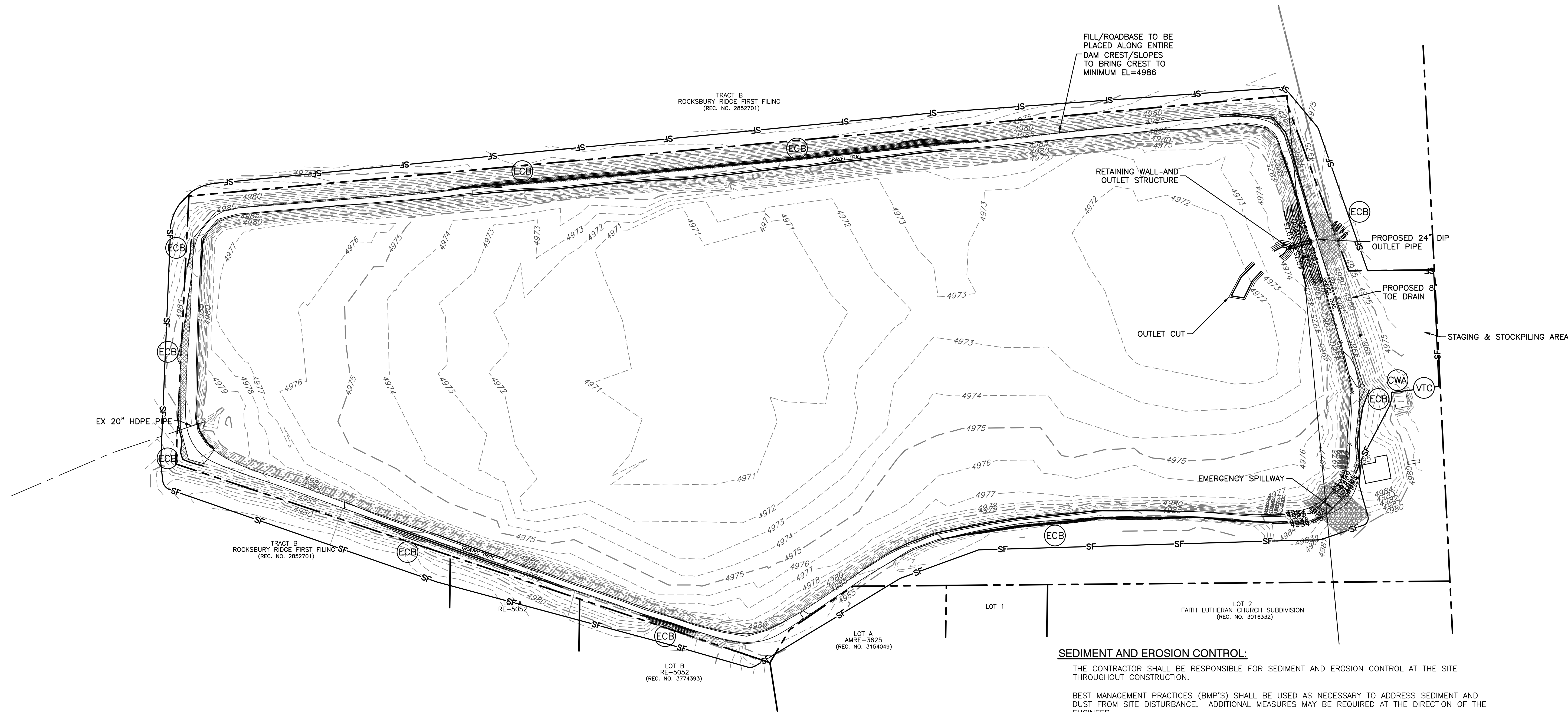
Town Of Johnstown

J&T Consulting, Inc.

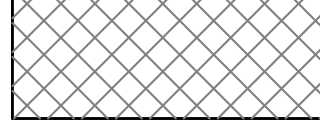
305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.j-tconsulting.com

p:\2025 johnstown reservoir repair\Drawings\J&T-JOHNSTOWN RESERVOIR_Bridge.dwg, 3 Excavation Plan, 7/1/2021 11:25:14 AM





LEGEND:

- | | |
|---|--------------------------------|
|  | PROPERTY LINE |
|  | FENCE LINE |
|  | DIRT ROAD |
|  | EXISTING CONTOURS |
|  | PROPOSED CONTOURS |
|  | SILT FENCE |
|  | EROSION CONTROL BLANKET |
|  | |
|  | VEHICLE TRACKING CONTROL |
|  | PORTABLE CONCRETE WASHOUT AREA |

SEDIMENT AND EROSION CONTROL:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEDIMENT AND EROSION CONTROL AT THE SITE THROUGHOUT CONSTRUCTION.

BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE USED AS NECESSARY TO ADDRESS SEDIMENT AND DUST FROM SITE DISTURBANCE. ADDITIONAL MEASURES MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.

BMP'S MAY INCLUDE, BUT ARE NOT LIMITED TO:

- MINIMAL DISTURBANCE FOR MINIMAL TIME PERIODS
GRAVEL CONSTRUCTION ENTRIES
SILT FENCE, STRAW BALE OR SAND BAG BARRIERS, ROCK CHECK DAMS
STORM SEWER INLET PROTECTION
SEDIMENT CAPTURE PONDS
SITE WATERING FOR DUST SUPPRESSION

BMP'S SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL INSPECT BMP'S WEEKLY AND AFTER SIGNIFICANT (GREATER THAN 0.1" PRECIPITATION) STORM EVENTS. THE MAINTENANCE AND REPAIR SHALL BE COMPLETED IN A TIMELY MANNER. SEDIMENT AND DEBRIS SHALL BE REMOVED WHEN THEY REACH HALF THE BMP HEIGHT OR IMPACT THE FUNCTION OF THE BMP.

SOIL STOCKPILES SHALL BE PROTECTED FROM SEDIMENT TRANSPORT BY SURFACE ROUGHENING, WATERING AND PERIMETER SILT FENCING. SOILS THAT WILL BE STOCKPILED FOR MORE THAN 30 DAYS SHALL BE MULCHED AND SEEDED WITH A GRASS COVER WITHIN 14 DAYS OF STOCKPILE CONSTRUCTION.

THE CONTRACTOR SHALL INSURE THAT ALL LOADS OF CUT AND FILL SOILS IMPORTED TO OR EXPORTED FROM THE SITE ARE PROPERLY LOADED AND COVERED TO PREVENT LOSS DURING TRANSPORT.

THE CONTRACTOR SHALL REMOVE ALL SEDIMENT, MUD, AND CONSTRUCTION DEBRIS RESULTING FROM THIS PROJECT FROM FLOWLINES AND PAVEMENT OF PUBLIC STREETS IN A TIMELY MANNER.

SOILS EXPOSED DURING LAND DISTURBING ACTIVITY SHALL BE KEPT IN A ROUGHENED CONDITION BY RIPPING OR DISCING ALONG LAND CONTOURS UNTIL MULCH, VEGETATION OR OTHER PERMANENT EROSION CONTROL IS IN PLACE. NO SOILS SHALL REMAIN EXPOSED BY LAND DISTURBING ACTIVITY FOR MORE THAN THIRTY (30) DAYS BEFORE REQUIRED TEMPORARY OR PERMANENT EROSION CONTROL IS INSTALLED UNLESS OTHERWISE APPROVED.

ALL TEMPORARY SEDIMENT CONTROLS WILL BE REMOVED WITHIN 30 DAYS AFTER THE FINAL STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, WHICHEVER OCCURS FIRST.

NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHENEVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

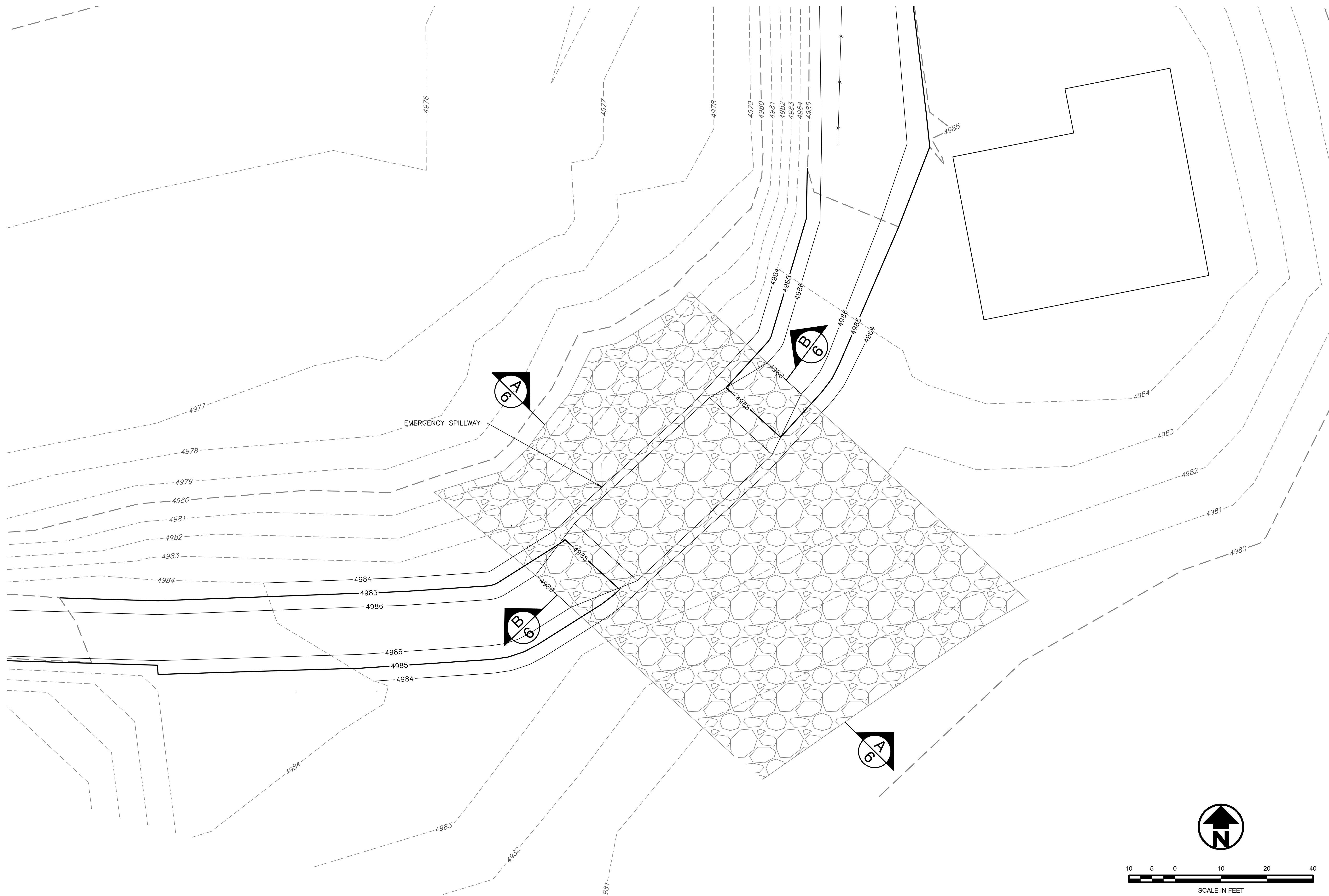
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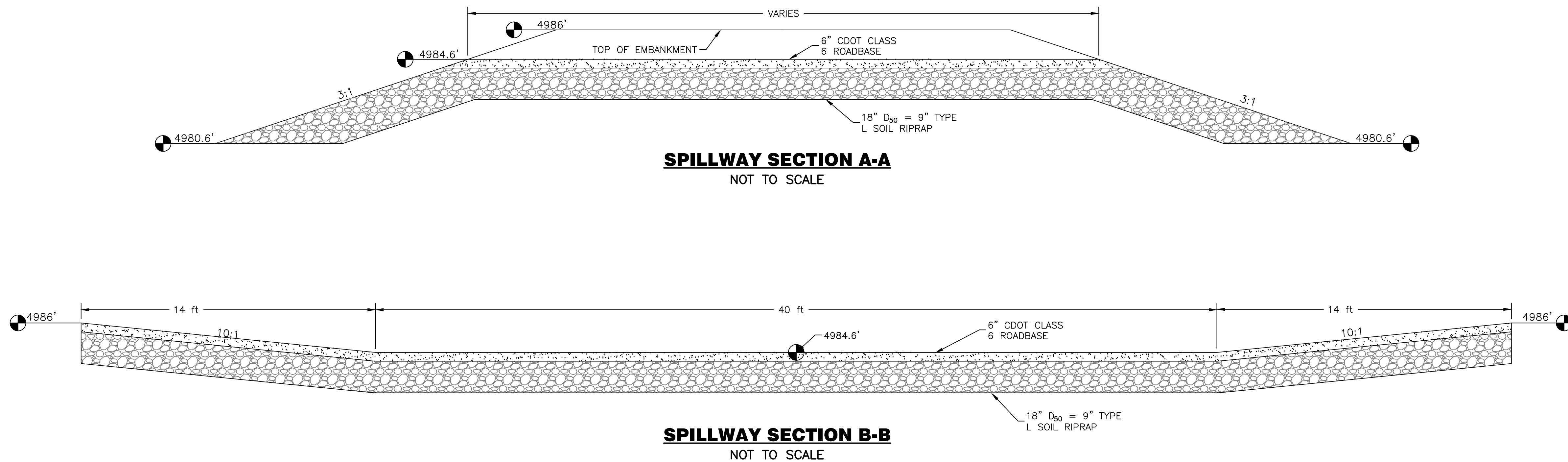
Job #	2022
Date	7.1.2
Drawn By	KJS
Designed By	KJS
Checked By	JCY
File	JT-Johnstown Reservoir
Scale	As Shown

Sheet: **4** Of: **15**

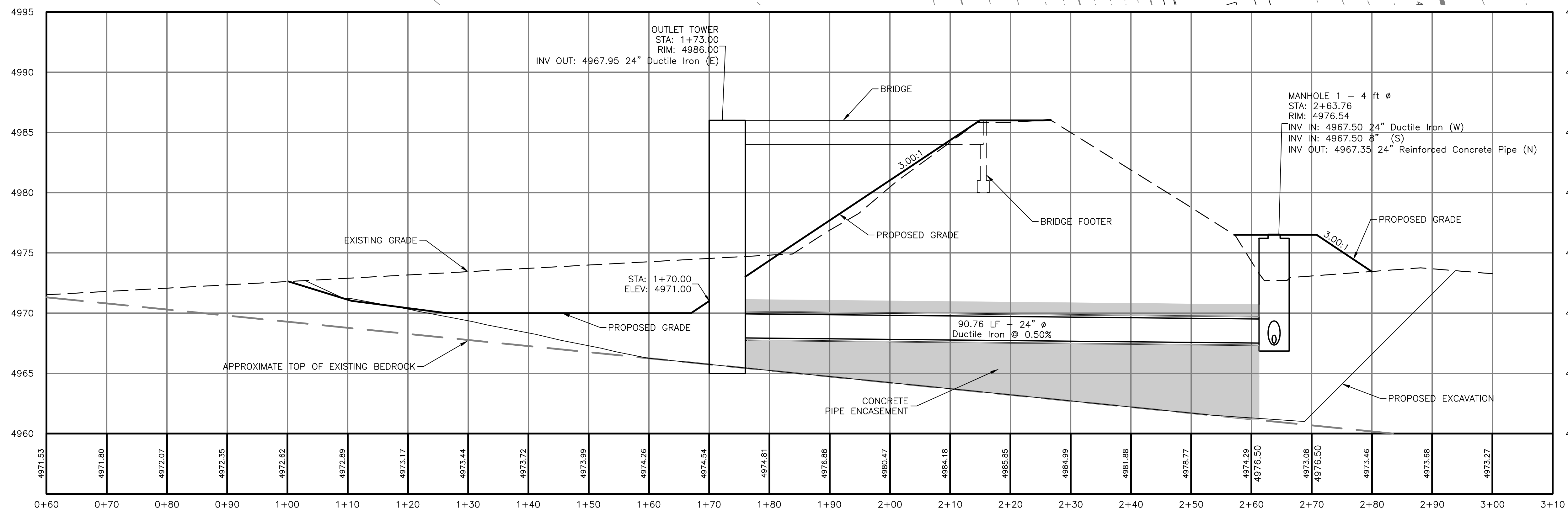
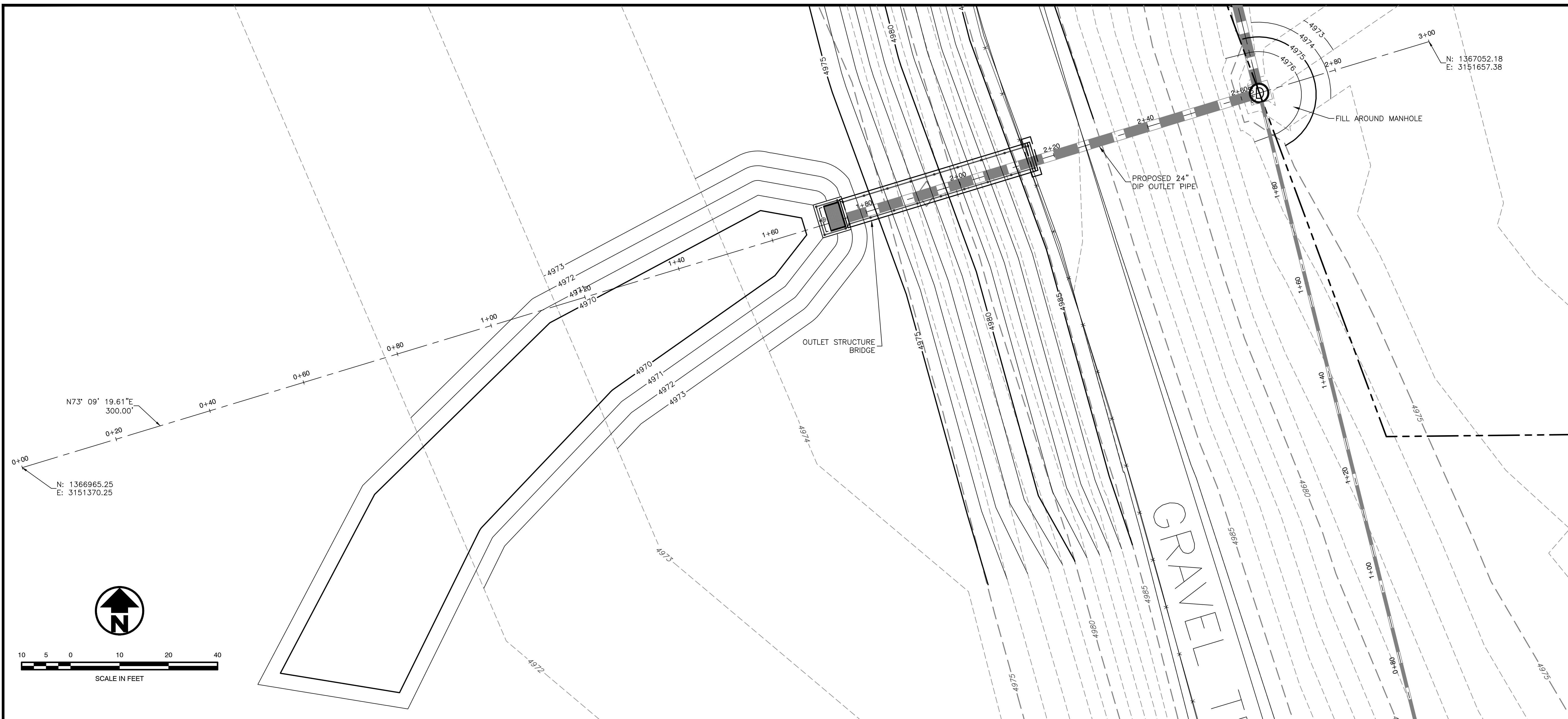
ISSUED FOR BID

Filing No. C-0625A





RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D ₅₀ * (INCHES)
TYPE L	70-100	15	9
	50-70	12	
	35-50	9	
	2-10	3	



Johnstown Reservoir Repair

Town Of Johnstown

J&T Consulting, Inc.

305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.j-tconsulting.com

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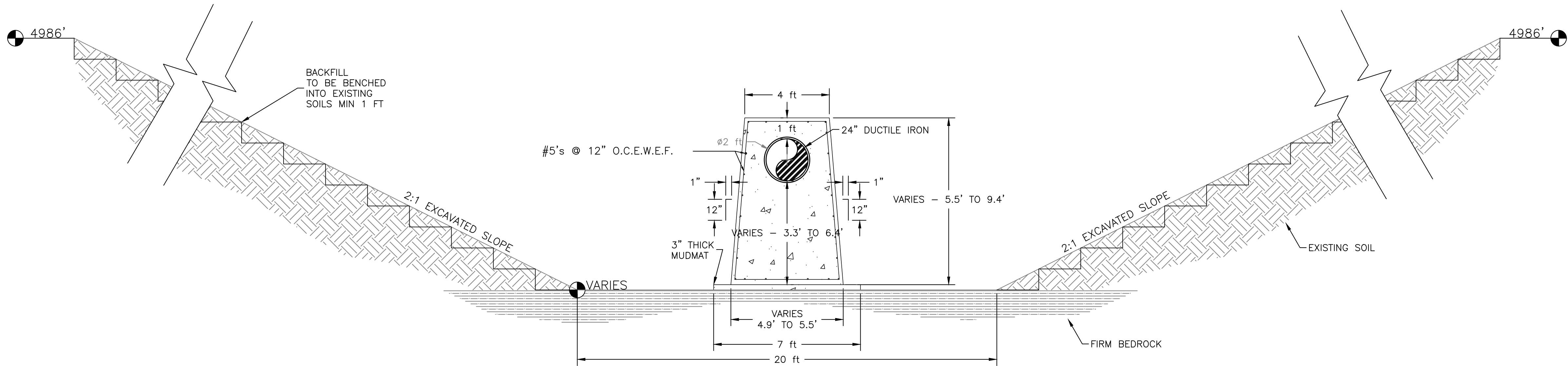
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Date	7.1.21
Drawn By	KJS
Designed By	KJS
Checked By	JCY
File	JT-Johnstown Reservoir
Scale	As Shown

Sheet: **7** Of: **15**

ISSUED FOR BID

Filing No. C-0625A

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EXCAVATION SECTION A-A
NOT TO SCALE

ISSUED FOR BID

Job # 20225
Date 7.1.21
Drawn By KJS
Designed By KJS
Checked By JCY
File JT-Johnstown Details
Scale Not to Scale

Sheet: 8 of 15

Filing No. C-0625A

Johnstown Reservoir Repair

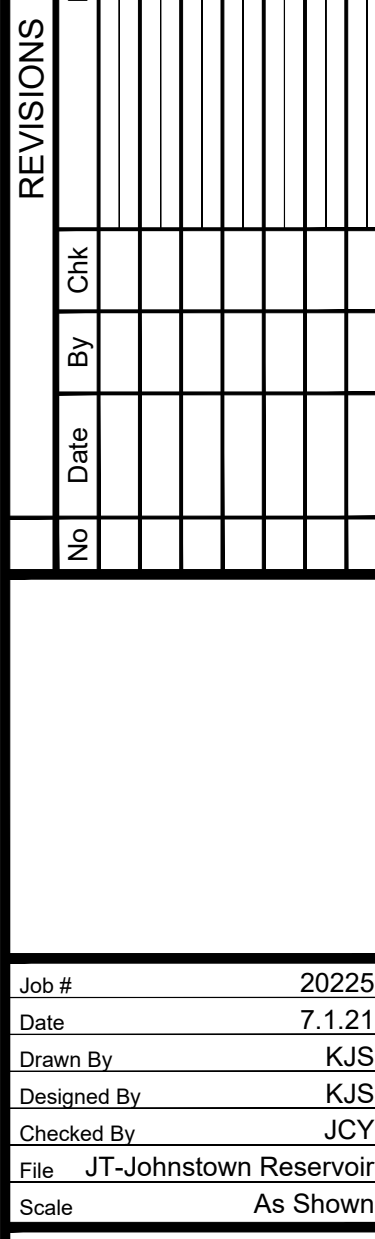
Town Of Johnstown

Excavation & Pipe Encasement Details

J&T Consulting, Inc.

305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.jtconsulting.com

Item #13.





<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
3"	100
NO. 4	95-100
NO. 8	75-100
NO. 16	50-85
NO. 30	25-60
NO. 50	10-30
NO. 100	2-10
NO.200	LESS THAN OR EQUAL TO 4

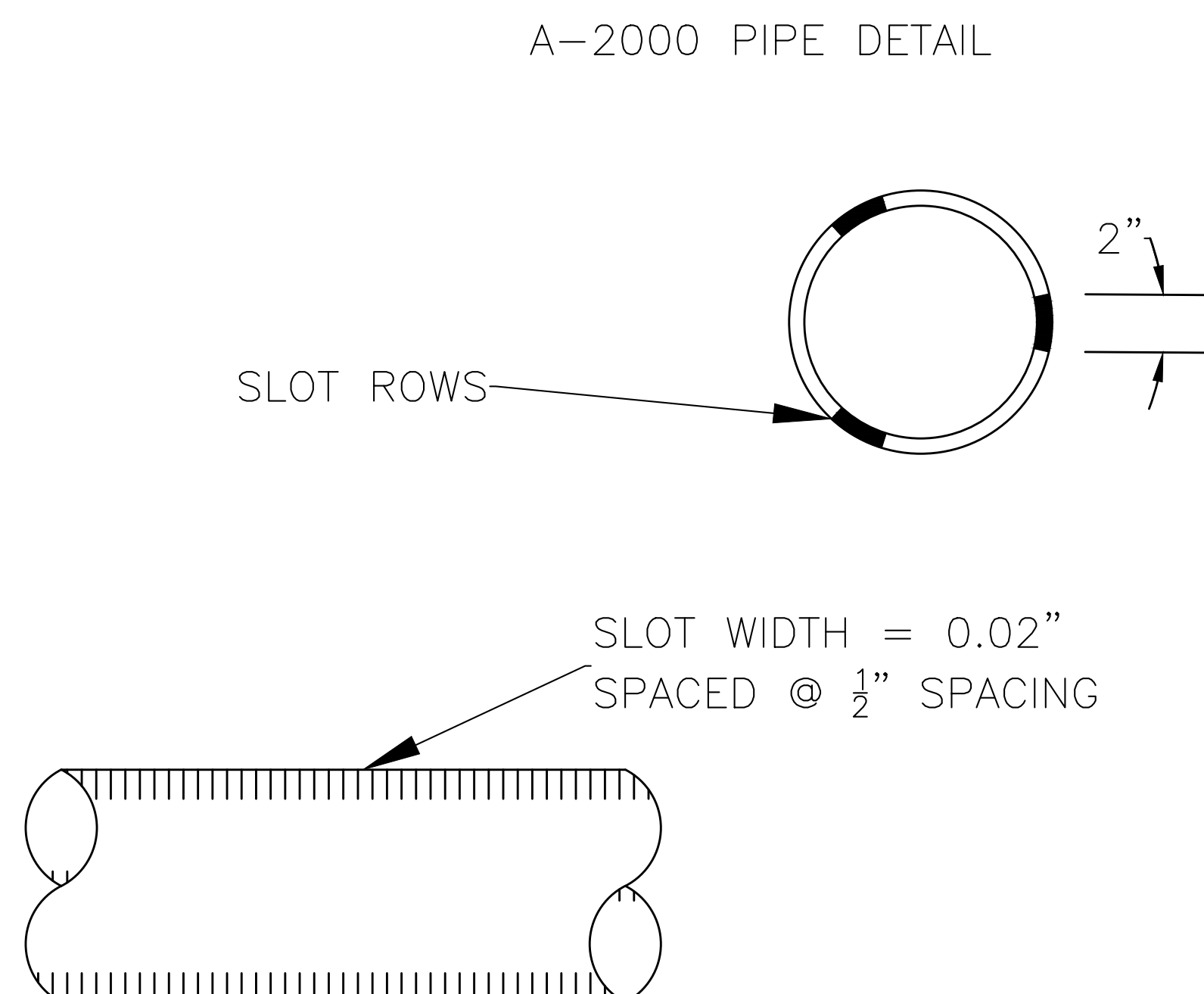
CONCRETE SAND SHALL BE COMPACTED WITH 4
PASSES OF A VIBRATING PLATE COMPACTOR.
SAND SHALL BE PLACED IN TWO LIFTS NO
THICKER THAN 12" PER LIFT.

DRAIN PIPE SPECIFICATIONS

1. PIPE SHALL BE A-2000 WITH GASKETED WATER TIGHT JOINT (OR APPROVED EQUAL).
2. PIPE SHALL BE SLOTTED AS FOLLOWS:
 - 2.1. THREE ROWS OF SLOTS
 - 2.2. SLOT WIDTH OF 0.02 INCHES
 - 2.3. SLOT LENGTH - 2"
 - 2.4. SLOT SPACING = 0.5"
3. PIPE SHALL BE INSTALLED PER MANUFACTURES RECOMMENATIONS.

BACKFILL DITCH NOTES

1. CONTRACTOR TO BACKFILL EXISTING DITCH
AT DOWNSTREAM TOE OF DAM WITH POSITIVE
GRADE AWAY FROM TOE.



Johnstown Reservoir Repair

Town Of Johnstown

[illegible]

Job #	20225
Date	7.1.21
Drawn By	KJS
Designed By	KJS
Checked By	JCY
File	JT-Johnstown Details
Scale	As Shown

Sheet: **10** Of: **15**

ISSUED FOR BID

Filing No. C-0625A

[illegible]

Job #	20225
Date	7.1.21
Drawn By	KJS
Designed By	KJS
Checked By	JCY
File	Outlet Tower Details.dwg
Scale	1" = 1'

Sheet: **11** Of: **15**

Johnstown Reservoir Repair

Town Of Johnstown



J&T Consulting, Inc.

ISSUED FOR BID

Filing No. C-0625A

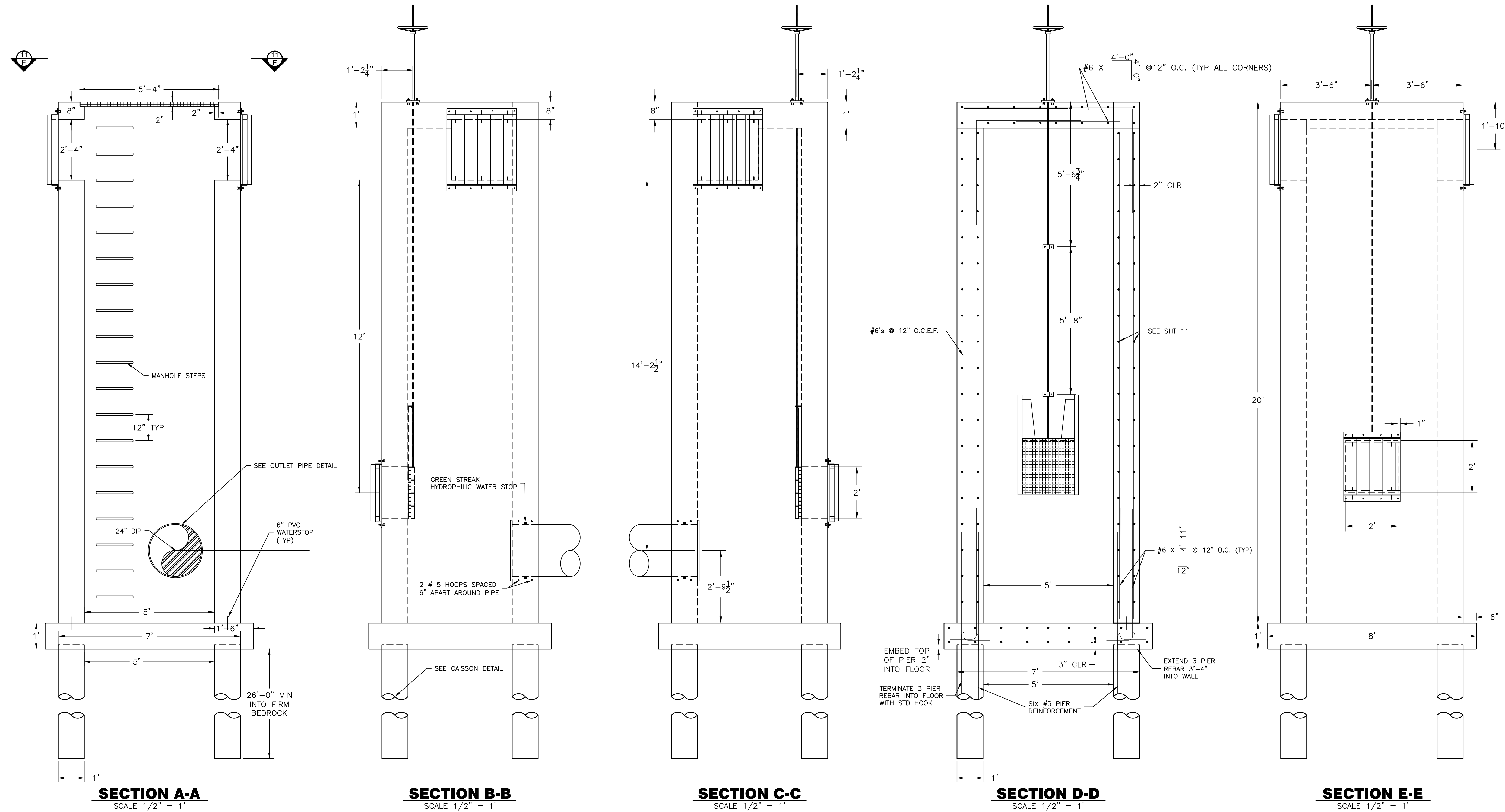
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Drawn By	KJS
Designed By	KJS
Checked By	JCY
File Outlet Tower Details.dwg	
Scale	As Shown

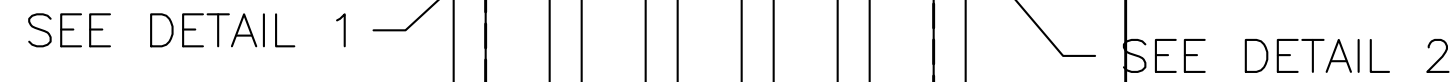
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ISSUED FOR BID

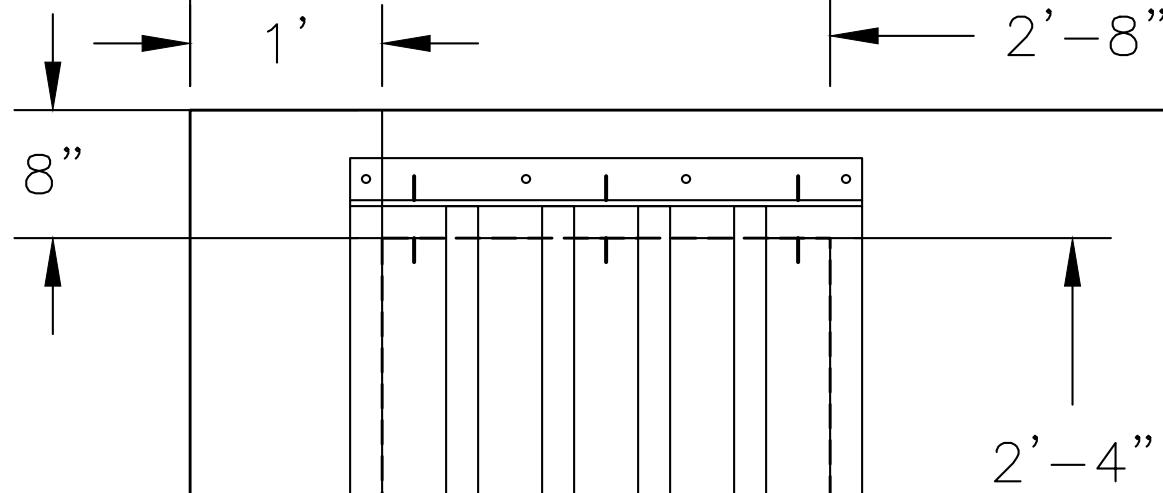
Filing No. C-0625A



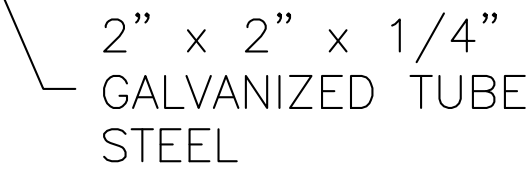
MINIMUM LAP SPLICE LENGTH AND STANDARD HOOK FOR HORIZONTAL AND VERTICAL BARS		
REBAR SIZE	MINIMUM LAP SPLICE LENGTH	STANDARD 90 DEGREE HOOK DIMENSION
#4	2'-8"	8"
#5	3-4"	10"
#6	4'-0"	12"



SCALE 1" = 1'



SCALE 1" = 1'



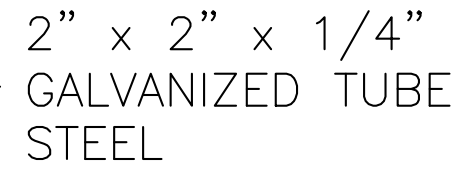
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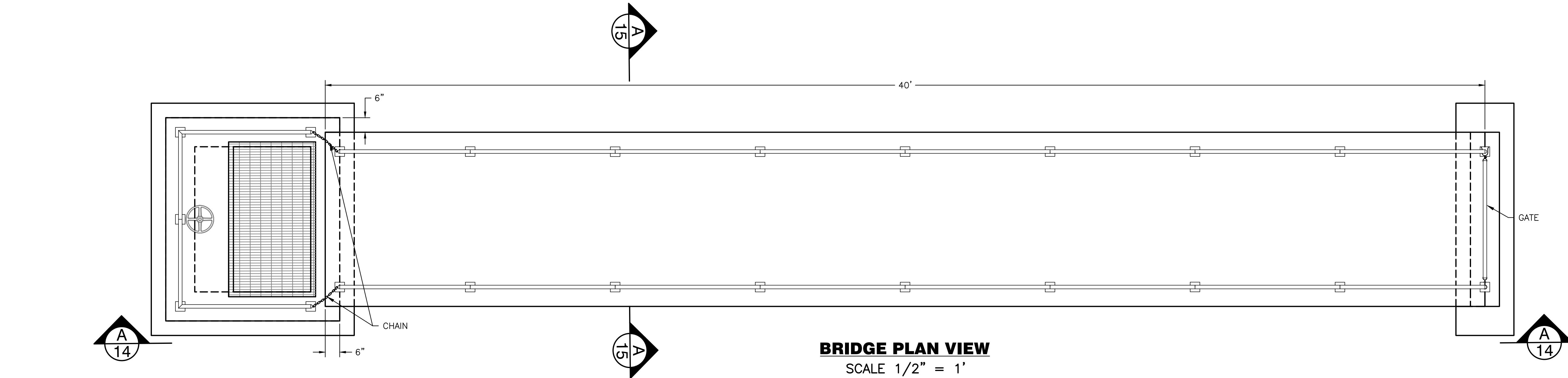


NOT TO SCALE



SCALE 1" = 1'

REVISIONS

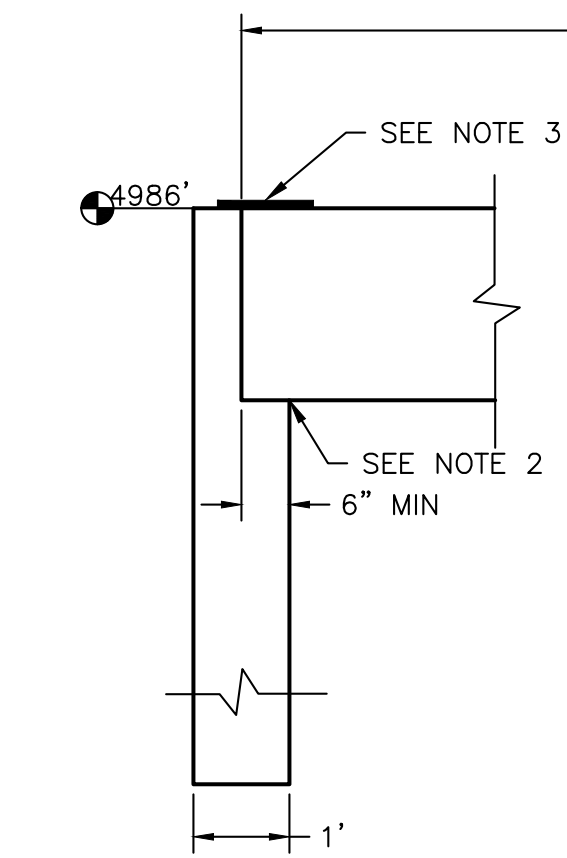


BRIDGE SECTION A-A
SCALE 1/2" = 1'

BRIDGE PLAN VIEW

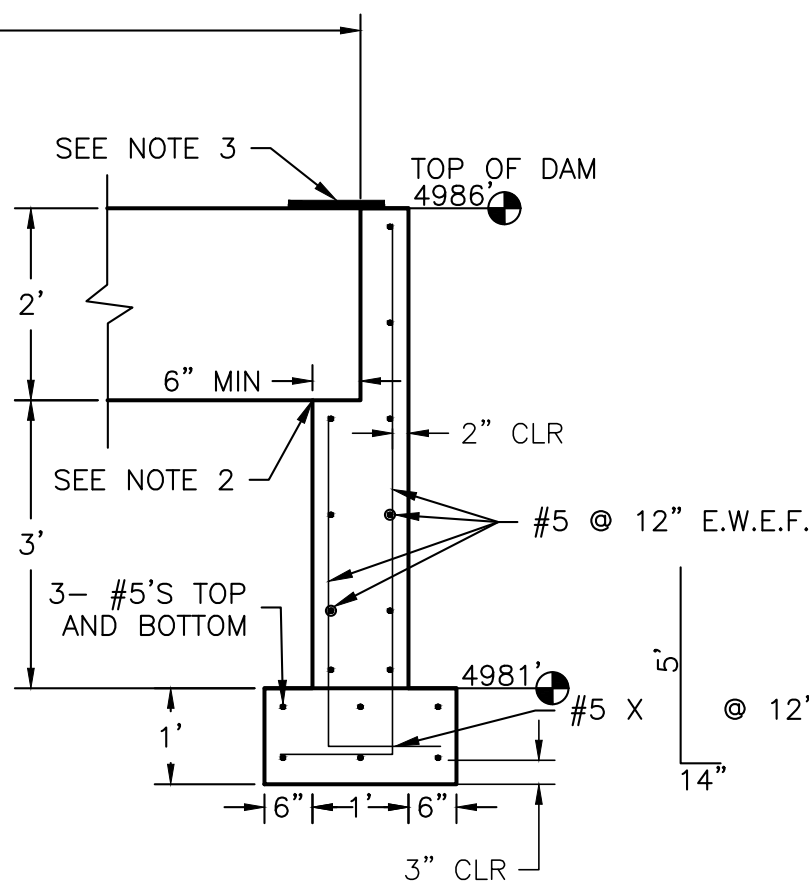
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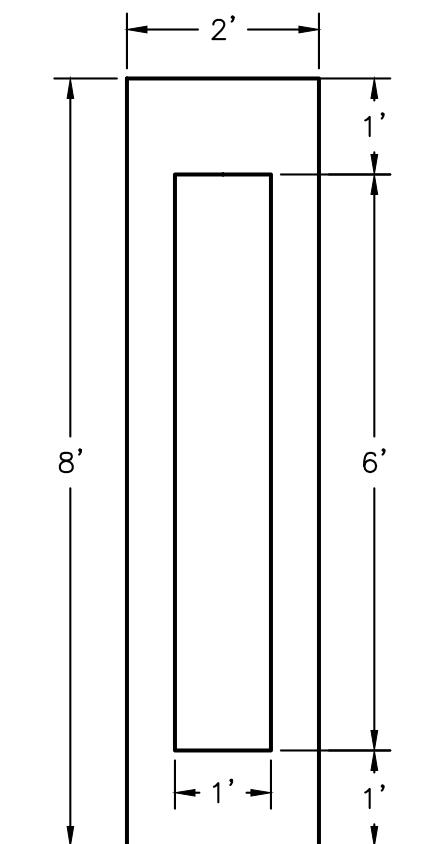


OUTLET TOWER

- NOTE:
1. TWIN TEE TO BE DESIGNED WITH 50 PSF LIVE LOAD.
 2. TWIN TEE SUPPLIER TO DESIGN CONNECTIONS FOR ATTACHING TWIN TEE TO OUTLET TOWER.
 3. 12" X 6" X 1/4" ALUMINUM PLATE ATTACHED TO ONE SIDE WITH 6 COUNTERSINK EXPANSION ANCHORS 1/4" X 2" (TYP @ EACH JOINT).

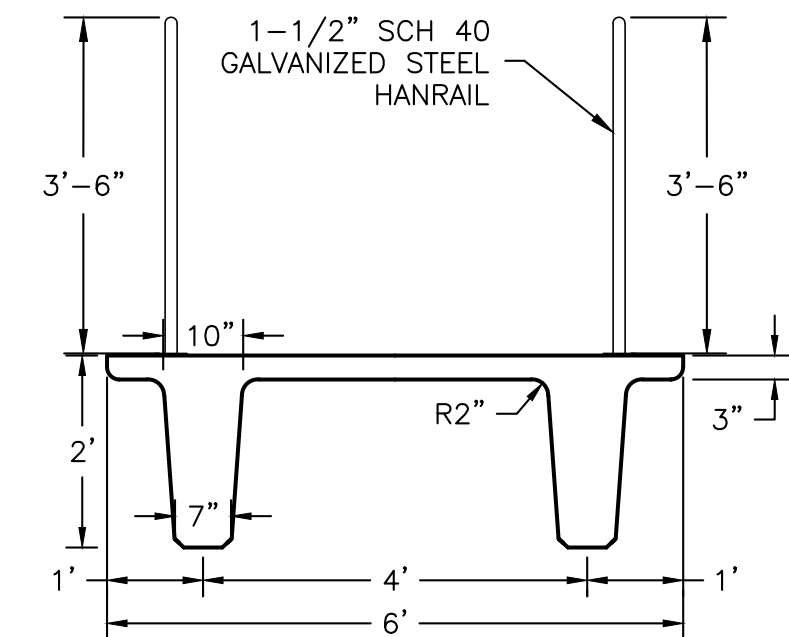


DAM FOOTER



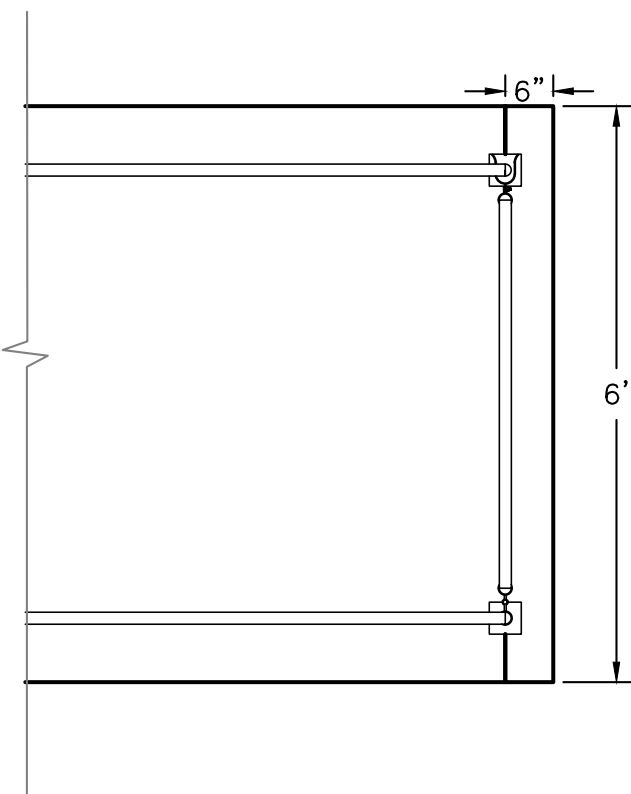
FOOTING PLAN

SCALE 1/2" = 1'



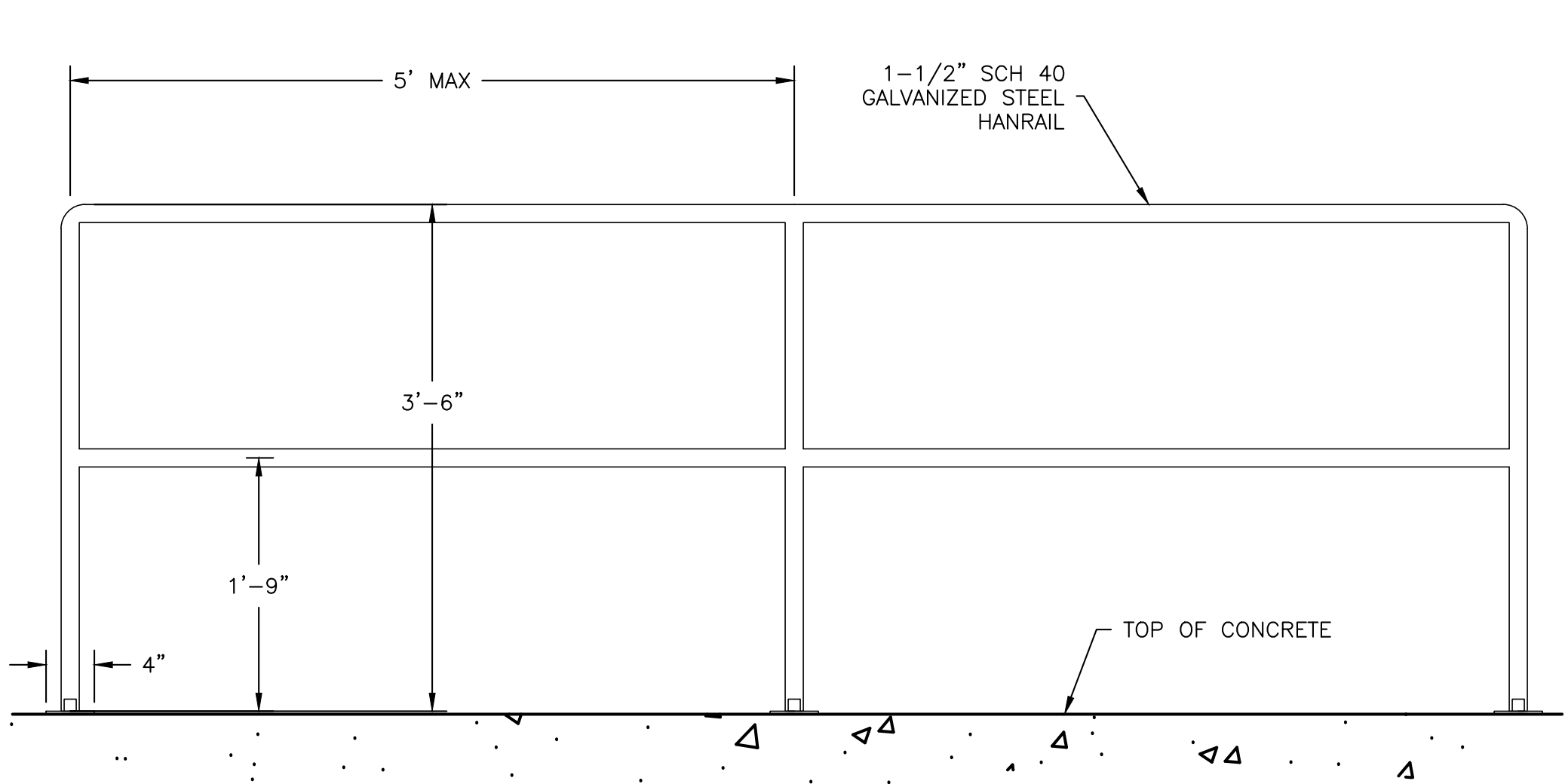
SECTION A-A
DOUBLE TEE BRIDGE
GIRDER CATWALK DETAIL

MAX STRESSING CAPACITY = 1240 k/stem
STANDARD STRAND = .6"Ø LOW RELAXATION



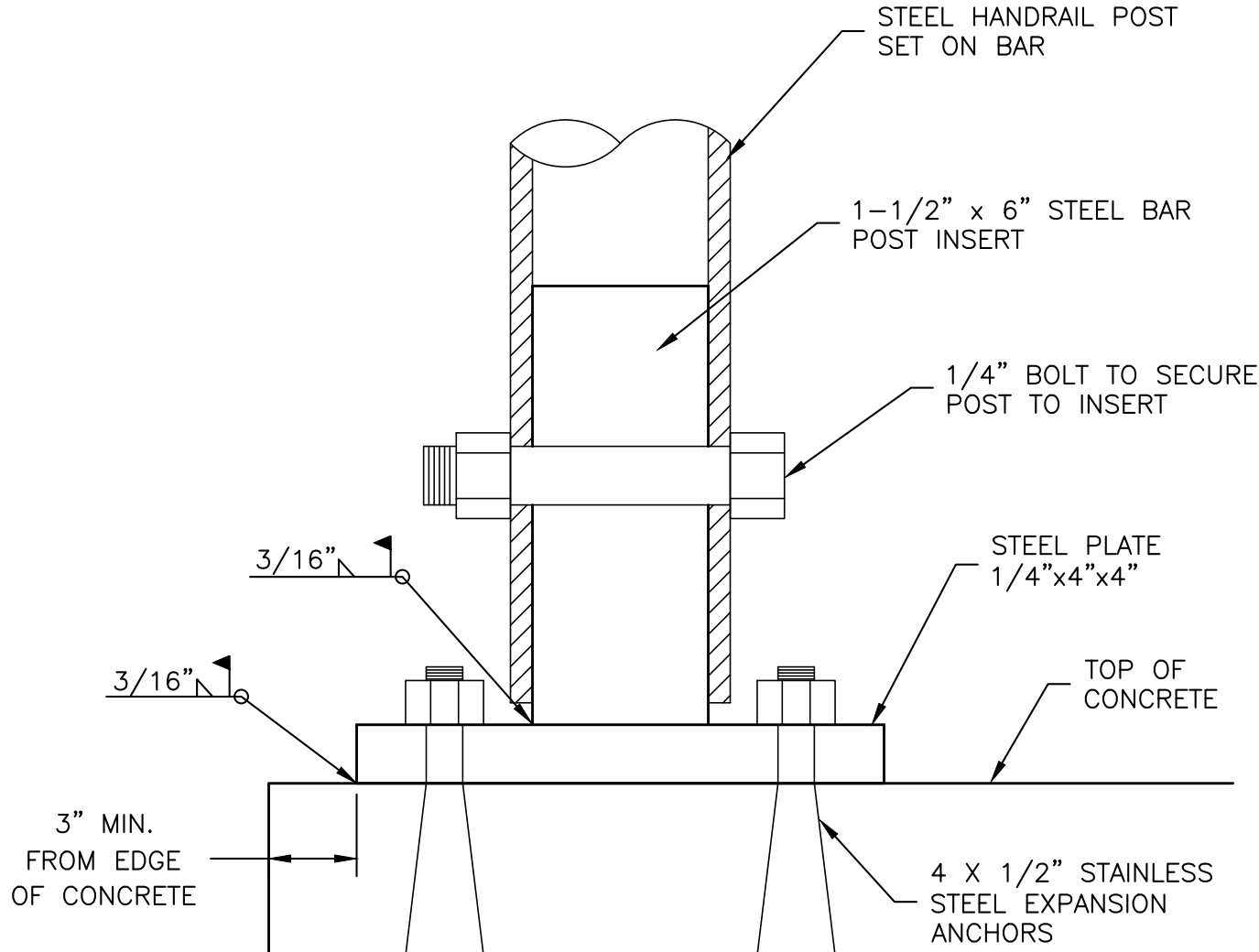
BRIDGE GATE DETAIL

SCALE 1/2" = 1'



TYPICAL HANDRAIL DETAIL

SCALE 1" = 1'



HANDRAIL POST DETAIL

NOT TO SCALE

ISSUED FOR BID

Job #	20225
Date	7.1.21
Drawn By	KJS
Designed By	KJS
Checked By	JCY
File	JT-Johnstown-Details
Scale	As Shown

Sheet: 15 of 15

Filing No. C-0625A

Johnstown Reservoir Repair

Town Of Johnstown

J&T Consulting, Inc.

305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.jtconsulting.com

Item #13.

Bridge Details 2

Project Manual ISSUED FOR BID

FOR
JOHNSTOWN RESERVOIR REPAIR
WELD COUNTY, COLORADO
DAM ID - 040132
CONSTRUCTION FILE NUMBER C-0625A

JULY, 2021

PREPARED FOR:



Johnstown
Colorado

450 S PARISH AVE.
JOHNSTOWN, CO 80534

PREPARED BY:



J&T Consulting, Inc.

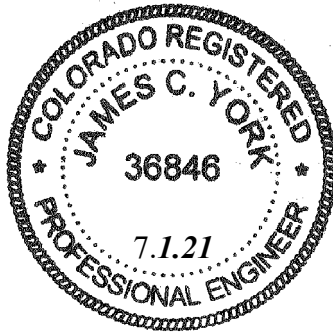
305 DENVER AVENUE – SUITE D
FORT LUPTON, CO 80621
PHONE: 303-857-6222
FAX: 303-857-6224

CERTIFICATION SHEET

JOHNSTOWN RESERVOIR REPAIR

WATER DIVISION 1, WATER DISTRICT 4
WELD COUNTY, COLORADO
DAM ID - 040132
SEO FILE NUMBER C-0625A

I hereby certify that these plans and specifications for the Johnstown Reservoir Repair were prepared under my direct supervision for the Owner thereof.



By: _____
James C. York, P.E. No 36846

Approved on this ____ day of _____, 20__.

By: _____
State Engineer

Bill McCormick, P.E.
Chief Dam Safety Branch
Colorado P.E. # 29127

SECTION 00 01 10

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00 45 13	Proposed Subcontractors Form
00 45 19	Noncollusion Affidavit of Prime Bidder

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00 72 00	Standard General Conditions of the Construction Contract
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00 01 10 - 1

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 32 91 19 Landscape Grading
 32 92 19 Seeding

DIVISION 33 – PIPE AND FITTINGS

33 11 13 Ductile Iron Pipe and Fittings

DIVISION 35 – WATERWAY AND MARINE CONSTRUCTION AND EQUIPMENT

35 20 16.26 Sluice Gates

GEOTECHNICAL EVALUATIONS

“Geotechnical Evaluation, Johnstown Reservoir Outlet Structure, Weld County, Colorado” by Cesare, Inc., dated February 19, 2021.

“Johnstown Reservoir Outlet Structure, Outlet Structure and Access Ramp Foundations, Addendum No. 1”, by Cesare, Inc., dated May 6, 2021.

END OF SECTION

00 01 10 - 2

SECTION 00 11 16

INVITATION TO BID

PDF copies of the bids should be submitted via email to J.C. York at jcyork@j-tconsulting.com by 4:00 P.M., local time, July 27, 2021, for the Johnstown Reservoir Repair project.

A Pre-Bid conference will be held via online meeting July 9, 2021 at 9:00 A.M. The conference is mandatory.

The work to be performed for the Johnstown Reservoir Repair Project generally consists of constructing a concrete outlet and spillway tower, a riprap lined emergency spillway, installing concrete manholes, removing and replacing an existing toe drain, grading around and within the reservoir, and various site improvements. The Town and the Engineer will be providing construction observations during construction. Construction material testing will be required and paid for by the Town.

All bids must be in accordance with the Contract Documents on file at the Town Hall, 450 South Parish Avenue, Johnstown, CO 80534.

Copies of the Contract Documents for use in preparing Bids may be obtained from: J&T Consulting, Inc., 305 Denver Avenue, Suite D, Fort Lupton, Colorado 80621. Please contact J.C. York, P.E. by phone at (303) 857-6222 or by e-mail at jcyork@j-tconsulting.com to receive a copy of the bid documents electronically at no charge.

Questions concerning the Contract Documents shall be directed in writing to J.C. York, P.E., at the above email address. Questions will be accepted until 5:00 P.M., July 23, 2021.

Bids will be received on a unit price basis. A Bid award is anticipated by August 6, 2021. and it is anticipated that execution of Contract Documents will be on or before August 20, 2021. Substantial Completion of the Work is required by January 31, 2022. Final Completion of the Work is required by March 2, 2022.

A Bid Bond and Performance and Payment Bonds will be required.

Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of Owner to make an award to that Bidder. Owner also reserves the right to waive informalities.

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered. The Issuing Office is as defined in the Invitation to Bid.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number and for the amount stated in the advertisement or invitation to bid may be obtained from the Issuing Office.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 Only Bidders that attended mandatory pre-bid conference shall be able to submit a bid.
- A. Each bid must contain evidence of Bidder's qualifications to do business in the state of Colorado, where the Project is located or covenant to obtain such qualifications prior to award of the contract.
- 3.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 4.01 Subsurface and Physical Conditions
- A. Geotechnical evaluation by Cesare, Inc. dated February 19, 2021.
- 4.02 Underground Facilities
- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data

furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.03 Hazardous Environmental Condition

A. No known Hazardous Environmental Condition(s) have been identified at this Site.

4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions.

4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

4.06 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;
- B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of geotechnical investigations and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions as containing reliable "technical data";
- E. consider the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;

- F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
 - G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
 - H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
 - I. determine that the Bidding Documents are sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.07 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – PRE-BID CONFERENCE

- 5.01 **A Pre-Bid Conference will be held via online meeting on July 9, 2021 at 9:00 A.M. local time.** Representatives of Owner and Engineer will be present to discuss the Project.
- 5.02 Bidders **are required to attend** and participate in the conference.
- 5.03 A site walk of the project will follow the Pre-Bid Conference for all interested Bidders.
- 5.04 Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 – SITE AND OTHER AREAS

- 6.01 The reservoir and associated improvements are identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. No questions received less than five days prior to the date for opening of Bids will be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed necessary by Owner or Engineer.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **five percent** of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within seven days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall not be Owner's exclusive remedy if Bidder defaults. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.
- 8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The dates by which the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or “or-equal” items. Whenever it is specified or described in the Bidding Documents that a substitute or “or-equal” item of material or equipment may be furnished or used by

Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

- 11.02 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 12 – PREPARATION OF BID

- 12.01 The Bid Form is included with the Project Manual.
- 12.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form.
- 12.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 12.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 12.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 12.06 A Bid by an individual shall show the Bidder's name and official address.
- 12.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 12.08 All names shall be printed in ink below the signatures.
- 12.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 12.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 13 – BASIS OF BID; COMPARISON OF BIDS

- 13.01 Sum of the unit prices
- A. Bidders shall submit a Bid filling in all unit price items as the basis as set forth in the Bid Form.

ARTICLE 14 – SUBMITTAL OF BID

- 14.01 With each copy of the Project Manual, a copy of the Bid Form is enclosed. The Bid Form shall be completed, with the Bid security, and all other forms including the proposed subcontractors form and non-collusion affidavit, shall be enclosed in an envelope as described below.
- 14.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Invitation to Bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation “BID ENCLOSED.” A mailed Bid shall be addressed to place as stipulated in the Invitation to Bid (P.O. Box for US Mail and street address for private mail carriers).

ARTICLE 15 – MODIFICATION AND WITHDRAWAL OF BID

- 15.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

ARTICLE 16 – OPENING OF BIDS

- 16.01 Bids will be opened at the time and place indicated in the Invitation to Bid. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.
- 18.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

- 18.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 18.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 18.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.
- 18.06 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

ARTICLE 19 – CONTRACT SECURITY AND INSURANCE

- 19.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 20 – SIGNING OF AGREEMENT

- 20.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 7 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

ARTICLE 21 – SALES AND USE TAXES

- 21.01 Owner is exempt from Colorado state sales and use taxes on materials and equipment to be incorporated in the Work.

ARTICLE 22 – RETAINAGE

- 22.01 Requirements for retainage are addressed in the Agreement.

END OF SECTION

00 21 13 - 7

SECTION 00 41 43

BID FORM

00 41 43 - 1

END OF SECTION

00 41 43 - 2



J&T Consulting, Inc.

Town of Johnstown

Johnstown Reservoir Repair

7/1/2021

BID FORM

© 2021 J&T Consulting, Inc.

Item #13.

Item Number	Description	Quantity	Unit	Unit Price	Total Price
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PHASE 1 ITEMS

General Items

1	Project Mobilization/Demobilization	1	LS		
2	Erosion Control	1	LS		
3	Dewatering Required to Complete the Project	1	LS		
4	Construction Staking	1	LS		
5	Clearing, Grubbing, Striping/Stockpiling/Replacing Topsoil	1	LS		
6	Site Restoration of all Disturbed Areas (final grading, seeding, mulching)	1	LS		
Phase 1 General Items Subtotal					

Reservoir Infrastructure

7	Embankment Excavation	4,115	CYD		
8	Embankment Backfill	3,935	CYD		
9	Remove and Dispose of Existing 16 in Clay Outlet Pipe and Concrete Vault	1	LS		
10	Concrete Outlet Tower Structure, Including Sluice Gate, Steel Grate, Trash Screens	1	LS		
11	40ft Precast Concrete Bridge, Including Footer, Connections and Appurtenances	1	LS		
12	1-1/2 in Diameter Galvanized Steel Handrail, Including all Appurtenances	99	LF		
13	Concrete Mud Mat	6	CYD		
14	24 in Restrained Joint, Concrete Encased, Ductile Iron Class 250 Outlet Pipe	91	LF		
15	4ft Diameter Concrete Flat-Top Manhole, Including Connection to Perforated Toe Drain Pipe.	1	LS		
16	4 ft Diameter Concrete Flat-Top Manhole, Including Connection to Existing RCP Pipe	1	LS		
17	Fill Around Manhole	33	CYD		
18	Remove and Replace Existing Toe Drain with 8" Contech A-2000 Perforated Toe Drain Pipe, Including No 8 or No 89 Aggregate Filter Gravel, and ASTM C-33 Concrete Sand Bedding	200	LF		
19	Utility Conflicts/Contingency - Additional requirements for modifying utilities not identified in drawings and/or for utility repair. Contractor to provide schedule of values and breakdown of required materials and labor for installation for review and approval before this allowance will be used.	1		\$45,000	\$45,000
Phase 1 Reservoir Infrastructure Subtotal					\$45,000

Phase 1 Total				
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J&T Consulting, Inc.

Town of Johnstown

Johnstown Reservoir Repair

7/1/2021

BID FORM

© 2021 J&T Consulting, Inc.

Item Number	Description	Quantity	Unit	Unit Price	Total Price
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PHASE 2 ITEMS (Additive Alternate)

General Items

1	Project Mobilization/Demobilization	1	LS		
2	Erosion Control	1	LS		
3	Construction Staking	1	LS		
4	Clearing, Grubbing, Striping/Stockpiling/Replacing Topsoil	1	LS		
5	Site Restoration of all Disturbed Areas (final grading, seeding, mulching)	1	LS		
Phase 2 General Items Subtotal					

Reservoir Infrastructure

6	Crest and Slope Fill, Bring Crest to Minimum 4986 Elevation All Around Reservoir	805	CYD		
7	6" Thick CDOT Class 6 Roadbase on Reservoir Crest	1,510	CYD		
8	18" Thick D50 = 9" Type L Soil Riprap on Emergency Spillway	615	CYD		
9	Utility Conflicts/Contingency - Additional requirements for modifying utilities not identified in drawings and/or for utility repair. Contractor to provide schedule of values and breakdown of required materials and labor for installation for review and approval before this allowance will be used.	1		\$10,000	\$10,000
Phase 2 Reservoir Infrastructure Subtotal					

Phase 2 Total					
---------------	--	--	--	--	--

SECTION 00 43 13

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address):*

SURETY *(Name and Address of Principal Place of Business):*

OWNER *(Name and Address):*

BID

Bid Due Date:

Description *(Project Name and Include Location):*

BOND

Bond Number:

Date *(Not earlier than Bid due date):*

Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER**SURETY**

Bidder's Name and Corporate Seal (Seal) _____
Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

00 43 13 - 1

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00 45 13
PROPOSED SUBCONTRACTORS FORM

LIST OF SUBCONTRACTORS

Herewith is the list of subcontractors referenced in the bid submitted by:

(Bidder)

To: (Owner) Town of Johnstown

Dated and which is an integral part of the Bid Form.

The following work will be performed (or provided) by subcontractors and coordinated by us:

WORK SUBJECT	NAME

END OF SECTION

00 45 13 - 1

SECTION 00 45 19

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF _____
COUNTY OF _____

_____, being first duly sworn, deposes and says that:

- (1) He is the _____ of _____, the Bidder that has submitted the attached Bid;
- (2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
- (3) Such Bid is genuine and is not a collusive or sham bid;
- (4) Neither the said Bidder nor any of its officers, partner, owners agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, or to fix any overhead, profit or cost element of the bid price or the bid price of any other Bidder, or to secure through the collusion, conspiracy, connivance or unlawful agreement any advantage against the Town of Johnstown or persons interested in the proposed Contract; and
- (5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Signed:

Subscribed and sworn to before me this ____ day of _____, 20__, by
_____, as
(Affiant)
_____, of _____, a
(title) (Bidder)
_____, organized pursuant to
(corporation or partnership)
the laws of the State of _____.

Notary Public

My Commission Expires _____

00 45 19 - 1

SECTION 00 51 00

NOTICE OF AWARD

TO: NAME
 ADDRESS
 ADDRESS CONTINUED

DATE: _____

Town of Johnstown
 Johnstown Reservoir Repair Project

The Town has considered the Bid submitted by you for the above described Work in response to its Request for Bids dated _____, and Instructions to Bidders.

You are hereby notified that your Bid has been accepted for Work in the amount or amounts shown on your Bid Proposal and Bid Schedule.

You are required by the Instructions to Bidders to execute the Contract and furnish the Performance Bond, the Payment Bond, certificates of insurance, and other documentation within 10 calendar days from the date of this notice.

If you fail to execute said Contract and to furnish said Bonds within 7 calendar days from the date of this Notice, the Town will be entitled to consider all your rights arising out of the Town's acceptance of your Bid as abandoned and as a forfeiture of your Bid Security as liquidated damages, and not as a penalty, for the delay and extra work caused thereby and also to compensate the Town for the difference between your bid and the next lowest bid. The Town will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Town.

Insurance certificates required for this Project shall be sent to Town of Johnstown, Attention: NAME, 450 South Parish Avenue, Johnstown, Colorado 80534.

TOWN OF JOHNSTOWN

By: _____

Title: _____

Attest: _____

ACKNOWLEDGEMENT OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by Contractor.

By: _____ Date: _____

 Title

00 51 00 - 1

SECTION 00 52 43

AGREEMENT

THIS AGREEMENT, entered into as of the ____ day of DATE, by and between the Town of Johnstown, hereinafter called "Owner" and _____, hereinafter called "Contractor." This Construction Agreement is referred to herein as either the "Agreement" or the "Contract".

In consideration of the mutual covenants and obligations hereinafter set forth, it is agreed by and between the parties hereto as follows:

Article 1. Contract Documents. The contract documents consist of this Agreement, exhibits to this Agreement, the conditions of the Contract (General, Supplementary, and other conditions), the drawings consisting of ____ sheets, specifications, Notice of Award, Notice to Proceed, Contractor's Bid, and all addenda issued prior to, and all modifications issued after execution of this Agreement. These form the Contract, and all are as fully a part of the Contract as if attached to this Agreement.

Article 2. Contractor's Representations.

In order to induce Owner to enter into this Contract, Contractor makes the following representations:

- a. Contractor has familiarized itself with the nature and extent of the Contract Documents, work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the work.
- b. Contractor has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect to said Underground Facilities are or will be required by Contractor in order to perform and furnish the work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Section 4.03 of the General Conditions.
- c. Contractor has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- d. Contractor has given Owner written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by Owner is acceptable to Contractor.

Article 3. Assignment. It is understood that the Owner enters into this Agreement based on the special abilities and representations of the Contractor and that this Agreement shall be considered as an agreement for personal services. Accordingly, the Contractor shall neither assign any responsibilities, nor delegate any duties arising under this Agreement without the prior written consent of the Owner.

Article 4. Scope of Work. Contractor shall provide all necessary labor, supervision, equipment, tools, and materials. Contractor acknowledges it has reviewed and agrees to comply with the performance of this Agreement. The work is generally described as follows:

Traffic control, erosion control, dewatering, construction staking, vacuum truck / probe potholing, clearing/grubbing/stripping/stockpiling, excavation, fill, grading, hauling, riprap and bedding, concrete structures and foundations, sluice gates and operators, hand rails, pipelines, ductile iron and pvc pipelines and fittings, valves, vaults, manholes, duct banks, and equipment, fencing, and restoration of disturbed areas.

Article 5. Time of Completion. Contractor shall begin work within seven (7) days after notice to proceed and agrees to substantially complete all work within 90 calendar days following the notice to proceed. Final completion is required 30 days after substantial completion. Any extensions of the time limit set forth above must be agreed upon in writing by the parties hereto. Weather days that result in no work being performed by the Contractor will be added to the 90 calendar days. Weather days shall be agreed to by Owner or Engineer and shall be acknowledged in writing.

Liquidated Damages. The Town and the Contractor recognize that time is of the essence in this Contract and that the Town will suffer financial loss if the Work is not substantially completed within the time specified in paragraph above, plus any extensions thereof allowed by the Town by written Change Order. They also recognize the delays, expense, and difficulties involved in proving, in a legal proceeding, the actual loss suffered by the Town if the Work is not substantially complete on time. Accordingly, rather than requiring any such proof, the Town and the Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the Town One Thousand Dollars (\$1,000.00) for each day that expires after the time specified in the Time of Completion paragraph until the Work is complete. It is agreed that this is a reasonable estimate of the damages likely to be suffered by the Town for late completion of the Work. If the Contractor shall fail to pay such liquidated damages promptly upon demand therefor, the Surety on the Performance Bond shall pay such damages. Also, the Town may withhold all, or any part of, such liquidated damages from any payment due the Contractor.

Delay Related Damages. The parties recognize and agree that in the event the Contractor does not timely achieve substantial completion on the Project the "Owner" will suffer actual and consequential damages. These damages may include, but are not limited to, interest on construction loans, additional engineering and construction observation fees, and fines from the State of Colorado. Contractor agrees that it shall be liable for Owner's actual and consequential damages as a result of late completion and that the Owner shall have the right to withhold payment to Contractor to the extent of Owner's potential liability for damages as a result of Contractor's late completion. This provision shall supersede and govern over any other conflicting term or provision in the contract documents.

Article 6. Contract Sum. The Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the unit price basis at the rates for the respective items on the Bid Schedule, attached as "Exhibit A". The total amount of the individual work items shall be: \$.

Article 7. Payment Procedures. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Owner as provide in Article 14 of the General Conditions.

- a. Progress Payments. All progress payments will be on the basis of the progress of the Work as established in the Section 2.07 of the General Conditions and in the case of Unit Price Work, based on the number of units completed.
- b. Retainage. Owner shall retain from progress payments, until payment is due under the terms and conditions governing final payments, amounts as follows:
 - (1) Retention of five percent (5%) of payments authorized until the Work is complete.
 - (2) Upon completion and acceptance of the Work, all retained amounts will be released to Contractor under the terms and conditions governing final payment. Consent of the Surety shall be obtained before retainage is paid by Owner. Consent of the Surety, signed by an agent, must be accompanied by a certified copy of such agent's authority to act for the Surety.
 - (3) Retainage shall apply to materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing upon which Contractor requests progress payment.
 - (4) Retainage withheld by the Owner shall not be subject to substitution by the Contractor with securities or any arrangements involving an escrow or custodianship therefore.

Article 8. Hazardous Materials. The parties shall deal with hazardous materials and environmental conditions at the work site in accordance with Section 4.06 of the General Conditions.

Article 9. Performance Guarantee.

- a. The Contractor shall fully and faithfully comply with all terms of this Contract for the Work described herein and hereby guarantees the workmanship and materials for a period of two years, commencing on the date of the Owner and Town's final acceptance of the Work. Contractor agrees to repair or replace, any workmanship or materials that become defective, within said two year period, even though notice thereof may be given by the Owner after said two year period. Repairs or replacement shall be at the Contractor's sole cost and expense. The necessity of repairs or replacement is at the sole determination of the Owner.
- b. The Contractor shall fully and faithfully discharge the Contractor's obligation with respect to the Work during the installation and construction period and with respect to those that may arise as a result of the Contractor's two year guaranty.
- c. The performance and completion of the warranty work are to be further guaranteed by Performance, Payment and Guarantee Bonds in an amount at least equal to the Contract Price, in the form and substance attached herewith.

Article 10. Owner's Representative. The Resident Project Representative (RPR) will be Owner's employee or agent at the Site, will act as directed by and under the supervision of the Owner,

and will confer with Engineer regarding RPR's actions in accordance with the Supplementary Conditions, Article 9.

Article 11. Notice. Any notice to be sent pursuant to this Agreement shall be deemed delivered if mailed to the other party at the following addresses. Any such notice shall be sent certified or registered mail, return receipt requested, postage prepaid.

Contractor	:	COMPANY NAME ADDRESS ADDRESS CONTINUED
Engineer:		J.C. York, P.E. J&T Consulting, Inc. 305 Denver Avenue, Suite D Fort Lupton, CO 80621
Owner:		NAME, TITLE Town of Johnstown 450 South Parish Avenue Johnstown, CO 80534

Article 12. Colorado Labor Preference. In accordance with C.R.S. § 8-17-101, et. seq., Colorado labor shall be employed to perform the work as provided by law.

Article 13. Bid Preference - Public Projects. In accordance with C.R.S. § 8-19-101, et. seq., Colorado resident bidders shall be allowed a preference against a nonresident bidder from a state or foreign country equal to the preference given are required by the state or foreign country in which the nonresident bidder is a resident to perform the work as provided by law.

Article 14. Discrimination and Affirmative Action. The Contractor agrees to comply with the letter and spirit of all applicable state and federal laws respecting discrimination and unfair employment practices

Article 15. Bribery and Corrupt Influences; Abuse of Public Office. The signatories hereto aver that they are familiar with C.R.S. § 18-8-301, et. seq. (Bribery and Corrupt Influences) and C.R.S. § 18-8-401, et. seq., (Abuse of Public Office), and that no violation of such provisions is present.

Article 16. Illegal Aliens.

- a. The Contractor shall not knowingly employ or contract with an illegal alien to perform work under this Contract. The Contractor certifies that:
 - (1) Contractor does not knowingly employ or contract with any illegal aliens;
 - (2) Contractor has confirmed or attempted to confirm the employment eligibility of all employees who are newly hired for employment in the United State; and
 - (3) Contractor shall not enter into a contract with a subcontractor that fails to certify

00 52 43 - 4

to the Contractor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this Contract.

- b. The Contractor shall comply with all reasonable requests made in the course of an investigation by the Colorado Department of Labor and Employment.
- c. If the Contractor fails to comply with any requirement of this provision, the Owner may terminate this Contract for cause and the Contractor shall be liable for actual and consequential damages to the State.
- d. A Contractor that operates as a sole proprietor hereby swears or affirms under penalty of perjury that the Contractor:
 - (1) Is a citizen of the United States or otherwise lawfully present in the United States pursuant to federal law; and shall produce proper identification prior to the effective date of this Contract.

Article 17. Binding on Successors. Except as herein otherwise provided, this Contract shall inure to the benefit of and be binding upon the parties, or any subcontractors hereto, and their respective successors and assigns in respect of all covenants, agreements and obligations contained in the Contract Documents.

Article 18. Attorney Fees. DELETED.

Article 19. Survival of Certain Contract Terms. Notwithstanding anything herein to the contrary, the parties understand and agree that all terms and conditions of this Contract and the exhibits and attachments hereto which may require continued performance or compliance beyond the termination date of the Contract shall survive such termination date and shall be enforceable by the Owner as provided herein in the event of such failure to perform or comply by the Contractor or its subcontractors.

Article 20. Complete Agreement. This Agreement constitutes the sole agreement between the parties concerning the subject matter hereunder and all prior negotiations, representations, understandings or agreements concerning the subject matter hereunder are hereby canceled. No modification, change or alteration of the Agreement shall be of any legal force or effect unless in writing, signed by all the parties hereto.

Article 21. Compliance with Applicable Laws. At all times during the performance of this Contract, the Contractor shall strictly adhere to all applicable Federal and State laws that have been or may hereafter be established.

Article 22. Venue, Governing Law. The venue in any and all legal actions regarding or arising out of the Agreement covered herein shall be solely in the district court in and for the COUNTY OF WELD, State of Colorado. This Agreement shall be governed by the laws of the State of Colorado.

Article 23. Partial Invalidity. If any provision of this Agreement are in violation of any statute or rule of law of the State of Colorado, then such provision shall be deemed null and void to the extent that they may be violative of law, but without invalidating the remaining provisions hereof.

Article 24. Original Counterparts. This Agreement may be executed in counterparts, each of which will be an original, but all of which together shall constitute one and the same instrument. This Contract is to be executed in quadruplicate.

Article 25. OSHA Requirements. Contractor agree that it alone bears the responsibility for providing a safe and healthy work environment and shall provide its employees with adequate orientation and training to safely perform the scope of work set forth in this contract. Contractor shall at all times comply with the safety and health regulations of the Occupational Safety and Health Act of 1970 (29CFR 1926) including all amendments and modifications thereto. In the event there is a conflict between the safety and health provisions of federal, state and local regulations, the more stringent provision shall prevail. Contractor acknowledges and agrees that with respect to the scope of work under this contract, it shall comply with all obligations and assume all responsibilities imposed upon the “controlling contractor” as such term is defined and construed under all OSHA rules and regulations. The Contractor shall adhere to all federal, state and local safety and health regulations, laws and ordinances.

Article 26. No Waiver of Governmental Immunity. The Owner, Town of Johnstown, its elected officials, officers and employees are relying upon, and do not waive or intend to waive by any provision in this Agreement, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, C.R.S. Sec. 24-10-101 et seq. as amended or otherwise available to the Town. Nothing herein shall operate as a waiver of any right the Town of Johnstown has of governmental immunity under Colorado law which is specifically herein reserved.

Article 27. Independent Contractor. Contractor is a separate, legal entity from the Town of Johnstown and the parties make this Agreement accordingly with the understanding that Contractor at all times is acting as an independent contractor and not an employee or agent of the Town. All persons retained by Contractor to perform services pursuant to this Agreement shall be employees or independent contractors of Contractor and are not employees, contractors or agents of the Town. Contractor does not have the authority to bind the Town of Johnstown by contract or otherwise.

Article 28. Indemnification by Contractor. Contractor shall defend, indemnify and hold the Town of Johnstown harmless from any damages, including but not limited to any loss, liability, expenses, suit or claim, or claim for injury to persons, or damage to property arising out of the activities of the Contractor or its subcontractors pursuant to this Agreement. Expenses shall include all out of pocket expenses, attorney fees, expert costs and related litigation fees.

Article 29. Approval required. This Agreement is subject to the final approval of the Johnstown Town Council and signature by the Mayor of Johnstown.

Article 30. Miscellaneous.

- a. Terms used in this Contract which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

IN WITNESS WHEREOF, the parties hereto have executed this Contract the day and year first above

00 52 43 - 6

written.

TOWN OF JOHNSTOWN

CONTRACTOR

Mayor

Title: _____

ATTEST: _____

Town Clerk

ATTEST: _____

Corporate Secretary

STATE OF COLORADO)

)ss.

COUNTY OF

)

The foregoing instrument was acknowledged before me this ____ day of _____, 2021
by _____ as Mayor and _____ as Town Clerk of the Town of Johnstown.

My commission expires:

Witness my hand and official seal.

Notary Public

00 52 43 - 7

SECTION 00 55 00

NOTICE TO PROCEED

TO: .
(Contractor)

Date: _____, 2021

Project:
Johnstown Reservoir Repair Project
Town of Johnstown

(Address)

You are hereby notified to commence work in accordance with the Contract dated_____, 2021, on or before _____, 2021, and you are to substantially complete the work within 90 consecutive calendar days thereafter. The date of final completion of all work is 30 calendar days after substantial completion and therefore March 2, 2022. The Bid Security submitted with your proposal is herewith returned to you.

TOWN OF JOHNSTOWN

By: _____

Title: _____

Address: 450 South Parish Avenue
Johnstown, CO 80534
Telephone: (970) 587-4664

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by

_____, (Contractor)

this the _____ day of _____, 2021.

By: _____

Title: _____

Telephone: _____

00 55 00 - 1

SECTION 00 61 13

PERFORMANCE AND PAYMENT BOND FORMS

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____
 _____ ("Principal") and _____
 _____ ("Surety"), hereby jointly and severally bind ourselves, our respective
 heirs, executors, administrators, successors and assigns, to pay the Town of Johnstown, State of Colorado
 ("Owner") the sum of _____
 _____ Dollars (\$ _____), in United States currency.

WHEREAS, Principal has, by means of a written agreement dated _____,
 entered into a contract with Owner for the construction of Johnstown Reservoir Repair Project, Town of
 Johnstown, which contract is by reference made a part hereof the same as though fully set forth herein
 (the "Contract");

NOW, THEREFORE, the conditions of this obligation are as follows:

FIRST. Principal shall: (1) faithfully perform each and every term and condition of said Contract
 on Principal's part; (2) fully indemnify and save harmless the Owner from all costs and damages which
 Owner may suffer by reason of Principal's failure to do so; and (3) fully reimburse and repay Owner all
 outlay and expenses which Owner may incur in making good any default.

SECOND. For a period of two years from Owner's final acceptance of the work performed
 pursuant to said Contract, the material furnished and used and the workmanship employed in the
 construction of the improvements described in the Contract shall be free from all defects. The Principal
 shall make such repairs as required to remedy any defects of which the Owner has given the Principal
 written notice prior to the expiration of the one-year warranty period hereby provided.

THIRD. Provided the Owner has given written notice to the Principal of defects in the Principal's
 performance of the Contract prior to the expiration of the two-year warranty period provided for above,
 this bond will remain in effect until defects have been remedied in accordance with the Owner's plans and
 specifications to the Owner's satisfaction.

FOURTH. If Principal or any of Principal's subcontractors fail to duly pay for any labor,
 materials, team hire, sustenance, provisions, provender, or other supplies used or consumed by Principal
 or Principal's subcontractor in performance of the Contract, or fails to pay any person who supplies rental
 machinery, tools, or equipment, in the prosecution of the Contract, Surety will pay the same in an amount
 not exceeding the sum specified in this bond together with interest at the rate allowed by statute.

FIFTH. The Owner shall not be joined in any action against the Principal or Surety on this bond
 to enforce payment for amounts lawfully due from the Principal or Principal's subcontractors for work
 performed under the Contract, nor shall the Owner be liable for the payment of any costs or expenses of
 such action.

SIXTH. In addition to all other conditions hereof, this bond includes all provisions set forth in section 38-26-106, Colorado Revised Statutes.

If all the above conditions are fully satisfied, this obligation shall be null and void; otherwise it shall remain in full force and effect.

For value received, Surety further agrees that, any Contract provision to the contrary notwithstanding, Surety's obligations hereunder shall not be affected in any way by any of the following and expressly waives notice of the same:

1. Any extension of time granted to Principal in which to perform the Contract.
2. Any change in the Plans, Drawings, Specifications, Contract or other Contract Documents.

An action on the performance provisions of this bond may be brought by the Owner or any person entitled to the benefits of this bond within five years from the time the cause of action arises.

Principal and Surety are jointly and severally liable under the provisions hereof and actions against either or both may proceed without prior action against the other, and both may be joined in one action.

SIGNED AND SEALED THIS _____ day of _____, 2021.

PRINCIPAL

SURETY

(Name of Company)

(Name of Company)

By: _____

By: _____

Address:

Address:

00 61 13 - 2

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____
 _____ ("Principal"), and _____
 _____ ("Surety"), hereby bind ourselves, our respective heirs,
 executors, administrators, successors and assigns jointly and severally to pay the Town of Johnstown,
 State of Colorado ("Owner"), the sum of _____
 _____ Dollars (\$ _____), in United States currency.

WHEREAS, the Principal has, by means of a written agreement dated _____,
 entered into a contract with the Owner for the construction of Johnstown Reservoir Repair Project, Town
 of Johnstown which contract is by reference made a part hereof the same as though fully set forth herein
 ("Contract");

NOW, THEREFORE, the conditions of this obligation are as follows:

FIRST. The principal shall at all times promptly make payments of all amounts lawfully due to
 all persons supplying or furnishing him or his subcontractors with labor, materials, rental machinery,
 tools, or equipment used or performed in the prosecution of the Contract and, further, shall indemnify and
 save harmless the Owner to the extent of any payments in connection with the carrying out of any such
 contract which the Owner may be required to make under the law.

SECOND. If the Principal or its subcontractor fails to duly make such payments, the Surety shall
 pay the same together with interest at the rate allowed by statute.

THIRD. The Owner shall not be joined in any action by a claimant against the Principal and the
 Surety on this bond nor shall the Owner be liable for payment of any costs or expenses of such suit.

FOURTH. In addition to all other conditions hereof, this bond includes all provisions set forth in
 section 38-26-105, Colorado Revised Statutes.

If these conditions are fully satisfied, this obligation shall be null and void; otherwise it shall
 remain in full force and effect.

For value received, Surety further agrees that, any Contract to the contrary notwithstanding,
 Surety's obligations hereunder shall not be affected in any way by any of the following and expressly
 waives notice of the same:

1. Any extension of time granted to Principal in which to perform the Contract.
2. Any change in the Plans, Drawings, Specifications, Contract or other Contract Documents.

An action on the payment provisions of this bond may be brought by the Owner or any person
 entitled to the benefits of this bond at any time within five years from date of final settlement of the
 Contract.

Principal and Surety are jointly and severally liable under the provisions hereof and actions

00 61 13 - 3

against either or both may proceed without prior action against the other, and both may be joined in one action.

SIGNED AND SEALED THIS _____ day of _____, 2021.

IN PRESENCE OF:

Principal

By: _____
(Name) (Title)

ATTEST: (As to Corporation)

Secretary

(CORPORATE SEAL)

Surety

By: _____
Attorney-in-fact

COUNTERSIGNED:

Give local address and phone
number:

()Resident Agent

Print Name

Street Address

City and State

(SEAL OF SURETY)

00 61 13 - 4

No. _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

Description:

Attachments:

Engineer:	
-----------	--

Receipt Acknowledged by Contractor: _____ **Date:** _____

736

Change Order Form

Change Order**No. _____**

Date of Issuance:

Effective Date:

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

Attachments (list documents supporting change):**CHANGE IN CONTRACT PRICE:****CHANGE IN CONTRACT TIMES:**

Original Contract Price:

\$ _____

[Increase] [Decrease] from previously approved
Change Orders No. _____ to No. _____:

\$ _____

Contract Price prior to this Change Order:

\$ _____

[Increase] [Decrease] of this Change Order:

\$ _____

Contract Price incorporating this Change Order:

\$ _____

Original Contract Times: ☐ Working days ☐ Calendar days

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

[Increase] [Decrease] from previously approved Change Orders No.
_____ to No. _____:

Substantial completion (days): _____

Ready for final payment (days): _____

Contract Times prior to this Change Order:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

[Increase] [Decrease] of this Change Order:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

Contract Times with all approved Change Orders:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

RECOMMENDED:

By: _____

Engineer (Authorized Signature)

Date: _____

Approved by Funding Agency (if applicable):

ACCEPTED:

By: _____

Owner (Authorized Signature)

Date: _____

ACCEPTED:

By: _____

Contractor (Authorized)

Date: _____

Date: _____

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of

the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the

Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

- 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
- 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

- 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
- 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
- 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

- 1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
- 2. is of such a nature as to require a change in the Contract Documents; or
- 3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments*:

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to

permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 - 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
 - 1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners,

employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of

them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or

entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its

use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner

and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas:

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts

any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.

- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

- 1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
- 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
- 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

- 1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
- 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the

Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
4. use or occupancy of the Work or any part thereof by Owner;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
6. any inspection, test, or approval by others; or
7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe

access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER’S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner’s duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner’s identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner’s responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner’s responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner’s Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws

and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations

on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of,

and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of

executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 - 1. deny the Claim in whole or in part;
 - 2. approve the Claim; or
 - 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in

the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,

architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's

review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

- 1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
- 2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
- 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 Contractor's Warranty of Title

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and

- d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 Final Completion Delayed

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- #### A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
3. Contractor's repeated disregard of the authority of Engineer; or
4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other

dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process; or
3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

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SUPPLEMENTARY CONDITIONS

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SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2007 Edition). All provisions which are not so amended or supplemented remain in full force and effect. These Supplemental Conditions supersede the General Conditions.

The terms used in these Supplementary conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS

SC-1.01A.19 Add the following sentence at the end of Paragraph 1.01.A.19:

The title of Architect as used in the Contract Documents refers to the Engineer.

SC-1.01A.34 Add the following sentence at the end of Paragraph 1.01.A.34:

The Project Manual also includes the bidding requirements, Contract Forms, General Conditions of the Contract, Supplemental Conditions and Specifications.

SC-1.01A.50 Add the following sentence at the end of Paragraph 1.01.A.50:

Work shall also include the materials and equipment provided by Contractor or equipment as provided by Owner for installation by Contractor.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.02A. Delete Paragraph 2.02A in its entirety and insert the following in its place:

Owner shall furnish to Contractor two (2) complete sets of the Contract Documents for use in the execution of the Work. Additional copies will be furnished, upon request, at the cost of the reproduction.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

SC-4.06 Delete Paragraphs 4.06.A and 4.06.B in their entirety and insert the following:

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

B. Not Used.

ARTICLE 5 – BONDS AND INSURANCE

SC-5.01 Add the following new paragraph immediately after Paragraph 5.01.C:

- D. In addition to the performance bond specified in the General Conditions, Contractor shall furnish Labor and Material Payment Bonds and Insurance Certificates. Owner and Engineer reserve the right to reject surety providing performance and payment bonds or other bonds as specified in the Contract Documents. Contract Agreement will not be executed until surety is acceptable to Owner and Engineer.

SC-5.02.A Delete Paragraph 5.02. A in its entirety and insert the following:

- A. All bonds and insurance required by the Contact Documents to be purchased and maintained by the Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the State of Colorado and must be countersigned by an agent who is a resident of the State of Colorado and must be accompanied by a certified copy of the authority to act for the surety and authority to transact business in the State of Colorado.

SC-5.04 Add the following new paragraphs immediately after Paragraph 5.04.B:

- C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:
1. Workers' Compensation and related coverages under Paragraphs 5.04.A.1 and A.2 of the General Conditions:
 - a. State of Colorado Statutory
 - b. Applicable Federal: Statutory
 - c. Employer's Liability \$100,000 each accident
\$500,000 disease, policy limit
\$100,000 disease, each employee
 2. Contractor's General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:
 - a. General Aggregate \$1,000,000

- b. Products Completed Operations Aggregate \$1,000,000
 - c. Personal and Advertising Injury \$500,000
 - d. Each Occurrence (Bodily Injury and Property Damage) \$500,000
 - e. Property Damage liability insurance will provide Explosion, Collapse, and Under-ground coverages where applicable.
 - f. Excess or Umbrella Liability
 - Bodily Injury and Property Damage \$2,000,000
 - Retention \$10,000
3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:
- a. Combined Single Limit of \$2,000,000

D. The Owner (Town of Johnstown), Engineer (J&T Consulting, Inc.), Owner's Material Testing Company (Cesare, Inc.), property owners (as listed in the drawings) shall be named as additional insureds.

SC-5.06.A Delete Paragraph 5.06.A in its entirety.

SC-5.06.B Delete Paragraph 5.06.B

SC-5.07.B.1 Delete subparagraph 5.07.B.1 in its entirety.

SC-5.09.A Delete Paragraph 5.09.A in its entirety and insert the following in its place:

- A. If the Owner has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the Contractor in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the Owner shall so notify the Contractor in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.01.B. Contractor shall provide to the Owner such additional information in respect of insurance. If Contractor does not purchase or maintain all of the Bonds and insurance required of Contractor by the Contract Documents, Contractor shall notify the Owner in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the Owner may elect to obtain equivalent Bonds or insurance to protect the

Owner's interests at the expense of the Contractor and a Change Order shall be issued to adjust the Contract Price accordingly.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

SC-6.06 Add the following new paragraph immediately after Paragraph 6.06.G:

- H. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by a particular Subcontractor or Supplier.

SC-6.08 Add the following new paragraph immediately after Paragraph 6.08. A:

- B. Contractor shall coordinate with all agencies as required in the Special Conditions for any and all permits required to complete the work.

SC-6.17 Delete paragraphs 6.17.A, B, C, D, and E in their entirety and replace with the following:

- A. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, Samples, or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time.
- B. In the event that Contractor requests a change of a previously approved item, Contractor shall reimburse Owner for Engineer's charges for its review time unless the need for such change is beyond the control of Contractor.

SC-6.20 Add the following new paragraph immediately after Paragraph 6.20.C:

- D. Governmental Immunities Act. The Owner is relying on, and does not waive or intend to waive by any provision of this Agreement, the monetary limitations or any rights, immunities and protection provided by the Colorado Governmental Immunities Act (C.R.S. § 24-10-101 et seq.) as from time to time amended, or otherwise available to the Town, its officers, agents, employees, attorneys, engineers, planners, indemnifiers and insurers.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

SC-9.03 Add the following new paragraphs immediately after Paragraph 9.03.A:

- B. The Resident Project Representative (RPR) will be Owner's representative at the Site, will act as directed by and under the supervision of Owner, and Engineer regarding. Where the Contract Documents require the Engineer to perform any act or function, this act or function shall be carried out by the RPR except when an interpretation of the contract Documents, or a decision resolving claims is involved. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:

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1. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.
2. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
3. Liaison:
 - a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, assist in providing information regarding the intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
4. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
5. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
6. Modifications: Consider and evaluate Contractor's suggestions and modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
7. Review of Work and Rejection of Defective Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress will not produce a completed Project that conforms generally to the Contract Documents or

will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

8. Inspections, Tests, and System Startups:
 - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
 - b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
9. Records:
 - a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
 - b. Maintain records for use in preparing Project documentation.
10. Reports:
 - a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawings and Sample submittals.
 - b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
 - c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.
11. Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

12. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
13. Completion:
 - a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.
 - b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied.
 - c. Observe whether all items on the final list have been completed or corrected and make recommendations to the Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's superintendent.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work unless such advice or directions are specifically required by the Contract Documents.
5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

SC-10.03.A.4. Add the following new paragraph immediately after Paragraph 10.03.A.3:

4. At the time of execution of a Change Order or Written Agreement, Owner and Contractor expressly acknowledge that said Change Order or Written Agreement provides for a fair and equitable adjustment in Contract Price and/or Contract Time for the additions, deletions, or revisions in the Work as authorized by said Change Order or Written Agreement. Owner and Contractor further expressly acknowledge that later claims for adjustments to the Contract Price and/or Contract Time associated with said Change Order or Written Agreement are not valid.

SC-10.05.G Add the following new paragraphs immediately after Paragraph 10.05.F:

- G. Should Contractor cause damage to the Work or property of any separate contractor or subcontractor at the site, or should any claim arising out of Contractor's performance of the Work at the site be made by any separate contractor against the Contractor, Owner, or Engineer, the Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration.

Contractor shall to the fullest extent permitted by Laws and Regulations, indemnify and hold Owner or Engineer harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against Owner or Engineer.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

SC-12.01.A Add the following language at the end of the last sentence of Paragraph 12.01A:

Changes in the Contract Price or Contract Time, which are agreed to by the parties by an appropriate, duly executed Change Order or Written Amendment shall constitute a full and final change or amendment to the Contract for any and all changes of which the Contractor is, or should have been, aware as of the date of the executed Change Order.

Accordingly, execution of a Change Order or Written Amendment by the Contractor shall constitute a waiver on the part of the Contractor of any further claims for changes in the Contract Price or Contract Time, which occurred or

may have occurred up through the date of any executed Change Order, whether such changes were expressly set forth in the executed change Order or not.

SC-12.03 Add the following new paragraph immediately after Paragraph 12.03.E.

- F. Time is an essential condition of the Contract. Should Contractor fail to perform any of the individual Work tasks within the period of time stipulated by the milestone(s) in the Agreement, Contractor shall pay to Owner, as liquidated damages and not as a penalty, the amounts set forth in the Agreement unless extensions of time granted by Owner expressly, waive liquidated damages in writing.

In case of joint responsibility for delay in the final completion of the Work, where two or more separate contracts are in force at the same time and cover work at the same site, liquidated damages assessed against any one contractor will be based upon the individual responsibility of that contractor for the delay as determined by, and in the judgment of, Engineer.

Owner shall have the right to deduct the liquidated damages from any money in its hands, otherwise due, or to become due, to Contractor, or to sue for and recover compensation for damages for nonperformance of this Contract within the time stipulated.

SC-12.03 Add the following new paragraph immediately after Paragraph 12.03.F:

- G. The Owner and Contractor are both aware that a substantial portion of the construction may be conducted during winter weather conditions, and that extremely variable and severe weather conditions are typical for the site of the Work. The Contractor expressly agrees that the Contract Price is based on completion of the Work within the times specified in the Agreement and under weather conditions typically encountered during the contemplated construction period at the site of the Work. For purposes of evaluating requests for extensions of time due to unusually severe weather conditions, the following conditions, and no others, will be considered unusually severe:

1. Precipitation exceeding the historical mean for the months of the construction period by more than one standard deviation;
2. For winter construction, average temperature less than the historical mean for the months of the construction period by more than one standard deviation;
3. For winter construction, number of days below freezing exceeding the historical mean for the months of the construction period by more than one standard deviation;
4. Isolated abnormal weather occurrences of a severely destructive nature, which in fact, cause such destruction at the site of the Work.

5. For the purpose of determining mean conditions, all available data contained in the records of the National Weather Service for reporting from, as well as data available from the State Climatologist for the same areas. The Contractor further agrees that should a request for time extension due to unusually severe weather conditions be made, the Contractor shall submit all necessary historical and detailed daily data during the construction period to support the claim.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-13.07 Add the following new paragraph immediately after Paragraph 13.07.E:

- F. Nothing in the General Conditions concerning the correction period shall establish a period of limitation with respect to any other obligation, which Contractor has under the Contract Documents. The establishment of a time period relates only to the specific obligations of the Contractor to correct the Work, and has no relationship to the time within which his obligations under the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish his liability with respect to his obligations other than to specifically correct the Work.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.02.A.1 Add the following as the last sentence of subparagraph 14.02.A.1:

Payment for materials and equipment not incorporated in the Work, but delivered and suitably stored, shall be based only upon the actual cost of such materials to Contractor, and shall not include any overhead or profit to Contractor.

SC-14.02.C.1 Delete Paragraph 14.02.C.1 in its entirety and replaced with the following:

1. Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

SC-14.02.D.3 Delete subparagraph 14.02.D.3 in its entirety and replace with the following:

3. Upon a subsequent determination that the Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1, as amended, and subject to interest as provided in the Agreement from the date of said determination, to the date of payment.

SC-14.07.C.1 Delete subparagraph 14.07.C.1 in its entirety and replace with the following:

1. The Owner shall make final payment to the Contractor in accordance with Section 14.07 of the General Conditions, except final payment shall not be due until forty-five (45) days after Owner approval of the final Application for Payment, or unless final payment is subject to statutory retention for unresolved claims as provided by C.R.S. § 38-26-107.

ARTICLE 16 – DISPUTE RESOLUTION

SC-16.01 Delete Paragraph 16.01 A, B and C in their entirety and insert the following:

- A. In the event of any dispute or claim arising under or related to this Agreement, the parties agree to use their best efforts to settle such dispute or claim through good faith negotiations with each other. If such dispute or claim is not settled through negotiations within 30 days after the earliest date on which one party notifies the other party in writing of its desire to attempt to resolve such dispute or claim then the parties shall proceed to mediation as a condition precedent to litigation. If mediation is unsuccessful, the parties shall proceed to Weld County District Court. The Surety and any other party may be joined in the lawsuit following either party's written request therefore. If such dispute or claim is not settled through arbitration, then either party may institute a civil action in the Weld County District Court. In either event, the prevailing party shall be awarded attorney fees and costs.

ARTICLE 17 – MISCELLANEOUS

SC-17.07 Add the following new paragraphs immediately after Paragraph 17.06:

- A. Owner is the Town of Johnstown. All notices, letters and communication directed to Owner shall be addressed and delivered to Claud Hanes, who is designated representative (below), with a copy to J&T Consulting, Inc., Engineer.

Town of Johnstown
130 South Parish Avenue
Johnstown, CO 80534

Attention: NAME, Town Administrator

J&T Consulting, Inc.
J.C. York, P.E.
305 Denver Avenue, Suite D
Fort Lupton, CO 80621

- B. All duties and responsibilities assigned to Engineer in the Contract Documents, with the corresponding rights and authority will be assumed by J&T Consulting, Inc. and their duly authorized agents. All notices, letters and communication directed to Engineer shall be addressed and delivered to address noted above.

- C. Owner may furnish a Resident Project Representative and assistants to aid Engineer in carrying out responsibilities at the site. The duties, responsibilities, and limitations of authority of the Resident Project Representative are set forth in paragraph SC-9.03 of these Supplementary Conditions.
- D. The business addresses of Contractor given in contract for the work and Contractor's office at the site of the Work are hereby designated as the places to which all notices, letters, and other communication to Contractor will be delivered
- E. Either Owner, Contractor, or Engineer may change his address at any time by an instrument in writing delivered to the other parties.

SC-17.08 Add the following new paragraph immediately after Paragraph 17.07:

The cross-referencing or specification sections under the heading "Related Sections" and elsewhere within each specification section is intended as an aid to the Contractor and shall not relieve the Contractor from his responsibility to coordinate the Work under the Contract Documents. Listings of cross-references are not intended to be comprehensive. The omission of a cross-reference to an additional or related requirement shall not relieve the Contractor of his obligation to provide a complete Project.

SC-17.09 Claims for Consequential Damages. The Contractor waives Claims against the Owner for consequential damages arising out of or relating to this contract. This mutual waiver includes, but is not limited to:

- A. damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- B. damages incurred by the Contractor for principal and home office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work specifically performed.

END OF SECTION

SPECIAL CONDITIONS

PART 1--GENERAL

1.01 EXISTING CONDITIONS

The bidder represents that he has carefully examined the contract documents and the site where the work is to be performed in accordance with the provisions of the General Conditions and Supplementary Conditions, and that he has familiarized himself with all local conditions and federal, state, and local laws, ordinances, rules, and regulations that may affect the performance of the work. The bidder further represents that he has studied all documents pertaining to the job site, that he has performed such additional surveys and investigations as he deems necessary to assure himself of his ability to complete the work at this bid price, and that he has correlated the results of all such data with the requirements of the contract documents.

The submittal of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, including locality, uncertainty of weather and all other contingencies, and as to the character, quality quantities, and scope of work.

The plans and specifications for the work show subsurface conditions or otherwise hidden conditions as they might be expected to exist; but it is not intended nor is it to be inferred that showing said conditions constitute a representation that such conditions are accurate or complete.

Where the Town or the Engineer or their consultants have made investigations of subsurface conditions in areas where the work is to be performed, such investigations were made only for the purpose of study and design. The conditions indicated by such investigations apply only at the specific location of each boring or excavation at the time the borings or excavations were made.

Where such investigations have been made, bidders or Contractors may inspect the records as to such investigations subject to the above limitations. The record of such investigations is not a part of the contract and is provided solely for the convenience of the bidder or Contractor.

No information derived from such inspection of records of investigation or compilation thereof made by the Town, the Engineer, or their consultant will in any way relieve the bidder or Contractor from any risk or from properly fulfilling the terms of the contract nor entitle the Contractor to any additional compensation.

Excavated soils which are excessively wet as determined by soil sampling and testing should be dried prior to being used in the backfill operation, or at the Contractor's option, be replaced with suitable backfill material from other areas of the project at no additional cost to the Town. Also, excavated soils containing debris, rubble, organic, and deleterious substances are not acceptable for use as backfill and shall be disposed of properly by the Contractor at no cost to the Town.

1.02 MOBILIZATION

The Contractor shall limit storage equipment and supplies and remain on the project site.

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1.04 SOILS AND CONCRETE TESTING

The Town of Johnstown will provide testing services for backfill compaction and concrete and asphalt testing.

The Contractor shall be responsible for coordinating soils testing for backfill compaction and concrete and asphalt testing. The Contractor shall give the testing service 24-hours notice for testing. The testing service reserves the right to reject any request for soils testing with less than 24-hours notice. The Contractor agrees to pay for all retesting due to failed tests at no cost to the Owner.

1.05 SURVEYING

The Contractor shall obtain and pay for surveying services for the staking of the project. The surveyor employed will be a Colorado Registered Licensed Surveyor and have the expertise to perform such services. All costs associated with surveying shall be included in the price of the project.

1.06 CONTRACTOR'S WORK HOURS

CONTRACTOR (and Subcontractor) regular working hours consist of up to 12 working hours between 7:00 a.m. and 7:00 p.m. or daylight hours, on a regularly scheduled basis, excluding Saturdays, Sundays, and holidays; unless the Contractor requests permission from the Town prior to extended hours or prior to work on Saturdays and Sundays the week prior such that the Town can make arrangements.

1.07 NOT USED

1.08 MAINTENANCE OF ACCESS TO RESIDENCES AND BUSINESSES

Street access to residences and businesses in the vicinity of the construction shall be maintained by the Contractor during the work. At least one 12-foot wide lane shall be maintained at all times for local traffic and emergency vehicle access. Lane closures must be approved by the Town of Johnstown prior to closures. The Contractor shall submit a traffic control plan to the Town of Johnstown for approval prior to any lane closure or construction.

Driveway access will likely be impacted at times. The Contractor shall make every effort to limit the time driveways are inaccessible, and shall take care to notify Town staff at least 48 hours in advance of when the driveway or parking area will be blocked or otherwise unusable.

1.09 COORDINATION AND NOTIFICATION OF SERVICE DISRUPTION

The Contractor shall personally contact each impacted household and business 48 hours in advance of temporary service disruption, informing residents and businesses of the estimated times and durations. Residents and businesses shall also be notified when service has been restored.

Service disruptions must be coordinated with the Town via the Engineer to ensure that there are no additional considerations required with service shutdowns in a particular area at a particular time.

The maximum amount of time that any resident or business may be out of service is four hours.

The maximum amount of time that fire protection lines may be out of service is four hours.

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1.10 COMMUNICATION WITH THE PUBLIC

The Town will assist with communication to the impacted residences, businesses regarding the construction. The Contractor should plan on continuous communication with residents regarding work schedule for the duration of the project. The Engineer will help facilitate the efforts, but his responsibilities are not a substitute for an adequate communication plan and implementation of that plan by the Contractor.

1.11 COORDINATION WITH TOWN STAFF

The Town's Public Works Department personnel are familiar with the project and the system, and are a valuable resource for information. However, they have many responsibilities, are not available at all times, and individuals may not have all the information available that is needed to make a field decision. The Contractor will only receive direction in the field from the Engineer and/or the Town.

1.12 CONSTRUCTION PHASING AND SCHEDULING

Substantial completion will require that all improvements are constructed.

Final completion will require that all punch list items are addressed and all remaining construction is completed (i.e. seeding and reclamation).

1.13 LOCATING AND MARKING EXISTING UTILITIES

The Contractor shall have all existing utilities marked prior to construction and verify their location. Existing utility information shown on the Drawings has been confirmed by only limited locate and potholing data, and may not reflect the exact position of existing utilities, and may not show all the utility lines present.

The Town will mark Town-owned utilities, but other utilities will need to be located. Coordinate utility locates through the Utility Notification Center of Colorado, 811.

Town-located utilities will be marked only one time. The Contractor shall be responsible for maintaining the locate marks. The Contractor must request the locates of town-owned utilities periodically as the work progresses rather than as a single event. Requests for locates shall not precede the construction activity in any given area by more than 2 weeks.

1.14 CONSTRUCTION MATERIAL STOCKPILE REQUIREMENTS

Construction stockpiles for earth, road base materials and pipe materials should be placed on-site. Contractor shall coordinate and review stockpiling with the Town prior to the work.

Measures to control migration of sediment from stockpiles should be put in place, especially if left overnight or over a weekend or other break in the work.

1.15 CONSTRUCTION EQUIPMENT

The Town has expressed the need to maintain the condition of the existing pavement and concrete infrastructure outside the project work areas, and along equipment and material haul routes. The use of appropriate construction equipment that is adequate to complete the required work for this project while

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minimizing pavement and concrete damage outside the defined work areas shall be required. The Contractor shall be held responsible for damages outside the defined work areas created by his activities.

1.16 PROTECTION OF EXISTING UTILITIES

Existing utilities that are not scheduled for replacement, removal or relocation shall be protected to avoid disruption of service. Adequate shoring, bracing and blocking shall be put in place to avoid damage or shifting of the utility lines and trench materials. All repairs required due to the work of the Contractor shall be the responsibility of the Contractor.

1.17 OPERATING EXISTING VALVES AND HYDRANTS

Existing valves and hydrants are to be operated by Town Public Works Department personnel only. Coordinate with Town personnel and the Engineer when operating any new valve adjacent to an existing water line.

1.18 CONSTRUCTION WATER

Use of a fire hydrant to supply construction water will require the Contractor to pay a \$1,500 fee for renting each meter and backflow preventer from the Town, as well as a non-refundable \$25 administration fee for each meter. Water usage will not be charged for by the Town, and the balance of the fee shall be refunded when the meter and backflow preventer are returned if there are no damages to the meter and backflow preventer. Construction water from the Town may not be obtained from an unmetered source.

1.19 PROTECTION OF EXISTING LANDSCAPING

Existing landscaping in the vicinity of the work areas shall be protected from damage, including lawns, shrubs and trees. Landscaping that interferes with the work may be removed after discussions with the property owner and approval from the Town and must be replaced in a manner satisfactory to the property owner and the Engineer. Damaged landscaping shall be replaced in-kind at the expense of the Contractor.

1.20 END OF WORKDAY SITE CONDITIONS

Streets where there is active work shall be swept daily at the end of the work shift.

1.21 COORDINATION AND REQUIREMENTS FOR UTILITY COMPANIES

Contractor shall coordinate with Poudre Valley REA for shielding overhead power lines (if required) in order to complete the work. Contractor shall maintain safe distances from overhead power lines to complete the work.

Contractor shall coordinate with Poudre Valley REA for any construction activities near overhead power lines. Contractor shall pay for material labor and equipment to shield overhead power lines and provide invoicing from Poudre Valley REA to the Town with the Contractor's monthly application for payment.

Contractor shall coordinate with Poudre Valley REA for holding or supporting any overhead power line pole if required and pay any charges for holding or supporting any overhead power line pole.

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Poudre Valley REA will not leave a support truck over night. Contractor shall provide a support truck from an independent company with acceptable equipment to hold over night and Poudre Valley REA would assist in the proper setup. Contractor shall pay for material labor and equipment to re-install and provide invoicing from United Power Company to the Town with the Contractor's monthly application for payment.

Contractor shall coordinate with Xcel Energy company for requirements for crossing oil/gas lines with heavy equipment to ensure their lines are protected during the hauling of excess excavation materials. Contractor to ensure that Xcel has access to these lines and all equipment and operation areas at all times during construction.

END OF SECTION

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 LOCATION

- A. All work to be performed under this Contract is located at the areas shown on the attached drawings.

1.02 DESCRIPTION OF WORK

- A. The work of this Contract consists of furnishing all labor, materials, equipment, and incidentals required and performing all construction, installation, and testing of all improvements, modifications, and additions, as shown on the Drawings and specified in these specifications. The work includes, but is not necessarily limited to: new water, and storm sewer piping; manholes, vaults, valves, fittings and appurtenances; reinforced cast-in-place concrete foundations and structures, sluice gates and actuators, hand rail, excavation, compacted fill, excess excavation hauling to off-site location, riprap and bedding placement, trenching and backfilling; dewatering, grading, fencing, connections to existing facilities, seeding; miscellaneous work and cleanup. Major items of the work include the following as shown on the Construction Drawings:

Mobilization: This work shall include all labor, equipment, materials, and incidentals required to mobilize the Contractor's work forces to complete the Project. This Base Bid Item shall have a maximum cost of 10 percent of the total Base Bid Amount as shown on the Bid Form.

Erosion Control: This work includes all labor, materials, equipment, and incidentals required for construction, support, for providing, installing and maintaining erosion control measures during the construction.

Construction Staking: This work includes all labor, materials, equipment, and incidentals required for construction.

Dewatering: This work includes all labor, materials, equipment, and incidentals required for dewatering the work areas, assuming that the reservoir has been initially drained by the Town prior to the start of construction.

Removals and Disposals: This work includes all labor, materials, equipment, and incidentals required for removing and disposing of the items.

Excavation and Fill: This work includes all labor, materials, equipment, and incidentals required for construction, support, connection, materials testing, including excavation, clearing and grubbing, grading, dewatering, subgrade preparation, fill placement, and seeding/restoration.

Concrete Mud Mat: This work includes all labor, materials, equipment, and incidentals required for providing and installing the mud mat

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Reinforced Concrete Structures: This work includes all labor, materials, equipment, and incidentals required for construction, support, connection, including excavation, backfilling, for providing and installing all cast-in-place concrete and appurtenances involved with the structures.

Concrete Bridge: This work includes all labor, materials, equipment, and incidentals required for construction, support, and connection, for providing and installing the concrete bridge

Handrails: This work includes all labor, materials, equipment, and incidentals required for construction.

Water Piping: This work includes all labor, materials, equipment, and incidentals required for construction, support, connection, testing of all pipelines, utilities, including excavation, backfilling, manholes, and fittings for all pipelines on this Project.

Sluice Gates and Operators: This work includes all labor, materials, equipment, and incidentals required for construction, support, connection, and testing of the gates and actuators.

Roadbase: This work includes all labor, materials, equipment, and incidentals required for construction.

Soil Riprap: This work includes all labor, materials, equipment, and incidentals required for construction.

1.03 CONTRACTOR'S USE OF PREMISES

- A. Contractor will not have complete and exclusive use of the premises for the performance of the work.
- B. Contractor shall limit the use of the premises for his/her work and for storage to allow for through traffic and operation of existing facilities during construction. The Contractor shall keep in mind that the Owner will continue to operate the existing facilities throughout construction.
- C. Contractor shall coordinate the use of the premises with the Owner. Areas requiring shutdown of the existing facilities shall be coordinated with the Owner 48 hours prior to taking those facilities out of service.
- D. Contractor shall assume full responsibility for security of all his/her, and his/her subcontractor's, materials and equipment stored on the site.
- E. Contractor, if directed by the Owner and/or Engineer, shall move any stored items that interfere with the operations of the Owner.
- F. Contractor shall obtain and pay for use of additional storage if needed to perform the work.

1.04 OWNER OCCUPANCY

01 11 00-2

- A. Owner will occupy premises during performance of the work for the conduct of his/her normal operations. Coordinate all construction operations with the Owner to minimize conflict and to facilitate Owner usage.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 20 00

MEASUREMENT AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Measurement and payment shall be as specified in this Section.
- B. Work to be performed under this contract will be paid for on a unit cost or lump sum basis under the appropriate unit cost or lump sum Bid Items shown on the Bid Schedule. No item of Work shown on the Drawings or in the Specifications will be considered for extra compensation due to a claim that it does not fall within the scope of one of the Bid items.
- C. Contractor shall, within 10 days of receipt of Notice to Proceed, submit a complete breakdown of lump sum and unit cost bid items (Schedule of Values) showing value assigned to each part of Work. Payment for materials delivered but not fully incorporated in Work will be made only if such materials are listed and assigned a value in Contractor's Schedule of Values.
- D. The work of this Contract consists of furnishing all labor, materials, equipment and incidentals required and performing all construction, installation and testing of all improvements, modifications and additions, all as shown on the Drawings and specified in these Specifications.

1.02 BID ITEMS

PHASE 1 ITEMS***General Items***1. Project Mobilization/Demobilization

Shall include all labor, materials, equipment, and incidentals required for the Contractor to mobilize. Shall include all costs for Contractor's insurance and bonds, construction permits and fees, job trailers and site administration expenses, utilities including power, telephone, etc. This item shall not exceed more than ten (10) percent of the Base Bid. This item will be paid 50 percent of the total at 25 percent project completion, an additional 30 percent of the total at 50 percent project completion, and the remaining 20 percent of the total at 100 percent project completion.

2. Erosion Control

Shall include all labor, materials, equipment, and incidentals required for construction.

3. Dewatering Required to Complete the Project

Shall include all labor, materials, equipment, and incidentals required for construction.

4. Construction Staking

Shall include all labor, materials, equipment, and incidentals required for construction.

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Reservoir Infrastructure

5. Clearing, Grubbing, Striping/Stockpiling/Replacing Topsoil
Shall include all labor, materials, equipment, and incidentals required for construction.
6. Site Restoration of all Disturbed Areas (final grading, seeding, mulching)
Shall include all labor, materials, equipment, and incidentals required for construction.
7. Embankment Excavation
Shall include all labor, materials, equipment, and incidentals required for construction.
8. Embankment Backfill
Shall include all labor, materials, equipment, and incidentals required for construction.
9. Remove and Dispose of Existing 16 in Clay Outlet Pipe and Concrete Vault
Shall include all labor, materials, equipment, and incidentals required for construction.
10. Concrete Outlet Tower Structure, Including Sluice Gate, Steel Grate, Trash Screens
Shall include all labor, materials, equipment, and incidentals required for construction.
11. 40ft Precast Concrete Bridge, Including Footer, Connections and Appurtenances
Shall include all labor, materials, equipment, and incidentals required for construction.
12. 1-1/2 in Diameter Galvanized Steel Handrail, Including all Appurtenances
Shall include all labor, materials, equipment, and incidentals required for construction.
13. Concrete Mud Mat
Shall include all labor, materials, equipment, and incidentals required for construction.
14. 24 in Restrained Joint, Concrete Encased, Ductile Iron Class 250 Outlet Pipe
Shall include all labor, materials, equipment, and incidentals required for construction.
15. 4ft Diameter Concrete Flat-Top Manhole, Including Connection to Perforated Toe Drain Pipe.
Shall include all labor, materials, equipment, and incidentals required for construction.
16. 4 ft Diameter Concrete Flat-Top Manhole, Including Connection to Existing RCP Pipe
Shall include all labor, materials, equipment, and incidentals required for construction.
17. Fill Around Manhole
Shall include all labor, materials, equipment, and incidentals required for construction.
18. Remove and Replace Existing Toe Drain with 8" Contech A-2000 Perforated Toe Drain Pipe, Including No 8 or No 89 Aggregate Filter Gravel, and ASTM C-33 Concrete Sand Bedding
Shall include all labor, materials, equipment, and incidentals required for construction.

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Project Allowances

19. Utility Conflicts/Contingency - Additional requirements for modifying utilities not identified in drawings and/or for utility repair. Contractor to provide schedule of values and breakdown of required materials and labor for installation for review and approval before this allowance will be used.

The use of this bid item shall be authorized by written order, and shall be binding on the Owner and the Contractor. The Engineer will authorize minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents and paid to the Contractor through use of this allowance bid item. Executed Authorization of Allowance Account must be agreed to by the Owner and Contractor in order to empower use of this bid item.

PHASE 2 ITEMS (Additive Alternate)

General Items

1. Project Mobilization/Demobilization
Shall include all labor, materials, equipment, and incidentals required for the Contractor to mobilize. Shall include all costs for Contractor's insurance and bonds, construction permits and fees, job trailers and site administration expenses, utilities including power, telephone, etc. This item shall not exceed more than ten (10) percent of the Base Bid. This item will be paid 50 percent of the total at 25 percent project completion, an additional 30 percent of the total at 50 percent project completion, and the remaining 20 percent of the total at 100 percent project completion.
2. Erosion Control
Shall include all labor, materials, equipment, and incidentals required for construction.
3. Construction Staking
Shall include all labor, materials, equipment, and incidentals required for construction.
4. Clearing, Grubbing, Striping/Stockpiling/Replacing Topsoil
Shall include all labor, materials, equipment, and incidentals required for construction.
5. Site Restoration of all Disturbed Areas (final grading, seeding, mulching)
Shall include all labor, materials, equipment, and incidentals required for construction.

Reservoir Infrastructure

6. Crest and Slope Fill, Bring Crest to Minimum 4986 Elevation All Around Reservoir
Shall include all labor, materials, equipment, and incidentals required for construction.
7. 6" Thick CDOT Class 6 Roadbase on Reservoir Crest
Shall include all labor, materials, equipment, and incidentals required for construction.

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8. 18" Thick D50 = 9" Type L Soil Riprap on Emergency Spillway
 Shall include all labor, materials, equipment, and incidentals required for construction.

Project Allowances

9. Utility Conflicts/Contingency - Additional requirements for modifying utilities not identified in drawings and/or for utility repair. Contractor to provide schedule of values and breakdown of required materials and labor for installation for review and approval before this allowance will be used.

The use of this bid item shall be authorized by written order, and shall be binding on the Owner and the Contractor. The Engineer will authorize minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents and paid to the Contractor through use of this allowance bid item. Executed Authorization of Allowance Account must be agreed to by the Owner and Contractor in order to empower use of this bid item.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination and project conditions.
- B. Field engineering.
- C. Preconstruction meeting.
- D. Progress meetings.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various sections to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

1.3 FIELD ENGINEERING

- A. Employ Land Surveyor registered in State of Colorado and acceptable to Owner.
- B. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.
- C. Control datum for survey is that shown on Drawings.
- D. Verify set-backs and easements; confirm drawing dimensions and elevations.
- E. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
- F. Submit copy of liner drawings signed by Land Surveyor depicting elevations and locations of the as constructed Work.
- G. Maintain complete and accurate log of survey control work as Work progresses.
- H. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

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- I. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.
- J. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect/Engineer.

1.4 PRECONSTRUCTION MEETING

- A. Engineer will schedule meeting after notice has been given to Owner that construction will begin.
- B. Attendance Required: Owner, Owner's Representative, Engineer, Geotechnical Engineer, Surveyor, and Contractor.
- C. Agenda:
 - 1. Distribution of Contract Documents.
 - 2. Submission of list of Subcontractors, list of products, and progress schedule.
 - 3. Designation of personnel representing parties in Contract, and Engineer.
 - 4. Procedures and processing of field decisions, submittals, substitutions.
 - 5. Scheduling.
 - 6. Scheduling activities of Geotechnical Engineer.
- D. Record minutes and distribute copies within seven days after meeting to participants, with two copies to Engineer, Owner, and those affected by decisions made.

1.5 PROGRESS MEETINGS

- A. Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- B. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner and/or Owner's Representative, Engineer, as appropriate to agenda topics for each meeting.
- C. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems impeding planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Maintenance of progress schedule.
 - 7. Corrective measures to regain projected schedules.
 - 8. Planned progress during succeeding work period.
 - 9. Coordination of projected progress.
 - 10. Maintenance of quality and work standards.
 - 11. Effect of proposed changes on progress schedule and coordination.
 - 12. Other business relating to Work.

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- D. Record minutes and distribute copies within seven days after meeting to participants, with two copies to Engineer, Owner, and those affected by decisions made.

END OF SECTION

01 30 00- 3

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULES

PART 1 GENERAL

1.01 CONTRACTOR REQUIREMENTS INCLUDED

- A. The Contractor shall submit his/her proposed Schedule of Work in accordance with the provisions and time frames stated in this Section and in the Contract. Three copies of all Schedules and Schedule updates shall be submitted initially and monthly thereafter.
- B. Contractor shall submit updated Schedule of Work monthly or more frequently when required and acceptable to the Engineer. Progress payment shall not be made unless the Contractor submits the monthly schedule update.
- C. Contractor's Schedule is to be considered and used as a working tool, and will not become part of Contract or Contract Documents.

1.02 RELATED REQUIREMENTS

- A. Conditions of Contract
- B. Section 01 11 00: Summary of Work
- C. Section 01 33 00: Submittal Procedures

1.03 FORM OF SCHEDULES

- A. The Schedule of Work shall utilize a Critical Path Method (CPM). Contractor shall prepare, maintain, and furnish current detailed progress and schedule charts using the CPM schedule, which shall support the Contract performance dates. Schedule shall identify Work in Contract in sufficient detail to ensure compliance with Contract dates, schedules, and sequences of construction.
- B. CPM schedule shall be maintained throughout life of Contract. Contractor shall designate an authorized representative within its firm who will be responsible for preparation of the CPM network plan and schedule and for monitoring progress of Project.
 - 1. Schedule submittal: In accordance with the Contract. Contractor shall submit to the Engineer complete CPM. A schedule of estimated monthly progress payments shall be developed by Contractor and submitted with CPM network plan. Contractor shall also submit Schedule of Values and schedule of Shop Drawings and sample submittals.
 - 2. Acceptance of Contractor's Schedule by Engineer will not relieve Contractor from compliance with all conditions of the Contract. Errors and omissions in accepted

Contractor's Schedule will not be cause for future claims by Contractor for extra costs or increased Contract Time.

4. Schedule is Contractor's schedule, prepared by him and he remains solely responsible for adherence thereto.
5. Changes to Schedule: Contractor may at any time make changes to its current plan and schedule upon notification to Engineer. Contractor shall submit changes schedule for any of the following reasons:
 - a. When delay in completion of any activity or group of activities indicates an extension of scheduled Project completion including delays which may be involved with change orders, strikes, unusual weather, etc.
 - b. Delays in submittals or deliveries or work stoppage are encountered which make re-planning or rescheduling of Work necessary.
 - c. Schedule does not represent actual prosecution and progress of Project.
6. Engineer's acceptance of changes to Schedule and all relevant data is contingent upon compliance with all other paragraphs of this Section and any other previous agreements or requirements by Engineer.
7. Contractor's cost of revisions to Schedule due to any cause shall be responsibility of Contractor.
8. Adjustment of Contract Completion: Contract Time will be adjusted only by Change Order for causes specified in this Contract. In the event Contractor requests an extension of Contract Time, he shall furnish such justification, CPM data, and supporting evidence as follows for a determination as to whether or not Contractor is entitled to an extension of Time under provisions of Contract: all CPM logic revisions, duration changes, and cost changes for Work in question and its relationship to other activities on accepted, current network plan.
9. Contractor shall submit a brief narrative report as part of monthly update. Narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates; and an explanation of corrective action taken or proposed.

C. Contractor failure to comply with this Section shall be a material breach of this Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed products list.
- D. Product data.
- E. Shop drawings.
- F. Test reports.
- G. Certificates.
- H. Manufacturer's instructions.
- I. Construction photographs.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work.
- E. Schedule submittals to expedite Project, and deliver to Engineer. Coordinate submission of related items.
- F. For each submittal for review, allow 14 days excluding delivery time to and from Contractor.
- G. Allow space on submittals for Contractor and Engineer review stamps.

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- H. When revised for resubmission, identify changes made since previous submission.
- I. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- J. Submittals not requested will not be recognized or processed.
- K. Provide copies of approved submittals to Owner and Owner's Representative.

1.3 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit preliminary outline Schedules within 14 days after date notice is given to Owner that work is scheduled to begin. After review, submit detailed schedules within 7 days modified to accommodate revisions recommended by Owner.
- B. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.
- C. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- D. Submit computer generated horizontal bar chart with separate line for each section of Work, identifying first work day of each week.
- E. Indicate estimated percentage of completion for each item of Work at each submission.
- F. Submit separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Engineer.
- G. Indicate delivery dates for products.
- H. Revisions To Schedules:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal.

1.4 PROPOSED PRODUCTS LIST

- A. Within 14 days after date notice is given to Owner that work is scheduled to begin, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

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1.5 PRODUCT DATA

- A. Product Data: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Design Documents
- B. Submit number of copies Contractor requires, plus three copies Engineer will retain.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.6 SHOP DRAWINGS

- A. Shop Drawings: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Design Documents.
- B. Submit number of opaque reproductions Contractor requires, plus three copies Engineer will retain.
- C. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.7 TEST REPORTS

- A. Submit for Engineer's knowledge as contract administrator or for Owner.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Design Documents.

1.8 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

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1.9 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, [start-up,] adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.10 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of construction throughout progress of Work to Engineer.
- B. Photographs: to be delivered in electronic format, JPG files, or approved equal.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality control and control of installation.
- B. Tolerances.
- C. References.
- D. Testing and inspection services.
- E. Testing Standards.
- F. Quality Control Testing.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. When manufacturers' instructions conflict with Design Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

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- B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes or these Specifications.
- B. Conform to reference standard by date of issue current on Design Documents, except where specific date is established by code.
- C. When specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

1.5 TESTING AND INSPECTION SERVICES

- A. Coordinate with Owner's testing agency or laboratory to perform specified testing.
- B. The testing firm will perform tests, inspections and other services specified in individual specification sections and as required by Engineer.
 - 1. Laboratory: Authorized to operate in State of Colorado.
 - 2. Laboratory Staff: Maintain full time registered Engineer on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an acceptable accuracy.
- C. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Engineer or Owner.
- D. Reports will be submitted by testing firm to Engineer, Contractor, and Owner, indicating observations and results of tests and indicating compliance or non-compliance with Design Documents.
 - 1. Submit final report indicating status of Work previously reported as non-compliant.
- E. Cooperate with testing firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Engineer and testing firm 48 hours prior to expected time for operations requiring services.
- F. Testing and employment of testing agency laboratory or any other form of quality control or quality assurance shall not relieve Contractor of obligation to perform Work in accordance with requirements of Construction Documents.

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- G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same testing firm on instructions by Engineer.
- H. Testing Agency Responsibilities:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site for on-site testing and/or observations.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials, mixes and methods with requirements of Design Documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests required by Engineer.
 - 7. Attend preconstruction meetings and progress meetings.
- I. Testing Agency Reports: After each test or site visit, promptly submit two copies of report to Engineer, Contractor, and Owner. When requested by Engineer, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Design Documents.
- J. Limits On Testing Authority:
 - 1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of design Documents.
 - 2. Agency or laboratory may not approve or accept any portion of the Work.
 - 3. Agency or laboratory may not assume duties of Contractor.
 - 4. Agency or laboratory has no authority to stop the Work.
 - 5. Agency has no responsibility or authority regarding job site safety.

1.6 TESTING STANDARDS

- A. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 2. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

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4. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
5. ASTM D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
6. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
7. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

B. The percent compaction requirements for earthwork will be evaluated as follows:

The in-place density as compacted by the Contractor will be determined by the field density test using the sand-cone method or the nuclear method. The maximum dry density of the fill at the location of the in-place density test will be estimated using full-curve compaction test (family of curves) of representative fill materials. The full-curve compaction tests will be performed according to ASTM D698. The percent compaction in-place will be calculated as the ratio (in percent) of the in-place dry density to the estimated maximum dry density of the compacted fill at the location of the in-place density test.

1.7 QUALITY CONTROL TESTING

Schedule of quality control testing shall be as summarized in Table 1 below:

Table 1 – Quality Control Testing Schedule		
Material	Test	Test Schedule
All Fill	Sieve Analysis (ASTM C136), USCS Classification (ASTM D2487), Standard Proctor (ASTM D698)	Every 2,000 cubic yards or each individual source/material
All Fill	In-place density & water content (ASTM D2922 and ASTM D3017)	Every 500 cubic yards or each individual source/material, minimum 1 per day

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Telephone service.
 - 3. Facsimile service.
 - 4. Temporary water service.
 - 5. Temporary sanitary facilities.
- B. Construction Facilities:
 - 1. Field offices and sheds.
 - 2. Vehicular access.
 - 3. Parking.
 - 4. Progress cleaning and waste removal.
 - 5. Traffic regulation.
- C. Temporary Controls:
 - 1. Barriers.
 - 2. Enclosures and fencing.
 - 3. Security.
 - 4. Water control.
 - 5. Dust control.
 - 6. Erosion and sediment control.
 - 7. Noise control.
 - 8. Pollution control.
- D. Removal of utilities, facilities, and controls.

1.2 TEMPORARY ELECTRICITY

- A. Complement existing power service capacity and characteristics as required for construction operations.

1.3 TELEPHONE SERVICE

- A. Provide, and maintain telephone service to field office at time of project mobilization and throughout the project.

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1.4 FACSIMILE SERVICE

- A. Provide and maintain to field office at time of project mobilization.

1.5 TEMPORARY WATER SERVICE

- A. Provide suitable quality water service as needed to maintain specified conditions for construction operations

1.6 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures.

1.7 FIELD OFFICES AND SHEDS

- A. Contractor is to provide sufficient space for field offices to incorporate plan layout space, and a table for phone/fax services.

1.8 VEHICULAR ACCESS

- A. Existing site access is to be used for construction access.

1.9 PARKING

- A. Provide temporary parking areas to accommodate construction personnel.
- B. Maintenance:
 - 1. Maintain traffic and parking areas in sound condition.
- C. Mud From Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.10 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
- B. Collect and remove waste materials, debris, and rubbish from site as needed and dispose off-site.

1.11 TRAFFIC REGULATION

- A. Signs, Signals, And Devices:
 - 1. Post Mounted Traffic Control and Informational Signs: As approved by Weld County.
- B. Haul Routes:
 - 1. Confine construction traffic to designated haul routes.

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1.12 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide protection for plants designated to remain. Replace damaged plants.

1.13 ENCLOSURES AND FENCING

- A. Construction: Contractor's option to install fencing as required to limit access to the site and provide safety barrier from construction activities.

1.14 SECURITY

- A. Security Program:
 - 1. Protect Work from theft, vandalism, and unauthorized entry.
- B. Entry Control:
 - 1. Restrict entrance of persons and vehicles into Project site.
 - 2. Allow entrance only to authorized persons with proper identification.
 - 3. Maintain log of visitors, make available to Owner on request.
 - 4. Coordinate access of Owner's personnel to site.

1.15 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water.

1.16 DUST CONTROL

- A. Execute Work by methods to minimize raising dust from construction operations.
- B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- C. Comply with all Federal, State, and local regulations concerning dust control.

1.17 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize surface area of bare soil exposed at one time.
- C. Provide temporary measures including berms, dikes, and drains, and other devices to prevent water flow.

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- D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Comply with all Federal, State, and local regulations concerning erosion and sediment control, and dewatering and stormwater discharges related to construction activity.

1.18 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by construction operations.
- B. Comply with all Federal, State, and local regulations concerning erosion and sediment control, and dewatering and stormwater discharges related to construction activity.

1.19 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.
- B. Comply with pollution and environmental control requirements of the Colorado Department of Health and Environment, and the Environmental Protection Agency.

1.20 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Final Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Product substitution procedures.

1.2 PRODUCTS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.
- B. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.

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- E. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed.

1.6 PRODUCT SUBSTITUTION PROCEDURES

- A. Engineer will consider requests for Substitutions only within 14 days after date notification to Owner that work has been scheduled to begin.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
 - 2. Will provide same warranty for Substitution as for specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Submit two copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
 - 2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
 - 3. Engineer will notify Contractor in writing of decision to accept or reject request.

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PART 2 PRODUCTS – Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Protecting installed construction.
- D. Project record documents.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Design Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Design Documents and ready for Engineer's review.
- B. Provide submittals to Engineer required by Owner.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean site; sweep paved areas, rake clean landscaped surfaces.
- C. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Prohibit traffic from landscaped areas.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.

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2. Specifications.
 3. Addenda.
 4. Modifications to the Design Documents.
 5. Reviewed Shop Drawings, Product Data, and Samples.
 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly, including survey of excavated surfaces and liner embankment placement.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and modifications.
- F. Record Drawings: Legibly mark each item to record actual construction including:
1. Surveyed elevations of excavations and limits/locations of fill for each fill type.
 2. Surveyed horizontal locations of each fill type.
 3. Surveyed locations/elevations of and geologic anomalies encountered during construction.
 4. Field changes of dimension and detail.
 5. Details not on original Design drawings.
- G. Submit documents to Engineer.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Formwork for cast-in place concrete.
 - 2. Shoring, bracing, and anchorage.
 - 3. Architectural form liners.
 - 4. Form accessories.
 - 5. Form stripping.
- B. Related Sections:
 - 1. Section 03 20 00 - Concrete Reinforcing.
 - 2. Section 03 30 00 - Cast-In-Place Concrete.
 - 3. Section 04 20 00 - Unit Masonry: Product requirements for masonry accessories for placement by this Section.
 - 4. Section 05 50 00 - Metal Fabrications: Product requirements for metal fabrications for placement by this Section.
 - 5. Section 32 13 13: Concrete Paving.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Formwork (Vertical Structures):
 - 1. Basis of Measurement: Incidental to all concrete work.
 - 2. Basis of Payment: Includes form materials, placement, placing accessories, stripping.
- B. Formwork (Horizontal Supported Structures):
 - 1. Basis of Measurement: Incidental to all concrete work.
 - 2. Basis of Payment: Includes form materials, placement, placing accessories, stripping.

1.3 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
 - 2. ACI 301 - Specifications for Structural Concrete.
 - 3. ACI 318 - Building Code Requirements for Structural Concrete.
 - 4. ACI 347 - Guide to Formwork for Concrete.
- B. American Forest and Paper Association:

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1. AF&PA - National Design Specifications for Wood Construction.
 - C. The Engineered Wood Association:
 1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.
 - D. ASTM International:
 1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 2. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
 - E. West Coast Lumber Inspection Bureau:
 1. WCLIB - Standard Grading Rules for West Coast Lumber.
- 1.4 DESIGN REQUIREMENTS
- A. Design, engineer and construct formwork, shoring and bracing in accordance with ACI 318 to conform to design and code requirements to achieve concrete shape, line and dimension as indicated on Drawings.
- 1.5 PERFORMANCE REQUIREMENTS
- A. Not applicable to this Project.
- 1.6 SUBMITTALS
- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- 1.7 SUSTAINABLE DESIGN SUBMITTALS
- A. Not applicable to this Project.
- 1.8 QUALITY ASSURANCE
- A. Perform Work in accordance with ACI 347, ACI 301, and ACI 318.
 - B. Perform Work in accordance with CDOT standards.
- 1.9 MOCK-UP
- A. Not applicable to this Project.
- 1.10 DELIVERY, STORAGE, AND HANDLING
- A. Section 01 60 00 - Product Requirements: Products storage and handling requirements.

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1.11 COORDINATION

- A. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

- A. Form Materials: At discretion of Contractor. Contractor to provide submittal.

2.2 PREFABRICATED FORMS

- A. Manufacturers: At discretion of Contractor. Contractor to provide submittal.
- B. Steel Forms: Sheet steel, suitably reinforced, and designed for particular use indicated on Drawings.
- C. Form Liners: Smooth, durable, grainless and non-staining hardboard, unless otherwise indicated on Drawings.

2.3 ARCHITECTURAL FORM LINERS

- A. Not applicable to this Project.

2.4 FORMWORK ACCESSORIES

- A. Form Ties: Snap-off type, metal, free of defects capable of leaving blemishes in concrete surface as determined by Engineer.
- B. Spreaders: Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. Wire ties, wood spreaders or through bolts are not permitted.
- C. Form Anchors and Hangers:
 - 1. Do not use anchors and hangers exposed concrete leaving exposed metal at concrete surface.
 - 2. Symmetrically arrange hangers supporting forms from structural steel members to minimize twisting or rotation of member.
 - 3. Penetration of structural steel members is not permitted.
- D. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
 - 1. Manufacturers:
 - a. Arcal Chemical Corporation Arcal-80.

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- b. Industrial Synthetics Company Synthex.
 - c. Nox-Crete Company Nox-Crete Form Coating.
 - d. Or approved equivalent
- E. Corners: Chamfer, rigid plastic or wood strip type; size as applicable.
- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.
- G. Water Stops: Rubber and Polyvinyl chloride, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, ribbed profile, preformed corner sections, heat welded jointing.

2.5 COATINGS

- A. Not applicable to this Project.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.
- C. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Engineer.

3.2 INSTALLATION

- A. Earth Forms:
 - 1. Trench earth forms neatly, accurately, and at least 2 inches wider than footing widths indicated on Drawings.
 - 2. Trim sides and bottom of earth forms.
 - 3. Construct wood edge strips at top of each side of trench to secure reinforcing and prevent trench from sloughing.
 - 4. Form sides of footings where earth sloughs.
 - 5. Tamp earth forms firm and clean forms of debris and loose material before depositing concrete.
- B. Formwork - General:
 - 1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.

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2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
 3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings.
 4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete.
 5. Complete wedging and bracing before placing concrete.
- C. Forms for Smooth Finish Concrete:
1. Use steel, plywood or lined board forms.
 2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
 3. Install form lining with close-fitting square joints between separate sheets without springing into place.
 4. Use full size sheets of form lines and plywood wherever possible.
 5. Tape joints to prevent protrusions in concrete.
 6. Use care in forming and stripping wood forms to protect corners and edges.
 7. Level and continue horizontal joints.
 8. Keep wood forms wet until stripped.
- D. Architectural Form Liners:
1. Erect architectural side of formwork first.
 2. Attach form liner to forms before installing form ties.
 3. Install form liners square, with joints and pattern aligned.
 4. Seal form liner joints to prevent grout leaks.
 5. Dress joints and edges to match form liner pattern and texture.
- E. Forms for Surfaces to Receive Membrane Waterproofing: Use plywood or steel forms. After erection of forms, tape form joints to prevent protrusions in concrete.
- F. Framing, Studding and Bracing:
1. Size framing, bracing, centering, and supporting members with sufficient strength to maintain shape and position under imposed loads from construction operations.
 2. Construct beam soffits of material minimum of 2 inches thick.
 3. Distribute bracing loads over base area on which bracing is erected.
 4. When placed on ground, protect against undermining, settlement or accidental impact.
- G. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301 and ACI 318.
- H. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

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- I. Obtain Engineer's approval before framing openings in structural members not indicated on Drawings.
- J. Install chamfer strips on external corners of beams, joists, columns, and walls.
- K. Do not reuse damaged wood formwork. Do not patch formwork.

3.3 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
- D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer's specifications. Do not coat forms for concrete indicated to receive "scored finish". Apply form coatings before placing reinforcing steel.

3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Install formed openings for items to be embedded in or passing through concrete work.
- B. Locate and set in place items required to be cast directly into concrete.
- C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- D. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Install water stops continuous without displacing reinforcement. Heat seal joints watertight.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
- H. Form Ties:
 - 1. Use sufficient strength and sufficient quantity to prevent spreading of forms.

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2. Place ties at least 1 inch away from finished surface of concrete.
 3. Leave inner rods in concrete when forms are stripped.
 4. Space form ties equidistant, symmetrical and aligned vertically and horizontally
- I. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- J. Construction Joints:
1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
 3. Show no overlapping of construction joints.
 4. Arrange joints in continuous line straight, true and sharp.
- K. Embedded Items:
1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
 2. Do not embed wood or uncoated aluminum in concrete.
 3. Obtain installation and setting information for embedded items furnished under other Specification sections.
 4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
 5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations.
- L. Openings for Items Passing Through Concrete:
1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
 2. Coordinate work to avoid cutting and patching of concrete after placement.
 3. Perform cutting and repairing of concrete required as result of failure to provide required openings.
- M. Screeds:
1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
 2. Slope slabs to drain where required or as shown on Drawings.
 3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.
- N. Cleanouts and Access Panels:
1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
 2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.

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3.5 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
- D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.6 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Engineer.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.
- D. Leave forms in place for minimum number of days as specified in ACI 347.

3.7 ERECTION TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 301 and ACI 318.

3.8 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements and Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.
- C. Notify Engineer after placement of reinforcing steel in forms, but prior to placing concrete.
- D. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

03 10 00- 8

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Reinforcing bars.
 - 2. Welded wire fabric.
 - 3. Reinforcement accessories.
- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories.
 - 2. Section 03 30 00 - Cast-In-Place Concrete.
 - 3. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Grounding concrete reinforcement.
 - 4. Section 32 13 13: Concrete Paving.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Bar Reinforcement:
 - 1. Basis of Measurement: Incidental to all concrete work.
 - 2. Basis of Payment: Includes reinforcement, placement, and accessories.
- B. Welded Wire Fabric Reinforcement:
 - 1. Basis of Measurement: Incidental to all concrete work.
 - 2. Basis of Payment: Includes welded wire reinforcement, placement, and accessories.

1.3 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 318 - Building Code Requirements for Structural Concrete.
 - 3. ACI 530.1 - Specifications for Masonry Structures.
 - 4. ACI SP-66 - ACI Detailing Manual.
- B. ASTM International:
 - 1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 2. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
 - 3. ASTM A496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.

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4. ASTM A497 - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
5. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
6. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
7. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
8. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
9. ASTM A775/A775M - Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
10. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement.
11. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
12. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
13. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Reinforcing Steel Bars.

C. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

D. Concrete Reinforcing Steel Institute:

1. CRSI - Manual of Standard Practice.
2. CRSI - Placing Reinforcing Bars.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Follow submittal procedures.
- B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel bending and cutting schedules, and supporting and spacing devices.
- C. Certificates: Submit AWS qualification certificate for welders employed on the Work.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
 1. Submit certified copies of mill test report of reinforcement materials analysis.

1.5 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

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1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with CRSI - Manual of Standard Practice ACI 301 & ACI 318.
- B. Perform Work in accordance with CDOT standards.

1.7 QUALIFICATIONS

- A. Welders: AWS qualified within previous 12 months.

1.8 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.1 REINFORCEMENT

- A. Deformed and Plain Reinforcement: ASTM A615/A615M; 60 ksi yield strength, steel bars, unfinished and epoxy coated finish.
- B. Welded Plain Wire Fabric: ASTM A185; in coiled rolls; unfinished.

2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type. Manufacturers: At discretion of Contractor.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.
- C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Type; size and shape to meet Project conditions.
- D. Reinforcing Splicing Devices: Exothermic welding type; full tension and compression; sized to fit joined reinforcing.
 - 1. Manufacturers: At discretion of Contractor.
- E. Reinforcing Splicing Devices: Mechanical set screw, swaged or threaded type; full tension and compression; sized to fit joined reinforcing.
 - 1. Manufacturers: At discretion of Contractor.
- F. Epoxy Coating Patching Material: Type as recommended by coating manufacturer.

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2.3 FABRICATION

- A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice & ACI 318.
- B. Form standard hooks for 180 degree bends, 90 degree bend, stirrup and tie hooks, and seismic hooks as indicated on Drawings.
- C. Form reinforcement bends with minimum diameters in accordance with ACI 318.
- D. Form ties and stirrups from the following:
 - 1. For bars No. 10 and Smaller: No. 3 deformed bars.
 - 2. For bars No. 11 and Larger: No. 4 deformed bars.
- E. Weld reinforcement in accordance with AWS D1.4.
- F. Epoxy-Coated Reinforcement: Clean surfaces, weld and re-protect welded joint in accordance with CRSI Manual of Practice.
- G. Locate reinforcement splices, at point of minimum stress. Review location of splices with Engineer.

2.4 SHOP FINISHING

- A. Epoxy Coated Finish for Steel Bars: Per CDOT Standards.
- B. Epoxy Coated Finish for Steel Wire: Per CDOT Standards.

2.5 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Make completed reinforcement available for inspection at manufacturer's factory prior to packaging for shipment. Notify Engineer at least seven days before inspection is allowed.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance.
 - 1. Do not weld crossing reinforcement bars for assembly except as permitted by Engineer.
- B. Accommodate placement of formed openings.

03 20 00- 4

- C. Space reinforcement bars with minimum clear spacing in accordance with ACI 318 of one bar diameter, but not less than 1 inch.
1. Where bars are indicated in multiple layers, place upper bars directly above lower bars.

- D. Maintain concrete cover around reinforcement in accordance with ACI 318 as follows:

Reinforcement Location		Minimum Concrete Cover
Footings and Concrete Formed Against Earth		3 inches
Concrete exposed to weather	No. 6 bars and larger	2 inches
	No. 5 bars and smaller	1-1/2 inches
Supported Slabs, Walls, and Joists	No. 14 bars and larger	1-1/2 inches
	No. 11 bars and smaller	3/4 inches
Beams and Columns		1-1/2 inches
Shell and Folded Plate Members	No. 6 bars and larger	3/4 inches
	No. 5 bars and smaller	1/2 inches

- E. Bond and ground reinforcement in accordance with requirements of Section 26 05 26.

3.2 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Install reinforcement within the following tolerances for flexural members, walls, and compression members:

Reinforcement Depth	Depth Tolerance	Concrete Cover Tolerance
Greater than 8 inches	plus or minus 3/8 inch	minus 3/8 inch
Less than 8 inches	plus or minus 1/2 inch	minus 1/2 inch

- C. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.

3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements and Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

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- B. Field testing will be performed by Owner's testing laboratory in accordance with ACI 318.
- C. Provide free access to Work and cooperate with appointed firm.
- D. Reinforcement Inspection:
 - 1. Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances.
 - 2. Welding: Inspect welds in accordance with AWS D1.1.
 - 3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
 - 4. Weldability Inspection: Inspect for reinforcement weldability when formed from steel other than ASTM A706/A706M.
 - 5. Continuous Weld Inspection: Inspect reinforcement as required by ACI 318.
 - 6. Periodic Weld Inspection: Other welded connections.

END OF SECTION

03 20 00- 6

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete for the following:
 - 1. Shear walls.
 - 2. Foundation walls.
 - 3. Supported slabs.
 - 4. Slabs on grade.
 - 5. Control, expansion and contraction joint devices.
 - 6. Equipment pads.
 - 7. Light pole base.
 - 8. Sign base.
 - 9. Fence post base
 - 10. Thrust blocks.
 - 11. Manholes.
 - 12. Storm drains Inlets.
- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories.
 - 2. Section 03 20 00 - Concrete Reinforcing.
 - 3. Section 03 35 00 - Concrete Finishing.
 - 4. Section 03 39 00 - Concrete Curing.
 - 5. Section 07 90 00 - Joint Protection.
 - 6. Section 07 95 00 - Expansion Control.
 - 7. Section 31 23 23 - Fill.
 - 8. Section 32 13 13 - Concrete Paving.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Concrete - Slab-on-fill or grade:
 - 1. Basis of Measurement: Lump Sum by Structure.
 - 2. Basis of Payment: Includes concrete, placement accessories, consolidating and leveling, troweling, curing.
- B. Concrete - Vertical in Forms:
 - 1. Basis of Measurement: Lump Sum by Structure.
 - 2. Basis of Payment: Includes concrete, placement accessories, consolidating, curing.
- C. Concrete - Miscellaneous Locations:
 - 1. Basis of Measurement: Lump Sum by Structure.

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2. Basis of Payment: Includes concrete, placement accessories, consolidating and leveling, troweling, curing.
- D. Concrete - Grouting:
1. Basis of Measurement: Lump Sum by Structure.
 2. Basis of Payment: Includes preparation of substrate, grout, placement, consolidating, troweling, curing.
- E. Devices: Control, Expansion and Contraction.
1. Basis of Measurement: Incidental to all concrete work.
 2. Basis of Payment: Includes component, placement with accessories.

1.3 REFERENCES

- A. American Concrete Institute:
1. ACI 301 - Specifications for Structural Concrete.
 2. ACI 305 - Hot Weather Concreting.
 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 4. ACI 308.1 - Standard Specification for Curing Concrete.
 5. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ASTM International:
1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 3. ASTM C33 - Standard Specification for Concrete Aggregates.
 4. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 5. ASTM C42/C42M - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
 6. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 7. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 8. ASTM C150 - Standard Specification for Portland Cement.
 9. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
 10. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 13. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
 14. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
 15. ASTM C595 - Standard Specification for Blended Hydraulic Cements.

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16. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
17. ASTM C685/C685M - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.
18. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
19. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
20. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
21. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
22. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
23. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
24. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
25. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
26. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
27. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
28. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
29. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
30. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
31. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
32. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
33. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
34. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.4 PERFORMANCE REQUIREMENTS

- A. Not applicable to this Project.

1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on joint devices, attachment accessories, and admixtures.

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- C. Design Data:
 - 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 - 2. Identify mix ingredients and proportions, including admixtures.
 - 3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
- D. Samples: Submit two samples of expansion/contraction joint and control joint.
- E. Manufacturer's Installation Instructions: Submit installation procedures and interface required with adjacent Work.

1.6 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.7 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 & ACI 318.
- B. Conform to ACI 305 when concreting during hot weather.
- C. Conform to ACI 306.1 when concreting during cold weather.
- D. Acquire cement and aggregate from one source for Work.
- E. Perform Work in accordance with CDOT standards.

1.9 MOCKUP

- A. Not applicable to this Project.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days.

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- B. Maintain high early strength concrete temperature after installation at minimum 50 degrees F for minimum 3 days.

1.11 COORDINATION

- A. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Concrete Materials: Provide in accordance with CDOT standards.

2.2 ADMIXTURES

- A. Furnish materials in accordance with CDOT standards.

2.3 ACCESSORIES

- A. Bonding Agent: Two component modified epoxy resin.
 - 1. Manufacturers:
 - a. At the discretion of the Contractor. Contractor to provide submittal that is on approved CDOT products list.
- B. Non-Shrink Grout: ASTM C1107, Grade A; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.
 - 1. Manufacturers:
 - a. At the discretion of the Contractor. Contractor to provide submittal that is on approved CDOT products list.

2.4 JOINT DEVICES AND FILLER MATERIALS

- A. Furnish materials in accordance with CDOT standards.
- B. Construction Joint Devices: Integral galvanized steel or extruded plastic, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.
- C. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric, vinyl, or neoprene filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; extruded aluminum or vinyl cover plate, of longest manufactured length at each location, recessed mounted; color as selected.

03 30 00- 5

- D. Sealant and Primer: as specified in Section 07 90 00.

2.5 CONCRETE MIX

- A. Provide concrete to the following criteria:
1. Class D:
 - a. Compressive Strength: 4,500 psi at 28 days.
 - b. Slump: Per approved mix design.
 - c. Minimum Cement Content: 615-660 pounds/cu yd.
 - d. Maximum Water/Cement Ratio: Per approved mix design.
 - e. Air Entrainment: 5 – 8 percent.
- B. Limit the following cementitious materials to maximum percentage by mass of all cementitious materials:
1. Fly Ash: Per approved mix design and CDOT Standards.
 2. Blast Furnace Slag: Per approved mix design and CDOT Standards.
 3. Fly Ash and Blast Furnace Slag: Per approved mix design and CDOT Standards.
- C. Use accelerating admixtures in cold weather only when approved by the Engineer in writing. Use of admixtures will not relax cold weather placement requirements.
- D. Use calcium chloride only when approved by the Engineer in writing.
- E. Use set retarding admixtures during hot weather only when approved by the Engineer in writing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.

03 30 00- 6

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301 & ACI 318 and CDOT Standards.
- B. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and forms are not disturbed during concrete placement.
- D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by adhesive applied between overlapping edges and ends through taping edges and ends.
- E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.
- G. Place joint filler in slab following pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Extend joint filler from bottom of slab to within 1/4 inch of finished slab surface. Conform to Section 07 90 00 for finish joint sealer requirements.
- I. Install construction joint devices in coordination with slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- J. Install joint device anchors. Maintain correct position to allow joint cover to be flush with slab finish.
- K. Install joint covers in longest practical length, when adjacent construction activity is complete.
- L. Apply sealants in joint devices in accordance with Section 07 90 00.
- M. Deposit concrete at final position. Prevent segregation of mix.
- N. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- O. Consolidate concrete.
- P. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

03 30 00- 7

- Q. Place concrete continuously between predetermined expansion, control, and construction joints.
- R. Do not interrupt successive placement; do not permit cold joints to occur.
- S. Place slabs in pattern indicated.
- T. Saw cut joints within 12 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- U. Screed slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.4 SEPARATE SLAB TOPPINGS

- A. Prior to placing floor topping, [roughen substrate concrete surface and] remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, reinforcing and other items to be cast in.
- C. Apply bonding agent to substrate.

3.5 CONCRETE FINISHING

- A. Provide formed concrete surfaces to be left exposed with sack rubbed finish as Scheduled in this section.
- B. Finish concrete slab surfaces to requirements of Section 03 35 00.

3.6 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
 - 1. Protect concrete slabs from freezing for minimum 7 days.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Cure concrete in accordance with ACI 308.1

3.7 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements and Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform field testing in accordance with CDOT standards.
- C. Inspect reinforcing placement for size, spacing, location, support.

03 30 00- 8

- D. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- E. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, standard cured.
 - 3. Sample concrete and make one set of four cylinders for every 50 cu yds or less of Class B structure concrete placed each day.
 - 4. Make one additional cylinder during cold weather concreting, and field cure.
 - 5. Class P concrete shall include AASHTO T 97 (ASTM C 78) Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading) performed with at least two specimens at seven days and four specimens at 28 days for a total of six specimens.
- F. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M.
 - 2. Air Content Test Method: ASTM C173/C173M and ASTM C231.
 - 3. Temperature Test Method: ASTM C1064/C1064M.
 - 4. Measure slump and temperature for each compressive strength concrete sample.
 - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- G. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39.
 - 2. Test Acceptance: In accordance with CDOT standards.
 - 3. Test one cylinder at 7days.
 - 4. Test two cylinders at 28 days.
 - 5. Retain one cylinder for testing when requested by Engineer.
 - 6. Dispose remaining cylinders when testing is not required.
- H. Beam Flexural Strength Testing for Class P and E Concrete:
 - 1. Test Method: AASHTO T 97 (ASTM C78).
 - 2. Test Acceptance: In accordance with CDOT standards.
 - 3. Test two specimens at 7days.
 - 4. Test four specimens at 28 days.
 - 5. Retain one cylinder for testing when requested by Engineer.
 - 6. Dispose remaining cylinders when testing is not required.
- I. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.8 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.

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- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections as directed by Engineer in accordance with ACI 301 & ACI 318.

3.9 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Architect/Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

3.10 SCHEDULE - CONCRETE TYPES AND FINISHES

- A. Foundations and Walls: 4,500 psi 28 day concrete, form finish with honeycomb filled surface.
- B. Underside of Supported Slabs and Structure Exposed to View: 4,500 psi 28 day concrete, sack rubbed finish.

3.11 SCHEDULE - JOINT FILLERS

- A. Slab Perimeter: Joint filler Type A set 1/8 inch below slab elevation.
- B. Exterior Retaining Wall: Joint filler Type F recessed 3/8 inch with sealant cover.

END OF SECTION

03 30 00- 10

SECTION 03 35 00
CONCRETE FINISHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Finishing concrete slabs.
 - 2. Slab surface treatment.
 - 3. Handicap Ramp Truncated Domes.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Section 03 39 00 - Concrete Curing.
 - 3. Section 07 90 00 - Joint Protection.
 - 4. Section 07 95 00 - Expansion Control.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
- B. ASTM International:
 - 1. ASTM E1155 - Standard Test Method for Determining Floor Flatness and of Levelness Using the F-number System.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Follow submittal procedures.
- B. Product Data: Submit data on concrete hardener, sealer, curing compounds and slip resistant treatment, compatibilities, and limitations.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit data on maintenance renewal of applied coatings.

03 35 00- 1

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 302.1.
- B. Perform Work in accordance with CDOT standards.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum 5 years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum 5 years documented experience.

1.8 MOCK-UP

- A. Not Required for this Project.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Deliver materials in manufacturer's packaging including application instructions.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

1.11 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate the Work with concrete floor placement and concrete floor curing.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:
 - 1. Hanoveer
 - 2. Davis Colors
 - 3. Or Approved Equivalent.

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2.2 COMPOUNDS - SEALERS

- A. Sealer: Manufacturers: At the discretion of the Contractor. Contractor to provide submittal that is on CDOT approved products list.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify slab surfaces are acceptable to receive the Work of this section.

3.2 SLAB FINISHING

- A. Finish concrete slab surfaces in accordance with ACI 301 & ACI 302.1.
- B. Steel trowel surfaces which are to be exposed.

3.3 SLAB SURFACE TREATMENT

- A. Apply sealer on slab surfaces.

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation of Surface Flatness For Exposed Concrete Slabs: 1/4 inch in 10 ft.
- C. Correct defects in defined slab floor by grinding or removal and replacement of defective Work. Areas requiring corrective Work will be identified by Engineer. Re-measure corrected areas by same process.

END OF SECTION

03 35 00- 3

SECTION 03 39 00
CONCRETE CURING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes initial and final curing of horizontal and vertical concrete surfaces.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Section 03 35 00 - Concrete Finishing.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
 - 3. ACI 308.1 - Standard Specification for Curing Concrete.
 - 4. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ASTM International:
 - 1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
 - 2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - 3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 - 4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on curing compounds, mats, film, compatibilities, and limitations.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301, ACI 302.1, ACI 318.
- B. Perform Work in accordance with CDOT standard.

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1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Deliver curing materials in manufacturer's packaging including application instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Membrane Curing Compound Type 1 clear or approved equivalent. Contractor to provide submittal on membrane curing compound.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify substrate surfaces are ready to be cured.

3.2 INSTALLATION - HORIZONTAL SURFACES

- A. Cure concrete in accordance with ACI 308.1.
- B. Membrane Curing Compound: Apply curing compound in two coats with second coat applied at right angles to first.

3.3 INSTALLATION - VERTICAL SURFACES

- A. Cure concrete in accordance with ACI 308.1.
- B. Membrane Curing Compound: Apply compound in two coats with second coat applied at right angles to first.

3.4 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished Work.
- B. Do not permit traffic over unprotected floor surface.

3.5 SCHEDULES

- A. Concrete Slabs and Walls: Membrane curing compound, clear color.

END OF SECTION

03 39 00- 2

SECTION 05 52 00

METAL RAILINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes steel pipe railings, balusters, and fittings; and handrails.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete:

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 4. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
 - 5. ASTM A513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
- B. Green Seal:
 - 1. GC-3 - Environmental Criteria for Anti-Corrosive Paints.
- C. National Ornamental & Miscellaneous Metals Association:
 - 1. NOMMA Guideline 1 - Joint Finishes.
- D. SSPC: The Society for Protective Coatings:
 - 1. SSPC - Steel Structures Painting Manual.
 - 2. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
 - 3. SSPC Paint 20 - Zinc-Rich Coating, Type I - Inorganic and Type II - Organic.

1.3 DESIGN REQUIREMENTS

- A. Structural Performance of Handrails and Railings: Top Rail of Guards:
 - 1. Capable of withstanding the following structural loads without exceeding the allowable design working stress of materials involved:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction, and a uniform load of 50 lbf/ft. (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf/ft. (1460 N/m) applied

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vertically downward. Concentrated and uniform loads need not be assumed to act concurrently.

- b. Handrails Not Serving as Top Rails: Concentrated load of 200 lbf (890 N) applied at any point and in any direction, and a uniform load of 50 lbf/ft. (730 N/m) applied in any direction. Concentrated and uniform loads need not be assumed to act concurrently.
- c. Infill Area of Guards: Horizontal concentrated load of 200 lbf (890 N) applied to 1 sq. ft. (0.09 sq. m) at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Load on infill area need not be assumed to act concurrently with loads on top rails.

1.4 SUBMITTALS

- A. Product Data: For mechanically connected handrails and railings, grout, anchoring cement, and paint products.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples: For each exposed finish required.

1.5 SUSTAINABLE DESIGN SUBMITTALS

- A. Not Used

1.6 QUALITY ASSURANCE

- A. Finish joints in accordance with NOMMA Guideline 1.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 STEEL RAILING SYSTEM COMPONENTS

- A. Rails and Posts: 1-1/2 inch diameter steel; welded joints.
- B. Fittings: Elbows, T-shapes, wall brackets, escutcheons; [cast] [machined] steel.

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- C. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
- D. Splice Connectors: Steel concealed spigots or welding collars.
- E. Galvanizing: ASTM A123/A123M; hot dip galvanize after fabrication.
- F. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I zinc rich
- G. Shop Primer: [SSPC Paint 15, Type 1, red oxide.] [_____].]
- H. Touch-Up Primer: Match shop primer.

2.2 FABRICATION

- A. Fit and shop assemble components in largest practical sizes for delivery to site.
- B. Fabricate components with joints tightly fitted and secured. Furnish spigots and sleeves to accommodate site assembly and installation.
- C. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- E. Exterior Components: Continuously seal joined pieces by [intermittent welds and plastic filler.] [continuous welds.] Drill condensate drainage holes at bottom of members at locations not encouraging water intrusion.
- F. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify field conditions are acceptable and are ready to receive work.
- C. Verify concealed blocking and reinforcement is installed and correctly located to receive wall mounted handrails.

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3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be embedded in concrete with setting templates, to appropriate sections.

3.3 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Anchor railings to structure with anchors.
- C. Touch-up surfaces and finishes after erection.
- D. Conceal bolts and screws whenever possible.
- E. Assemble with spigots and sleeves to accommodate tight joints and secure installation.

END OF SECTION

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SECTION 31 05 13

SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Subsoil materials.
 - 2. Topsoil materials.
- B. Related Sections:
 - 1. Section 31 23 23 - Fill.
 - 2. Section 32 91 19 - Landscape Grading.
 - 3. Section 32 92 19 - Seeding.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 2. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 4. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 - 5. ASTM D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - 6. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - 7. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Materials Source: Submit name of imported materials source.

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PART 2 PRODUCTS

2.1 EMBANKMENT MATERIALS

- A. Embankment Fill: Compacted Embankment
1. Fill material will be brought from off-site and is need to meet the following qualifications.
 2. The compacted embankment shall consist of inorganic clay soil material. The material may be random or homogenous fill. The moisture shall be within 2% of optimum moisture.
 3. The soils should be relatively well-graded and shall not consist of any material greater than two inches in diameter.
 4. The material shall conform to the following gradation:

<u>Screen Size</u>	<u>Percent Passing</u>
3 inch	100
No. 200	60-100

2.2 TOPSOIL MATERIALS

- A. Topsoil:
1. Material used for topsoil will be obtained from on-site and off-site locations.
 2. Free of roots, rocks larger than 1 inch, subsoil, debris, large weeds and foreign matter.

2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements
- B. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 STOCKPILING

- A. Stockpile materials on site if necessary.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Stockpile differing materials apart to prevent mixing.
- D. Prevent intermixing of soil types or contamination.

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- E. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

31 05 13- 3

SECTION 31 05 16

AGGREGATES FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Coarse aggregate materials.
 - 2. Fine aggregate materials.
- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork: Fill and grading materials.
 - 2. Section 31 23 17 - Trenching.
 - 3. Section 31 23 23 - Fill.
 - 4. Section 32 91 19 - Landscape Grading.
 - 5. Section 33 11 13 – Public Water Distribution Systems.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Earthfill Material
 - 1. Basis of Measurement: By cubic yard.
 - 2. Basis of Payment: Includes supplying aggregate materials, stockpiling, placing where required, and compacting.
- B. Sand Bedding Material (ASTM C33 Concrete Sand):
 - 1. Basis of Measurement: Included in the cost of toe drain.
 - 2. Basis of Payment: Includes supplying aggregate materials, stockpiling, placing where required, and compacting.
- C. Filter Gravel Material (ASTM No. 8 or No. 89 gravel):
 - 1. Basis of Measurement: Included in the cost of toe drain.
 - 2. Basis of Payment: Includes supplying aggregate materials, stockpiling, placing where required, and compacting.
 - 3.
- D. Roadbase (CDOT class 6):
 - 1. Basis of Measurement: By ton.
 - 2. Basis of Payment: Includes supplying aggregate materials, stockpiling, placing where required, and compacting.

1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.

2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 3. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 7. ASTM D4253 - Test Methods for Maximum Index Density of Soils Using a Vibratory Table
 8. ASTM D4254 - Test Methods for Minimum Index Density of Soils and Calculation of Relative Density
 9. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Samples: Submit 50 lb sample of each type of fill to testing laboratory.
- C. Materials Source: Submit name of imported materials suppliers.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.6 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work, if possible. If not possible, identify potential sources at the beginning of construction for time to evaluate the sources.
- B. Perform Work in accordance with Town of Johnstown standards.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Earthfill Material: Fine-grained, inorganic, clay material. Free of roots, debris, and gravel over 2 inches in diameter. Graded in accordance with ASTM C136,; within the following limits:

Sieve Size	Total Percent Passing by Weight
2 inch	100
No. 200	60-100

- B. Sand Filter Material (ASTM C33 Concrete Sand): Coarse Stone, or Crushed Gravel, washed stone; free of shale, clay, friable material and debris; graded in accordance with ASTM C33; within the following limits:

Sieve Size	Total Percent Passing by Weight
3/8 inches	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10
No. 200	0-4

- C. Road Base (CDOT Class 6): Coarse Stone, or Crushed Gravel, washed stone; free of shale, clay, friable material and debris; graded in accordance with ASTM C136; within the following limits:

Sieve Size	Total Percent Passing by Weight
3/4 inches	100
No. 4	30-65
No. 8	25-55
No. 200	3-12

PART 3 EXECUTION

3.1 STOCKPILING

- A. Stockpile materials on site at locations indicated and designated by Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Do not allow segregation during stockpiling.
- D. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- E. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

31 05 16 - 4

SECTION 31 10 00

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing surface debris.
2. Removing designated trees, shrubs, and other plant life.
3. Removing abandoned utilities.
4. Excavating topsoil.

1.2 SUBMITTALS – Not used

1.3 QUALITY ASSURANCE

- A. Conform to applicable codes for disposal of debris.

PART 2 PRODUCTS - Not used.

2.1 MATERIALS – Not used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements.
- B. Verify existing plant life designated to remain is tagged or identified.
- C. Identify waste area for placing removed materials.

3.2 PREPARATION

- A. Call Local Utility Line Information service not less than three working days before performing Work.
1. Request underground utilities to be located and marked within and surrounding construction areas.

3.3 PROTECTION

- A. Locate, identify, and protect utilities indicated to remain, from damage.

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- B. Protect trees, plant growth, and features designated to remain, as final landscaping.
- C. Protect bench marks, survey control points, and existing structures from damage or displacement.

3.4 CLEARING

- A. Clear areas required for access to site and execution of Work to minimum depth of 12 inches.
- B. Remove trees, including entire root ball, and shrubs in Work area.
- C. Clear undergrowth and deadwood, without disturbing subsoil.

3.5 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Remove abandoned utilities. Indicate removal termination point for underground utilities on Record Documents.
- C. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.
- D. Do not burn or bury materials on site. Leave site in clean condition.

3.6 TOPSOIL EXCAVATION

- A. Excavate topsoil from Work area without mixing with foreign materials for use in finish grading.
- B. Stockpile in area designated on site and protect from erosion.

END OF SECTION

31 10 00- 2

SECTION 31 23 16

EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavation from borrow.
 - 2. Water content and drainage.
 - 3. Excavation for embankment foundation
 - 4. Stripping for foundation of embankment
 - 5. Protection of foundation materials
- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork.
 - 2. Section 31 10 00 – Site Clearing.
 - 3. Section 31 23 23 - Fill.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 2. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- B. Local utility standards when working within 24 inches of utility lines.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Submit a borrow area use plan which describes anticipated use, borrow area layouts, equipment, and operations.

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PART 2 PRODUCTS - Not Used.

PART 3 EXECUTION

3.1 PREPARATION

- A. Call Local Utility Line Information service not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Protect utilities indicated to remain from damage.
- D. Protect bench marks, survey control points, existing structures, fences, paving, from excavating equipment and vehicular traffic. Immediately replace any monuments damaged or removed by construction activities.

3.2 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing.
- B. Request visual inspection of bearing surfaces by Engineer and inspection agency before installing subsequent work. Contact Engineer 48 hours before exposing the foundation and coordinate activities so the area can be observed, mapped and covered within the time limitations presented in this section.

3.3 WATER CONTENT AND DRAINAGE

- A. The water content of the material prior to loading and hauling to the fill shall be in accordance with Section 31 23 23. The material shall be conditioned to within 3 percent of the proper moisture content prior to loading and hauling to the fill. If required, water shall be introduced into the borrow area for the wetting fill material by irrigation, at least two (2) days in advance of excavation operations. Moisture contents can be supplemented by water trucks and thorough disking. If borrow material is too wet it shall be processed as necessary prior to bringing it to the fill.
- B. When water is introduced for conditioning fill material prior to excavation, care shall be exercised to wet the material uniformly to produce the required water content for placement and compaction, avoiding both excessive runoff and accumulation of water in depressions. The Contractor is cautioned to control carefully the application of water and check on the depth and amount of water penetration during application so as to avoid overirrigation.
- C. If at any location in the fill material, before or during excavation operations, there is excessive water content, steps shall be taken to reduce the water content by selective

31 23 16- 2

excavation to secure the drier materials; by excavating and placing in temporary stockpiles material containing excessive moisture; by excavating drainage ditches; by allowing adequate additional time for curing or drying; by disking and/or harrowing, or by any other approved means.

3.4 EXCAVATION FOR EMBANKMENT FOUNDATION

- A. Insofar as practicable, as determined by the Engineer, suitable material excavated under the provisions of this Section shall be used in the required construction work for embankment fill, or transported to stockpiles for later use in the required construction work as approved by the Engineer.
- B. Excavated materials that are unsuitable for use in the required construction work or are in excess of construction needs, as determined by the Engineer, shall be wasted on-site at an Engineer approved location, or removed from the site at the discretion of the Contractor.
- C. Excavated materials that may otherwise be suitable for use in the required construction work but for which it is not practicable, that they be used or stockpiled shall be wasted on-site at an Engineer approved location, or removed from the site at the discretion of the Contractor.
- D. The alignments and excavation lines shown on the Drawings are subject to such changes as may be found necessary by the Engineer to adapt the foundation excavation and other features to the conditions disclosed by the excavation.
- E. Accurate trimming of the slopes of the excavation will be required, and the excavation shall conform to the established lines and grades. Loose rock shall be removed from foundation contacts.
- F. Foundation irregularities shall be reduced as determined by the Engineer to provide satisfactory foundation contours. Any irregularities found in the foundation area, including carbonaceous materials, shall be overexcavated and removed to a minimum depth of 3 feet and beyond the limits of the irregularity a minimum of 10 feet. Suitable material shall be placed and compacted in the removal area on the foundation surface.

3.5 STRIPPING FOR FOUNDATION OF EMBANKMENT

As provided in Section 31 10 00, areas where embankment material is to be placed shall first be stripped in accordance with the Drawings, these Specifications, and to the satisfaction of the Engineer.

3.6 EXCAVATION TO BEDROCK SURFACE

The excavation shall be excavated in the embankment foundation to, at a minimum, the lines and grades shown on the Drawings. Excavation will extend to sound rock or to firm material to the satisfaction of Engineer. Sound rock or firm material shall be determined visually by the Engineer and shall be primarily claystone bedrock that appears uniform and excavates in a

31 23 16- 3

relatively uniform manner. The material shall be non-yielding to rubber tire pressure from scrapers and shall require a rock hammer to break it apart. The initial excavations shall be observed by an engineer experienced with dam embankment construction or similar bedrock material. All loose, soft, or deleterious material shall be removed from the rock surface and pockets and depressions to the satisfaction of the Engineer. Special considerations are required for the last 2 feet of excavation to reduce the potential of damaging the bedrock surface. The last 2 feet of excavation shall be conducted with rubber tired equipment. Other areas of the embankment foundation where shown on the Drawings shall be excavated to sound rock or to an otherwise suitable foundation to the satisfaction of the Engineer. The last 2 feet of excavation shall be conducted with rubber tired equipment.

3.7 PROTECTION OF FOUNDATION MATERIALS

Embankment foundation materials exposed during excavation for the embankment foundation, shall be protected from freezing and surface drying in accordance with the requirements of Section 31 23 23.

END OF SECTION

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SECTION 31 23 17

TRENCHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavating trenches for utilities.
 - 2. Compacted fill from top of utility bedding to subgrade elevations.
 - 3. Backfilling and compaction.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete: Concrete materials.
 - 2. Section 31 05 13 - Soils for Earthwork: Soils for fill.
 - 3. Section 31 05 16 - Aggregates for Earthwork: Aggregates for fill.
 - 4. Section 31 23 16 - Excavation:
 - 5. Section 31 23 23 - Fill: General backfilling.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Trenching:
 - 1. Basis of Measurement: Included in cost of pipe items.
 - 2. Basis of Payment: Includes excavating to required elevations, protecting excavation, and stockpiling excavated materials removing excavated materials from site. Over Excavating: Payment is not made for over excavated work nor for replacement materials.
- B. Subsoil Fill:
 - 1. Basis of Measurement: Included in the cost of pipe items.
 - 2. Basis of Payment: Includes furnishing fill material, stockpiling, scarifying substrate surface, placing where required, and compacting.
- C. Structural Fill:
 - 1. Basis of Measurement: Included in the cost of pipe items.
 - 2. Basis of Payment: Includes furnishing fill material, stockpiling, shaping substrate surface, placing where required, and compacting.
- D. Granular Fill:
 - 1. Basis of Measurement: Included in the cost of pipe items.
 - 2. Basis of Payment: Includes furnishing fill material, stockpiling, scarifying substrate surface, placing where required, and compacting.
- E. Concrete Fill:
 - 1. Basis of Measurement: Included in the cost of pipe items.
 - 2. Basis of Payment: Includes furnishing materials, forming, mixing and placing where required, and curing.

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1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
 - 2. AASHTO T99 - Standard Specification for Moisture-Density Relations of Soils Using a 2.27-kg (5-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
 - 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 3. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - 5. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - 6. ASTM D4253 - Test Methods for Maximum Index Density of Soils Using a Vibratory Table
 - 7. ASTM D4254 - Test Methods for Minimum Index Density of Soils and Calculation of Relative Density
 - 8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 9. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 - 10. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.

1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.
- C. Product Data: Submit data for geotextile fabric indicating fabric and construction.
- D. Samples: Submit 50 lb sample of each type of fill to testing laboratory.
- E. Materials Source: Submit name of imported fill materials suppliers.
- F. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 SUSTAINABLE DESIGN SUBMITTALS

- a. Not applicable to this Project.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with City of Fort Lupton standards.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.9 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Embankment Fill: as specified in Sections 31 05 13.
- B. Granular Fill: as specified in Section 31 05 16

2.2 ACCESSORIES

- A. Geotextile Fabric (if required): Non-biodegradable, non-woven.
 - 1. TC Mirafi; Model.
 - 2. Tensar Earth Technologies, Inc.; Model.
 - 3. Or approved equivalent.

PART 3 EXECUTION

3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
 - 1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

- A. Call Local Utility Line Information service not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum locations.
- C. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- D. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities indicated to remain.
- F. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

3.3 TRENCHING

- A. Excavate subsoil required for utilities to utility service.
- B. Remove lumped subsoil, cobbles larger than 6 inches and/or boulders, and rock up of 1/6 cubic yard, measured by volume. Remove larger material as specified in Section 31 23 18.
- C. Perform excavation within 24 inches of existing utility service in accordance with the utility's requirements.
- D. Do not advance open trench more than 200 feet ahead of installed pipe.
- E. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.
- F. Excavate bottom of trenches maximum 2 feet wider than outside diameter of pipe.
- G. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material, pipe, and utilities.
- H. Do not interfere with 45 degree bearing splay of foundations.
- I. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls can not be sloped, provide sheeting and shoring to protect excavation as specified in this section.
- J. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by Engineer until suitable material is encountered. Notify Engineer, and request instructions.
- K. Cut out soft areas of subgrade not capable of compaction in place. Backfill with an Appropriate Fill Type and compact to density equal to or greater than requirements for subsequent backfill material.
- L. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

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- M. Correct areas over excavated with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by [Architect/Engineer].
- N. Remove excess subsoil not intended for reuse, from site.

3.4 SHEETING AND SHORING

- A. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- B. Support trenches more than 4 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.
- C. Design sheeting and shoring to be removed at completion of excavation work.
- D. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- E. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.5 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place material in continuous layers as follows:
 - 1. Compacted Fill: Maximum 8 inches compacted depth.
 - 2. Granular Fill: Maximum 8 inches compacted depth.
- D. Compaction shall be by mechanical means only. Water settling or jet shall not be used. Placement and compaction methods shall not disturb or damage existing or new utilities in trench or adjacent structures.
- E. Fill shall be placed at optimum moisture content plus or minus 2%.
- F. Do not leave more than 20 feet of trench open at end of working day.
- G. Protect open trench to prevent danger to the public. Open trenches shall be covered with a steel plate overnight to protect the public.

3.6 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 0.10 feet from required elevations.

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3.7 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements and Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Maximum Density and Optimum Moisture Content shall be determined in accordance with ASTM D698 for Random and Select Fill.
- C. Maximum and Minimum Index Densities for Relative Density shall be determined in accordance with ASTM D4253 and D4254 for Free-draining Fill
- D. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D2922.
- E. When tests indicate Work does not meet specified requirements, corrective action shall be taken until the Work meets specified requirements and retested for verification.]
- F. Frequency of Tests: 1 moisture density test for every 100 feet of pipe.

3.8 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

3.9 SCHEDULE

- A. Piping:
 - 1. Cover pipe and bedding with appropriate Fill to subgrade elevation.
 - 2. Compact uniformly to minimum 95 percent of maximum density as determined by ASTM D698 and plus or minus 2% of the optimum moisture.

END OF SECTION

SECTION 31 23 19

DEWATERING AND DRAINAGE

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Furnish, install, operate, monitor, maintain, and remove temporary dewatering and drainage systems as required. Lower and control water levels below inverts to permit construction in the dry.
- B. Provide, maintain, and remove temporary surface water control measures to sufficiently drain and remove surface water before it enters any excavations, or grading. If surface water does enter excavation or grading, implement control measures so that it is adequately removed.
- C. Collect and properly dispose of all discharge water from dewatering and drainage systems.
- D. Repair damage caused by dewatering and drainage system operations.
- E. Remove temporary dewatering and drainage systems when no longer needed. Restore all disturbed areas.
- F. Obtain, pay for, and comply with any and all required permits.

1.2 SUBMITTALS (see Section 01 33 00)

- A. Quality Control Submittal
 - 1. Water Control Plan
 - a. At a minimum, the Water Control Plan shall include:
 - (1) Descriptions of proposed groundwater and surface water control facilities including, but not limited to, equipment, methods, standby equipment and power supply, pollution control facilities, discharge locations to be utilized, provisions for immediate temporary water supply and other requirements, as specified in this Section.
 - b. If the system is modified during installation or operation, the Water Control Plan shall be revised or amended as appropriate and shall be resubmitted.
- B. Administrative Submittals
 - 1. Discharge permits.

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1.3 DEFINITIONS

- A. Where the phrase "in the dry" is used in this Section, *in situ* soil moisture content shall be no more than 4 percentage points above the optimum moisture content for that soil.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. All Excavations: Water shall be continuously controlled during the course of construction, including weekends, holidays, and during periods of work stoppages. Contractor shall provide adequate backup systems to maintain control of water.
- B. Properly control and dispose of any surface runoff, preventing it from entering excavations. Contractor shall comply with sedimentation and erosion.

3.2 DEWATERING SYSTEMS

- A. Provide, operate, and maintain dewatering systems of sufficient size and capacity to permit excavation and subsequent construction in the dry. Groundwater level shall be lowered and maintained to below the invert of the proposed structures. Contractor shall continuously maintain excavations to be free of water, regardless of source, until backfilled to final grade. No additional compensation shall be made for dewatering operations meeting the above requirements.
- B. Design and Operate Dewatering Systems:
 - 1. To prevent loss of ground as water is removed.
 - 2. To avoid inducing settlement or damage to existing facilities completed work, or adjacent property.
- C. Provide supplemental ditches and sumps only as necessary to collect water from local seeps. Ditches and sumps shall not be used as the primary means of dewatering.

3.3 DISPOSAL OF WATER

- A. Obtain discharge permit for water disposal from jurisdictional authorities.
- B. Treat water collected by dewatering or surface operations, as required by regulatory agencies, prior to discharge.
- C. Discharge water as required by discharge permit and in a manner that will not cause erosion, flooding, or otherwise damage existing facilities, completed work, or adjacent property.

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- D. Remove solids from any treatment facilities required by discharge permit and perform maintenance of treatment facilities as necessary to maintain their efficiency.

3.4 PROTECTION OF PROPERTY

- A. Contractor shall make an assessment of potential for dewatering induced settlement and shall provide and operate devices or systems, including but not limited to: reinjection wells, infiltration trenches, and cutoff walls, necessary to prevent damage to existing facilities, completed work, and adjacent property.
- B. Securely support existing facilities, construction work, completed work, and adjacent property vulnerable to settlement due to dewatering operations. Support shall include, but not be limited to, bracing, underpinning, or compaction grouting.

3.5 REMEDIATION OF GROUNDWATER DEPLETION

- A. If dewatering reduces quantity or quality of water produced by existing wells, Contractor shall temporarily supply water to affected well owners from other sources. Contractor shall furnish water of a quality and quantity equal to or exceeding the quality and quantity available to the well owner prior to beginning work, or as satisfactory to each well owner.

END OF SECTION

SECTION 31 23 20

TEST PITS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavation of test pits in compacted earthfill during the progress of the Work. Location and times of excavating test pits shall be as necessary to examine or obtain samples of specific portions of the work in accordance with the applicable provisions of Section 01 40 00, and as determined by the Engineer.
- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork.
 - 2. Section 31 23 16 - Excavation.
 - 3. Section 31 23 23 - Fill

PART 2 PRODUCTS

2.1 BACKFILLING TEST PITS

After examination of test pits and collection of embankment samples, the test pits shall be backfilled with earthfill conforming to the adjacent embankment materials, which shall be placed in layers, moistened, and compacted in accordance with the applicable provisions of Section 31 23 23, as applicable.

PART 3 EXECUTION

3.1 EXCAVATION OF TEST PITS

- A. The surface dimensions and depth of each test pit will be determined by the Engineer, but in general, no test pit will involve the excavation and backfill of more than 10 cubic yards of earthfill.
- B. The sides of the test pits shall be excavated to as near vertical as practicable but in accordance with applicable safety requirements to allow inspection of the compacted earthfill by the Engineer.
- C. The Contractor shall adjust its operations so that test pits will remain open for a maximum of 4 hours to facilitate inspection and collection of embankment samples.
- D. Prior to backfilling the test pit wall shall be sloped to 1 vertical to 1 horizontal or flatter.

END OF SECTION

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SECTION 31 23 23

FILL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Embankment construction
 - 2. Placing earthfill.
 - 3. Specially compacted earthfill in embankment.
- B. Related Sections:
 - 1. Section 01 30 00 – Administration Requirements.
 - 2. Section 01 70 00 – Execution and Closeout Requirements.
 - 3. Section 31 05 13 – Soils for Earthwork.
 - 4. Section 31 23 16 – Excavation.
 - 5. Section 31 23 19 – Dewatering.
 - 6. Section 32 91 19 – Landscape Grading.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 2. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 4. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 - 5. ASTM D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Materials Source: Submit name of imported fill materials suppliers.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Embankment Fill as specified in Section 31 05 13.

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- B. Topsoil as specified in Section 31 05 13.

PART 3 EXECUTION

3.1 EMBANKMENT CONSTRUCTION

The completed liner embankment shall be to the lines and grades shown on the Drawings.

A. PLACING

1. The Contractor's operations, including handling and placing of the embankment materials, shall be such as to prevent segregation of the materials.

B. FOUNDATION PREPARATION

1. The embankment footprint, and excavation requirements are specified in this Section.
2. The Contractor shall allow sufficient time prior to final foundation preparations to allow for observations and geologic logging of the exposed foundation as outlined in Sections 01 30 00 and 01 70 00. The schedule for this work shall be coordinated with the Engineer to prevent delay in final foundation preparations and fill placement or rework of prepared surfaces or exposed bedrock.
3. No materials shall be placed in any portion of the embankment until the foundation for each section has been unwatered, cleared, grubbed, stripped, suitably prepared, and approved by the Engineer.
4. All portions of excavations made for test pits or other subsurface explorations found within the liner foundation areas which extend below or beyond the established lines of excavation for liner embankment foundation, shall be filled with compacted earthfill.
5. All joints, cracks, fractures, cavities, depressions, and irregularities, either existing or resulting from foundation excavation and preparation and exposed within the footprint of the liner shall be cleaned of all loose infilling materials and debris to expose firm native as specified herein for general foundation preparations. The final cleaning and condition of the exposed surfaces shall meet the intentions these foundation preparation specifications and observed by the Engineer for determination of acceptance for placement of backfill. The void space and openings resulting from the removal of the loose infillings and debris shall be filled with embankment fill material conditioned at two percent under to two percent over optimum moisture content (per ASTM D698) and compacted so to meet the minimum compaction sections presented herein for this material.
6. Embankment shall not be placed on a foundation which contains frozen material, or which has been subjected to freeze-thaw action, desiccation or damage by vehicular traffic, or exists at moisture conditions above specified limits. This prohibition encompasses all foundation types, including the natural ground, all prepared subgrades, whether in an excavation or on an embankment, and all

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layers of previously placed and compacted earthfill which become the foundations for successive layers of earthfill.

7. All material that freezes or has been subjected to freeze-thaw action, or has desiccated, or has been excessively wetted during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, or winter shutdowns or earthwork operations, shall be removed to a depth that is acceptable to the Engineer and replaced with new material. Alternatively, the material shall be thawed, dried, moisture conditioned, reworked, and recompacted to the specified criteria before additional material is placed.
8. The Engineer will determine when placement of fill shall cease due to cold weather. The Engineer may elect to use average daily air temperatures, and/or physical observation of the soils for this determination.
9. Bedrock Foundation Surfaces:
 - a. Prior to the first layer of earthfill being placed in contact with bedrock, all bedrock surfaces within the area to receive fill shall be cleaned of all loose and objectionable materials in an approved manner by handwork, barring, picking, brooming, air jetting, or other effective means. In no case shall the selected method result in further loosening, deterioration or undermining of the surface being cleaned. This includes the foot traffic during cleaning and over prepared surfaces and methods of removing collected materials and debris during cleaning so not to adversely impact the prepared surface. The final 2 feet of excavation shall be conducted with rubber tired equipment. No steel tracked or wheeled equipment shall be allowed within 2 feet of the bedrock surface.
10. Vertical formation surfaces shall be not more than 3 feet in height, and benches of sufficient width shall be provided as necessary so that the average slope of any formation surface is not steeper than one horizontal to two vertical. Resloping of formation surfaces shall be accomplished by the method that results in the least damage to the formation left in place.
11. Formation protrusions that will prohibit the specified placement and compaction of earthfill materials shall be removed as provided in Section 31 23 16. The formation surface remaining after removal of protrusions shall be cleaned, and all loose and objectionable material removed prior to placement of the earthfill.
12. Foundation Surfaces:
 - a. The Foundation shall be excavated to exposed firm bedrock as outlined Section 31 23 16. Areas of soft or fractured material within the bedrock foundations shall be over excavated a minimum of 3 feet to expose firm and less permeable bedrock surface. The final depth and configuration of the overexcavation shall be approved by the Engineer. The last 2 feet of excavation shall be conducted with rubber tired equipment. No steel

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tracked or wheeled equipment shall be allowed within the last 2 feet of excavation.

- b. Surface preparation in these areas shall be as outlined above with the exceptions or additions presented as follows. The prepared surfaces shall be cleaned in a manner outlined above or as necessary to produce a thoroughly clean surface for fill placement and free of all loose material or other contaminants such as wind blown soils or fall in from adjacent areas. The final surface shall exhibit a geometry, both overall and locally suitable to provide a complete and continuous contact between the fill and the bedrock rock surface.
- c. Cleaning of all loose material and protection of the underlying material and exposed bedrock surface may require vacuuming with an industrial sized vacuum truck or broomed with a power broom.
- d. The prepared surface shall be observed by the Engineer and approved prior to fill placement. The approved surface shall be backfilled as soon as possible following approval. The approved surface shall be backfilled or otherwise protected from degradation or contamination within a 6-hr period following approval unless otherwise approved by the Engineer.
- e. Surfaces applicable to cleaning and surface preparations under this paragraph shall extend over the foundation floor and continuous up sidewalls for 18 inches from the floor in areas of earthfill placement.
- f. Exposed foundation surfaces shall be cleaned and approved by the Engineer prior to fill placement. In no case shall the Contractor clean key trench areas for approval that cannot be covered with fill, as applicable, within the same shift. Exposure of the excavated formation surface upon which fill will be placed shall be limited to 6 hours, which time shall commence at the completion of each portion of the excavation, and which will include the time required for final cleanup and surface treatment.

- 13. The Contractor shall mobilize sufficient equipment, materials, and manpower prior to the start of final excavation in order to limit the exposure time so specified.

C. PLACING EMBANKMENT MATERIALS

- 1. The suitability of each part of the foundation for placing embankment materials thereon and of all materials for use in embankment construction will be determined by the Engineer.
- 2. No brush, roots, sod, or other perishable or unsuitable materials shall be placed in the embankment.
- 3. Each load of the material placed in the embankment, whether from excavation for other parts of the Work or from the borrow pit, shall be placed in accordance with the plans and specifications.

4. In any separate portion of liner embankment being constructed, each layer shall be constructed continuously and approximately horizontal for the width and length of such portion at the elevation of the layer, with the exception of the ends of the fill section which can be constructed at maximum 3:1 slopes or flatter. When the portions of the liner are extended laterally to connect to an existing portion of the liner the existing liner shall be overexcavated to firm, properly moisture conditioned embankment prior to placement of new fill adjacent to the existing fill.
5. The Contractor shall maintain the embankment in an approved manner, including maintaining surfaces free of weeds or other vegetation, until final completion and acceptance of all the work under the Contract.
6. During temporary shutdown periods, or winter shutdown periods, the embankment shall be protected by "dry lifting" a minimum of 1 foot depth over the fill to protect from frost.
7. Prior to resuming the placement of embankment material after temporary or winter shutdown periods, the Contractor shall remove the "dry lift" material, and overexcavate the existing surface down to firm, unfrozen, frost free, properly moisture conditioned fill prior to new fill placement. The depth of the overexcavation shall be approved by the Engineer. Prior to placement of new fill the area shall be scarified and moisture conditioned to specified moisture limits.

D. RATE OF PLACEMENT

Unless otherwise directed by the Engineer, the embankment shall be maintained at approximately the same level regardless of the number of types of materials being placed.

E. MAINTENANCE AND PROTECTION OF EMBANKMENT MATERIALS

1. The Contractor shall maintain and protect the embankment in a satisfactory condition at all times until final completion and acceptance of all work under the Contract. If in the opinion of the Engineer, the hauling equipment causes horizontal shears or slick sides, rutting, quaking, heaving, cracking or excessive deformation of the embankment, the Contractor shall limit the type, load or travel speed of the hauling equipment on the embankment.
2. Any approved embankment material which is lost in transit or rendered unsuitable after being placed in the embankment and before final acceptance of the Work, shall be replaced by the Contractor in a satisfactory manner.
3. The Contractor shall excavate and remove from the embankment any material that the Engineer considers objectionable and shall also dispose of such material and refill the excavated area as directed.

3.2 PLACING EARTHFILL

- A. The distribution and gradation of the earthfill materials shall be such that the earthfill will be free from lenses, pockets, streaks, voids, or layers of material differing

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substantially in texture, gradation, or water content from surrounding material.

- B. The combined excavation and placing operations shall be such that the earthfill materials, when placed on the embankment, will be blended sufficiently in the opinion of the Engineer to secure the highest practicable degree of uniformity and strength.
- C. Placing of earthfill materials includes dumping, spreading, and mixing the earthfill materials and any other operations on the surface of the earthfill portion of the embankment necessary to blend earthfill materials to form as homogeneous a layer as practicable prior to compaction. Successive loads of material shall be dumped and spread on the earthfill so as to produce the best practicable distribution of the material, subject to the approval of the Engineer; and for this purpose, the Engineer may designate the locations in the earthfill where the individual loads shall be deposited.
- D. The earthfill materials shall be dumped and spread in a direction parallel to the crest of the embankment. When windrows of material are formed as a result of the dumping operations, such windrows shall be parallel to the crest of the embankment.
- E. The material placed in the earthfill shall be spread in level, continuous, horizontal layers such that the loose layers shall not exceed 8 inches in thickness prior to compaction.
- F. The first layer of fill placed over or against the prepared surface of the bedrock shall be placed wet of optimum. Material along the floor and side wall contact shall be wheel rolled for compaction with a rubber-tired piece of equipment. Such equipment shall be a Caterpillar 988 front-end loader with a loaded bucket, a scraper, or equivalent as approved by the Engineer. Material in subsequent lifts along the side wall of the key trench shall be compacted in the same manner.
- G. As soon as practicable after commencement of construction of any section of the embankment; the fill shall be raised or slightly sloped as determined by the Engineer so that the surface of the fill will drain freely to the rear of the fill so that it enters the dewatering trench or runs off laterally along the back wall of the excavation and shall be so maintained throughout construction.
- H. If, in the opinion of the Engineer, the surface of the prepared foundation or the surface of any previously compacted layer of earthfill is too dry or too smooth to bond properly with the layer of earthfill material to be placed thereon, it shall be moistened and disked or scarified in an approved manner to a sufficient depth to provide a satisfactory bonding surface before the earthfill material is placed.
- I. If, in the opinion of the Engineer, the surface of any previously compacted layer of the earthfill in place is too wet for proper compaction of the layer of earthfill material to be placed thereon, it shall be removed, allowed to dry, or be worked with a disk to reduce the water content to the required amount, and then it shall be recompacted before the next succeeding layer of earthfill material is placed.
- J. After a layer of earthfill has been dumped and spread, it shall be disked to break up and blend the earthfill materials. Smooth, hard surfaces and deep ruts in the surface of earthfill resulting from the passage of construction equipment during placing operations shall be removed by diskings or scarifying. Disking to obtain a uniform distribution of water content throughout the uncompacted layer as detailed below, may be substituted

for disking required to break up and blend the earthfill materials. Disking shall be performed with a heavy disk plow to the full depth of the uncompacted layer. The diameter of the disk shall not be less than 24 inches at any time during the disking operations. If one pass of the disk does not accomplish the breaking up and blending of the earthfill, additional passes of the disk may be required.

- K. Prior to placement of earthfill on or against the surfaces of previously placed and compacted portions of the liner embankment, all previously placed and compacted materials which have become soft or loose due to exposure to weather, which contain erosion channels or cracks, or which are excessively dry, shall be reworked by removing and replacing, or by recompacting as directed by the Engineer. The replaced materials shall be compacted as required by these Specifications for the type of material being compacted. Damaged or loosened surfaces shall be recompacted as originally specified for the material being recompacted.
- L. At all times during the dumping and spreading processes, the Contractor shall maintain a personnel force adequate to remove all roots and debris from all embankment materials and all cobbles of greater than 3 inches in maximum dimension from embankment fill materials. Cobbles so removed and the roots and debris shall be removed from the embankment and disposed of in an approved manner. The entire surface of any section of the embankment under construction shall be maintained in such condition that construction equipment can travel on any part of any one section. Ruts in the surface of any layer shall be removed by scarifying before placing and compacting additional material.
- M. WATER CONTENT AND DENSITY CONTROL
 - 1. General:
 - a. Each layer of the earthfill material on the embankment shall be compacted by a sufficient number of passes, but no less than 2 complete passes, to achieve the specified percent compaction shown below, which shall be the minimum compaction effort to be performed by the Contractor. One pass is defined as the passing of both drums of a double drum tamping foot roller over the material to be compacted. During compaction, the water content of the earthfill materials shall be such that the water content and dry density of the compacted earthfill will be maintained within the control limits specified below. The results of testing specially compacted earthfill will not be combined with the results of testing earthfill compacted by tamping rollers.
 - 1. Embankment fill: 98% maximum dry density.
 - 2. Fill outside embankment: 95% maximum dry density.
 - 3. Topsoil: No requirement.
 - b. To determine that the water content and dry density requirements of the compacted earthfill are being met, field and laboratory tests will be made by the testing agency at frequent intervals on samples of compacted

material taken at embankment locations determined by the Engineer. Field and laboratory tests will be made by the testing agency in accordance with Section 01 40 00. The results of all completed earthwork tests shall be available to the Engineer and Owner as soon as is reasonable.

- c. Materials not meeting the specified water content or dry density requirements, or any other specified material property, as determined by the tests, shall be reworked until approved results are obtained. If freezing of previously compacted and accepted earthfill has resulted in a decrease in compacted density of the earthfill as determined by the Engineer, the Contractor shall rework or overexcavate and replace the earthfill as directed until approved densities are obtained. Reworking shall include removal, rehandling, reconditioning, rerolling, or combinations of these procedures.

2. Water Content Control:

- a. The optimum water content is defined as "the water content of a soil at which it can be compacted to its laboratory maximum dry density by a given compactive effort." The laboratory maximum dry density in pounds per cubic foot is the maximum dry density obtained from a curve of water content versus dry density for a given compactive effort.
- b. As far as practicable, the material shall be brought to the proper water content for compaction in the borrow pit or at the site of required excavation before excavation, and the Contractor shall make allowances for water loss during excavation, transportation, and placing operations.
- c. Supplementary water, if required, shall be added to the material by sprinkling on the earthfill, and each layer of earthfill shall be conditioned by disking or other approved methods so that the water is distributed uniformly throughout the layer. Water applied on a layer of fill shall be accurately controlled in amount so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the embankment, so that the material is too wet per specifications, the rolling on that section of the embankment shall be delayed until the moisture content of the material is reduced to an amount within the specified limits.
- d. The water contained in the earthfill material during compaction shall be distributed uniformly throughout the layer of material being compacted. The moisture content after compaction shall be as uniform as practicable throughout any one layer of the earthfill material. The allowable ranges of water content are based on design considerations.

- e. Material represented by the samples tested having a water content outside the limits shown below will be rejected and shall be removed or reworked until the water content is between these limits as specified below.
 - 1. Embankment Fill: Less than two (2) percent below optimum water content and more than two (2) percent above optimum water content.
 - 2. Fill outside embankment: Less than two (2) percent below optimum water content and more than two (2) percent above optimum water content.
 - 3. Topsoil: No requirement
- 3. Density Control:
 - a. Density control of compacted embankment fill shall be such that the dry density of the portion of the compacted material passing a United States Standard No. 4 sieve as determined by tests performed by the Engineer shall conform to the following limits:
 - 1. Material represented by samples having a dry density less than 98% of its laboratory maximum dry density will be rejected as outlined below. Such rejected material shall be rerolled or reworked as necessary until its dry density is equal to or greater than 98% of its maximum dry density.
 - 2. For all embankment fill having a dry density greater than the above limit and based on a continuous record of tests made by the Engineer on previously compacted and accepted embankment fill, the uniformity of dry density shall be such that:
 - a. The average dry density of all accepted embankment fill and of material represented by any 10 consecutive tests within a work area of the embankment shall be not less than 85% of the laboratory maximum dry density with no single test sample being lower than 95% of the maximum dry density.
 - 3. The Engineer will inform the Contractor of single sample test results and the running average compacted density, The Contractor shall immediately make adjustments in procedures as necessary to maintain the dry density within the specified limits of uniformity.
 - b. Density control of compacted fill outside the embankment shall be such that the dry density of the portion of the compacted material passing a United States Standard No. 4 sieve as determined by tests performed by the Engineer shall conform to the following limits:
 - 3. Material represented by samples having a dry density less than

95% of its laboratory maximum dry density will be rejected as outlined below. Such rejected material shall be rerolled or reworked as necessary until its dry density is equal to or greater than 95% of its maximum dry density.

4. For all fill outside of the embankment having a dry density greater than the above limit and based on a continuous record of tests made by the Engineer on previously compacted and accepted fill outside the embankment, the uniformity of dry density shall be such that:
 - b. The average dry density of all accepted fill outside the embankment and of material represented by any 10 consecutive tests within a work area of the fill shall be not less than 95% of the laboratory maximum dry density with no single test sample being lower than 92% of the maximum dry density.
3. The Engineer will inform the Contractor of single sample test results and the running average compacted density, The Contractor shall immediately make adjustments in procedures as necessary to maintain the dry density within the specified limits of uniformity.

N. ROLLERS

1. Tamping Foot type rollers shall be used for compacting the fill soils. The rollers shall be capable of effectively achieving the required density for the entire depth of the lifts being placed. The rollers shall be suitable for the material being placed, capable of rates of production, which will not cause any delays to the progress of the work. The length of each tamping foot shall sufficient to penetrate the thickness of each loose lift. Each compactor shall be equipped with cleaners on the drums so soil cannot building up and reduce the compactive effort of the machine.

O. COMPACTION

1. When each layer or a portion of a layer of earthfill has been blended, leveled, and conditioned to have the water contained therein distributed uniformly throughout the layer, as detailed above, it shall be compacted by passing the drum of a tamping roller over it a sufficient number passes (with a minimum of 2 complete passes) to achieve the specified minimum allowable compaction. On rough or irregular formation surfaces or formation surfaces which could be damaged by tamping rollers, as determined by the Engineer, the initial layer of earthfill shall be compacted with a rubber-tired roller having a minimum wheel load of 25,000 pounds and tire pressure of 80 to 100 pounds per square inch. When compacted, the dry density of the earthfill shall be uniform throughout the depth of the layer. Passes of the tamping roller or rubber-tired roller shall be carried out so that the

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compactive effort is uniformly distributed in a systematic manner over the entire layer. When two- or four-drum, self-propelled rollers are used which have drums laterally separated by the operator's cab and differential, the uncompacted central portion of the roller path shall not be compacted until the outer portions of the path have been fully compacted.

2. Where steep abutments, construction activities, or other factors make it impractical or inefficient to complete the required number of drum passes while maintaining the same direction of roller travel, additional passes as needed to achieve compaction shall be performed by routing the tamping rollers parallel to the obstructions as approved by the Engineer. Portions of the earthfill which are not accessible to tamping rollers shall be specially compacted with power tampers or other approved methods in accordance with the provisions of this Section.
3. If, in the opinion of the Engineer, the compacted earthfill material has a water content greater than allowed above, the earthfill material shall be worked with a disk or other suitable equipment to reduce the water content to the amount specified, shall be allowed to dry until such time as its water content is within the limits specified above, or the material shall be removed from the embankment.
4. If, in the opinion of the Engineer, the compacted earthfill material has a water content less than allowed above, water shall be added to the uncompacted earthfill, and the earthfill shall be worked with a disk or other suitable equipment to distribute the water uniformly throughout the uncompacted layer.
5. Compacted earth material that has a water content or dry density which does not meet the limits specified above, shall be reworked and rerolled, as directed by the Engineer, to obtain the water content and dry density specified for compacted earthfill.
6. At locations and at such times as determined by the Engineer, the Contractor shall excavate test pits in previously compacted earthfill for the purpose of obtaining samples of previously compacted earthfill or for determining whether the earthfill contains unbonded layers of earthfill or unblended earthfill materials. Such test pits shall be in accordance with Section 31 23 20.

3.3 SPECIALLY COMPACTED EARTHFILL EMBANKMENT

A. LOCATIONS OF SPECIALLY COMPACTED EARTH FILL

Specially compacted earthfill will be required at the following locations:

1. Earthfill in embankment placed and compacted in depressions and irregularities in foundation surfaces where designated by the Engineer.
2. Earthfill material locations outside the limits of the embankment where designated by the Engineer.

B. PLACING

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1. Material used in specially compacted earthfill shall conform to embankment fill material required for earthfill in liner embankment in Section 31 05 13: Provided, all roots, debris, and cobbles of greater than 3 inch in maximum dimension are removed from the material and are not placed in specially compacted earthfill.
2. Specially compacted earthfill material shall be placed in accordance with the applicable provisions this specification: Provided: That earthfill material to be specially compacted may require placement in layers thinner than those specified for roller compaction of earthfill material to obtain the desired compaction with the equipment used.
3. Where the foundation or compacted surface of any layer is too smooth to bond properly with the succeeding layer, it shall be scarified or otherwise roughened to provide a satisfactory bonding surface before the next layer of earthfill material is placed.

C. COMPACTING

1. When each layer of material has been conditioned to have the required water content, it shall be compacted by special rollers, mechanical tampers, or by other approved methods. All equipment and methods used shall be subject to approval by the Engineer.
2. Adjacent to restrictive areas as approved by the Engineer, compaction by rubber-tired equipment of a layer of earthfill not to exceed 2 feet in horizontal width may be substituted for compaction by mechanical tampers: Provided, That smooth surface left by the use of rubber-tired equipment shall be treated as prescribed above, prior to placement of the subsequent layer of earthfill.
3. The water content control and density control shall be equivalent to that obtained in the earthfill placed in the liner embankment in accordance with this specification.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements.

a. PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements

END OF SECTION

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SECTION 31 25 13

EROSION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Site Stabilization
- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork.
 - 2. Section 31 05 16 - Aggregates for Earthwork.
 - 3. Section 31 10 00 - Site Clearing.
 - 4. Section 31 23 16 - Excavation.
 - 5. Section 31 23 23 - Fill.
 - 6. Section 32 91 19 - Landscape Grading.
 - 7. Section 32 92 19 - Seeding.

1.2 REFERENCES

- A. Urban Drainage & Flood Control District (UDFCD) Criteria Manual Volume 3
- B. Colorado Department of Health and Environment (CDPHE) regulations.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Stormwater Management Plan (SWMP)
- C. CDPHE Temporary Construction Dewatering Permit (if required).
- D. CDPHE Stormwater Discharge Permit (if required).

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

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3.2 SITE STABILIZATION

- A. Incorporate erosion control devices indicated in the SWMP into the Project at the earliest practicable time.
- B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.

3.3 FIELD QUALITY CONTROL

- A. Inspect erosion control devices per the SWMP and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.

3.4 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
- B. When sediment accumulation in sedimentation structures has reached a point one-half depth of sediment structure or device, remove and dispose of sediment.
- C. Do not damage structure or device during cleaning operations.
- D. Do not permit sediment to erode into construction or site areas or natural waterways.
- E. Clean channels when depth of sediment reaches approximately one half channel depth.

3.5 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

END OF SECTION

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SECTION 31 37 00

RIPRAP

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Riprap placed loose.
- B. Related Sections:
 - 1. Section 31 23 16 - Excavation
 - 2. Section 31 23 23 - Fill.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Riprap:
 - 1. Basis of Measurement: By cubic yard.
 - 2. Basis of Payment: Includes supply and placing riprap.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for riprap.
- C. Manufacturer's Certificate: Certify product meets or exceeds specified requirements.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this project.

1.5 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Furnish materials in accordance with Urban Drainage and Flood Control District.
- B. Riprap: Type L; 9-inch median size.

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PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 40 00 – Quality Requirements.

3.2 PLACEMENT

- A. Place riprap as indicated on Drawings.
- B. Installed Thickness: As indicated on Drawings.

END OF SECTION

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SECTION 31 63 29

DRILLED CONCRETE PIERS (CAISSONS)

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Information concerning a sub-surface soil investigation by the Owner's Geotechnical Engineer is available and will be furnished by the Owner upon request. The contractor may use the data included therein for his general information only. The Architect/Engineer is not responsible for the accuracy or applicability of the data therein.

1.2 DEFINITIONS

- A. Casing: Steel cylinder used to resist earth and water pressures, to serve as concrete form, and to protect personnel.
- B. Dry Method: A method of pier installation in which concrete is placed in the dry. Casing may or may not be used to maintain sidewall stability.
- C. Owner's Representative: The Architect, Structural Engineer, or Geotechnical Engineer authorized to act on behalf of the Owner.
- D. Owner's Representative - Geotechnical Engineer: The Geotechnical Engineer specifically authorized to carry out the responsibilities defined in this specification.
- E. Tremie method: Procedure for placing concrete under water or slurry using a watertight steel pipe or tube to place concrete without washing out cement fines.

1.3 STANDARDS

- A. The following Standards are listed in this specification:

ASTM A36 Standard Specification for Carbon Structural Steel

ASTM A283 Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

ASTM A929 Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe

ASTM C33 Standard Specification for Concrete Aggregates

ASTM C94 Specification for Ready Mixed Concrete

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ASTM C150 Specification for Portland Cement

ASTM D1143 Standard Test Method for Piles Under Static Axial Compressive Load

ASTM D4380 Standard Test Method for Density of Bentonitic Slurries

ASTM D4381 Standard Test Method for Sand Content by Volume of Bentonitic Slurries

ASTM D4972 Standard Test Method for pH of Soils

1.4 SCOPE OF WORK

- A. The Drilling Contractor shall furnish all labor, materials, services, equipment (including temporary casings and/or dewatering where required), and shall install all piers at the locations and depths shown on the drawings or as otherwise directed by the Owner's Geotechnical Engineer. Installation methods compatible with the design may be used if acceptable to the Owner's Geotechnical Engineer. Methods that are not compatible with the design shall be excluded from consideration.
- B. The Drilling Contractor shall furnish and place all reinforcing steel, dowels, and anchor bolts that are shown on the drawings to be embedded in the pier.
- C. The General Contractor shall provide all necessary excavation, sheeting and bracing or other adequate maintenance of excavation banks, suitable runways and ramps as necessary for access of pier drilling, control of ground and surface water as necessary to keep the work area sufficiently dry, suitable access roads for movement of equipment and materials to and from pier locations, field layout required for pier work including setting and maintaining a location stake for each pier and giving cut-off grades on all piers, removal and replacement of all overhead and underground obstructions as required, and coordination of all concrete ordering and delivery.

1.5 QUALIFICATIONS

- A. Drilled piers shall be installed by a specialty Drilling Contractor with suitable equipment, competent personnel, and a reputation of satisfactorily performing the work. The Contractor shall have a minimum of 5 years successful experience and a minimum of 5 successful installations on projects of a similar size and scope to this project and of using similar installation methods as may be anticipated for this project. Evidence of compliance with this section shall be submitted to the Architect/Engineer prior to entering into a contract for the work.

1.6 QUALITY ASSURANCE

The Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.

- A. Codes and Standards: The Drilling Contractor shall comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

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1. ACI 301 - "Specifications for Structural Concrete for Buildings".
2. ACI 117 - "Specifications for Tolerances for Concrete Construction and Materials."
3. ACI 318 - "Building Code Requirements for Reinforced Concrete".
4. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice".
5. ANSI/AWS D1.1 "Structural Welding Code - Steel".
6. ANSI/AWS D1.4 "Structural Welding Code – Reinforcing Steel".

In addition, all applicable building code and local regulations shall be followed. In case of conflict, the strictest interpretation shall govern.

B. Survey Work:

1. The General Contractor shall employ a qualified surveyor to perform all surveys, layouts and measurements for drilled pier work including the layout of anchor rods and/or reinforcing steel dowels embedded in drilled piers. The surveyor shall conduct the layout work for each drilled pier to the lines and levels required prior to beginning excavation and shall make actual in-place measurements of each drilled pier plan location, shaft diameter, bottom and top elevations and deviations from specified tolerances.
2. The surveyor shall record and submit all information pertinent to each drilled pier and cooperate with other testing and inspection personnel to provide data for all required reports.

C. Testing Laboratory Requirements: The Drilling Contractor shall cooperate with all testing and inspection personnel employed to perform field quality control tests and inspections. See Testing Laboratory section of the specifications for required tests and inspections to be performed by the Testing Laboratory and Geotechnical Engineer.

Inspection or testing by the Owner does not relieve the Contractor of his responsibility to perform the Work in accordance with the Contract Documents.

1.7 JOB CONDITIONS

A. Site Information:

1. Data on indicated subsurface conditions are not intended as representations or warranties of continuity of such conditions. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by the Contractor. The data are made available for convenience of the Contractor.
2. The Contractor may make additional test borings and other exploratory operations at no additional cost to the Owner.
3. The Contractor shall inspect the site prior to drilling operations and shall determine any constraints to the work presented by the existing surface conditions and report them to the Owner's Representative.

B. Protection of Existing Structures: Locate all existing underground structures and utilities that are to remain in service during construction. Protect above-ground structures, underground utilities and other construction from damage caused by drilling operations.

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Report any conflicts between drilling work and underground utilities and structures to the Owner's Representative and do not proceed with the work until the conflict is resolved.

1.8 PREINSTALLATION CONFERENCE

- A. At least 7 days prior to beginning pier installation, the Contractor shall conduct a meeting to review the proposed excavation, inspection, and concrete and reinforcement placement methods and procedures to produce pier construction of the required quality. Also review requirements for submittals, status of coordinating work and availability of materials. Establish work progress schedule and procedures for bearing surface inspection, materials testing, and certifications. The Contractor shall send a pre-installation conference agenda to all attendees 7 days prior to the scheduled date of the conference.
- B. The Contractor shall require responsible representatives of every party who is concerned with the concrete work to attend the conference, including but not limited to the following:
 - Contractor's Superintendent
 - Laboratory responsible for field material testing
 - Drilling Subcontractor
 - Ready-Mix Concrete Producer
 - Geotechnical Engineer
 - Owner's and Architect's/Engineer's Representative
- C. Minutes of the meeting shall be recorded, typed and printed by the Contractor and distributed by him to all parties concerned within 5 days of the meeting. One copy of the minutes shall be transmitted to the following for information purposes:
 - Owner's Representative
 - Architect
 - Engineer-of-Record
- D. The Engineer shall be present at the conference. The Contractor shall notify the Engineer at least 7 days prior to the scheduled date of the conference.

1.9 SUBMITTALS

- A. Concrete Mix Design: Submit concrete mix designs suitable for method of concrete placement for Engineer and Owner's Testing Laboratory approval prior to pier installation.
- B. Drilling Records: The Contractor and the Owner's Geotechnical Engineer or other authorized inspector shall each submit copies of the drilling record for each pier to the Architect/Engineer immediately after drilling. The reports shall indicate the name of the job, name of Contractor, and name of drilling superintendent. For each pier installed, the report shall indicate the following information:
 - 1. Pier number and location
 - 2. Pier shaft diameter
 - 3. Bottom elevation
 - 4. Top elevation

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5. Pier length
6. Theoretical volume of concrete in pier
7. Actual volume of concrete placed
8. Reinforcing steel size and depth actually placed
9. Drilling start and finish time
10. Concreting start and finish time
11. Variation from specified tolerances including surveyed location and plumbness
12. Construction method (dry method, casing method, or slurry displacement method)
13. Groundwater conditions (rate of water infiltration and depth of water in hole prior to concreting for dry piers; water elevation in hole for wet piers)
14. Elevation of top and bottom of any casing left in place
15. Description of temporary or permanent casing (including purpose, diameter, wall thickness and length)
16. Description and elevation of any obstructions encountered and whether removal was obtained
17. Description of pier bottom including amount and extent of loose material
18. Method of concrete placement
19. Any difficulties encountered in drilling or concreting operations
20. Any deviations from specifications.

For piers founded in rock, also record elevation at which rock was encountered, depth of socket, and record of any rock core samples made.

Reports prepared by the Owner's Geotechnical Engineer or authorized inspector shall be compiled and signed by a licensed professional engineer in the state where the project is located. Reports prepared by the Contractor shall be compiled and signed by the drilling superintendent.

C. Shop Drawings:

1. Reinforcing Steel: Submit shop drawings for all drilled pier and pier cap reinforcing steel.
2. Installation Method: Submit detailed procedures of the installation method, including (where applicable) type and number of drilling rigs and equipment, casing size and length, casing removal method, drilling fluid type, dewatering method, concrete placement, and reinforcing steel securing and placement.

D. Product Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items.

E. Qualification Data:

1. Submit qualification data for firms and persons specified in the article entitled "Qualifications" to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

2. Submit Welding Procedure Specifications (WPS) in accordance with ANSI/AWS D1.1 for all welded joints in steel casing. Submit test reports showing successful passage of qualification tests for all non-prequalified WPSs.
 3. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests as specified in section 1.05-B. If recertification of welders is required, retesting will be at Contractor's responsibility.
- F. Alternates: The Drilling Contractor shall submit his bid based on the specifications as written without exceptions. He may submit bids for alternates to the specifications or modifications to the design, load test program, or installation specifications for consideration by the Owner's Representative and the Owner.
- G. Post Construction Survey: After completion of pier placement, the Contractor shall provide the Owner's Representative with an as-built survey showing the actual locations of the piers at the top elevations. This survey shall show the plumbness of vertical piers, and all abandoned piers and their replacements. No construction of superstructures shall commence until this survey has been reviewed and accepted by the Owner's Representative. In order to facilitate the progress of the Work, the Contractor shall submit partial pier surveys for approval as the Work proceeds.

PART 2 PRODUCTS

2.1 CONCRETE

Concrete shall be as specified in the "Cast-in-Place Concrete" section of the specifications, in the general notes, and on the drawings, with the additional requirements specified below:

- A. Maximum Aggregate Size: Provide maximum aggregate size of three quarters of minimum clear spacing between individual reinforcing bars or bundles of bars, with 1 1/2" maximum.
- B. Water Reducing Admixtures: Where required by mix design, use water-reducing admixtures in strict compliance with manufacturers directions. Admixtures to increase cement dispersion, or provide increased workability for low-slump concrete may be used at contractor's option. Use admixtures in the amounts as recommended by manufacturer for climatic conditions prevailing at time of placing concrete. Adjust quantities of admixtures as required to maintain quality control.
- C. Slump Limits: Proportion concrete to have a slump that is suitable for the placement process used. The mix must remain fluid throughout the concrete placement time and during extraction of any temporary casing. The design shall be in accordance to ACI and ADSC procedures.

2.2 REINFORCING STEEL

- A. See "Concrete Reinforcing Steel" section of the specifications.

- B. Reinforcing Support and Positioning Devices: Devices made of non-corrosive material that support and align reinforcing steel within the shaft and that provide the appropriate side and bottom cover to the reinforcing steel. Acceptable manufacturers include:

“Pierresearch”
 “Aztec, a Dayton-Superior Company”
 “Foundation Technologies, Inc.”

2.3 STEEL CASING

- A. Steel casing shall conform to ASTM A 283, Grade C or ASTM A 36.
- B. Corrugated steel casing shall conform to ASTM A 929.

2.4 CONCRETE MIXING

- A. Ready Mix Concrete: Comply with the requirements of ASTM C94.
- B. Hot Weather Concreting: The maximum acceptable concrete temperature at the truck discharge point shall be 95°F. Refer to Hot Weather Concreting Practices specified in "Cast-in-Place Concrete" section of the specifications for required hot weather concreting practices.
- C. Cold Weather Concreting Practices: Refer to the "Cast-in-Place Concrete" section of the specifications for cold weather concreting practices and the conditions under which they are to be followed.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Requirements:
1. Excavate holes for drilled piers to dimensions and required bearing strata or elevations as shown on the drawings unless directed otherwise in the field by the Owner's Geotechnical Engineer.
 2. Maintain sidewall stability during drilling. If sidewall instability is encountered that the Owner's Representative considers excessive, the Contractor shall use alternate drilling methods such as temporary casing or slurry displacement method.
 3. Excavate holes for closely spaced piers and those occurring in fragile or sand stratas only after adjacent holes are filled with concrete and allowed to set a minimum of 6 hours or longer as required for concrete to harden unless temporary casing to maintain sidewall stability is used.
 4. Drilled pier design dimensions and depths shown on the drawings are based on bearing and/or friction in assumed strata. If bearing stratum is not capable of maintaining the assumed capacity, the foundation system shall be revised as directed by the Owner's Geotechnical Engineer and Owner's Representative. The Owner's Geotechnical Engineer may require drilling deeper than planned depths.

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Revisions will be paid for in accordance with contract conditions relative to changes in the work. Refer to drawings for design bearing pressures and skin friction values.

5. The shaft shall be cleaned such that not more than 3 inches of loose material remains at the bottom of the shaft.

B. Equipment:

1. Provide adequate equipment so work is expedited to the fullest extent possible. Use equipment fully capable of excavating shafts to depths, diameters, and sizes indicated, and within the specified tolerances. Maintain equipment in satisfactory operating condition and provide sufficient quantity of equipment to maintain the projected schedule of the Work.
2. Using bits or augers with a power-driven rotary-type rig, a shaft of a diameter specified on the drawings shall be excavated from the ground surface to a depth as specified on the drawings or as ordered by the Owner's Geotechnical Engineer.

C. Obstructions:

1. If rocks, boulders, or other unforeseen obstructions are encountered which cannot be removed by standard drilled pier excavation methods, and if such obstructions are not indicated by available sub-surface data, removal of such obstructions will be paid for in accordance with the terms of the Contract relative to changes in the Work.
 2. Remove such obstructions by hand labor using air-powered tools or by other safe methods recognized in the construction industry. Standard drilled pier excavation methods include the use of core barrels with pier drilling equipment.
 3. The work of this Section includes demolition and removal of rock, boulders, concrete, masonry, and other subsurface obstructions that are indicated by the Contract Documents, or by the available subsurface exploration data, and such work will not be considered a change in the Work.
- D. Overexcavation: No payment will be made for extra length or greater diameter of drilled piers when they are installed to a greater depth or are larger than required unless authorized by the Owner's Geotechnical Engineer. Overexcavated drilled piers will be measured and paid for in accordance with the original design or authorized design depth and diameter.
- E. Excavated Material: Remove excavated material and dispose of it off site.

3.2 DEWATERING

- A. Dewatering shall be at the Contractor's discretion.
- B. Provide and maintain pumping equipment to keep excavations free of water before placing concrete. An excavation is considered dry if the water rises at a rate of less than 1/4 inch per minute and the height of water at the bottom of the pier does not exceed two inches at the time of concrete placement.
- C. Dewater in a manner that will not create subsidence or ground loss that might adversely affect the Work or existing adjacent structures. Should the dewatering system employed

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involve pumping inside the pier, extreme caution shall be used to prevent an unbalanced water head from causing a "blowout", bottom heave, or "quick" condition that could disturb the proposed bearing stratum or surrounding soil strata.

- D. The dewatering method shall be submitted for review and approval of the Owner's Geotechnical Engineer.
- E. Conduct water to general site run-off ditches and disposal areas with discharge lines. Provide ditching as required to conduct water to site drainage facilities.
- F. If excessive water and/or sidewall instability is encountered and drilling operations must be halted, consult with Geotechnical Engineer and Owner's Representative before using alternate methods of construction.

3.3 TEMPORARY STEEL CASINGS

A. Requirements:

- 1. Provide temporary casing at locations as directed by the Geotechnical Engineer where the soil will not stand without support or where sloughing of the sides of shafts may seriously delay or endanger the satisfactory completion of excavation and placement of concrete. Also provide temporary casing at locations as directed by the Geotechnical Engineer to stabilize the shaft due to the inflow of water into the excavation.
- 2. The Contractor shall have immediately available for use on the job an ample supply of casing for each size that will be required for use in the shafts and shall provide additional amounts, as required, to ensure the orderly progress of the job.
- 3. Such casing may be in short pieces but with jointing devices of sufficient strength that assembled sections of casing may be pulled complete as concrete is placed, or immediately thereafter. Provide casing of sufficient strength to withstand handling stresses, concrete pressure, and surrounding earth and/or fluid pressures. Make diameter of excavation in relation to diameter of casing such as to create a minimum of void space outside of casing. Provide casing with a minimum inside diameter minimally larger than the outside diameter of drill bits.

B. Delivery, Handling, and Storage of Casing

- 1. Deliver casing to site in undamaged condition.
- 2. Handle and protect casing to maintain diameter within plus or minus two percent.

- C. Casing Withdrawal: Unless otherwise approved by the Owner's Representative, all temporary casing shall be removed from shafts as concrete is placed or immediately thereafter, and in such a manner as to prevent sloughing material from dropping to the bottoms of shafts or falling on top of freshly placed concrete. Casings shall be pulled in a single continuous smooth operation without sudden jerks or impact. Maintain head of concrete above the bottom of the casing that exceeds the soil and water pressure at all times during casing withdrawal. Water within the casing shall be positively displaced by the concrete. Do not vibrate concrete internally before the casing is withdrawn. A vibratory casing extractor may be used. Do not withdraw casing after the concrete has

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attained initial set. The casing withdrawal and concreting operations shall be observed by the Geotechnical Engineer.

3.4 DRILLED PIERS IN ROCK

- A. Requirement: Provide drilled piers socketed into rock as shown on the drawings or as directed by the Owner's Geotechnical Engineer.
- B. Classification of Rock: Rock is defined as material which cannot be drilled with a conventional earth auger or underreaming tool, and requires use of special rock augers, core barrels, air tools, blasting, or other methods of hand excavation. Earth seams, rock fragments, and voids included in rock excavation area will be considered rock for full volume of shaft from initial contact with rock for pay purposes. The work of this section includes demolition and removal of rock, boulders, concrete, masonry, and other subsurface obstructions that are clearly indicated by contract documents, or by available subsurface exploration data, and such work will not be considered a change in work.

3.5 REINFORCING STEEL PLACEMENT

- A. Before placing, clean reinforcing steel and dowels of loose rust, scale, dirt, grease and other material that could reduce or destroy bond.
- B. Fabricate and erect reinforcing cages in shafts as one continuous unit using inner ring reinforcing guide. Place reinforcement accurately and symmetrically about axis of hole and hold securely in position during concrete placement. The Contractor shall verify depths of drilled piers prior to cutting and tying reinforcing steel cages. Reinforcing steel shall be delivered to the site in standard 60-foot lengths and cut as required. Splice no more than 33% of the bars at any one location, alternating spliced and unspliced bars in a symmetrical pattern. Splices shall be 30 bar diameter compression splices for bars #11 and smaller and mechanical end bearing compression splices for #14 and #18 bars unless noted otherwise on the drawings. See drawings for additional splice information. The Contractor shall be responsible for adding additional reinforcing steel ties or spirals as required to ensure stability of cage and maintenance of shape and configuration as required for proper lifting, handling, and placement.
- C. Provide cover to reinforcing steel of not less than 3 inches of concrete. Provide spacer devices to maintain side and bottom cover. Devices shall be installed in accordance with manufacturer's instructions.
- D. Permissible reinforcing steel upward vertical movement during casing withdrawal shall be no greater than 6 inches. Downward movement should not exceed 6 inches for every 20 feet of shaft length.
- E. Use templates to set anchor bolts, leveling plates and other accessories furnished under work of other sections. A qualified and licensed Engineer/Land Surveyor shall determine the plan location and elevation of such devices. Provide spacers (capable of sliding on any temporary casings required), blocking and holding devices to maintain required position during concrete placement.

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- F. The General Contractor shall protect exposed ends of dowels and anchor bolts from mechanical damage and exposure to weather by wrapping and taping with polyethylene or other suitable material.

3.6 CONCRETE PLACEMENT

A. General:

1. Fill drilled piers with concrete immediately after inspection and approval by the Geotechnical Engineer or other authorized inspector. All shafts drilled shall be filled with concrete the same day. No shaft shall be allowed to remain open longer than 4 hours.
2. Place concrete continuously and in a smooth flow without segregating the mixed materials.
3. Place concrete by means of bottom discharge bucket, flexible drop chute, elephant trunk hopper, concrete pump, or tremie. Free fall of concrete may be used if provided for in concrete mix design and provided it is directed through a hopper or chute such that fall is down center of shaft without hitting sides or reinforcing steel. Free fall of concrete is not permitted for depths greater than 10 feet.
4. Place concrete in-the-dry if at all possible. If water occurs, and it is impracticable to dewater drilled pier excavation, and reasonable attempts to seal off water flow have failed, allow water level to attain its normal level and place concrete by tremie method or by concrete pumping. Other methods of depositing concrete underwater may only be used if approved by Architect/Engineer.
5. Stop concrete placement at cut-off elevation shown, screed level, and apply a scoured, rough finish. Where cut-off elevation is above ground elevation, form top section above grade and extend shaft to required elevation.
6. Provide mechanical vibration for consolidation of at least top 5' of each shaft but only after any temporary casing is pulled or when casing is permanent.
7. Interrupted placing operations of over one hour duration will require a cold joint installation as follows. Leave resulting shaft surface approximately level. At resumption of concrete placing, clean off surface laitance, roughen as required, and slush with a 1-to-1 cement grout or commercial bonding agent before remainder of concrete is placed. Intentional cold joints will not be permitted.
8. Concrete shall not be placed in adjacent drilled piers located within three center-to-center shaft diameters of each other until concrete has cured a minimum of 6 hours.
9. Aluminum pipe or equipment shall not be used for placing concrete.

B. Tremie Method:

1. The drilled shafts shall be filled with concrete by the use of a tremie or concrete pump extending from above the ground surface to the bottom of the drilled shaft. Inspection of the empty tremie on the bottom may be requested of the Contractor by the Owner's authorized inspector. The tube shall be filled to the top extending above the ground. The filled tremie shall be picked up off the bottom of the shaft to allow the weight of the concrete to displace any water greater than 3 inches deep at the shaft bottom. At no time is the tremie to be pulled to such a height as

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to clear the surface of the concrete already placed in the shaft or water being displaced. All concrete shall be poured through the now open tremie with care taken to maintain a sufficient head of concrete to completely displace all water and suspended cuttings of material and to provide sufficient pressure so as to prevent reduction in pile diameter by earth pressure on the fresh concrete. The concrete in each pile shall be carried above cut-off elevation and then dipped out while fresh to cut-off elevation.

2. All concrete shall be deposited through the tremie or pumpline so as to provide a continuous flow, without aggregate segregation, from bottom to top of pile. The production and delivery of the ready-mixed concrete shall be such that not more than 45 minutes shall elapse between the depositing of successive batches of concrete to ensure a monolithic unit of concrete. No deviation from this method will be acceptable.
3. Should the surface of the concrete in the shaft be breached by the tremie or pumpline, the tube shall immediately be withdrawn from the hole, re-sealed and re-lowered below the surface of the concrete, and pouring operations re-started. Should the Owner's authorized inspector deem it necessary, the Contractor shall instead retrieve the reinforcing steel cage, redrill the shaft to reopen the hole, and begin the concreting operations from the bottom of the pier shaft.
4. If the Owner's authorized inspector has reason to suspect that the concrete was breached by the tremie or pumpline or that the pier, for any other reason, may contain extraneous material or otherwise fail the specifications, he may order the pier cored for inspection and/or testing. If the core recovery and/or test results indicate noncompliance with the specifications, the Contractor shall bear the expense of the investigation and/or testing and shall also, at no cost to the Owner, install proper additional construction as required by the Architect/Engineer. Should the investigation and/or testing indicate compliance with the specifications the Owner shall bear the cost of such investigation and/or testing.

C. Hot and Cold Weather Placement: Refer to Part II.

3.7 CONSTRUCTION TOLERANCES

- A. Plan Location: The tolerance on plan location for the top of the drilled pier shall not be more than 1/24 of the pier diameter or 3" in any direction, whichever is less. If the as-installed shaft is larger than required, the center of the shaft may be taken as the center of a shaft having the required area that lies wholly within the as-installed shaft.
- B. Plumbness: Permissible tolerance for plumbness shall be 1.5% of the length. The centers of the top and bottom may be taken as the center of the required area that lies wholly within the as installed area.
- C. Bottom Area: The bottom of the pier shall be essentially horizontal within a tolerance of 1 vertical to 12 horizontal with the area of the bottom bearing not less than 98% of that specified on the drawings.
- D. Top Area: The Contractor shall remove excess concrete at the top of the pier beyond the limits of the pier diameter. The pier top diameter shall be the same diameter as the shaft below. Piers extending above the ground surface shall be formed.

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- E. Concrete Cut-Off Elevation: Concrete cut-off elevation at the pier top shall be plus one inch to minus three inches.
- F. Anchorage Embedment Tolerance: Vertical and horizontal deviation from design location for individual anchorage components embedded in the pier shall not exceed ± 0.5 inches.
- G. If any of the above tolerances are exceeded, the Architect/Engineer shall immediately be notified to evaluate the eccentricity in the pier and recommend corrective measures. The cost of reengineering and corrective construction shall be borne by the Contractor.

3.8 INSPECTIONS AND TESTS FOR DRILLED PIER EXCAVATIONS

- A. Verification of Design: Bottom elevations, bearing and/or skin friction capacities and lengths of drilled piers as shown on the drawings are estimated from available subsurface data.
- B. Notification of Architect/Engineer: If field conditions differ from the data and design recommendations outlined in the Geotechnical Report, the Geotechnical Engineer shall notify the Architect/Engineer immediately.
- C. Additional Tests: Additional tests may be required by the Geotechnical Engineer to determine new design criteria. Such tests shall be made as quickly as possible so as not to delay the concreting operations any longer than absolutely required.
- D. Observation Requirements: Each drilled pier shall be inspected by the authorized inspector and approved prior to placement of concrete.
- E. Cooperation with Testing and Inspection Personnel: The Contractor shall provide facilities as required to assist in the inspection and testing of the excavations, and cooperate with the inspecting and testing personnel to expedite the work.
- F. Notification of Observer: The Contractor shall notify the authorized observer at least twelve hours prior to the time the excavation will be ready for inspection. Drilled shaft installation shall not proceed without the authorized observer on site.
- G. Personnel Safety: The Contractor shall provide gas testing equipment, protective cage, or temporary casing or shoring of proper diameter, length, and thickness, and all other safety equipment required by law for inspection and testing of drilled piers and to protect workmen and inspectors during hand belling or other operations necessitating entry into shaft.

3.9 APPROVAL BY THE GEOTECHNICAL ENGINEER

- A. Approval by the Owner's Geotechnical Engineer is required on all pier installation criteria and his/her decision and judgment on pier length, rejection of piers, additional piers required, and all other pier installation and capacity questions shall be final.

3.10 CONTRACT BASIS

31 63 29- 13

- A. Basis of Bids: Bids shall be based on number of drilled piers, design length from top elevation to bottom of shaft and diameter of shaft, as shown on drawings. The bid price shall include cost for temporary casing of excavation that may be required.
- B. Basis for Payment: Payment for drilled piers will be made on actual net volume of drilled piers in place and accepted. The actual length and shaft diameter may vary to coincide with elevation where satisfactory bearing or friction strata is encountered, and with actual bearing value of bearing strata determined by testing services, and with stability and characteristics of soil strata. Adjustments will be made on net variation of total quantities, based on design dimensions for shafts.
 - 1. There will be no additional compensation for excavation, concrete fill, reinforcing, casings, or other costs due to unauthorized overexcavating shafts. Overexcavated piers will be measured and paid for in accordance with required design or authorized depth. No payment will be made for rejected drilled piers.
 - 2. Prices quoted shall include full compensation for labor, temporary casing, materials, tools, equipment, and incidentals required for excavation, trimming, shoring, casings, dewatering, reinforcement, concrete, and other items for complete installation.
- C. Unit Prices (NOT USED)

END OF SECTION

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SECTION 32 91 13

SOIL PREPARATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Preparation of subsoil.
 - 2. Placing topsoil.
- B. Related Sections:
 - 1. Section 32 05 13 - Soils for Earthwork.
 - 2. Section 32 91 19 - Landscape Grading.
 - 3. Section 32 92 19 – Seeding.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. Topsoil: As specified in Section 31 05 13

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

3.2 PREPARATION OF SUBSOIL

- A. Prepare sub-soil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated sub-soil.
- C. Scarify subsoil to depth of 3 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted sub-soil.

32 91 13- 1

3.3 PLACING TOPSOIL

- A. Spread topsoil to minimum depth of 6 inches over area to be seeded. Rake until smooth.
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

END OF SECTION

32 91 13- 2

SECTION 32 91 19
LANDSCAPE GRADING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Final grade topsoil for finish grade.
- B. Related Sections:
 - 1. Section 31 23 23 - Fill.
 - 2. Section 3105 13 - Soils for Earthwork.
 - 3. Section 32 92 19 - Seeding.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures

PART 2 PRODUCTS

2.1 MATERIAL

- A. Topsoil as specified in Section 31 05 13.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify substrate base has been contoured and compacted.

3.2 PREPARATION

- A. Protect landscaping and other features remaining as final Work.

3.3 SUBSTRATE PREPARATION

- A. Eliminate uneven areas and low spots.
- B. Remove debris, roots, branches, stones, in excess of 1 inch in size. Remove contaminated subsoil.

32 91 19- 1

- C. Scarify surface to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.4 PLACING TOPSOIL

- A. Place topsoil in all disturbed areas outside of liner limits and on liner in all areas above normal operating water surface elevation. Place topsoil during dry weather.
- B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.
- C. Remove roots, weeds, rocks, and foreign material while spreading.
- D. Lightly compact placed topsoil.
- E. Leave stockpile area and site clean and raked, ready to receive seeding.

3.5 TOLERANCES

- A. Top of Topsoil: Plus or minus 1 inch.

3.6 PROTECTION OF INSTALLED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Prohibit construction traffic over topsoil.

3.7 SCHEDULES

- A. Compacted topsoil thicknesses:
 - 1. Seeded Grass: 6 inches.

END OF SECTION

32 91 19- 2

SECTION 32 92 19

SEEDING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fertilizing.
 - 2. Seeding.
 - 3. Mulching.
 - 4. Maintenance.
- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork.
 - 2. Section 32 91 13 - Soil Preparation
 - 3. Section 32 91 19 - Landscape Grading.

1.2 DEFINITIONS

- A. Weeds: Vegetative species other than specified species to be established in given area.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories.

1.4 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, purity of seed mix, and vendor's name.
- B. The quantity of pure live seed shall be determined using the following formula:
 - 1. $\text{Pounds of Seed (Bulk)} \times \text{Purity} \times \text{Germination} = \text{Pounds of Pure Live Seed (PLS)}$

1.5 QUALIFICATIONS

- A. Seed Supplier: Company specializing in manufacturing Products specified in this section with minimum three years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

32 92 19- 1

- B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 PRODUCTS

2.1 SEED MIXTURE

A. Seed Mixture:

Scientific Name	Common Name	Variety	Pounds PLS/Ac	Percent
GRASSES				
Agropyron riparium	Streambank Wheatgrass	Sodar	1.0	7.1
Agropyron smithii	Western Wheatgrass	Arriba	2.0	14.3
Agropyron smithii	Western Wheatgrass	Rosanna	2.0	14.3
Andropogon gerardi	Big Bluestem		2.0	14.3
Boutelona gracillis	Blue Grama	Lovington	1.0	7.1
Buchloe dactyloides	Buffalograss	Sharps Improved	0.5	3.6
Festuca prantensis	Meadow Fescue		1.0	7.1
Panicum virgatum	Switchgrass	Tralblazer	1.5	10.7
Poa compressa	Canad Bluegrass	Rubens	0.5	3.6
Schizachyrium scoparium	Little Bluestem	Cimarron	1.5	10.7
Sporobolus cryptandrus	Sand Drop Seed		0.5	3.6
FORBS				
Achillea millefolium	Yarrow		0.1	.7
Gailiardia aristata	Blanketflower		0.2	1.4
Linum lewisii	Blue Flax		0.2	1.4
		Totals	14.0	100

2.2 ACCESSORIES

- A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are acceptable.
- B. Fertilizer: Commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil.

32 92 19- 2

- C. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify prepared soil base is ready to receive the Work of this section.

3.2 FERTILIZING

- A. Apply fertilizer at application rate recommended by manufacturer
- B. Apply after smooth raking of topsoil.
- C. Do not apply fertilizer at same time or with same machine used to apply seed.
- D. Mix fertilizer thoroughly into upper 2 inches of topsoil.
- E. Lightly water soil to aid dissipation of fertilizer. Manually irrigate top level of soil uniformly.

3.3 SEEDING

- A. Apply seed evenly in two intersecting directions. Rake in lightly.
- B. Apply seed at the vendor's recommended bulk seed rate/acre according to the quantity of PLS contained in their bulk seed to achieve the specified PLS/acre rate.
- C. Where access is limited and seed is applied by hand broadcasting, apply the seed mix at twice the PLS rate per acre.
- D. Do not seed areas in excess of that which can be mulched on same day.
- E. Do not sow immediately following rain, when ground is too dry, or when winds are over 10 mph.
- F. Immediately following seeding, apply mulch to thickness of 1/4 inch. Maintain clear of shrubs and trees.
- G. Apply water with fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

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3.4 MAINTENANCE

- A. Water to prevent grass and soil from drying out.
- B. Control growth of weeds. Apply herbicides. Remedy damage resulting from improper use of herbicides.
- C. Immediately reseed areas showing bare spots.
- D. Repair washouts or gullies.
- E. Protect seeded areas with warning signs during maintenance period.

3.5 SCHEDULE

- A. Seed all areas where topsoil is placed, including all disturbed areas outside of embankment construction, and portions of the embankment above the normal operating water surface elevation.

END OF SECTION

32 92 19- 4

SECTION 33 11 13 A

DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to fabricate, supply, and deliver all Goods (ductile iron pipe, fittings, and appurtenances) and Services for work under this Section. This shall include, but not be limited to: shop welding, joints, harnessing attachments, linings inside, and coating system for outside of all items complete as shown on the Drawings and as specified herein.
- B. Unless otherwise noted, "pipe" shall mean pipe work of any type including pipe, fittings, joints, or appurtenances.

1.03 SUBMITTALS

- A. Shop drawings, including piping layouts, design calculations warranty information, test reports, and schedules shall be submitted to the Engineer.
- B. Submit shop drawings. Shop drawings shall include, but not be limited to:
 - 1. The grade of material; size, wall thickness of the pipe and fittings and appurtenances, type and location of fittings, specials, and valves; and the type and limits of the lining, lining reinforcing, and coating systems of the pipe and fittings. Methods and procedures recommended by the coating manufacturer will be documented.
 - 2. Joint details; methods and locations of supports; and complete information concerning type, size, and location of all welds. Shop and field welds will be clearly differentiated, and welds will be clearly detailed with preparation procedures for all pipe and parent metal comprising each weld. Critical welding procedures will be identified along with methods for controlling welding stresses and distortions. Locations and proposed joint details will also be clearly identified.
 - 3. All other pertinent technical information for all items to be furnished; product data to show compliance of all couplings, supports, fittings, coatings, and related items.
- C. Prior to shipment, submit a statement of compliance that the pipe, fittings, gaskets, linings and exterior coatings for this project have been manufactured and tested in accordance with AWWA and ASTM standards and requirements specified herein.

1.04 REFERENCE STANDARDS

- A. Unless otherwise noted in these Contract Documents, the standards referenced below shall apply to this Section and shall take precedence. Additional references may be noted in text and/or on the Drawings.

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B. Where reference is made to standards, the revision in effect at the time of bid opening shall apply.

C. American Water Works Association (AWWA)

1. AWWA C104* - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
2. AWWA C105* - Polyethylene Encasement for Ductile-Iron Pipe Systems
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 In. through 48 In. (75 mm through 1200 mm) for Water and Other Liquids
4. AWWA C111 - Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings
5. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges
6. AWWA C150 - Thickness Design of Ductile-Iron Pipe
7. AWWA C151 - Ductile Iron Pipe, Centrifugally Cast, for Water
8. AWWA C153 - Ductile-Iron Compact Fittings for Water Service for Water Service
9. AWWA C600 - Standard for Installation of Ductile Iron Water Mains and Their Appurtenances. (Installation by Others)
10. AWWA M45 - Handbook for Ductile Iron Pipe and Fittings

(*) - See Section 09950 for applicability

D. American Society for Testing and Materials (ASTM) (see Section 15120)

1. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
2. ASTM A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service
3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs 60,000 psi Tensile Strength
4. ASTM C150 - Standard Specification for Portland Cement (see Section 09950)

E. American National Standards Institute (ANSI)

1. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings

1.05 QUALITY ASSURANCE

33 11 13a-2

- A. It is a requirement of these Contract Documents to have all of the ductile iron pipe and fittings under this Section designed and supplied by a single manufacturer rather than have selection and supply of these items by a number of different manufacturers.
- B. All ductile-iron pipe and fittings to be installed under this project shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.
- C. Inspection of the pipe will be made by Engineer or Owner after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the specification requirements even though pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery (including for defects from manufacturing or deliver/transport) shall be marked for identification and shall immediately be removed from the job at the Contractor's expense.

1.06 DESCRIPTION OF SYSTEMS

- A. Pipe shall be made in America as manufactured by Griffin Pipe, American Cast Iron Pipe Co., U.S. Pipe or an approved equal who is a member of the Ductile Iron Pipe Association (DIPRA). All ductile iron pipe shall be by a single manufacturer and all ductile iron fittings shall be by a single supplier. The fittings supplier shall certify in writing that their fittings are compatible with the supplied brand of pipe.
- B. Piping is to be installed in those locations as shown on the Drawings, and only where specifically indicated.

1.07 MARKINGS, HANDLING, AND STORAGE

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe or linings coatings. See also AWWA C600 and the referenced AWWA standards for shipping, handling, and storage procedures. Pipe or fittings shall not be dropped. All pipe or fittings shall also be examined as noted in Division 1. Any damage to linings or coatings discovered during examination shall be repaired to the satisfaction of the Engineer at the cost of the Contractor, before proceeding with the Work. Pipe shall be transported from the coating plant to the jobsite on padded bunks with nylon tie-down straps or padded banding to adequately protect the pipe and coating.
- B. All pipe and fittings shall be thoroughly cleaned, and shall be kept clean until they are used in the Work.
- C. Lined and/or coated pipe shall be suitably protected from exposure and heating of the sun at all times following procedures recommended by the coating system manufacturer. Exposure will not be allowed (except for short periods such as installation, assembly, and coating repairs).
- D. In handling the pipe, a double 2-ft wide cushioned sling shall be used or other devices and methods acceptable to the Engineer. No uncushioned ropes, chairs, wedges, cables, or levers shall be used in handling the finished pipe, fittings, or couplings. Care should be taken not to mar the pipe's outer coating. Padded wooden pipe cradles or chocks suitable for protection of tape or polyurethane coatings shall be used between fabricated pipes and beneath them on rough

33 11 13a-3

surfaces when pipes are stacked. Pipe shall not be stored on bare ground unless soft sand berms are used to support the pipe.

- E. No metal tools or heavy objects shall be permitted to come into contact unnecessarily with the finished coating.
- F. It shall be the responsibility of the Contractor to prevent damage to the linings or coating that might be caused by handling and/or storage of the completed pipe at low temperature (due to embrittlement) or high temperatures or direct sunlight.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Ductile iron pipe shall conform to AWWA C151. Pipe shall be supplied in standard lengths as much as possible, with shorter pipe segments where required.
- B. All pipe shall have a pressure class rating of 250 psi.
- C. All flanges shall be rated for the same pressure as the adjacent pipe in all cases. Compatibility of the flanges with 250-lb class and higher special class AWWA valves will be the responsibility of the Contractor.
- D. Ductile iron pipe shall have locking restrained joint ends with rubber gaskets as noted on the drawings and in compliance with the requirements of this Section. Gaskets shall be manufactured of vulcanized styrene butadiene rubber (SBR) meeting all the requirements of AWWA C111 for push on and mechanical joints.

2.02 DUCTILE IRON PIPE DESIGN

- A. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C150. The pipe classes determined for various sizes and conditions shall provide the total calculated thickness at a minimum or conform to minimum pipe class specified in Paragraph 2.01 above or as shown on the Drawings, whichever is greater.

2.03 END TREATMENT/JOINTS

- A. Unless otherwise noted ends shall be:
 - 1. Where noted on the Drawings
 - 2. All ductile iron pipe/fitting joints shall be push-on, rubber gasket type per AWWA C111 in unrestrained areas. In restrained areas, both pipe and fitting joints shall be push-on, rubber gasket, restrained joint per the manufacturer's standard.

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- B. Flanges shall be faced and drilled after being screwed on the pipe, with flanges true to 90 degrees with the pipe axis and shall be flush with end of pipe.
 - 1. Gaskets shall be full-face rubber, 1/8-in thick SBR material such as American Toruseal Gasket, or approved equal. Refer to paragraph 2.01 for drilling patterns associated with main pipe isolation valves and blind or dish head flanges. Special material, ring gaskets may be required for pressures exceeding 250 psi for ANSI rated and custom flanges branching off the main pipe.
 - 2. Flanged joints shall be supplied with bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. The number and size of bolts shall comply with the same standard as the flange. Bolts and nuts shall, except as otherwise specified or noted on the Drawings, comply with the ASTM A193 grade B7.
 - 3. Blind flanges shall be similar to regular flanges.
- C. Restrained joints shall be "Locked-type" joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. Restrained joints shall be suitable for the specified test pressure. Restrained joints shall be restrained push-on joints, "Megalug" by EBAA Iron, Snap-Ring by Griffin Pipe, TR Flex by US Pipe and Foundry; Lok-Ring by American Cast Iron Pipe Company or equal. Joints shall be fabricated of heavy section ductile iron casting. Bolts and nuts shall be low carbon steel conforming to ASTM A193, Grade B7.
 - 1. The required lengths of restrained joints shall be as shown on the Drawings.
- D. Couplings/Adaptors
 - 1. Closures shall be made with mechanical joint ductile iron solid sleeves and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be subject to approval of the Engineer. Where required, proper restraint must be developed across the coupling.

2.04 FITTINGS

- A. Pipe fittings shall be ductile iron with pressure rating of 250 psi for all piping. Fittings shall meet the requirements of AWWA C110 or AWWA C153 as applicable.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe. Under no circumstances shall the pipe be dropped or skidded against each other. Slings, hooks, or pipe tongs shall be used in pipe handling. All pipe and fittings shall be examined before laying and no piece shall be installed that is found to be defective. Damage to the pipe coatings shall be repaired per manufacturer's recommendations.

- B. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work and when installed or laid, shall conform to the lines and grades required.
- C. Materials, if stored, shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times.
- D. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to manufacturer's recommendations.
- E. Gaskets for mechanical, restrained, and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

3.02 LAYING DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe and fittings shall be installed in accordance with requirements of the laying Schedule and AWWA C600, except as otherwise specified herein. A firm, even bearing throughout the length of the pipe shall be provided by digging bell holes at each joint and by tamping backfill materials at the side of the pipe to the springline per details shown on the Drawings. Blocking will not be permitted.
- B. All pipe shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plugs or other approved means. Good alignment shall be preserved in laying. The deflection at joints shall not exceed that recommended by manufacturer. Fittings, in addition to those shown on the Drawings, shall be provided, if required, for crossing utilities, which may be encountered upon opening the trench. Solid sleeves shall be used only where approved by the Engineer.
- C. All ductile iron pipe laid underground shall have a minimum of 5-ft of cover unless otherwise shown on the Drawings or as specified herein. Pipe shall be laid such that the invert elevations shown on the Drawings are not exceeded.
- D. Fittings, in addition to those shown on the Drawings shall be provided, where required, in crossing utilities, which may be encountered upon opening the trench. Solid sleeve closures shall be installed at locations approved by the Engineer.
- E. The pipe interior shall be maintained dry clean throughout the construction period.
- F. When field cutting is required, the cutting shall be accomplished with an abrasive wheel saw, torch cutter, or self-powered machine cutter in order to provide a smooth, 90-degree angle cut to the axis of the pipe. The cut end shall be beveled and coated according to the manufacturer's recommendations. Cutting of restrained joint pipe will not be allowed unless it is necessary to align a closure at a fitting, valve, casing, or other location-sensitive appurtenance. In these cases, the plain end shall be restrained with a manufacturer's field restraint system compatible with the system already being used or the appropriate weld rings may be field welded in accordance with the pipe and ring manufacturer's instructions.

33 11 13a-6

G. Jointing Ductile-Iron Pipe:

1. Push-on joints shall be made in strict accordance with manufacturer's instructions, AWWA C600, and Appendix B of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe. The joint surfaces shall be cleaned and lubricated and the plain end of the pipe shall be aligned with the bell of the pipe to which it is to be joined and pushed home. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.
 2. Mechanical joints (where used) shall be assembled in strict accordance with the manufacturer's instructions, AWWA C600, and Appendix A of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Pipe shall be laid with bell ends looking ahead. To assemble the joints in the field, thoroughly clean and lubricate the joint surfaces and rubber gasket. Bolts shall be tightened to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage. After installation, apply a bitumastic coating to bolts and nuts and install polyethylene encasement as specified within this section.
 3. Bolts in mechanical or restrained joints shall be tightened alternately and evenly.
 4. Restrained joints shall be installed according to pipe manufacturer's instructions.
- H. All blow-offs, outlets, valves, fittings, and other appurtenances required shall be set and jointed as indicated on the Drawings in accordance with the manufacturer's instructions.
- I. Sleeve couplings shall be installed only where required for closure or shown on the Drawings. Couplings shall not be assembled until adjoining joints have been assembled. After installation apply a heavy bitumastic coating to bolts and nuts and install protective wrap recommended by the coupling manufacturer. Care shall be exercised to insure that insulating properties of insulating and dielectric couplings are maintained.
- J. All joints shall be electrically bonded using bonding wire and brazing cartridges, as acceptable to the Engineer

3.04 TESTING

- A. See Section 33 11 13 – Public Water Distribution Systems

3.05 CLEANING

- A. At the conclusion of the work, thoroughly clean all of the pipe by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material, which may have entered during the construction period. All debris shall be removed from the pipeline. The lowest segment outlet shall be flushed last to assure debris removal.
- B. After the pipelines are cleaned and if the groundwater level is above the pipe or water surface in trench is above the pipe following a heavy rain, the Engineer will examine the pipe for leaks. If

33 11 13a-7

defective pipes or joints are discovered at this time, they shall be repaired or replaced by the Contractor.

3.06 DISINFECTION

A. Not Applicable

END SECTION

33 11 13a-8

SECTION 35 20 16.26

SLUICE GATES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required and install complete sluice gates, operators, and appurtenances complete and ready for operation and field tests as shown on the Drawings and as specified herein.

1.02 SUBMITTALS

- A. Submit to the Engineer shop drawings and product data showing materials of construction and details of installation.
 - 1. Complete description of all materials
 - 2. Certified shop and installation Drawings showing all details of construction, dimensions, and anchor bolt locations
 - 3. Descriptive literature, bulletins, and/or catalogs of the equipment
 - 4. A complete bill of materials
 - 5. The weight of each component
 - 6. A list of manufacturer's recommended spare parts
 - 7. Stem sizing calculations and forces
- B. In the event it is not possible to conform with certain details of this Section, describe completely all non-conforming aspects.
- C. Operation and Maintenance Data
 - 1. Operating and maintenance instructions for each type of equipment shall be furnished to the Engineer. The instructions shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment.
 - 2. A factory representative who has complete knowledge of proper operation and maintenance shall be provided for a minimum of the days noted below for each type item to instruct representatives of the Owner on the proper operation and maintenance of the equipment. Provide 1 day for sluice gates.
- D. The Contractor shall provide all final approved shop drawings, installation instructions, certified test reports, electrical and other schematics, drawings, data sheets, operations and maintenance manuals, and warranties and guaranties in hard copy and digital format.

1.03 REFERENCE STANDARDS

35 20 16.26- 1

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings
 - 2. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
 - 3. ASTM B98 - Standard Specification for Copper-Silicon Alloy Rod, Bar and Shapes
- B. American Water Works Association (AWWA)
 - 1. AWWA C501 - Cast-Iron Gates
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.04 QUALITY ASSURANCE

- A. All of the items and appurtenances specified under this Section of the same type shall be furnished by a single manufacturer who has at least 10 years experience, in the manufacture of the equipment furnished. All sluice gates and operators shall be by one Manufacturer.
- B. The sluice gates shall be manufactured by Rodney Hunt, Hydrogate, Waterman, or approved equal.

1.05 SYSTEM DESCRIPTION

- A. All of the gates are intended to be specifically designed for use with controlling and/or isolating the flow of raw water.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. All items under this Section shall be delivered, stored, and handled in compliance with the manufacturer's requirements and as herein specified:
 - 1. Care shall be taken in loading, transporting, and unloading to prevent injury to items and their operators, and to their respective coatings, they shall not be dropped. All items shall be examined before installation and no component shall be installed that is found to be defective. All coating damage shall be repaired to the satisfaction of the Owner's representative.
- B. Storage and Protection: Special care shall be taken to prevent plastic and similar brittle items from being directly exposed to the sun, or exposed to extreme temperatures. Reference manufacturer's storage and protection information for further requirements.

PART 2 PRODUCTS

2.01 MATERIALS – GENERAL

35 20 16.26- 2

- A. All units shall be of the type, size and location as shown on the Drawings, with the operators factory mounted.
- B. All fasteners, hardware, bolts, washers and trim shall be Type 316 stainless steel, unless specifically noted otherwise.

2.02 SLUICE GATES

- A. The gate shall be conventional frame, rising stem, fabricated of cast iron and shall have adequate strength to prevent distortion in handling and placing and under any condition of service outlined herein. All mating and sliding surfaces shall be fully machined.
- B. Unseating head for the gate shall be rated for the head each gate will be encounter during operation.
 - 1. Gate bottom elevation = 4971: 15 feet of head
- C. Frames shall be of cast iron, ASTM A126, Class B, one-piece flat or flange type construction, rectangular or circular opening, as required.
 - 1. Machined to be surface mounted directly to concrete and grouted in place per manufacturer's requirements.
 - 2. Sides shall extend upward so as to support and retain at least half the disc when in the full open position.
 - 3. Shall have machined dove-tailed grooves on the front face into which the type 316 stainless steel or bronze seat facings shall be driven and machined to a 63 micro-in finish. The back of the frame shall be machined to be surface mounted directly to concrete and grouted in place per manufacturer's requirements.
 - 4. Shall have integrally cast pads machined with keyways to receive top wedge seats.
 - 5. Anchor bolts shall be stainless steel and shall be epoxy set into concrete.
- D. The gate guide and disc shall be of cast iron, ASTM A126, Class B, one-piece construction, rectangular with integrally cast vertical and horizontal ribs. A reinforcing rib along each side shall be provided to ensure rigidity between the side wedges. The disc shall be manufactured so that deflection of the top and bottom ribs with full head on the gate will be less than 0.025-in.
 - 1. The gate slide shall have machined dove-tailed grooves on the seating face into which type 316 stainless steel or bronze seat facings shall be driven and machined to a 63-micro-inch finish.

35 20 16.26- 3

2. A tongue on each side, extending the full length of the gate, shall be machined on all sides with a 1/16-in clearance maintained between the gate tongue and gate guide groove. The sluice gates shall have stainless steel or bronze lined disc tongues.
 3. Wedge pads for side and top wedges shall be cast integrally on the gate and machined to receive the adjustable, Type 316 stainless steel or bronze wedges. The side wedge pads shall be located at the ends of horizontal ribs.
 4. A heavily reinforced nut pocket shall be cast integrally on the vertical centerline and above the horizontal center and be of such shape to receive the square-backed manganese bronze stem block. Operating or lift nuts for the gates shall be bronze.
 5. The guides shall withstand the total thrust due to the water pressure and the wedging action. The guides shall be machined on all contact surfaces and a groove shall be machined the entire length of the guide to allow 1/16-in clearance between the gate tongue and the guide groove. The sluice gates shall have stainless steel or bronze lined guide grooves. The guides shall be of such length as to retain and support at least 1/2 the gate in the full open position. The guides shall be integrally cast or attached to the frame with silicon bronze or stainless steel studs and nuts and shall be doweled to prevent any relative motion between the guides and the frame. Stainless steel or bronze wedge seats shall be securely attached to machined pads on the guides.
 6. The wedges shall be type 316 stainless steel or bronze machined on all contact surfaces. They shall be attached to the gate with type 316 stainless steel or silicone bronze studs and nuts and shall have type 316 stainless steel or silicone bronze adjusting screws with lock nuts or other approved method.
 7. All seat facings shall be type 316 stainless steel or bronze. The extruded seat facings shall be of special shape to fill and permanently lock in the machined dove-tail grooves when pneumatically impacted into place. Attaching pins and screws will not be allowed. The installed seat facings shall be machined to a 63 micro-in finish.
- E. All fasteners for the gate and seal components shall be of stainless steel, ASTM A276, Type 316, or bronze ASTM B98, CA-655.
- F. The stem shall be of Type 316 stainless steel for the entire length, the metal having a tensile strength of not less than 60,000 psi. The stem shall:
1. Have sufficient diameter at the base of the thread to lift the weight of the gate, offset the resistance of the gate to the maximum unbalanced head and fully allow for starting impact.
 2. Transmit in compression at least two times the rated output of the crank operated floor stand with a 40 lb effort on the crank.

35 20 16.26- 4

3. The threaded portion of the stem shall have machine cut threads of the Acme type.
 4. Stems of more than one section shall be joined by stainless steel couplings pinned and bolted to the stems. All threaded and keyed couplings of the same size shall be interchangeable.
 5. The gates shall be provided with adjustable bronze stop collars on the stem to prevent overclosing of the gate.
- G. Stem guides shall be provided as recommended by the manufacturer. Stem guide shall be cast iron, bronze bushed, mounted in a cast iron bracket. It shall be adjustable in two directions and spaced at sufficient intervals to adequately support the stem. This spacing shall not exceed 10-ft.
- H. Flush-Bottom Closure Seals
1. Compressible Resilient Seal
 - a. Attached to bottom of disc with a bronze or stainless steel bar and bronze or stainless steel fasteners.
 - b. Specially molded shape designed to fit a lip machined on bottom rib of disc.
 - c. Shaped to produce a wide sealing area on a machined cast iron stop bar, bolted and keyed to gate frame to form a flush invert.
 - d. Differential sealing pressure of resilient seal on stop bar shall be variable by adjustment of side wedges on gate.
 2. Alternative Closures
 - a. Solid, square-cornered, resilient rubber seal in place of bottom dovetail facing and wedging devices.
 - b. Securely fastened to bottom cross member of frame on a stop plate, with a retainer bar and stainless steel fasteners.
 - c. Make top surface of seal flush with invert of gate opening.
 - d. Machine full length of bottom edge of disc accurately to make contact with seal when disc is closed.

2.03 OPERATORS

- A. Gates shall be manually operated using a handwheel.

35 20 16.26- 5

- B. The gate will have a maximum necessary operating force of 40 lbs.
- C. Cast iron housing will completely enclose the lift mechanism.
- D. Handwheel shall be positioned 36" above the operating floor.
- E. Gate Operators shall be equipped with fracture-resistant clear butyrate plastic stem covers, which shall not discolor or become opaque for a minimum of 5 years after installation. The top of the stem cover shall be closed. The bottom end of the stem cover shall be mounted in a housing or adapter plate for easy field mounting. Stem covers shall be complete with indicator markings to indicate gate position.

PART 3 EXECUTIONS

3.01 INSTALLATION

- A. Installation of all gates and appurtenances shall be in strict accordance with the manufacturer's drawings and recommendations. Frames and guides shall be installed in a true vertical plane and shall be installed with 90-degree corners.
- B. Gates with embedded guides and inverters shall be installed in accordance with the recommendations of the manufacturer subject to the Engineer's approval.

3.02 INSPECTION AND TESTING

- A. In addition to requirements in Part 1 of this Section, furnish the services of a factory representative for 1 day for the sluice gates who has complete knowledge of proper installation, startup and operation of the gates, and to inspect the final installation and supervise a test of the equipment. If there are difficulties in operation of the equipment due to the manufacturer's fabrication or Contractor's installation, additional services shall be provided at no additional cost to the Owner. The factory representative shall also provide training to Town staff on the gate operation(s).
- B. After installation, all gates shall be field tested at maximum differential head to ensure that all items of equipment are in compliance with this Section, including the leakage requirements.
 - 1. Maximum allowable leakage for sluice gates shall be: 0.1 gpm/ft of perimeter under the design seating head, and 0.2 gpm/ft perimeter for unseating heads of 20-ft or less.
- C. In the event that any unit fails to meet the above requirements, the necessary changes shall be made and the unit retested. If the unit remains unable to meet the test requirements to the satisfaction of the Engineer, it shall be removed and replaced with a satisfactory unit at no additional cost to the Owner.

END OF SECTION

35 20 16.26- 6



GEOTECHNICAL EVALUATION

Johnstown Reservoir Outlet Structure
Weld County, Colorado



Report Prepared for:

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**Project No. 20.3062
February 19, 2021**

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GEOTECHNICAL EVALUATION

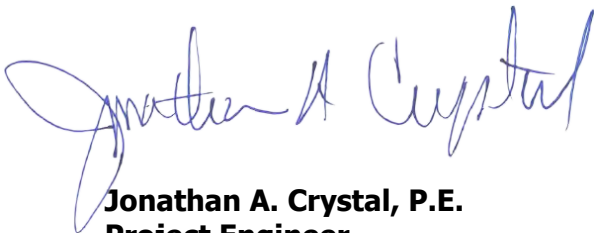
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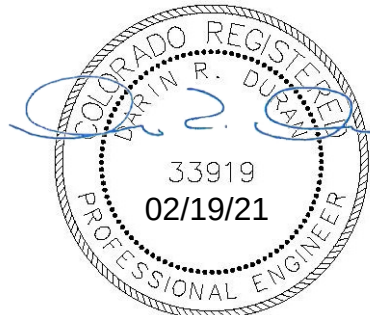
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FIGURE

VICINITY MAP..... FIGURE 1

APPENDICES

FIELD EXPLORATION APPENDIX A
LABORATORY TESTING APPENDIX B
SLOPE STABILITY RESULTS APPENDIX C

COMMON ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ABC	aggregate base course
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
ADSC	Association of Drilled Contractors
AI	Asphalt Institute
APM	asphalt paving material
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
bgs	below ground surface
CDOT	Colorado Department of Transportation
CBR	California Bearing Ratio
CFR	Code of Federal Regulations
CGS	Colorado Geological Survey
CKD	cement of kiln dust stabilized subgrade
CMU	concrete masonry unit
CSEO	Colorado State Engineer's Office
CTB	cement treated base course
deg	degree
EDLA	equivalent daily load application
e_m	edge moisture variation distance
EPS	expanded polystyrene
ESAL	equivalent single axle loads
f'_c	specified compressive strength of concrete at the age of 28 days
F_a	seismic site coefficient
FHWA	Federal Highway Administration
FS	factor of safety
F_v	seismic site coefficient
GSA	global stability analysis
GVW	gross vehicle weight
IBC	International Building Code
ICC-ES	International Code Council Evaluation Services, Inc.
IRC	International Residential Code
kip	1,000 pounds-force
km	kilometer
LTS	lime treated subgrade
MDD	maximum dry density
mg/L	milligrams per liter
MGPEC	Metropolitan Government Pavement Engineers Council
mm	millimeter
M_r	resilient modulus
MSE	mechanically stabilized earth
mV	millivolts
NAPA	National Asphalt Pavement Association
N_{DESIGN}	design gyrations

OSHA Occupational Safety and Health Administration
OMC..... optimum moisture content
OWTS onsite wastewater treatment system
PCA..... Portland Cement Association
PCC..... portland cement concrete
pcf pounds per cubic foot
pci..... pounds per cubic inch
pH..... power of hydrogen
psf pounds per square foot
psi..... pounds per square inch
PT post-tension
RAP..... recycled asphalt pavement
S_s..... mapped spectral accelerations for short periods
UBC Uniform Building Code
USGS United States Geological Survey

1. PURPOSE

1.1 GENERAL

Cesare, Inc. (Cesare) completed a geotechnical evaluation of the outlet structure replacement location of the existing Johnstown Reservoir in Weld County, Colorado. The purpose of the project is to replace the existing outlet structure due to leakage in the fall of 2020.

1.2 SCOPE OF SERVICES

Cesare's proposed scope of services is detailed in Cesare's Proposal Agreement No. F201001.

2. SUMMARY OF FINDINGS AND CONCLUSIONS

This section is intended as a summary only and does not include design details. The report should be read in its entirety and utilized for design.

- C Cesare encountered a surface layer of granular material about 1 foot thick, which was likely base course used for a travel surface on the dam. Below the base course, the borings encountered about 8 to 16 feet of fill overlying weathered claystone in Borings B-1, B-2, and B-4 or native clays in Boring B-3. Claystone bedrock was encountered below the weathered claystone and clays at a depth of about 23 feet in B-1, B-2, and B-3 and 13 feet in B-4, extending to the remaining depths explored. A zone of about 1 foot of granular material was encountered in B-4 at a depth of about 9 feet, directly overlying the weathered claystone. The granular material may be pipe or structure bedding.
- C The embankment is over 100 years old and little is known of its design or construction.
- C The new outlet is anticipated to be a cast iron pipe (CIP) encased in concrete bearing on undisturbed competent claystone bedrock.

3. RESERVOIR HISTORY

Cesare understands the reservoir is on the order of 100 years old. Little is known of its design or construction. A new outlet was constructed in about 1952 for emergency discharge. Design documents for the new outlet were available; however, as-built documents were not available. The outlet began leaking in the fall of 2020, requiring emergency repair of the outlet.

4. PROJECT DESCRIPTION

The project consists of open cut excavating through the existing embankment, removing the existing outlet works, and constructing a more vigorous outlet structure. In addition, the repair will include localized grading to direct ponded water to the outlet structure intake. The grading will require excavating the existing soil up to an estimated 3 feet at the upstream dam toe. Some regrading of the existing embankment is planned, with a planned crest elevation of 4,984 feet and the maximum storage elevation of 4,981 feet. An outlet tower inside the reservoir will allow discharge from the reservoir.

Cesare understands normal operation is providing water for the treatment plant, which is understood to be low discharge rates CSEO requires a minimum design rapid drawdown of 1 foot, per day, for 5 days.

5. GEOLOGIC CONDITIONS

The soil onsite is described as eolian sediment, windblown deposits comprised of loess, clay, and silt mixtures. These sediments are Quaternary Middle Holocene and Upper Pleistocene in age, and generally 3 to 15 feet thick¹.

6. SITE CONDITIONS

Johnstown Reservoir is about 38 acres in area, roughly rectangular, and located in the southwest quarter of Section 1 and extends into the southeast quarter of Section 2, Township 4 North, and Range 68 West in Weld County. More specifically, the reservoir is north of State Highway 60 (SH60) and about 1 mile east of the Interstate Highway 25 (I25) intersection with SH60 and about 2-1/2 miles west of Johnstown, Colorado. The site location is shown in the vicinity map presented in Figure 1. The reservoir is bounded by an open space setback, with residential properties and a church bordering the outer open space perimeter on all sides.

The reservoir is positioned on an east sloping, low topographic ridge with the ground surface to the north and south sloping downwards to the northeast and southeast. Vegetation consists of a sparse to heavy growth of native and landscaping grasses. Cesare noted no bodies of water outside the reservoir in the vicinity of the site at the time of its field exploration. The reservoir water surface level was low, only a few feet deep, due to the leakage and subsequent CSEO decree.

7. FIELD EXPLORATION

Subsurface conditions were explored on December 2, 2020 by drilling four borings at the locations indicated in the boring location plan presented in Appendix A. Three borings were drilled to about 40 feet in depth along the existing dam centerline. One boring at the embankment downstream toe near the existing outlet was drilled to about 25 feet in depth. Graphical logs of the subsurface conditions observed, locations of sampling, and further explanation of the exploration performed are presented in the boring logs and accompanying key to symbols contained in Appendix A.

8. LABORATORY TESTING

Cesare personnel returned samples obtained during field exploration to its laboratory where professional staff visually classified them and assigned testing to selected samples to evaluate pertinent engineering properties. Laboratory tests performed are listed in Table 8.1. Further discussion of laboratory testing and laboratory test results are presented in Appendix B.

TABLE 8.1. Laboratory Testing Performed

Laboratory Test	To Evaluate
Grain size analysis	Grain size distribution for classification purposes.
Atterberg limits	Soil plasticity for classification purposes.
Moisture density relationships	Evaluate the relationship of moisture content, compactive effort, and compacted density.
In situ moisture and density	Evaluate in situ moisture content and density
Water soluble sulfate content	Potential reaction of the soil with cementitious material.

¹ Palkovic, M.J., Morgan, M.L., 2017, Geologic Map of the Johnstown Quadrangle, Larimer and Weld Counties, Colorado, Colorado Geologic Survey.

9. SUBSURFACE CONDITIONS

Cesare's borings encountered:

- Existing embankment fill to depths of about 8 to 16 feet in Borings B-1 through B-3.
- Existing fill, likely pipe backfill for the outlet installed in 1953, to 9 feet in B-4. Granular material found at the bottom of the fill and directly overlying weathered bedrock is likely pipe bedding for the outlet.
- Native clay below the fill in B-3 that extended to a depth of 23 feet.
- Weathered claystone bedrock in B-1, B-2, and B-4 below the fill.
- Claystone bedrock at depths of about 23 feet in B-1 through B-3 and about 13 feet in B-4.
- Groundwater at depths of 15, 18, 14 and 8 feet in Borings B-1 through B-4, respectively, at the time of drilling.
- Groundwater at depths of 15, 14-1/2, 13, and 4-1/2 feet in Borings B-1 through B-4, respectively, 1 day after drilling,.
- Borings B-1 through B-4 caved to depths of 38, 37, 27, and 16-1/2 feet immediately after drilling.

These observations represent conditions at the time of field exploration and may not be indicative of other times or other locations. Groundwater in the embankment can be expected to fluctuate and will be primarily influenced by height of water in the reservoir. Regional groundwater can be influenced by variations in seasons, weather, precipitation, drainage, vegetation, landscaping, and irrigation. Discontinuous zones of perched water may exist or develop within the overburden material and/or upper zones of the bedrock. Cesare's field explorations were performed during the fall when regional groundwater levels are usually lowest. Regional groundwater levels may be higher in the spring and early summer.

10. EMBANKMENT ANALYSIS

The CSEO considers the embankment as stable in its present configuration. Cesare's evaluation is intended to verify the embankment's stability at the repair location, considering the existing conditions and post repair conditions.

10.1 EMBANKMENT CONFIGURATIONS

10.1.1 Existing Configuration

The existing embankment at the outlet repair location has a crest width of about 12 feet wide at an elevation of about 4,986 feet. The upstream and downstream embankment slopes are about 3:1, horizontal to vertical. The upstream slope is about 11 feet high from its present toe and the downstream slope is about 13 feet high. The present downstream slope has a localized steepened slope of about 1-1/2:1 at its toe.

10.1.2 Repair Configuration

The final embankment will have a 12 foot wide crest width at an elevation of 4,986 feet. The upstream and downstream slopes are planned for 3:1. Excavation planned for the pond bottom at the embankment toe at the outlet is expected to extend to about elevation 4,971 feet, about 15 feet from the crest at that location.

10.2 MATERIAL PARAMETERS

Cesare based the stability analysis and seepage parameters on its field and laboratory test results, and experience with similar projects.

10.2.1 Seepage Analysis

Cesare used permeability values based on its experience and the laboratory classification, moisture density relationship, and in situ physical characteristics results. Due to the dam's age, the seepage parameters for the various materials will remain consistent, with the only modification being the fill placed in the repair section. The fill is expected to be of lower permeability than the existing material considering its compaction by modern earthwork equipment, as opposed to the equipment likely used when the embankment was first constructed.

No in situ permeability testing was performed. The upper portion of claystone in the Front Range typically exhibits permeabilities somewhat higher than expected for this material. This higher permeability is likely relating to fracture flow, at least in the unweathered claystone. Packer tests in unweathered claystone typically exhibit nonuniform permeability, indicating fracture flow in the fresher claystone is unlikely to be uniform below the embankment. Work by Zhang² (2013) and others indicates claystone fractures tend to close under increased loading and when wetted. Although the upper bedrock has likely gained the maximum moisture it is capable of under the existing conditions, Cesare believes a conservative approach considering fracture flow during the reservoir life is appropriate.

The material requiring seepage parameters for analysis includes the existing and new fill soil, native soil, weathered bedrock, and unweathered bedrock; the values for which are presented in Table 10.1. The values presented for embankment material and weathered bedrock are based on laboratory test results previously described. The permeability of the unweathered bedrock considers Packer test results from similar projects and research into published rates for the local claystone bedrock.

TABLE 10.1. Design Hydraulic Conductivities

Material	Saturated Hydraulic Conductivity (cm/sec)	Saturated Hydraulic Conductivity (ft/sec)
Existing embankment fill	1.70 x E-6	5.54 x E-8
New embankment fill	4.97 x E -7	1.64 x E-8
Native clay soils	7.07 x E-7	2.32 x E-8
Weathered claystone	1.0 x E-8	3.3 x E-10
Unweathered claystone	1.0 x E-5*	3.3 x E-7*

* Horizontal conductivity. Vertical is one order of magnitude less.

10.2.2 Strength Parameters

Based on Cesare's testing and judgement, strength parameters assigned to embankment material are presented in Table 10.2.

² Zhang, C.L., Experimental evidence for self-sealing of fractures in claystone. J. Phys. Chem. Earth (2011), doi:10.1016/ j.pce.2011.07.030.

TABLE 10.2. Stability Analysis Strength Parameters

Material	Friction Angle (degrees)	Cohesion (psf)
Existing embankment fill	30	100
New embankment fill	30	200
Native clay soil	25	50
Weathered claystone	25	100
Unweathered claystone	0	3000
Residual claystone	15	0

10.3 SEISMIC DESIGN

The "Rules and Regulations for Dam Safety and Dam Construction" (2007) indicate a pseudostatic analysis for embankment dams is acceptable, for the following cases:

"5.9.2.3.1 The embankment is to be mechanically compacted to at least 95% of the maximum standard Proctor density, ASTM D698, or at least 90% of the maximum modified Proctor density, ASTM D1557 or at least 70% relative density per ASTM D4253 and ASTM D4254, if Proctor testing is not appropriate; no materials prone to liquefaction are present in the foundation and the design peak bedrock acceleration is 0.20g or less; or

5.9.2.3.2 The embankment is to be mechanically compacted to at least 95% of the maximum standard Proctor density, ASTM D698, or at least 90% of the maximum modified Proctor density, ASTM D1557; potentially submerged portions of the embankment except for internal drain elements are constructed of clayey material; the dam is constructed on clayey soil or bedrock foundation and peak bedrock acceleration is 0.35g or less; and

5.9.2.3.3 All static stability safety factor requirements of these Rules are met; minimum freeboard requirements of these Rules are met; and the pseudostatic coefficient selected for analysis must be at least 50% of the design peak bedrock acceleration, but not less than 0.05g and the factor of safety under pseudostatic analysis shall be 1.0 or greater. In determining the factor of safety for pseudostatic analysis, a search for the critical failure surface shall be made."

The analysis requirement includes using at least 50% of the peak acceleration, but not less than 0.05g. Cesare used 0.1g in that this value is customarily used and is suitably conservative.

10.4 STABILITY AND SEEPAGE RESULTS

Cesare analyzed the repair zone for seepage and stability, considering both existing and repaired conditions. Analysis included steady state seepage at full pool surface elevation for both upstream and downstream slopes and rapid drawdown on the upstream face by means of a transient analysis. The rapid drawdown discharge rate was 17 cfs, which has a relative equivalence of 1 foot of drawdown, per day. Cesare also analyzed the downstream slope at full pool, considering a pseudo seismic force and considering residual bedrock strength. These scenarios meet the CSEO

requirements (2020). Results of Cesare's stability analyses are presented in Table 10.3 and include the CSEO's requirements.

TABLE 10.3. Stability Analyses Results

Section	Analysis	Factor of Safety		Required Factor of Safety
		Block	Circular	
Existing	Full, steady state upstream	2.54	2.47	1.5
	Full, steady state upstream, pseudo seismic	1.71	1.67	1.0
	Full, steady state downstream	1.81	1.73	1.5
	Full, steady state downstream, pseudo seismic	1.34	1.27	1.0
	Transient upstream	1.82	1.74	1.2*
Repaired	Full, steady state upstream	3.94	3.78	1.5
	Full, steady state upstream, pseudo seismic	2.68	2.56	1.0
	Full, steady state downstream	3.50	3.29	1.5
	Full, steady state downstream, pseudo seismic	2.56	2.41	1.0
	Full, steady state downstream, residual bedrock strength	2.84	3.07	1.1**
	Transient upstream	2.84	2.67	1.2*

* Lowest factor of safety.

**Case by case determination.

10.5 SETTLEMENT

Cesare did not perform a settlement analysis on the embankment. The embankment at the repair section is estimated to be about 33 feet from the embankment crest to its contact with competent bedrock. Considering this and Cesare's experience with timed consolidation results, Cesare estimates less than about 1/2 foot of embankment consolidation during construction. This consolidation typically occurs rapidly in clays with sand contents similar to the clays encountered at this site in both existing embankment and native soil. Settlement may be complete by the end of embankment construction, however, Cesare recommends a minimum of 1/2 foot of camber to account for unforeseen conditions. The bedrock supporting the embankment is unlikely to consolidate or deflect.

11. CONSTRUCTION CONSIDERATIONS

11.1 GROUNDWATER CONTROL

Groundwater was measured within the lower portion of existing fill in Boring B-1, in the weathered bedrock in Boring B-2, and in the native clay soil in B-3. Boring B-2 was located within the anticipated repair zone; thus, will likely represent the groundwater conditions during construction. All water levels appear within the anticipated vertical extent of the repair zone. The nature of the subsurface material may result in variable rates of inflow into the open excavation; however, the difference between the existing embankment, native clays, and weathered bedrock is not expected to be large. The contractor should implement groundwater control that will minimize disturbance to foundation material, all excavation activities, and fill placement. The groundwater appeared to be within the lower portion of the area to receive fill, such that groundwater control will be required for at least a

portion of the fill placement. Saturated borrow material may require wasting. The contractor should be responsible for designing and maintaining dewatering systems. Localized sumps may be adequate.

Surface drainage should be prevented from entering or flooding excavations and from causing uncontrolled erosion on excavated slopes. The contractor should be responsible for controlling surface drainage and meeting applicable local, state, and federal regulations.

11.2 EXCAVATIONS

11.2.1 General Considerations

The relative ease or difficulty of the excavation of the material onsite is not anticipated to vary greatly, both horizontally and with depth. Material ranged from existing embankment fill, unconsolidated native deposits, and weathered bedrock exhibiting single digit blow counts that should be readily excavated. Excavation should stop at competent bedrock contact. Excavation using rippers or tracked vehicles should stop before reaching final foundation surface as discussed in Section **11.3 FOUNDATION PREPARATION**. Blasting of foundation material will not be allowed.

11.2.2 Embankment Foundations

Soil and weathered bedrock should be excavated to remove soft and compressible material to contact of competent bedrock to provide proper support for the new outlet pipe and its encasement. The excavated soil and weathered bedrock may be used as fill for these areas, provided it is free of organics or other deleterious material. The side slopes excavated into the existing embankment should be benched at minimum vertical intervals of 1 foot and horizontal intervals of 2 feet, as fill is placed. At least the upper 6 inches of exposed embankment soil on the excavation slope benches should be moistened and compacted similar to the repair fill soil.

11.2.3 Fill Material

The soil excavated from the repair area is intended for use as repair embankment construction. The weathered claystone bedrock can also be used for embankment.

11.2.4 Moisture Conditioning

The embankment material should be conditioned in the required excavation area to within $\pm 2\%$ of optimum moisture content according to ASTM D698. Based on laboratory results, Cesare estimates most of the soil to be excavated is well over its optimum moisture content. Moistening material may be required and can be accomplished through mixing on grade; however, drying of the excavated material will likely be required. Variable moisture contents exist naturally and the contractor should design a program to moisten or dry the material to produce uniform moisture contents in the embankment material. Application of water should be carefully controlled to avoid overwatering or drying of the borrow material.

11.2.5 Temporary Cuts

Temporary cuts in the existing embankment, native soil, and weathered bedrock material should not exceed slopes of 2 horizontal to 1 vertical (2:1). Construction materials should not be stored adjacent to the slope crest, which would result in surcharging the slope and reducing its stability. Temporary cuts in competent bedrock material should not exceed slopes of 1:1. Steeper slopes may require

bracing or other stabilization methods to provide safe working conditions. The contractor should be responsible for designing and maintaining construction slopes. All slopes should be protected from runoff due to precipitation events. Methods of slope stabilization should comply with applicable state, local, and federal regulations.

11.3 FOUNDATION PREPARATION

Where claystone bedrock will be used for embankment and outlet pipe foundation, precautions should be considered for construction. Claystone bedrock tends to air slake upon exposure and drying. The foundation in the outlet line alignment and outlet structure should be protected from losing moisture, freezing, and effects of weathering. To accomplish this, Cesare recommends that a temporary cover of a few feet of unexcavated material be left in place until construction is ready to proceed. Final excavation, preparation, and backfilling must be done in small sections so that work can be completed before the foundation is damaged from drying. Within 10 hours of exposing the final foundation surface, surveying, inspection, foundation preparation, and placement of protective coatings or fill should take place. Experience gained during construction may allow for variations in this. Use of concrete mud mats should be considered for bedrock protection in outlet structure and other structure areas that must be left open for extended periods of time.

Exposed finished surfaces should be kept from drying or slaking. Temporary plastic may be effective in limited areas. If exposed surfaces dry out, become desiccated, slake, or are loosened or disturbed, the affected material should be removed just prior to fill or structure placement. Cesare's experience has shown that metal tracked equipment should be kept off the final excavated surface. Rubber tired equipment should be used for the final excavation to foundation grade.

11.4 OUTLET PIPE

The outlet pipe should bear on competent bedrock encased in reinforced concrete. The depth to bedrock in the outlet location will require on the order of 2 to 6 feet of excavation below the pipe invert to contact competent bedrock. The bedrock will likely be exposed for sufficient time to allow desiccation and cracking. Thus, a mud mat should be placed on it and below the encasement. The encasement's longitudinal sides should have slopes of 1 to 10, horizontal to vertical, from the bearing surface. A collar should surround the encasement on all four sides by at least 12 inches of filter material meeting the project requirements. The filter material should extend along the encasement at least 5 feet.

12. SOLUBLE SULFATE CONTENT

Water soluble sulfate contents of 0.01% and 0.0% were measured on samples of native and fill clays. Results are summarized in Appendix B. The PCA publication titled, *Design and Control of Concrete Mixtures* 2002 and the ACI publication titled *Building Code Requirements for Structural Concrete and Commentary* consider this range negligible for water soluble sulfate exposure. Recommendations for all concrete which will be in contact with or within 6 inches of these soils are shown in Table 12.1.

TABLE 12.1. Information from ACI 318-08 - Table 4.3.1

Water Soluble Sulfates (%)	Exposure Class	Maximum (w/cm)*	Minimum f_c , (psi)	Cementitious materials† (types)			Calcium Chloride Admixture
				ASTM C150	ASTM C595	ASTM C1157	
<0.10	S0	N/A	2,500	No type restriction	No type restriction	No type restriction	No restriction
$0.10 \leq$ to <0.20	S1 Moderate	0.50	4,000	II [‡]	IP (MS) IS (<70) (MS)	MS	No restriction
≤ 0.20 to ≤ 2.00	S2 Severe	0.45	4,500	V [§]	IP (HS) IS (<70) (HS)	HS	Not permitted
>2.00	S3 Very Severe	0.45	4,500	V + pozzolan or slag	IP (HS)+pozzolan or slag or IS (<70) (HS)+pozzolan or slag	HS+pozzolan or slag	Not permitted

*For lightweight concrete, see ACI 318-08 4.1.2.

†Alternative combinations of cementitious materials of those listed in Table 4.3.1 shall be permitted when tested for sulfate resistance and meeting the criteria in ACI 318-08 4.5.1.

‡For seawater exposure, other types of Portland cements with tricalcium aluminate (C_3A) contents up to 10 percent are permitted if the w/cm does not exceed 0.40.

§Other available types of cement such as Type III or Type I are permitted in Exposure Classes S1 or S2 if the C_3A contents are less than 8 or 5 percent, respectively.

|| The amount of the specific source of the pozzolan or slag to be used shall not be less than the amount that has been determined by service record to improve sulfate resistance when used in concrete containing Type V cement. Alternatively, the amount of the specific source of the pozzolan or slag to be used shall not be less than the amount tested in accordance with ASTM C1012 and meeting the criteria in ACI 318-08 4.5.1.

Refer to ACI 318-08 R4.3.1 for further interpretation of this table.

13. GEOTECHNICAL RISK

The concept of risk is an important aspect of any geotechnical evaluation. The primary reason for this is that the analytical methods used by geotechnical engineers are generally empirical and must be tempered by engineering judgment and experience, therefore, the solutions or recommendations presented in any geotechnical evaluation should not be considered risk free, and more importantly, are not a guarantee that the interaction between the soil and the proposed construction will perform as predicted, desired, or intended. The engineering recommendations presented in the preceding sections constitute Cesare's best estimate of those measures that are necessary to help the structure perform in a satisfactory manner based on the information generated during this evaluation, training, and experience in working with these conditions.

14. LIMITATIONS

This document has been prepared as an instrument of service for the exclusive use of J&T Consulting, Inc. for the specific application to the project as discussed herein and has been prepared in accordance with geotechnical engineering practices generally accepted in the state of Colorado at the date of its preparation. No warranties, either expressed or implied, are intended or made. This document should not be assumed to contain information for other parties or other purposes.

The findings of this evaluation are valid as of the date its preparation. Changes in the conditions of

a property can occur with the passage of time, whether due to natural processes or the works of people on this or adjacent properties. Standards of practice evolve in engineering and changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this evaluation may be invalidated wholly or partially by changes outside of Cesare's control, therefore, this evaluation is subject to review and should not be relied upon without such review after a period of 3 years.

In the event that changes, including but not limited to, the nature, type, design, size, elevation, or location of the project or project elements as outlined in this report are made, the conclusions and recommendations contained in this report shall not be considered valid unless Cesare reviews the changes and either confirms or modifies the conclusions of this report in writing.

Cesare should be retained to review final plans and specifications that are developed for proposed construction to judge whether the recommendations presented in this report and any addenda have been appropriately interpreted and incorporated in the project plans and specifications as intended.

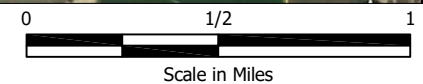
The exploration locations for this evaluation were selected to obtain a reasonably accurate depiction of underground conditions for design purposes and these locations are often modified based on accessibility and the presence of underground or overhead utility conflicts. Variations from the soil conditions encountered are possible. These variations may necessitate modifications to Cesare's design recommendations, therefore, Cesare should be retained to observe subsurface conditions, once exposed, to evaluate whether they are consistent with the conditions encountered during Cesare's exploration and that the recommendations of this evaluation remain valid. If parties other than Cesare perform these observations and judgements, they must accept responsibility to judge whether the recommendations in this report remain appropriate.

Cesare's scope of services for this report did not include either specifically, or by implication, any environmental assessment of the site or identification of contaminated or hazardous material or conditions.

Cesare should be retained during construction to observe and/or test the following:

- ☒ completed excavations.
- ☒ placement and compaction of fill.
- ☒ proposed import or onsite fill material.

Cesare offers many other construction observations, materials engineering, and testing services and can be contacted to discuss further.



BASEMAP FROM GOOGLE EARTH PRO©.

PROJECT NO:	20.3062		
PROJECT NAME:	Johnstown Reservoir Outlet Structure		
DRAWN BY:	RCK	CHECKED BY:	JAC2
DWG DATE:	12.15.2020	REV. DATE:	--

FIGURE 1
Vicinity Map

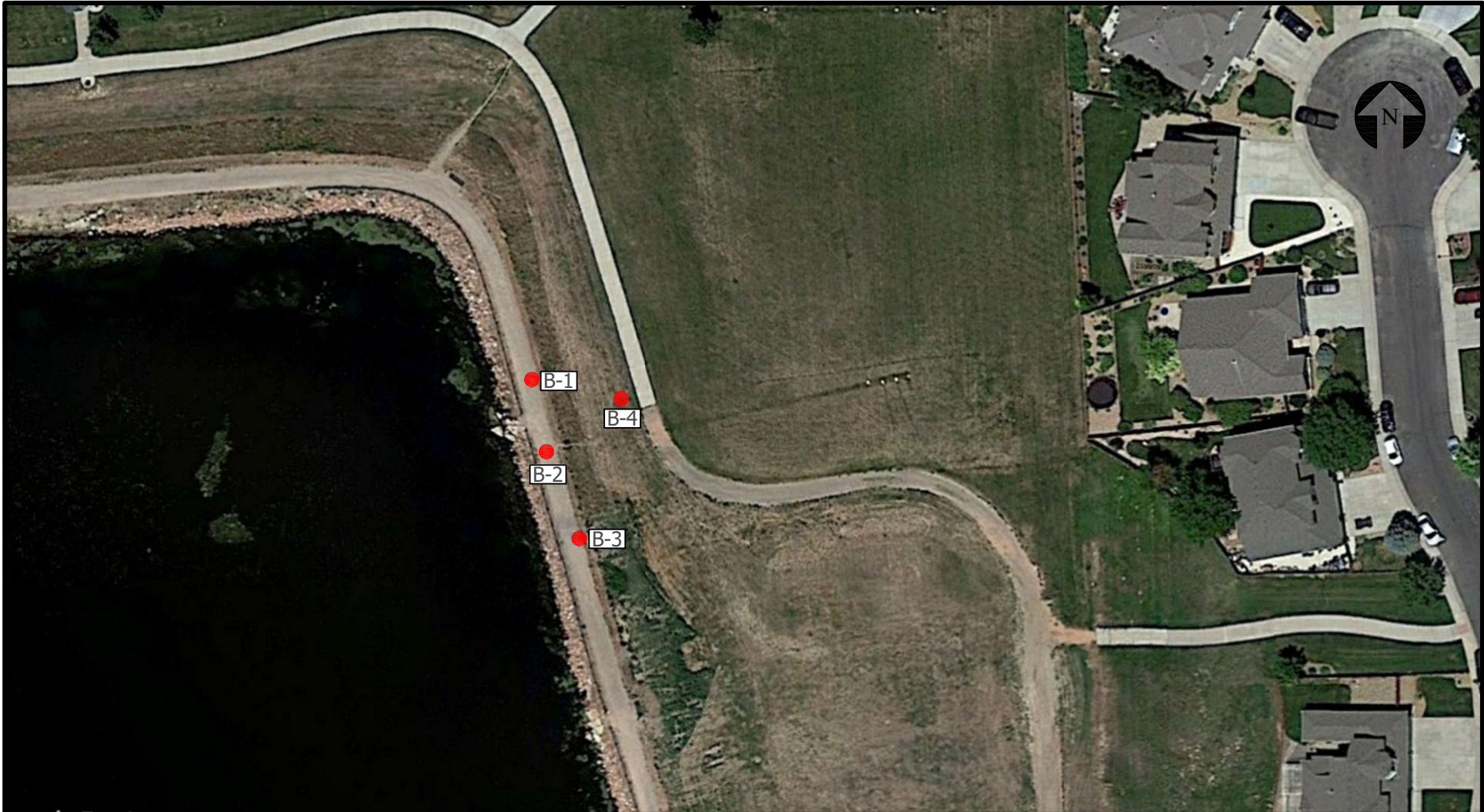


APPENDIX A

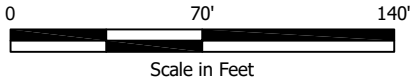
Field Exploration

FIELD EXPLORATION

Samples of the subsoil were obtained at this site using a modified California sampler which was driven into the soil by dropping a 140 pound hammer through a free fall of 30 inches. The modified California sampler is a 2-1/2 inch outside diameter by 2 inch inside diameter device lined with brass tubes. The procedure to drive the modified California sampler into the soil and to record the number of blows required to do so is known as a penetration test. The number of blows required for the sampler to penetrate 12 inches gives an indication of the relative stiffness of cohesive soil, relative density of non-cohesive soil, and relative hardness of sedimentary bedrock material encountered. Bulk samples were collected from cuttings generated during drilling. Locations of sampling and penetration test results are presented on the boring logs and key to symbols/legend contained in this appendix.



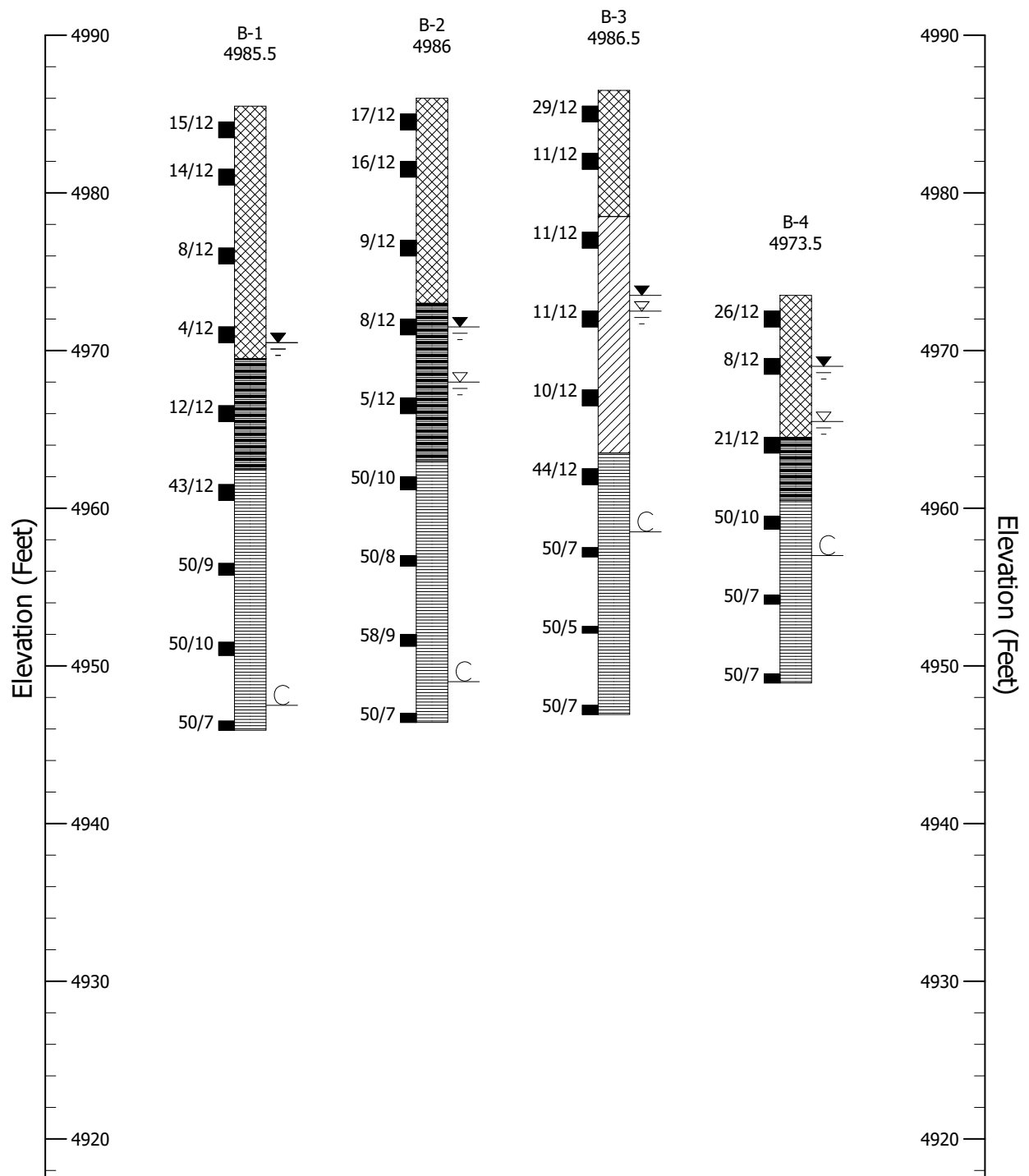
LEGEND: B-1 BORING LOCATIONS



BASEMAP FROM GOOGLE EARTH PRO©.

PROJECT NO:	20.3062		
PROJECT NAME:	Johnstown Reservoir Outlet Structure		
DRAWN BY:	RCK	CHECKED BY:	JAC2
DWG DATE:	12.16.2020	REV. DATE:	--

BORING LOCATION PLAN



BORING LOGS

PROJECT NO:	20.3062
PROJECT NAME:	Johnstown Reservoir Outlet Structure
DWG DATE:	2/10/2021



KEY TO SYMBOLS

Symbol Description

Strata symbols



FILL: CLAY, lean, to with sand, stiff to very stiff, moist, brown, olive (CL, A-7-6, A-6); POSSIBLE PIPE BEDDING: SAND, open graded medium sand size, wet, medium dense, dark gray (SP, A-1-b); SURFACE TRAVEL COURSE: SAND, clayey, with gravel, slightly moist, dense, (SC, A-6).



CLAY, moist, stiff, brown (CL, A-6, A-7-6).



WEATHERED CLAYSTONE, moist to very moist, soft to very stiff, light to dark olive.



CLAYSTONE, moist, hard to very hard, light to dark olive, olive tan, olive brown, olive gray.

Misc. Symbols



Water level during drilling



Water level 1 day after drilling.

Soil Samplers



Modified California sample

Notes:

1. 15/12 indicates 15 blows with a 140-pound hammer falling 30 inches were required to drive a modified California barrel sampler 12 inches.
 2. Exploratory borings B-1 through B-4 were drilled on December 2, 2020 using a CME-55 drill rig equipped with 4-inch diameter continuous flight solid stem auger.
 3. Relative elevations of borings B-1 through B-4 were provided by J&T Consulting from project survey.
 4. Groundwater was encountered at depths of 15, 18, 14, and 8 feet below ground surface in borings B-1 through B-4, respectively, during drilling. Groundwater was measured at depths of 15, 14-1/2, 13, and 4-1/2 feet below ground surface in borings B-1 through B-4, respectively, 1 day after drilling. Borings were grouted solid at the completion of the latter groundwater measurement.
 5. Contacts between soil units are approximate and may be gradational.
 6. These logs are subject to the limitations, conclusions, and recommendations in this report.
- Project No. 20.3062.



APPENDIX B

Laboratory Testing

SUMMARY OF LABORATORY TEST RESULTS

Johnstown Reservoir Outlet Structure

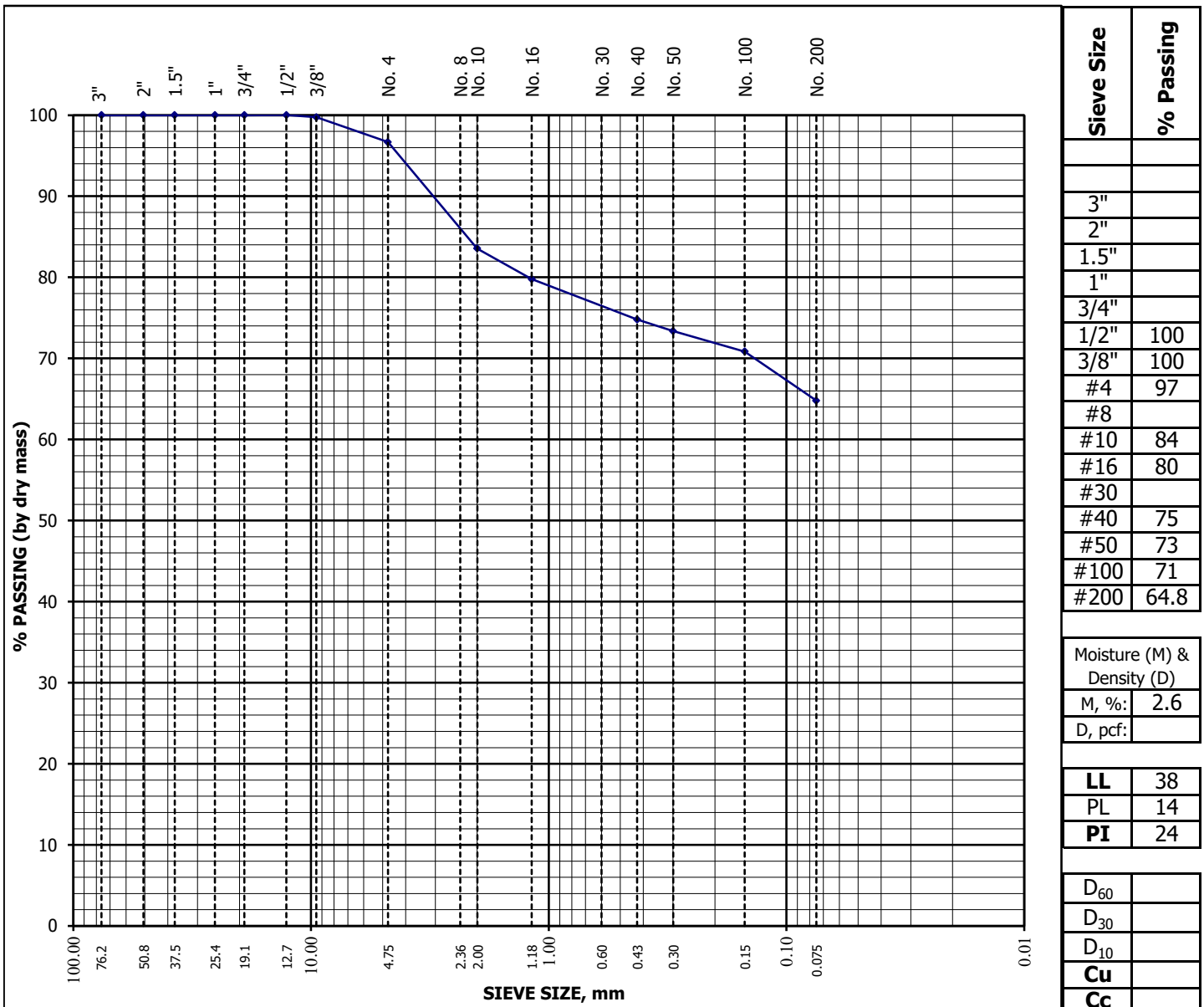
Project No. 20.3062

Sample Location		Natural Dry Density (pcf)	Natural Moisture Content (%)	Standard Proctor		Water Soluble Sulfates (%)	Gradation			Atterberg Limits		Material Type
Boring	Depth (feet)			Maximum Dry Density (pcf)	Optimum Moisture Content (%)		Gravel (%)	Sand (%)	Silt/Clay (%)	Liquid Limit (%)	Plasticity Index (%)	
B-1	0 to 5		2.6	114.4	15.2		3	30	64.8	38	24	FILL: CLAY, sandy, lean (A-6(13))
B-1	1	109.0	17.7				2	8	90.3	47	32	FILL: CLAY, lean (A-7-6(30))
B-1	4	109.2	19.1					12	88.0	37	24	FILL: CLAY, lean (A-6(20))
B-1	9	94.8	27.5					8	91.9	43	28	FILL: CLAY, lean (A-7-6(26))
B-2	0 to 5		2.0	120.2	11.9		9	39	47.3	30	16	FILL: SAND, clayey (A-6(4))
B-2	1	106.2	20.0				2	8	89.6	47	33	FILL: CLAY, lean (A-7-6(30))
B-2	4	109.6	19.5					12	87.8	43	29	FILL: CLAY, lean (A-7-6(25))
B-2	9	99.6	25.5					8	91.7	44	29	FILL: CLAY, lean (A-7-6(27))
B-2	14	96.6	27.3			0.01						WEATHERED CLAYSTONE: CLAY, lean (A-7-6)
B-3	1	116.5	15.4				6	12	82	44	29	FILL: CLAY, lean, with sand (CL, A-7-6(23))
B-3	4	103.7	18.4				2	19	79	46	30	FILL: CLAY, lean, with sand (CL, A-7-6(23))
B-3	9	96.4	27.5					10	90	42	27	CLAY, lean (A-7-6(24))
B-3	14	101.9	24.9									WEATHERED CLAYSTONE: CLAY, lean (A-7-6)
B-4	4					0.00						FILL: CLAY, lean (CL, A-7-6)

GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 16-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. De Los Santos
Lab ID Number: 2021425 Reviewer: J. Crystal
Sample Location: B-1 at 0' to 5'
Visual Description: CLAY, sandy, brown

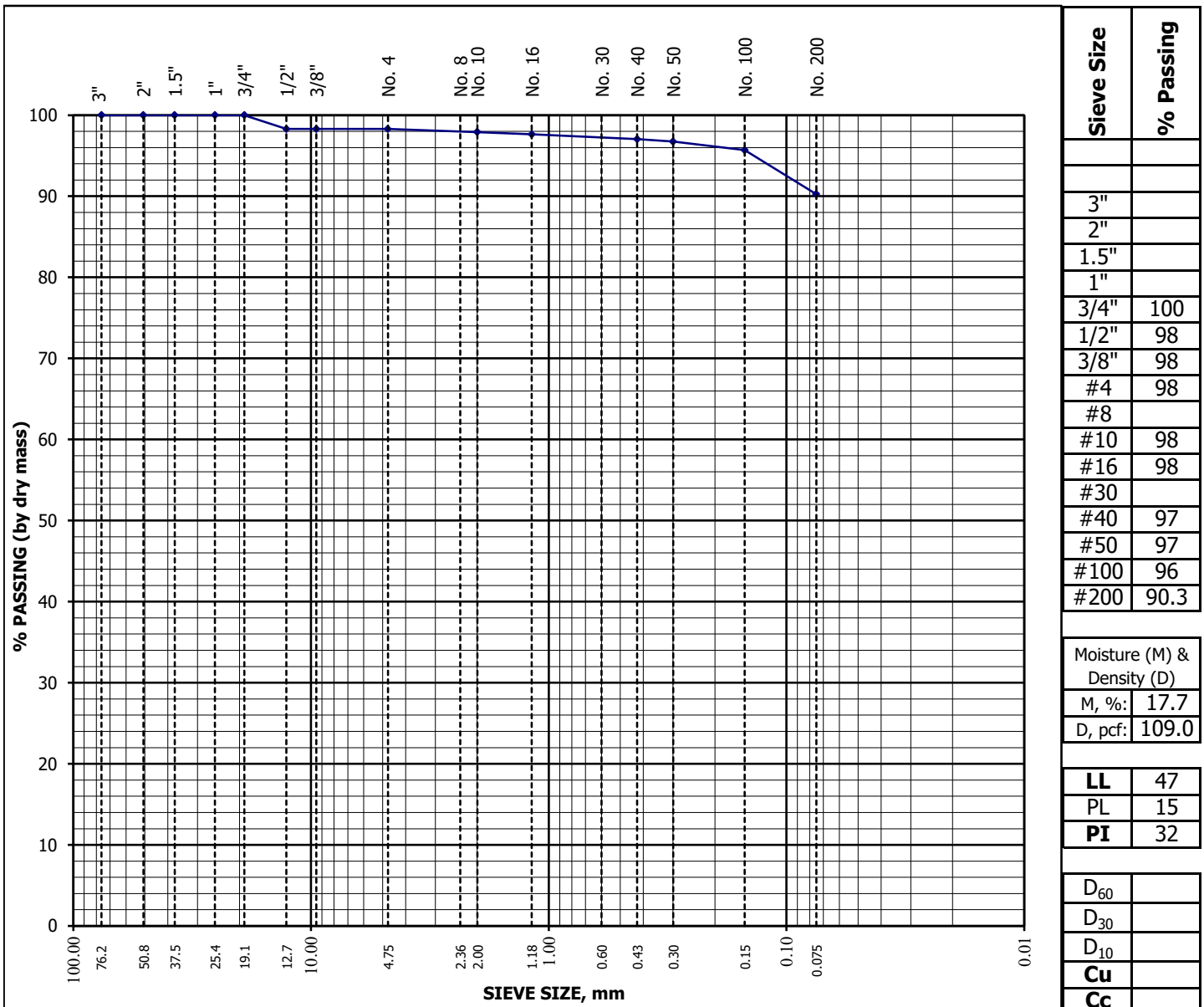
AASHTO M 145 Classification: A-6 **Group Index:** 13
Unified Soil Classification System
(ASTM D 2487): (CL) **Sandy lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021426 Reviewer: J. Crystal
Sample Location: B-1 at 1'
Visual Description: CLAY, brown

AASHTO M 145 Classification: A-7-6 **Group Index:** 30
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



Moisture (M) & Density (D)
M, %: 17.7
D, pcf: 109.0

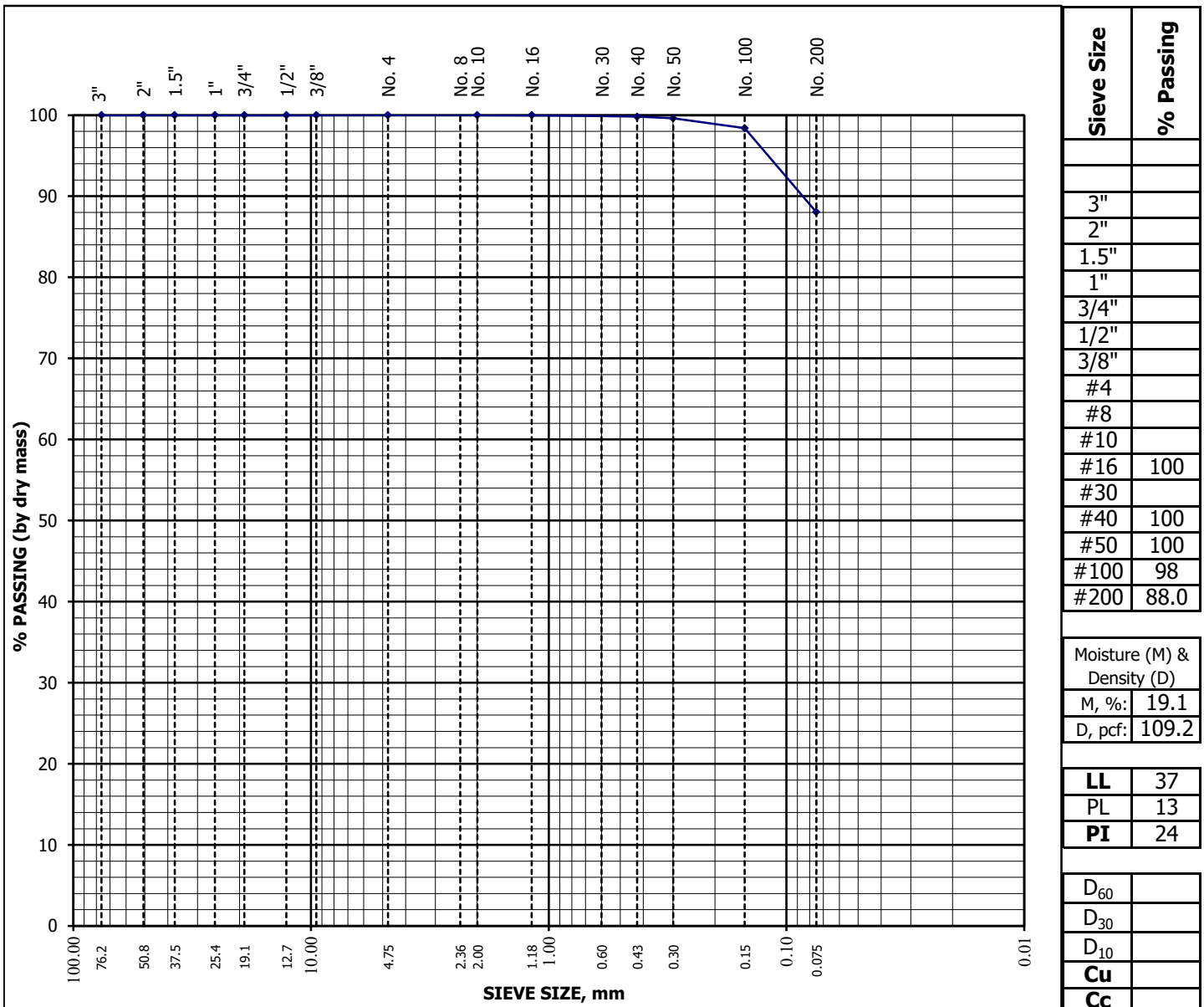
LL 47
PL 15
PI 32

D₆₀
D₃₀
D₁₀
Cu
Cc

GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021427 Reviewer: J. Crystal
Sample Location: B-1 at 4'
Visual Description: CLAY, brown

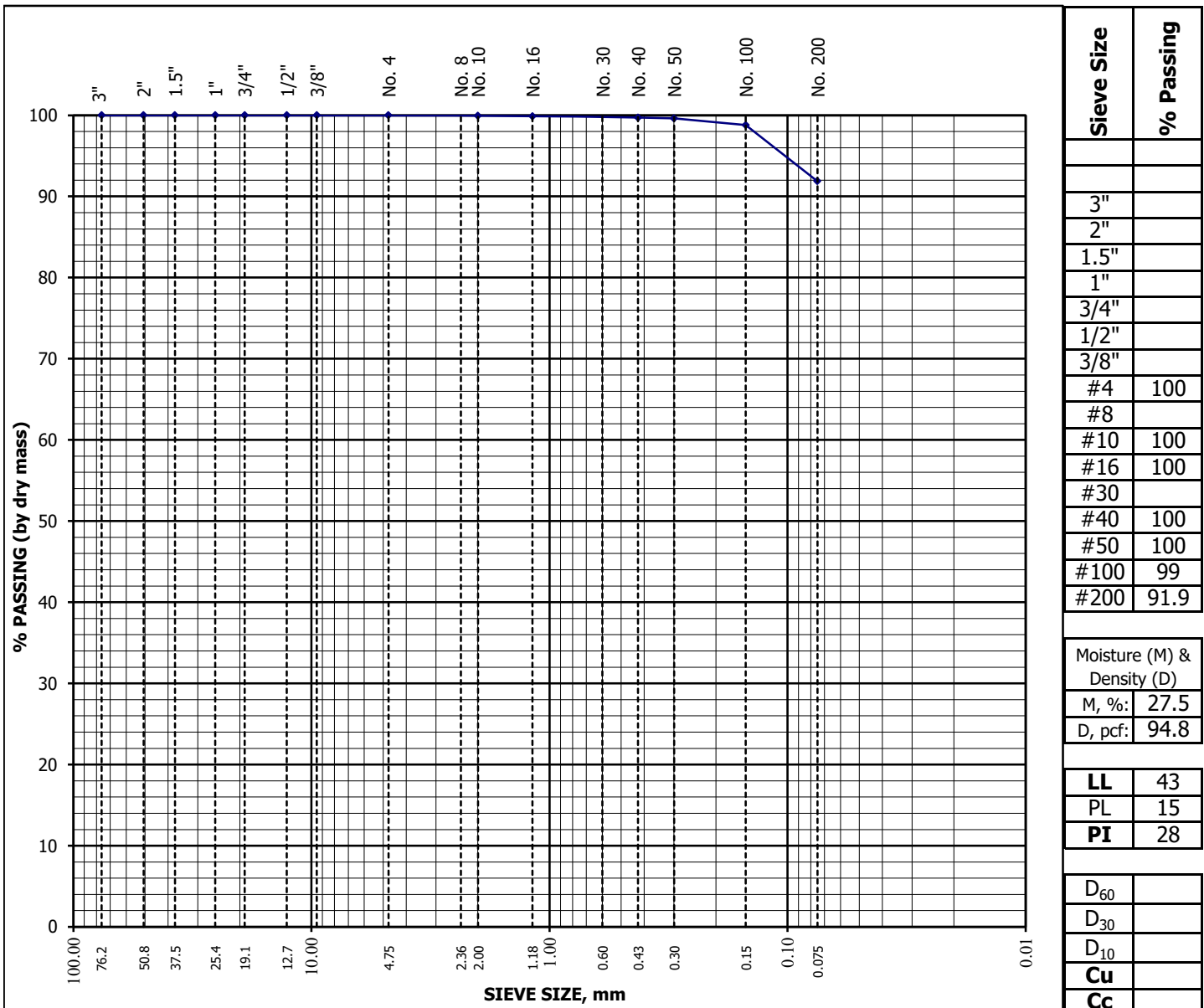
AASHTO M 145 Classification: A-6 **Group Index:** 20
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021428 Reviewer: J. Crystal
Sample Location: B-1 at 9'
Visual Description: CLAY, brown

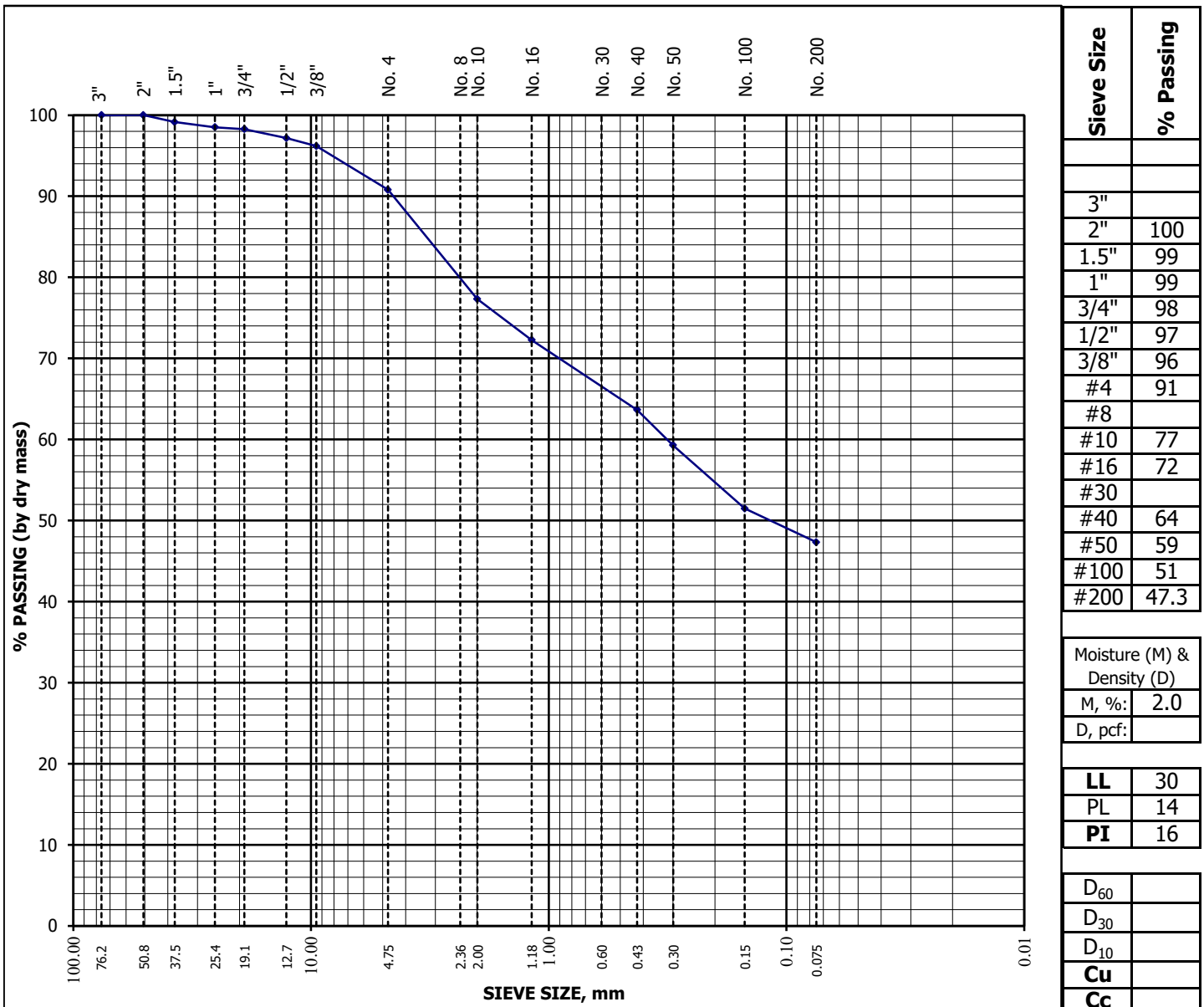
AASHTO M 145 Classification: A-7-6 **Group Index:** 26
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 16-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. De Los Santos
Lab ID Number: 2021429 Reviewer: J. Crystal
Sample Location: B-2 at 0' to 5'
Visual Description: SAND, clayey, brown

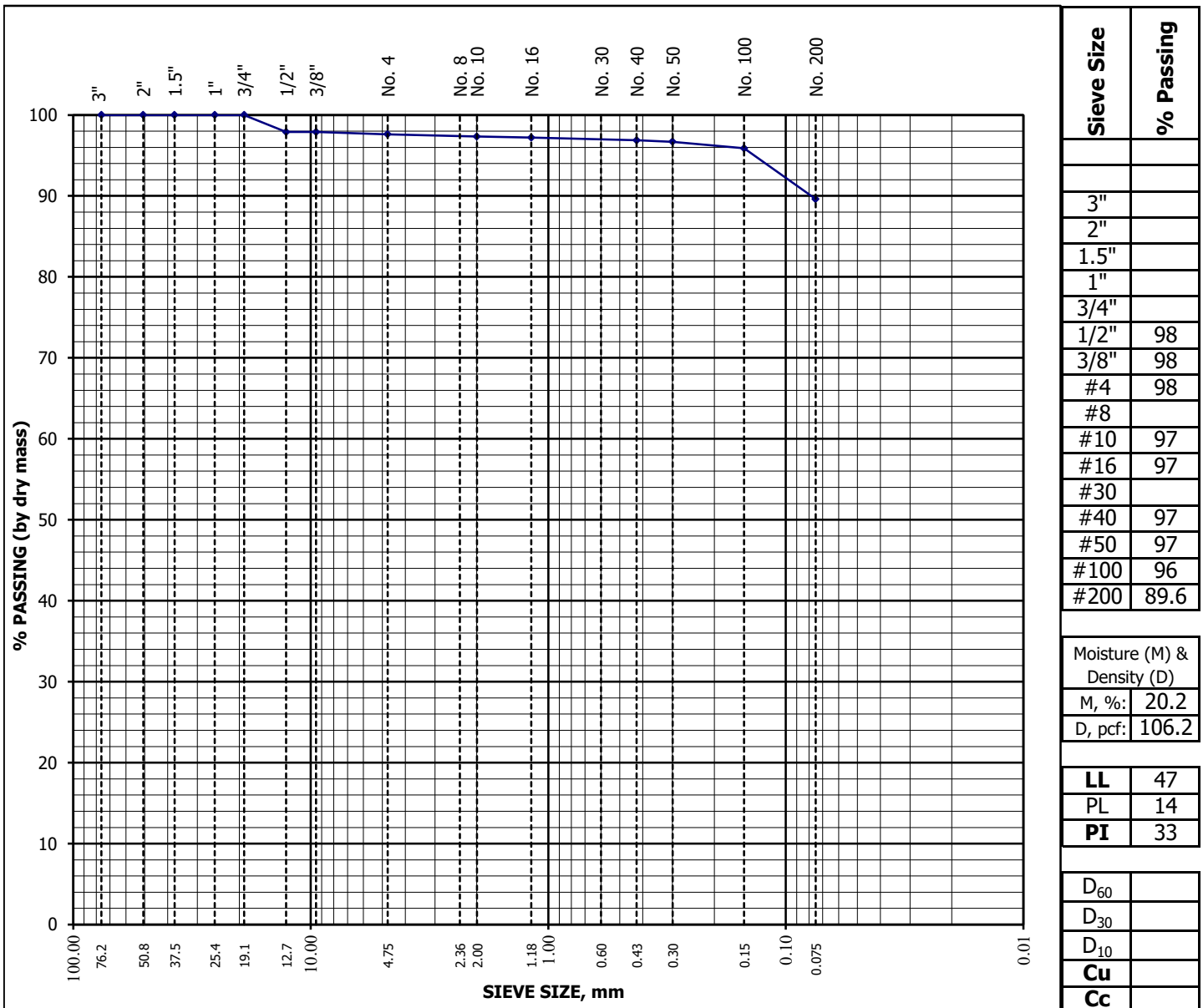
AASHTO M 145 Classification: A-6 **Group Index:** 4
Unified Soil Classification System
(ASTM D 2487): (SC) **Clayey Sand**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021430 Reviewer: J. Crystal
Sample Location: B-2 at 1'
Visual Description: CLAY, brown

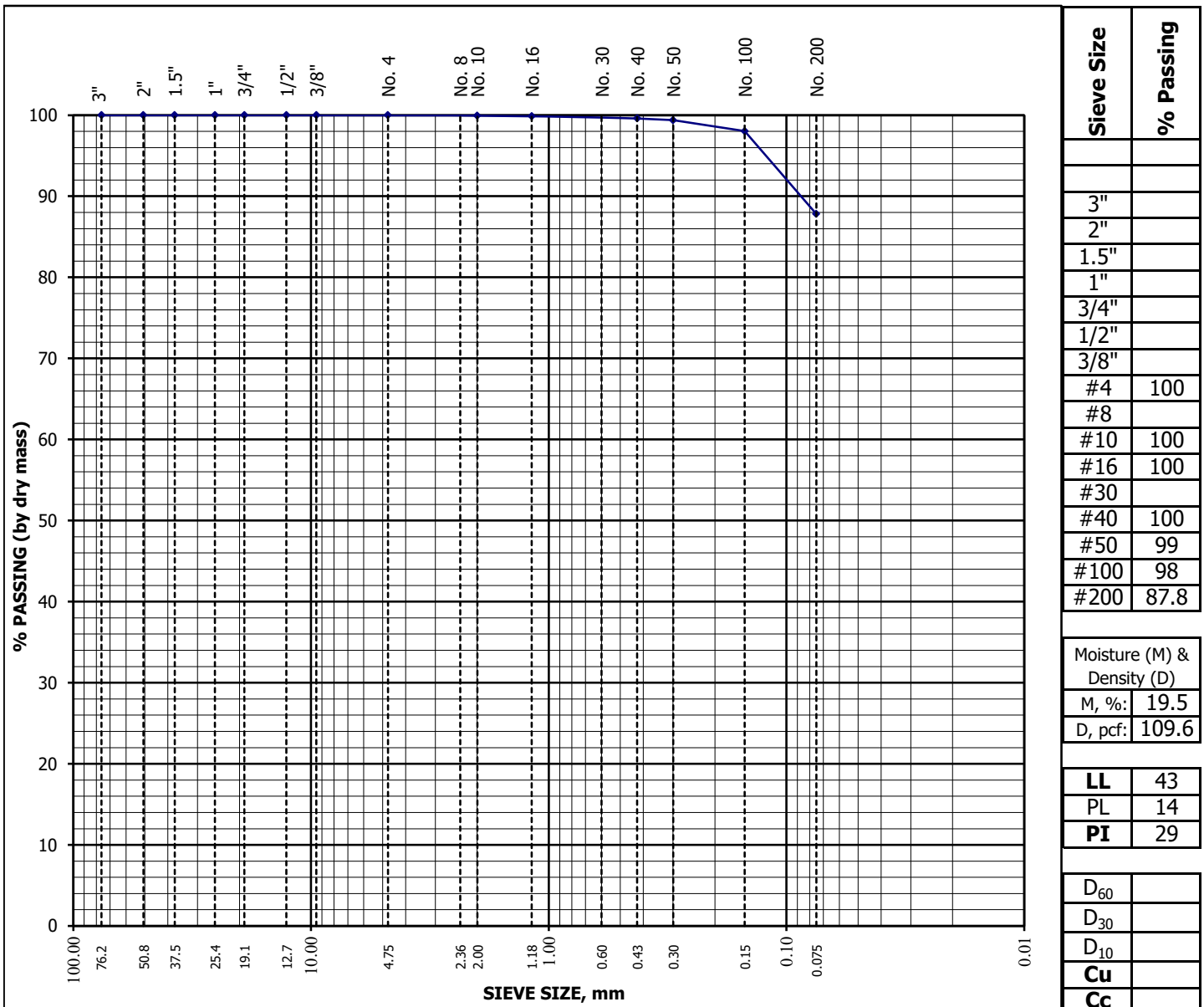
AASHTO M 145 Classification: A-7-6 **Group Index:** 30
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021431 Reviewer: J. Crystal
Sample Location: B-2 at 4'
Visual Description: CLAY, brown

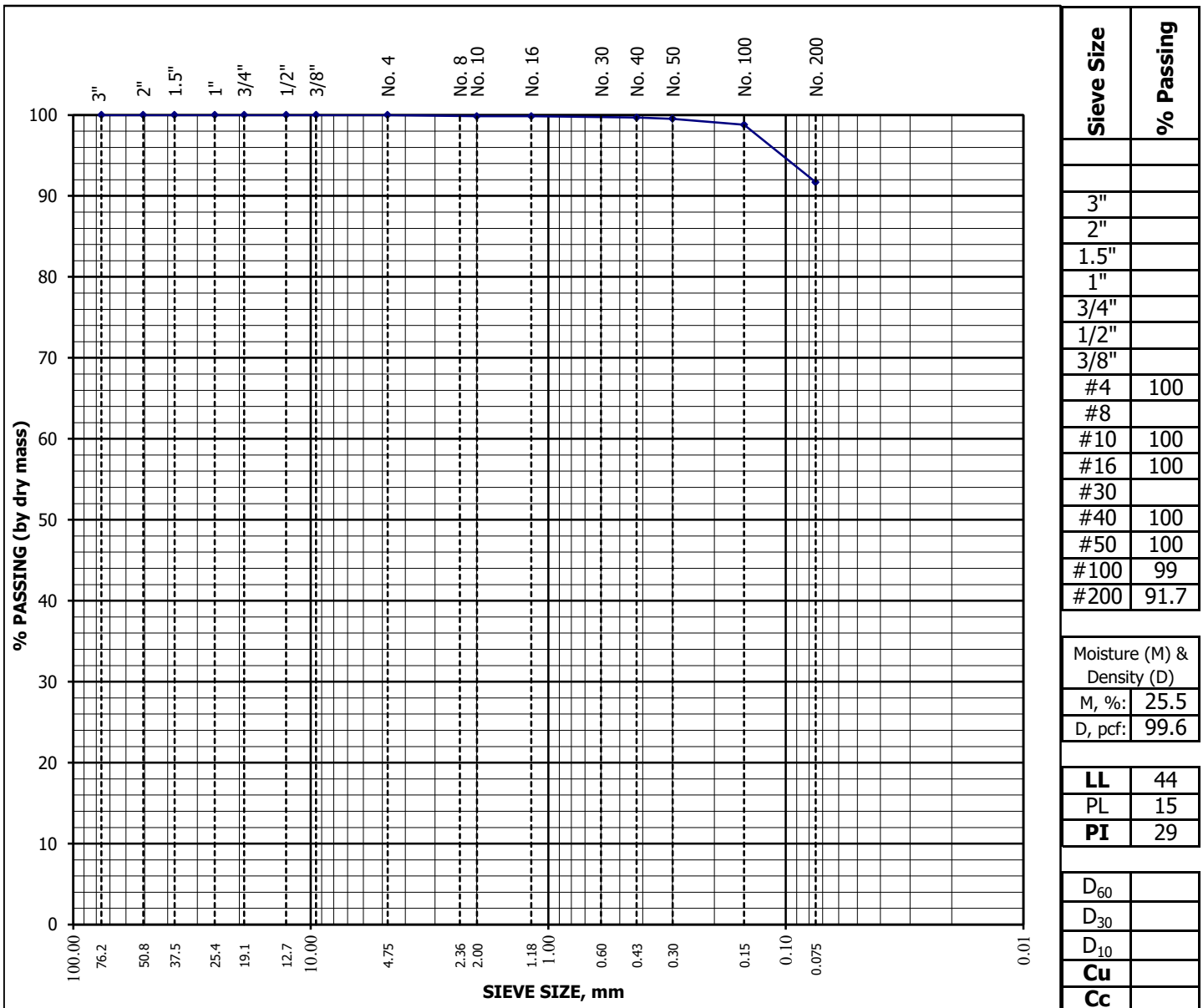
AASHTO M 145 Classification: A-7-6 **Group Index:** 25
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021432 Reviewer: J. Crystal
Sample Location: B-2 at 9'
Visual Description: CLAY, brown

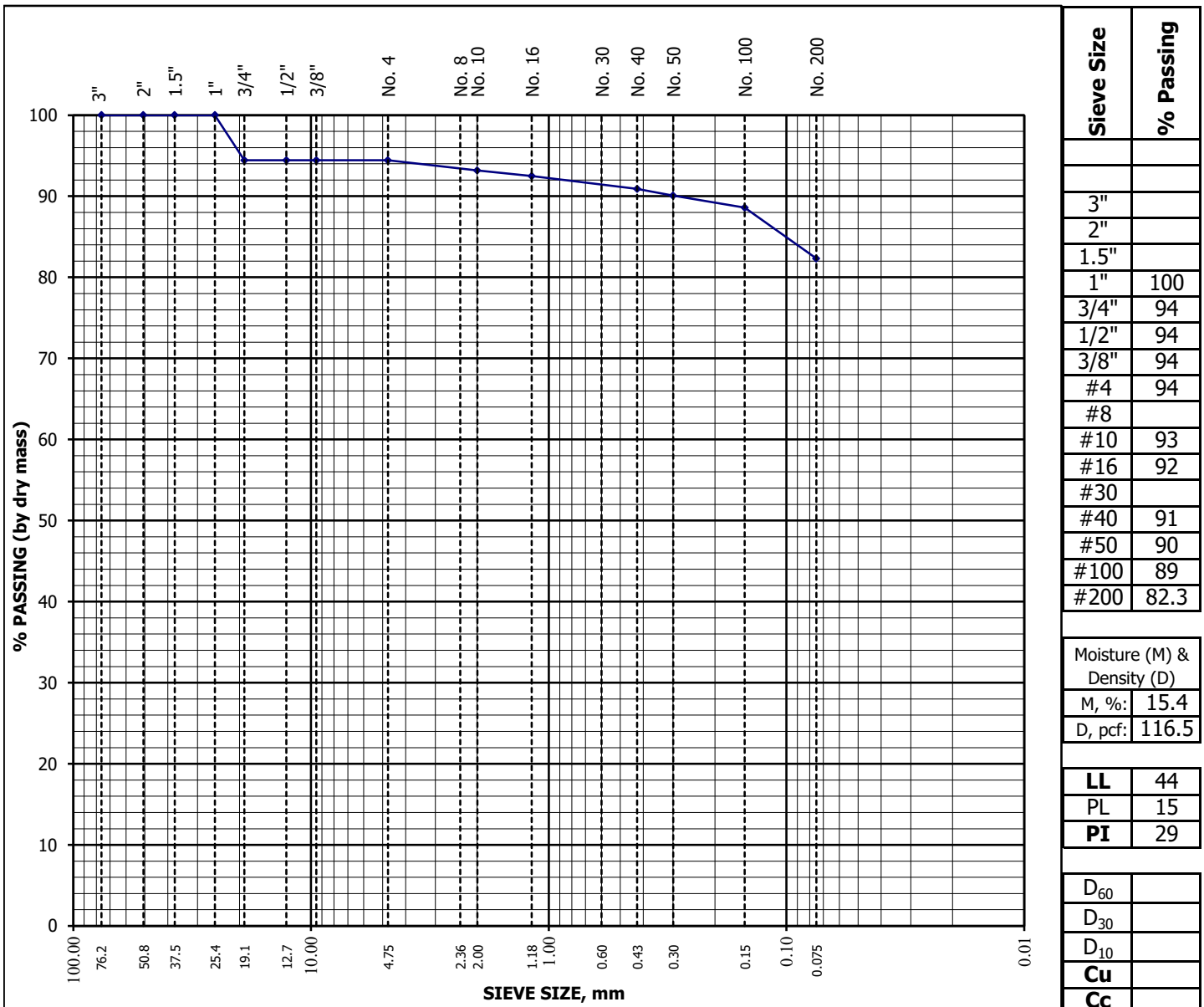
AASHTO M 145 Classification: A-7-6 **Group Index:** 27
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021435 Reviewer: J. Crystal
Sample Location: B-3 at 1'
Visual Description: CLAY, with sand, brown

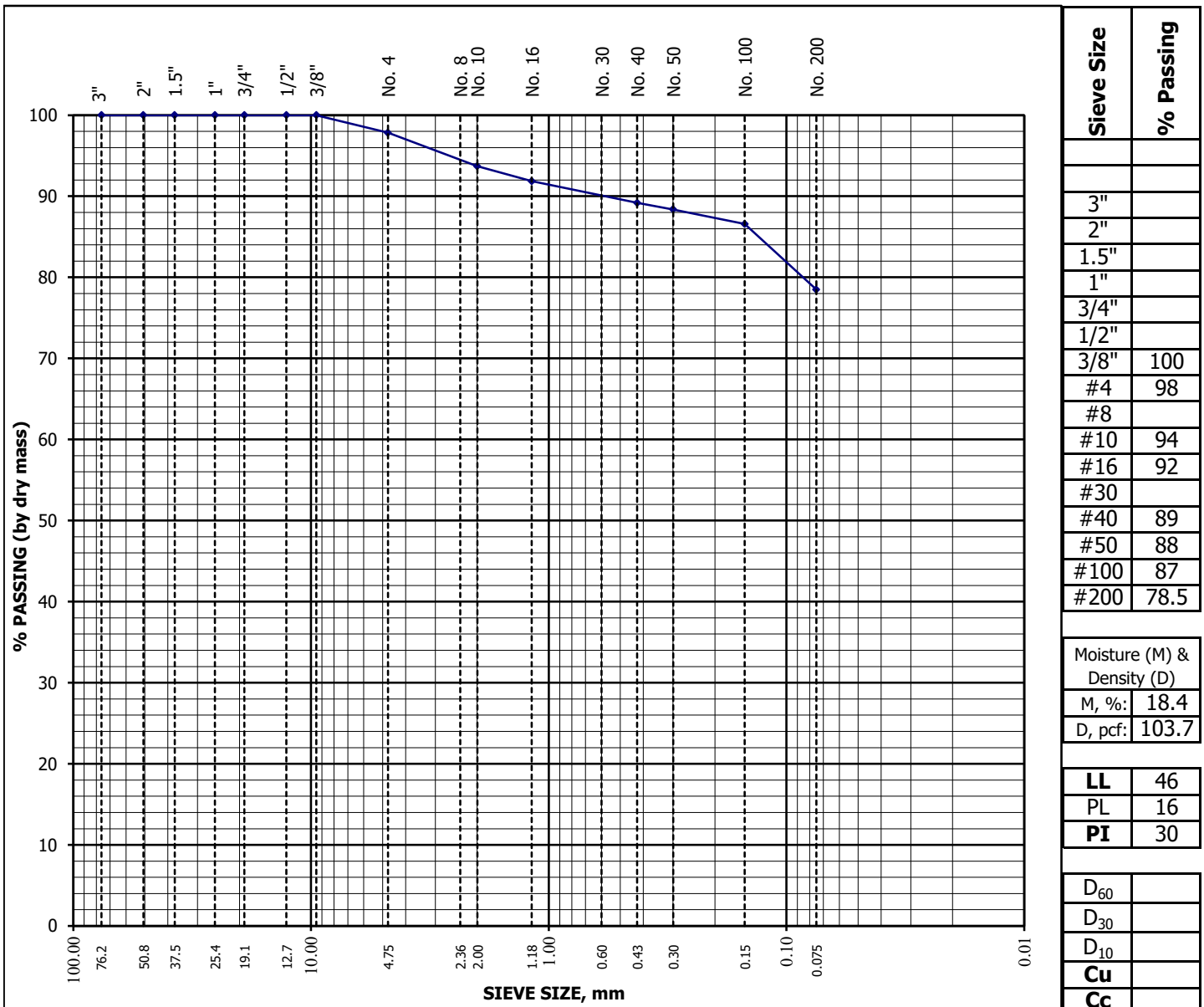
AASHTO M 145 Classification: A-7-6 **Group Index:** 23
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay with sand**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021435 Reviewer: J. Crystal
Sample Location: B-3 at 4'
Visual Description: CLAY, with sand, brown

AASHTO M 145 Classification: A-7-6 **Group Index:** 23
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay with sand**



Moisture (M) & Density (D)
M, %: 18.4
D, pcf: 103.7

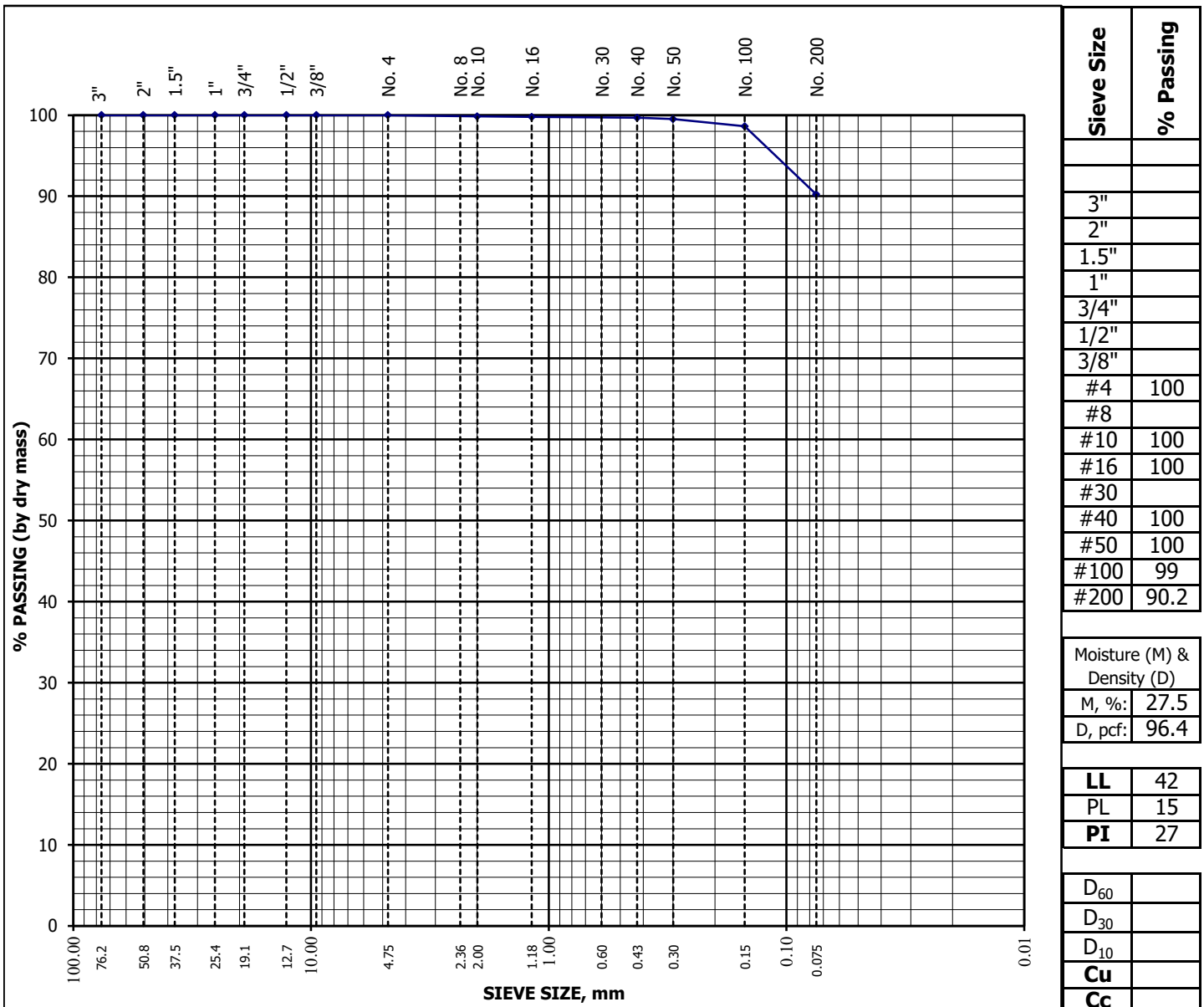
LL 46
PL 16
PI 30

D₆₀
D₃₀
D₁₀
Cu
Cc

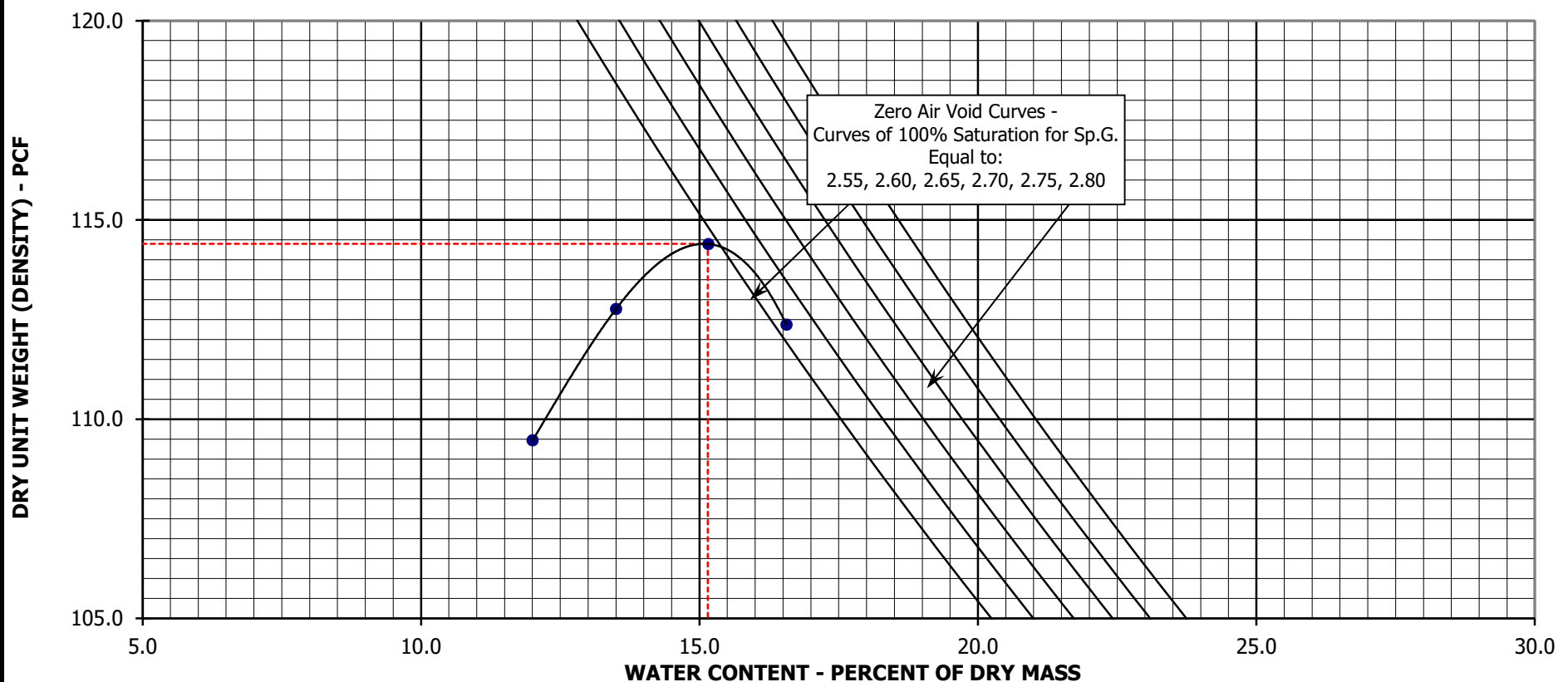
GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021436 Reviewer: J. Crystal
Sample Location: B-3 at 9'
Visual Description: CLAY, brown

AASHTO M 145 Classification: A-7-6 **Group Index:** 24
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**

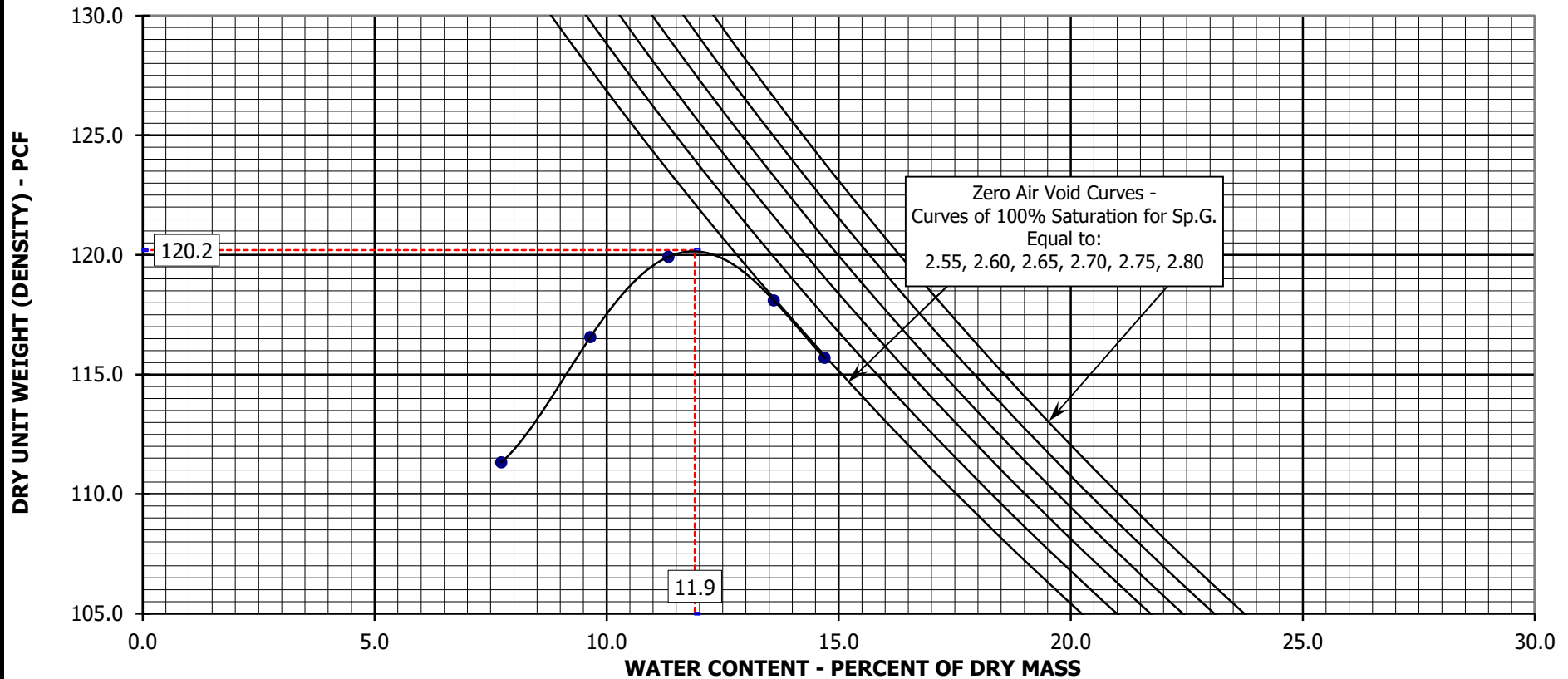


Laboratory Maximum Dry Unit Weight (Density): 114.4 pcf
Laboratory Optimum Moisture Content (OMC): 15.2 %



Sample Location	Depth (ft)	LL	PL	PI	-#200 (%)	Soil Description & Classification	Moisture/Density Relationship (Proctor) Test
B-1	0 to 5	38	14	24	64.8	Visual: CLAY, sandy, brown AASHTO: A-6(13) USCS: CLAY, sandy, lean	Project Number: 20.3062, J&T Consulting, Inc. Project Name: Johnstown Reservoir Outlet Structure Drawn By: K. Lang Checked By: J. Crystal Date: 21-Dec-20 Tested by: J. De Los Santos Date: 18-Dec-20 Lab ID Number: 2021425

Laboratory Maximum Dry Unit Weight (Density): 120.2 pcf
Laboratory Optimum Moisture Content (OMC): 11.9 %



Sample Location	Depth (ft)	LL	PL	PI	-#200 (%)	Soil Description & Classification	Moisture/Density Relationship (Proctor) Test
B-2	0 to 5	30	14	16	47.3	Visual: SAND, clayey, brown AASHTO: A-6(4) USCS: (SC) Sandy clay	Project Number: 20.3062, J&T Consulting, Inc. Project Name: Johnstown Reservoir Outlet Structure Drawn By: K. Lang Tested by: J. De Los Santos Checked By: J. Crystal Date: 18-Dec-20 Date: 21-Dec-20 Lab ID Number: 2021429

SOIL CHEMICAL TESTS

Project Number: 20.3062, J&T Consulting, Inc. Date: 11-Feb-21
 Project Name: Johnstown Reservoir Outlet Structure Technician: G. Hoyos
 Lab ID Number: 212211 Reviewer: J. Crystal
 Sample Location: B-2 at 14'
 Visual Description: CLAY, sandy, brown

Dish+Wet Soil (g): _____
 Dish+Dry Soil (g): _____
 Dish Wt. (g): _____
 Air Dried Moisture
 Content (%): _____

Water Soluble Sulfate (Colorado Procedure CP-L-2103)

Dilution	Reading, mg/L	Concentration, ppm	Concentration, %
100:1	1.0	100	0.01

pH (ASTM D 4972, 20g of -#10)

pH Meter Reading: _____

Water Soluble Chloride (HACH Method 8113, 100g of -#10)

Dilution	Reading (mg/L)	Result (mg/L)

Resistivity (AASHTO T 288, -#10)

Readings (ohm*cm)

Lowest Resistivity

SOIL CHEMICAL TESTS

Project Number: 20.3062, J&T Consulting, Inc. Date: 11-Feb-21
 Project Name: Johnstown Reservoir Outlet Structure Technician: G. Hoyos
 Lab ID Number: 212212 Reviewer: J. Crystal
 Sample Location: B-4 at 4'
 Visual Description: CLAYSTONE, sandy, brown

Dish+Wet Soil (g): _____
 Dish+Dry Soil (g): _____
 Dish Wt. (g): _____
 Air Dried Moisture
 Content (%): _____

Water Soluble Sulfate (Colorado Procedure CP-L-2103)

Dilution	Reading, mg/L	Concentration, ppm	Concentration, %
100:1	0.0	0	0.00

pH (ASTM D 4972, 20g of -#10)

pH Meter Reading: _____

Water Soluble Chloride (HACH Method 8113, 100g of -#10)

Dilution	Reading (mg/L)	Result (mg/L)

Resistivity (AASHTO T 288, -#10)

Readings (ohm*cm)

Lowest Resistivity



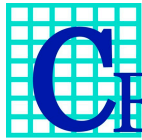
APPENDIX C

Slope Stability Results



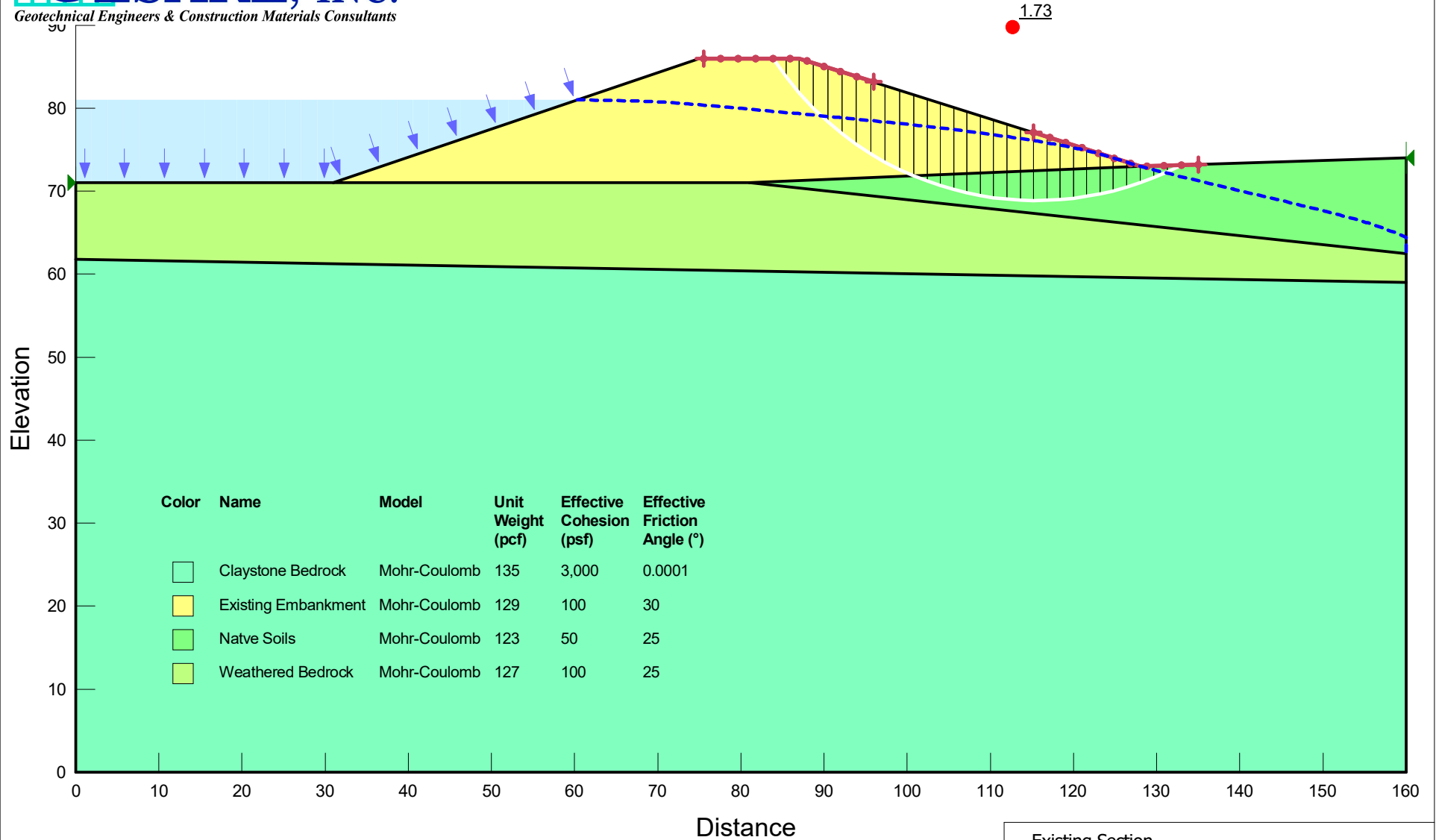
APPENDIX C

Slope Stability Results Existing

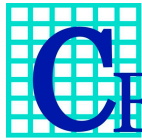


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

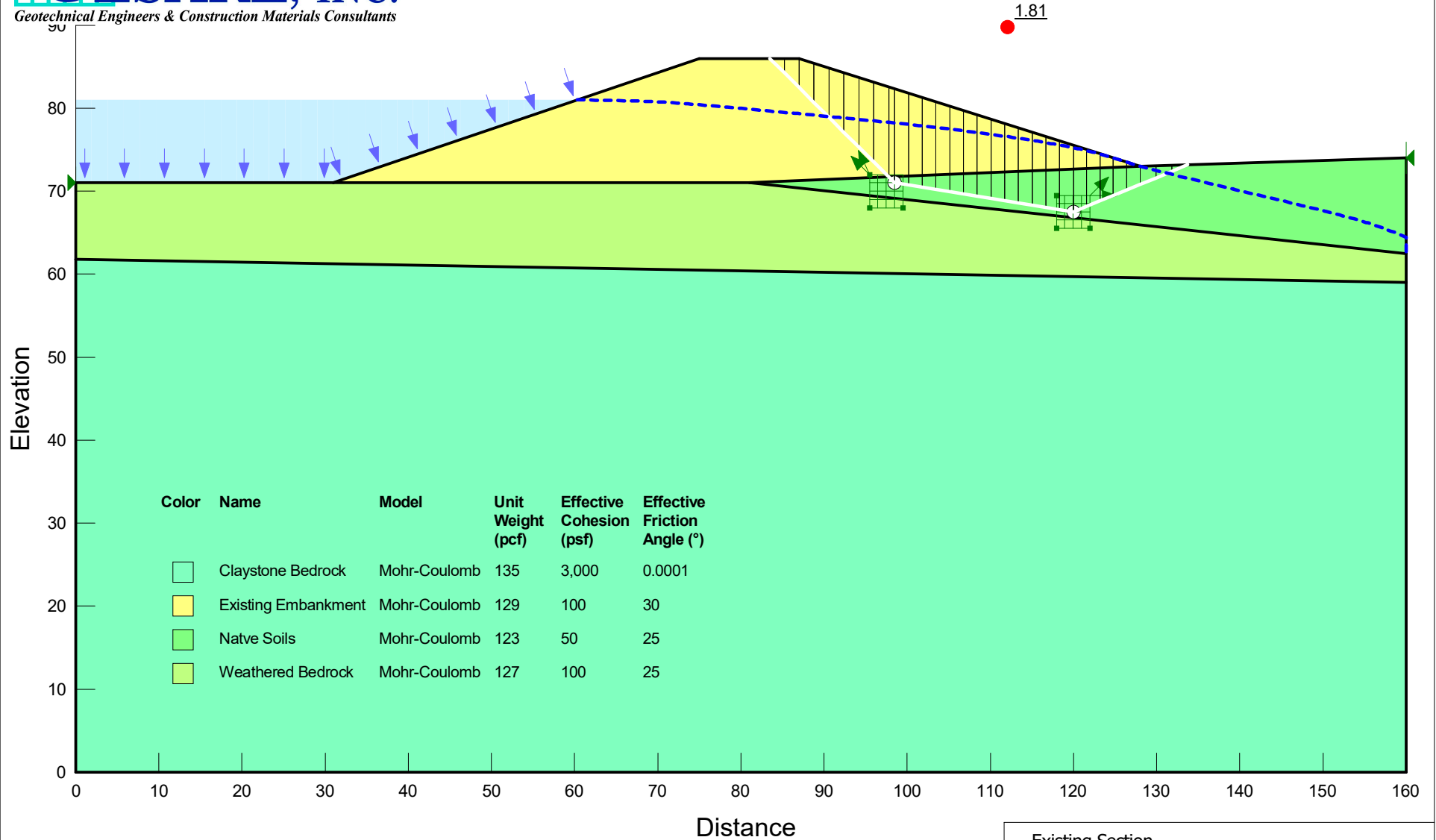


Existing Section
Full Reservoir Steady State Seepage
Downstream Circular Failure
Critical Failure Surface

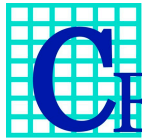


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

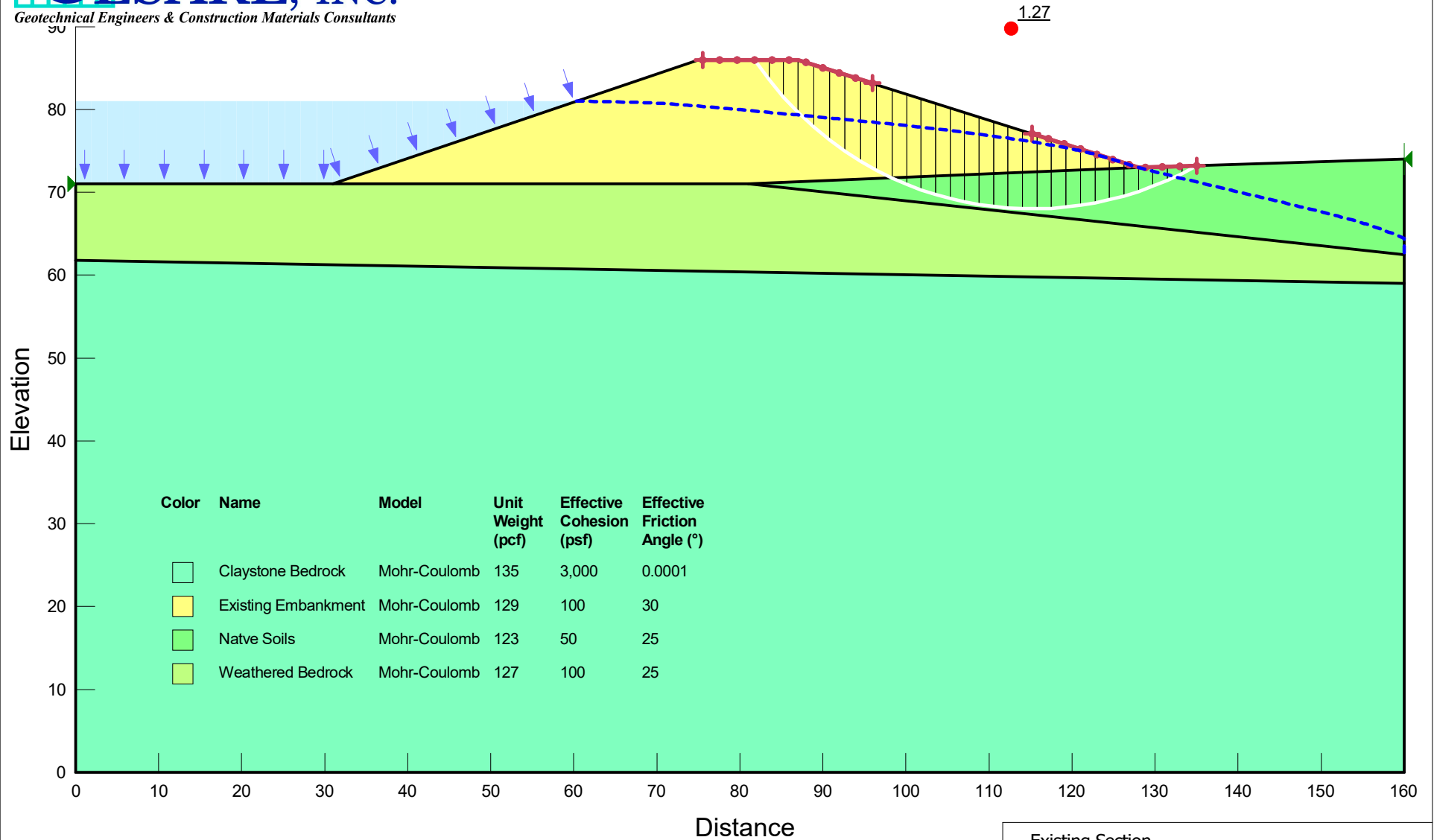


Existing Section
Full Reservoir Steady State Seepage
Downstream Block Failure
Critical Failure Surface

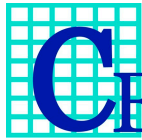


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

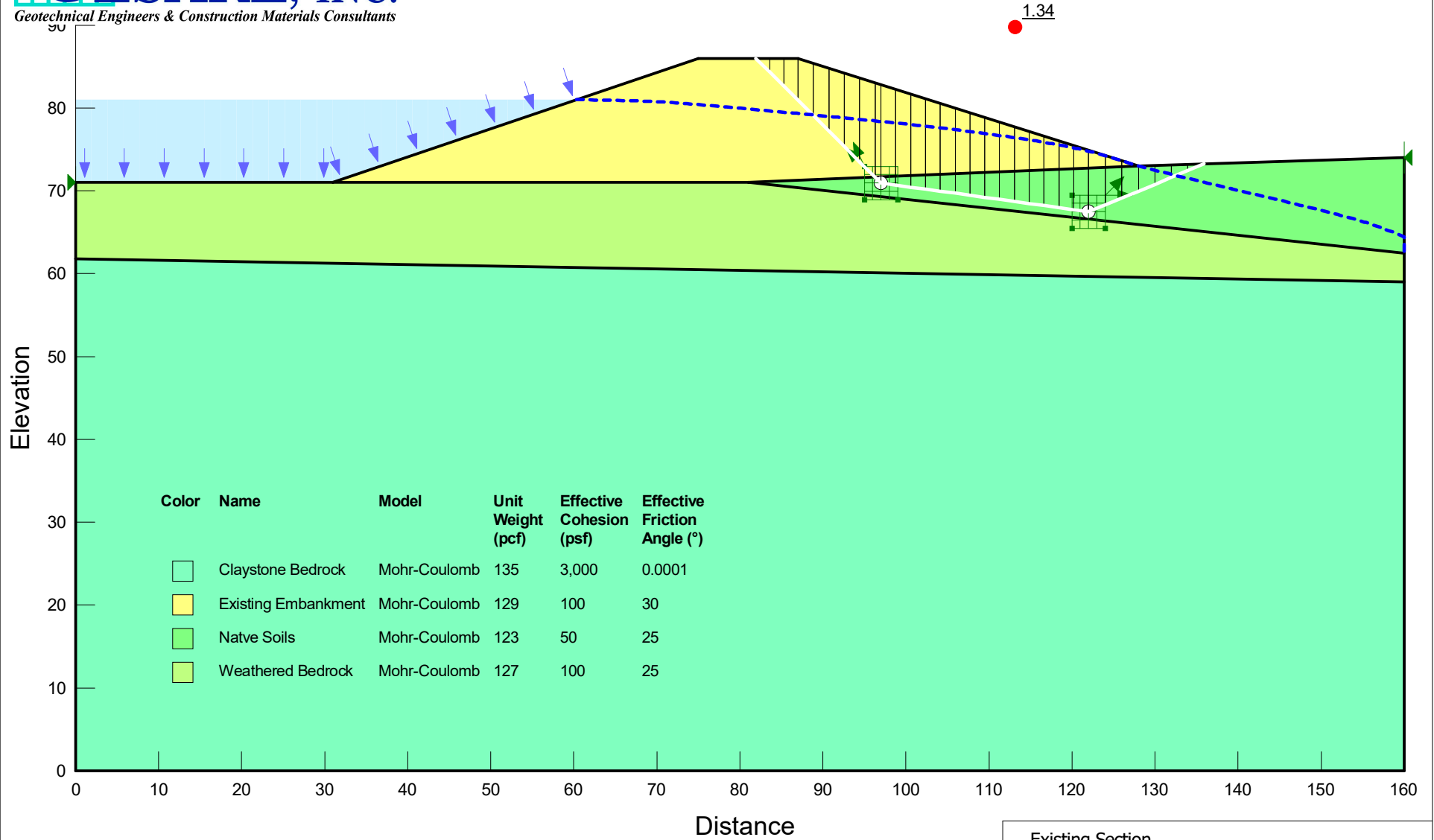


Existing Section
Full Reservoir Steady State Seepage
Downstream Circular Failure - Pseudo Seismic
Critical Failure Surface

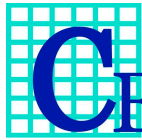


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

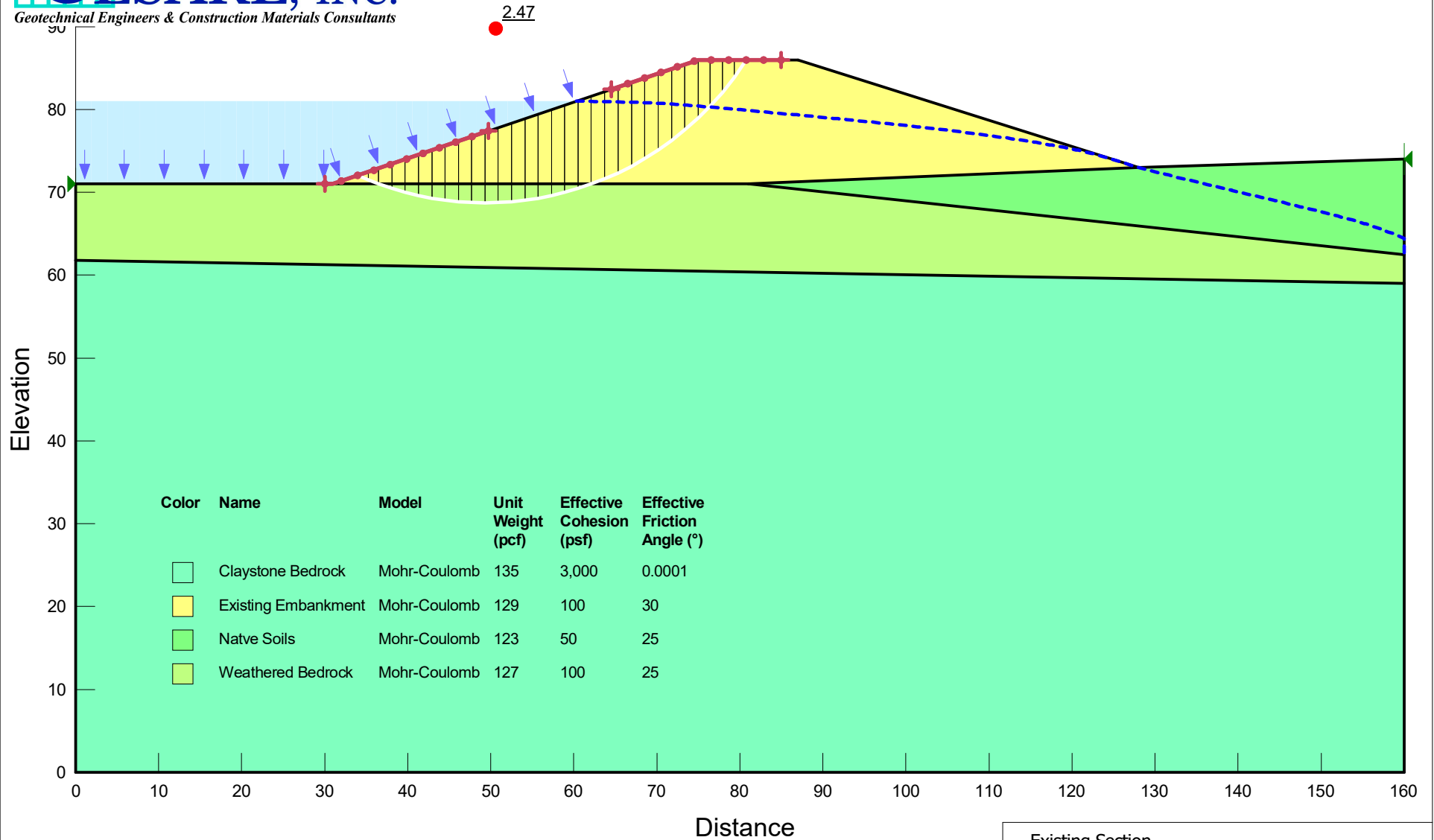


Existing Section
Full Reservoir Steady State Seepage
Downstream Block Failure - Pseudo Seismic
Critical Failure Surface

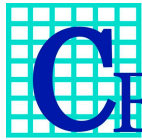


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

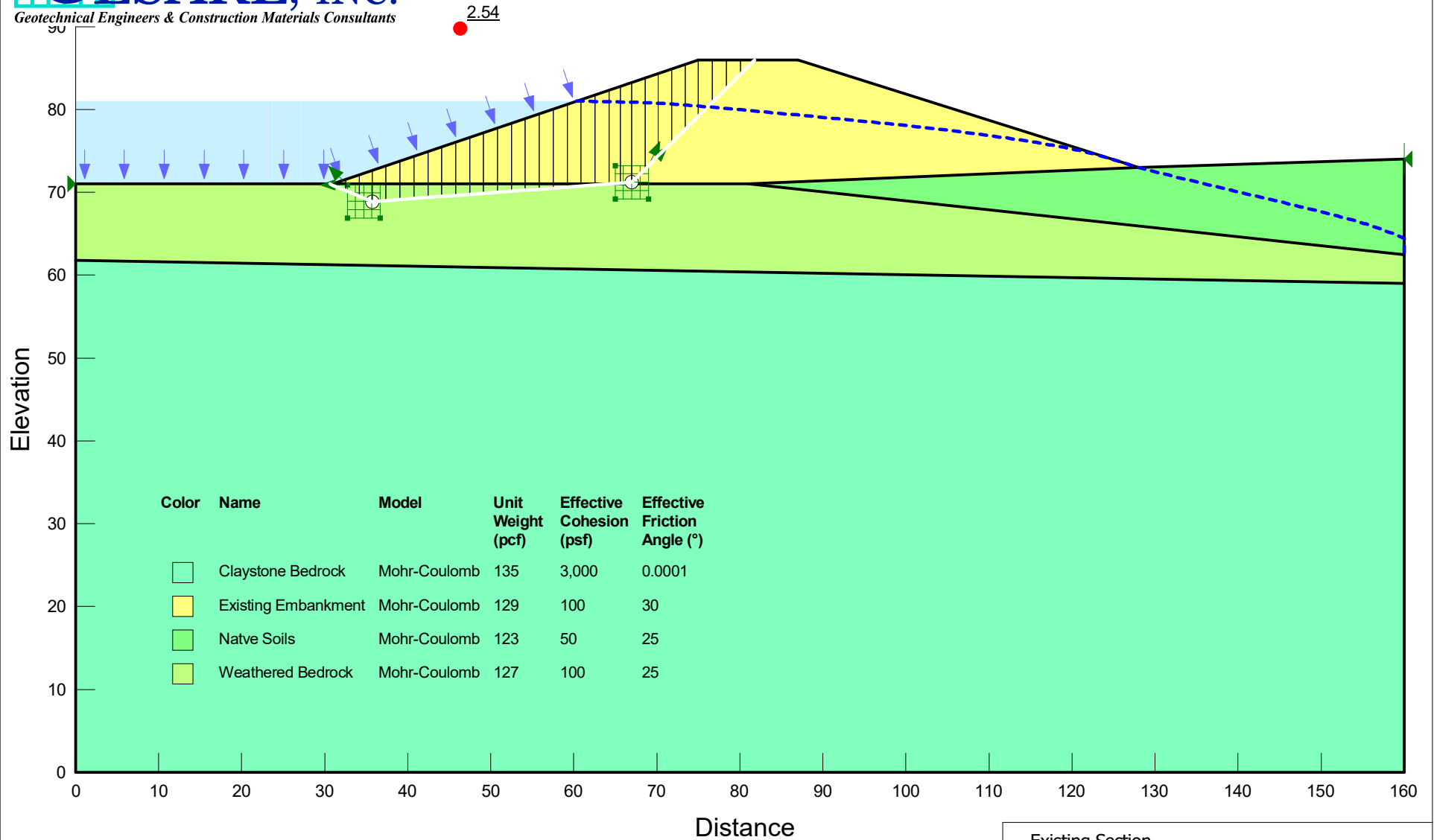


Existing Section
Full Reservoir Steady State Seepage
Upstream Circular Failure
Critical Failure Surface

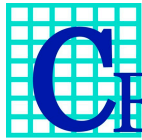


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

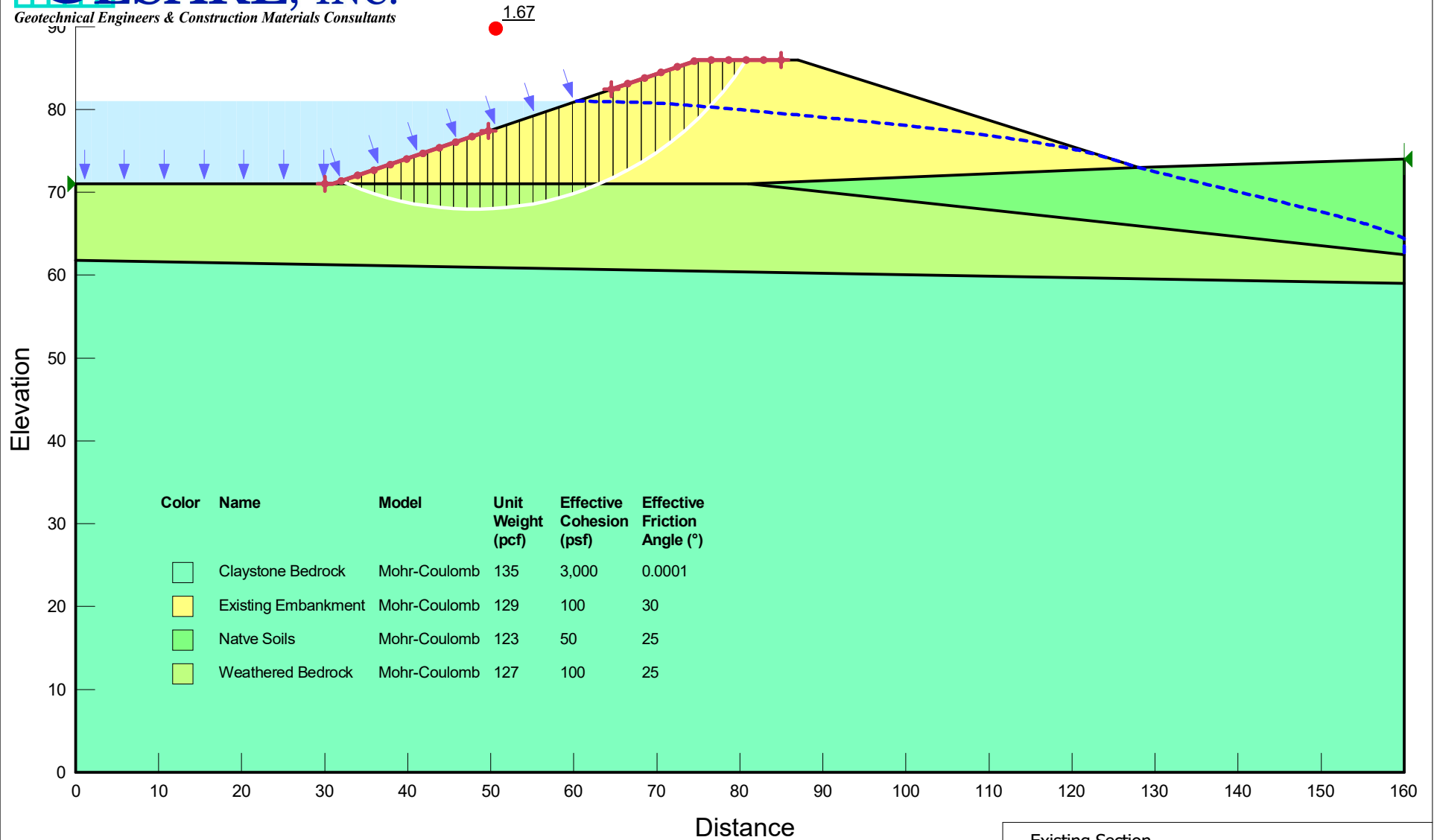


Existing Section
Full Reservoir Steady State Seepage
Upstream Block Failure
Critical Failure Surface

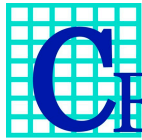


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

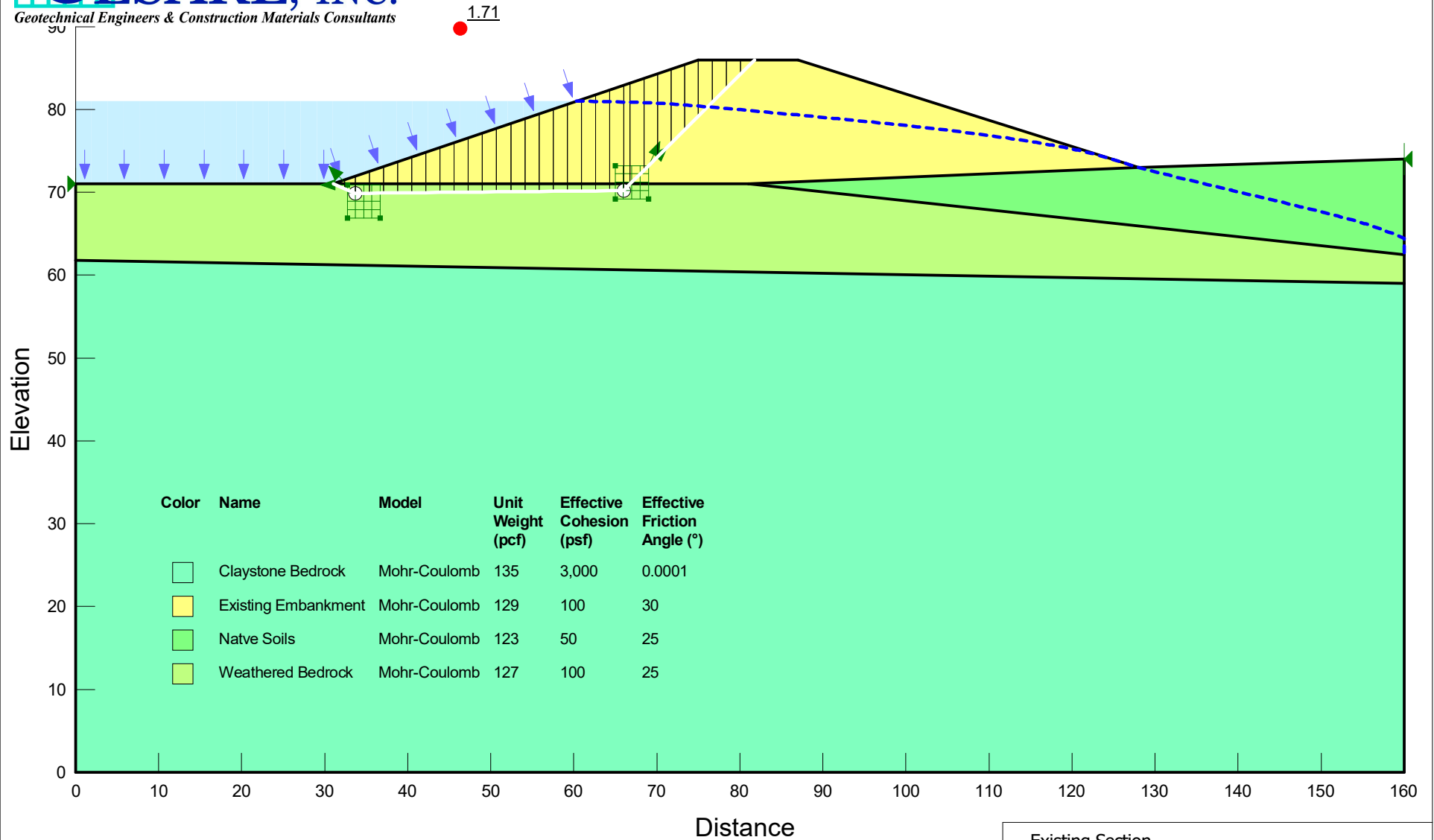


Existing Section
Steady State Seepage
Upstream Circular Failure - Pseudo Seismic
Critical Failure Surface

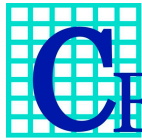


CESARE, INC.
Geotechnical Engineers & Construction Materials Consultants

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**

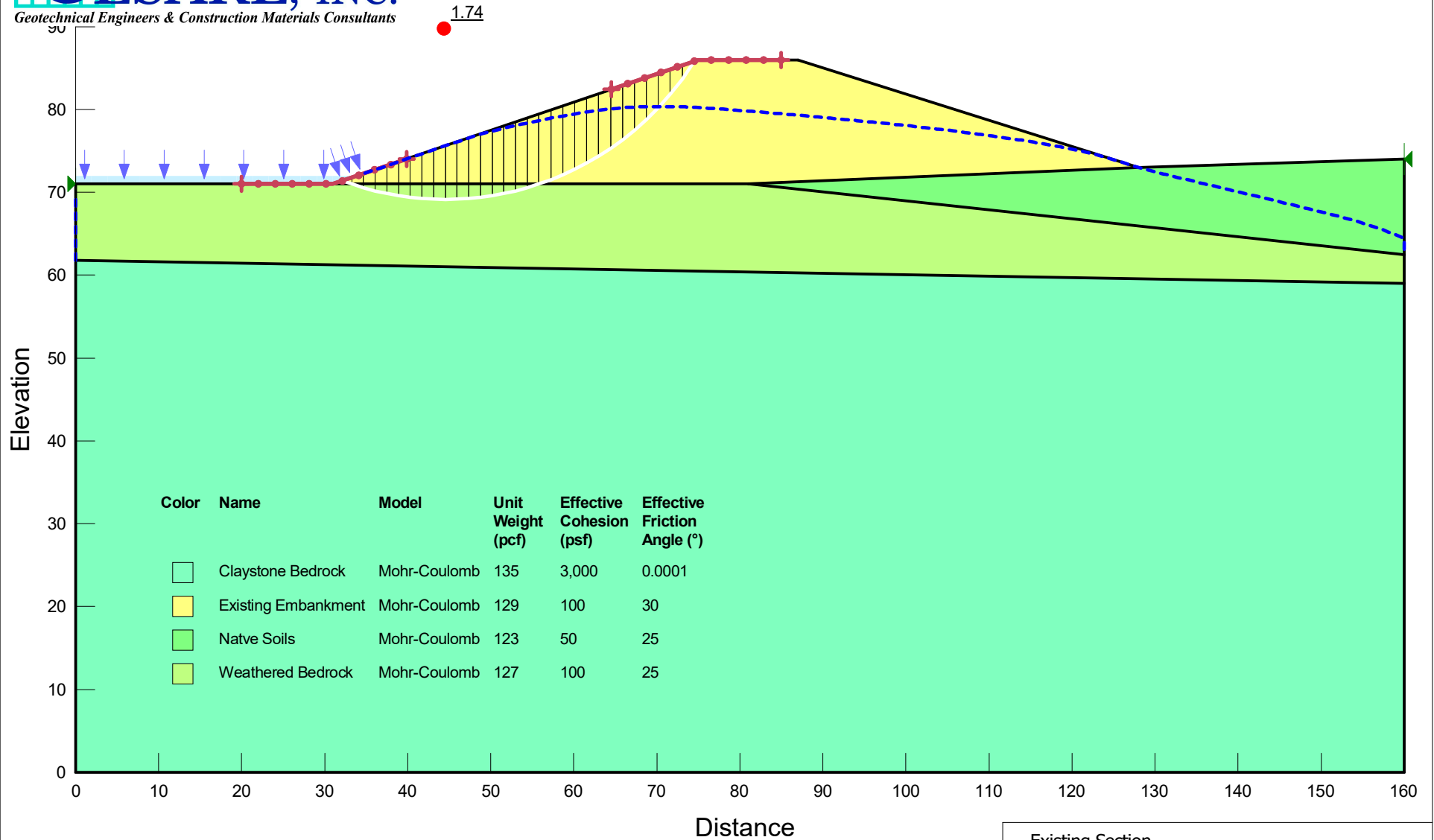


- Existing Section
- Steady State Seepage
- Upstream Block Failure - Pseudo Seismic
- Critical Failure Surface

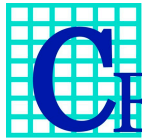


CESARE, INC.
Geotechnical Engineers & Construction Materials Consultants

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**

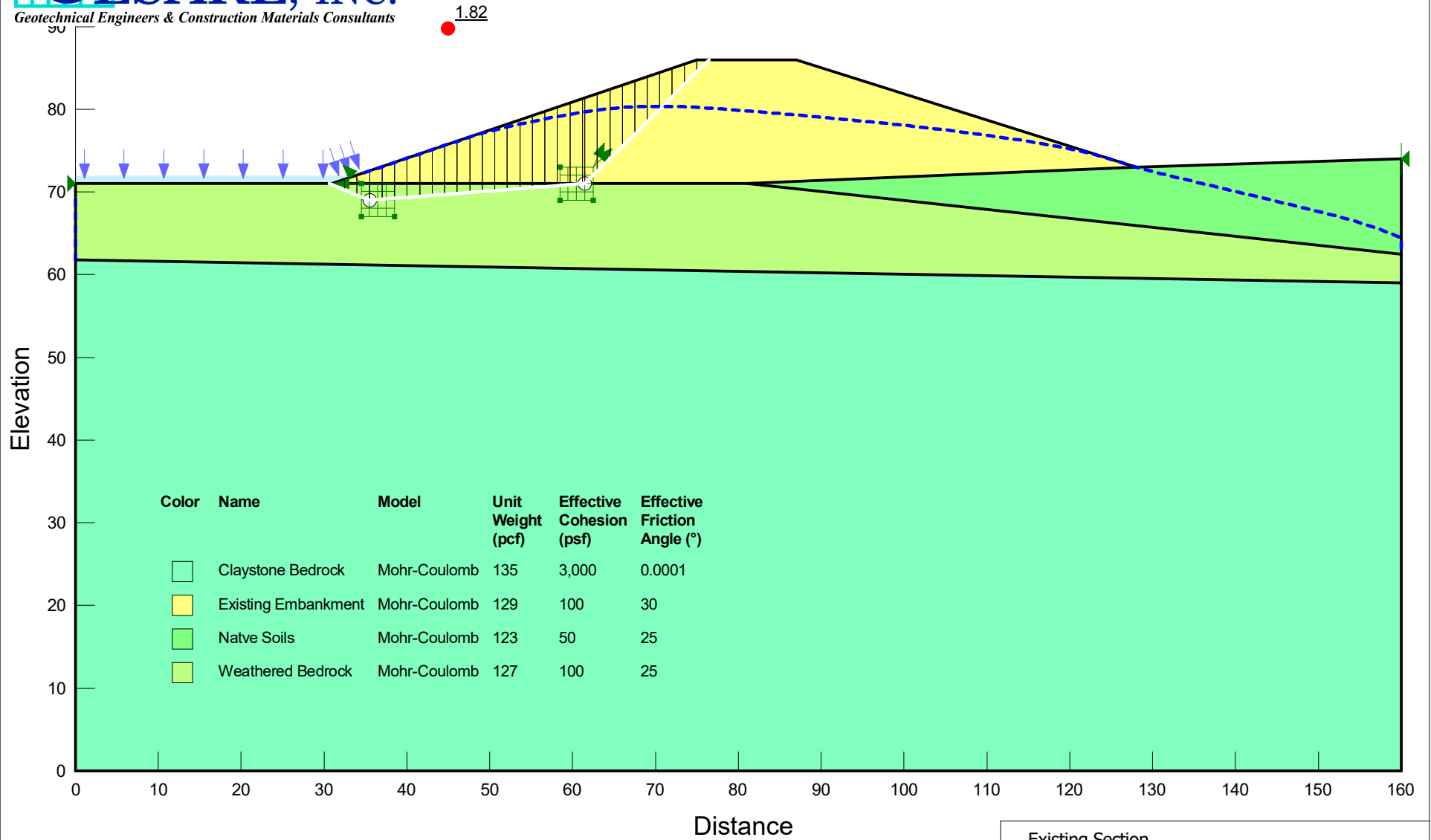


- Existing Section
- Rapid Drawdown Transient Seepage
- Upstream Circular Failure
- Lowest Critical Failure Surface of All Time Steps



Geotechnical Engineers & Construction Materials Consultants

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**

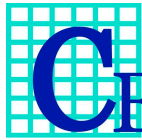


- Existing Section
- Rapid Drawdown Transient Seepage
- Upstream Block Failure
- Lowest Critical Failure Surface of All Time Step



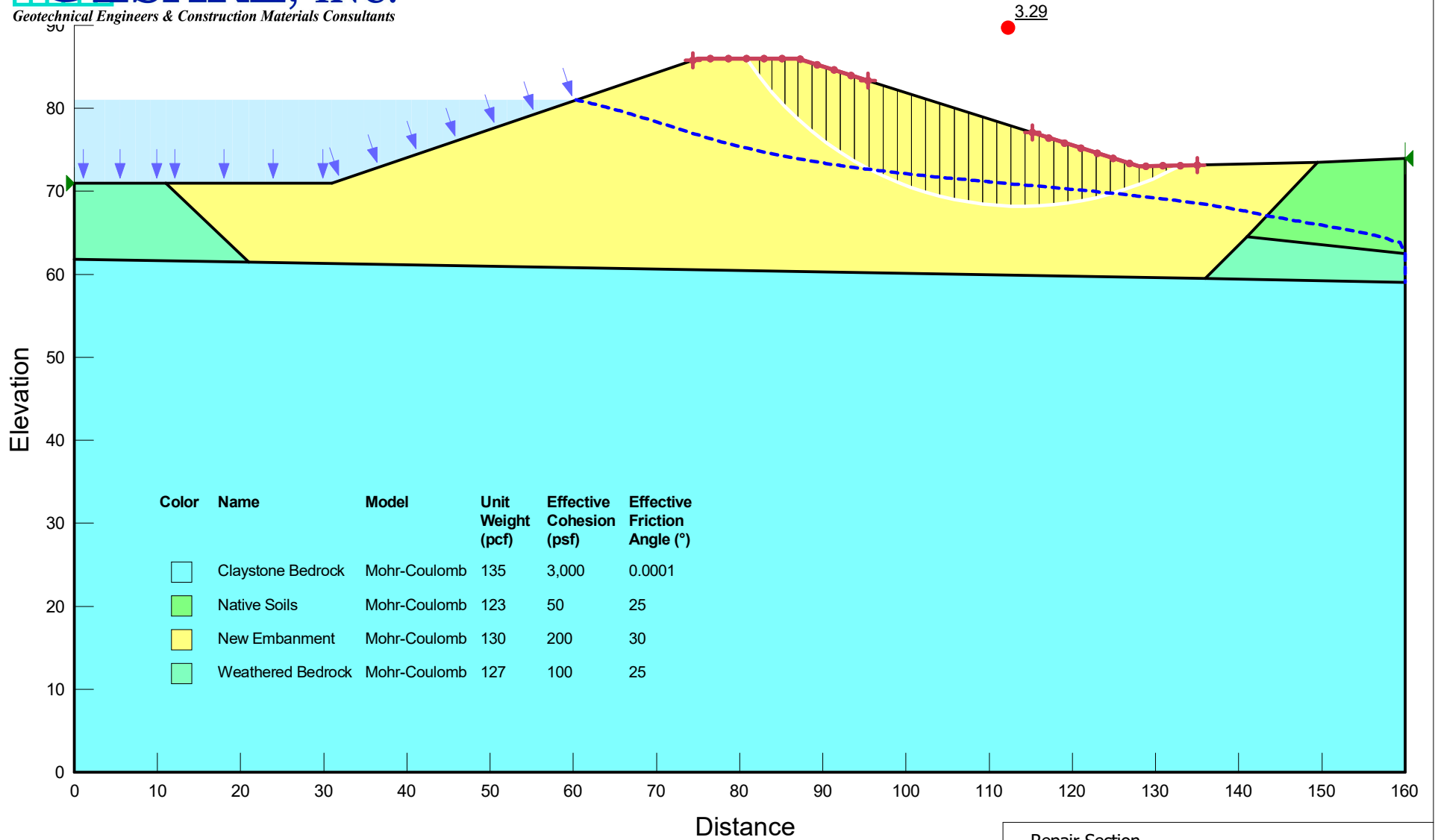
APPENDIX C

Slope Stability Results
Repaired

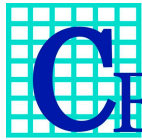


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

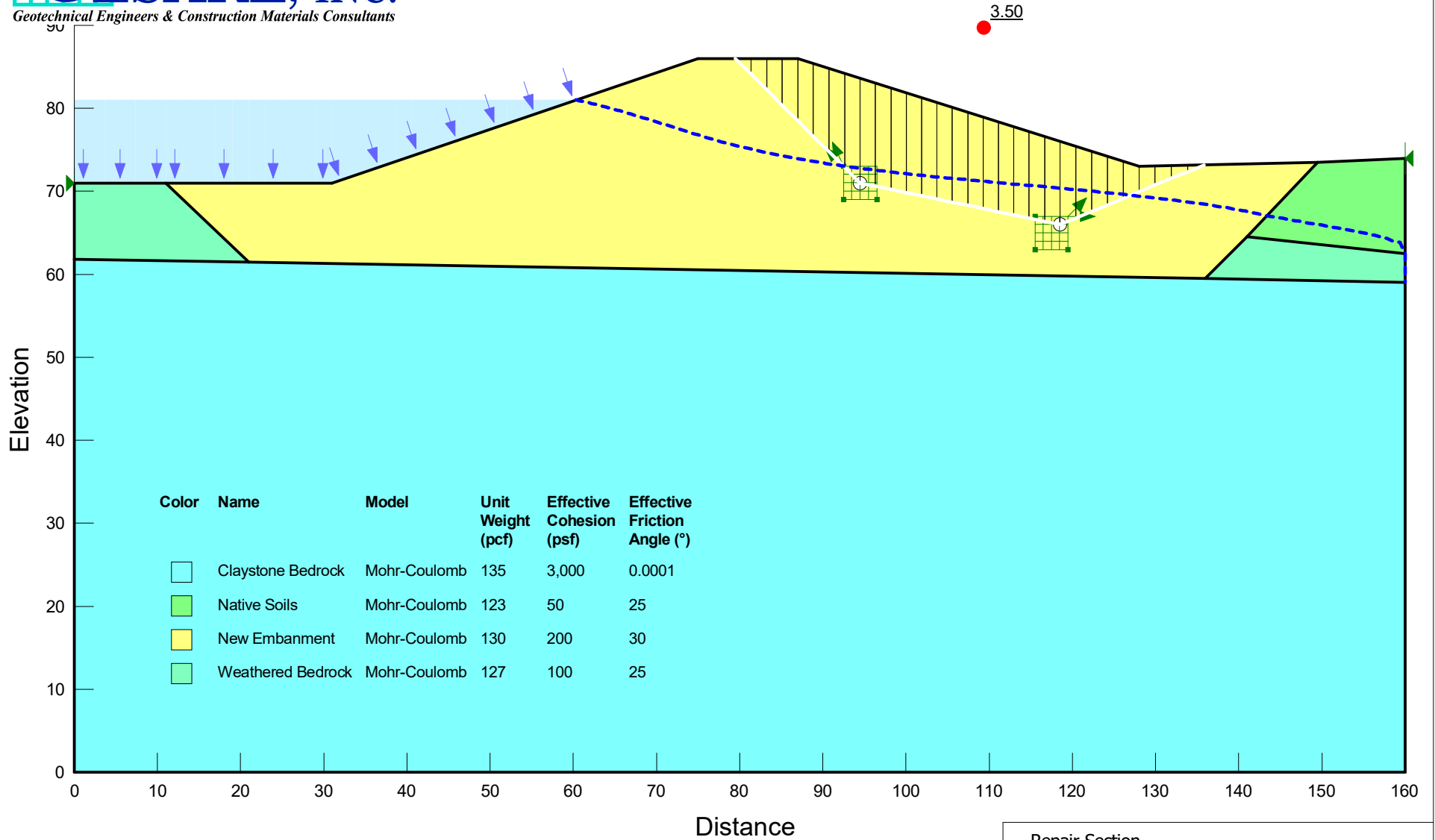


Repair Section
Full Steady State Seepage
Downstream Circular Failure
Critical Failure Surface

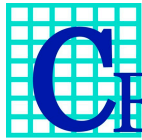


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

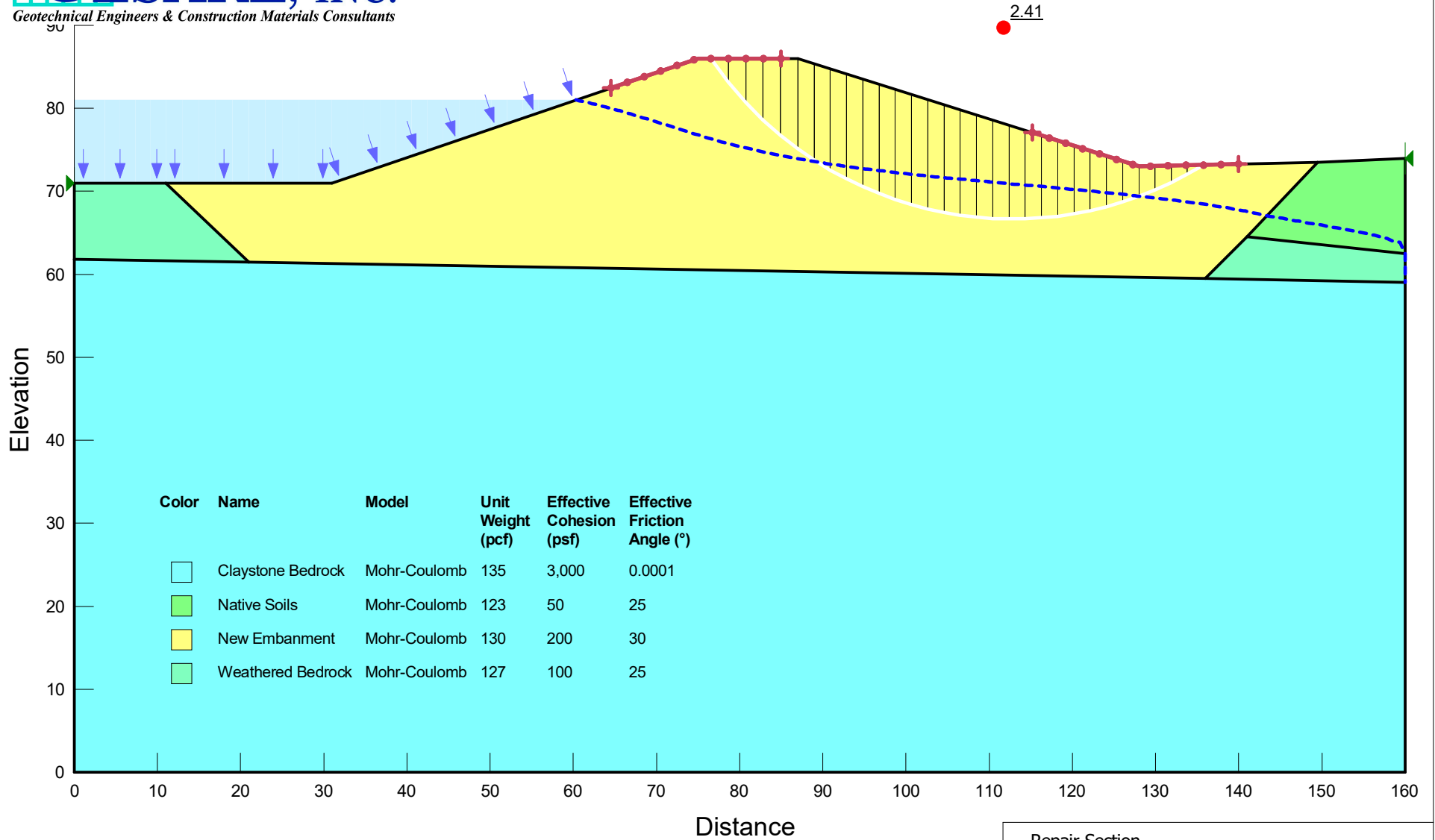


Repair Section
Full Steady State Seepage
Downstream Block Failure
Critical Failure Surface

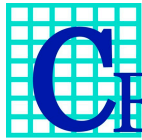


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

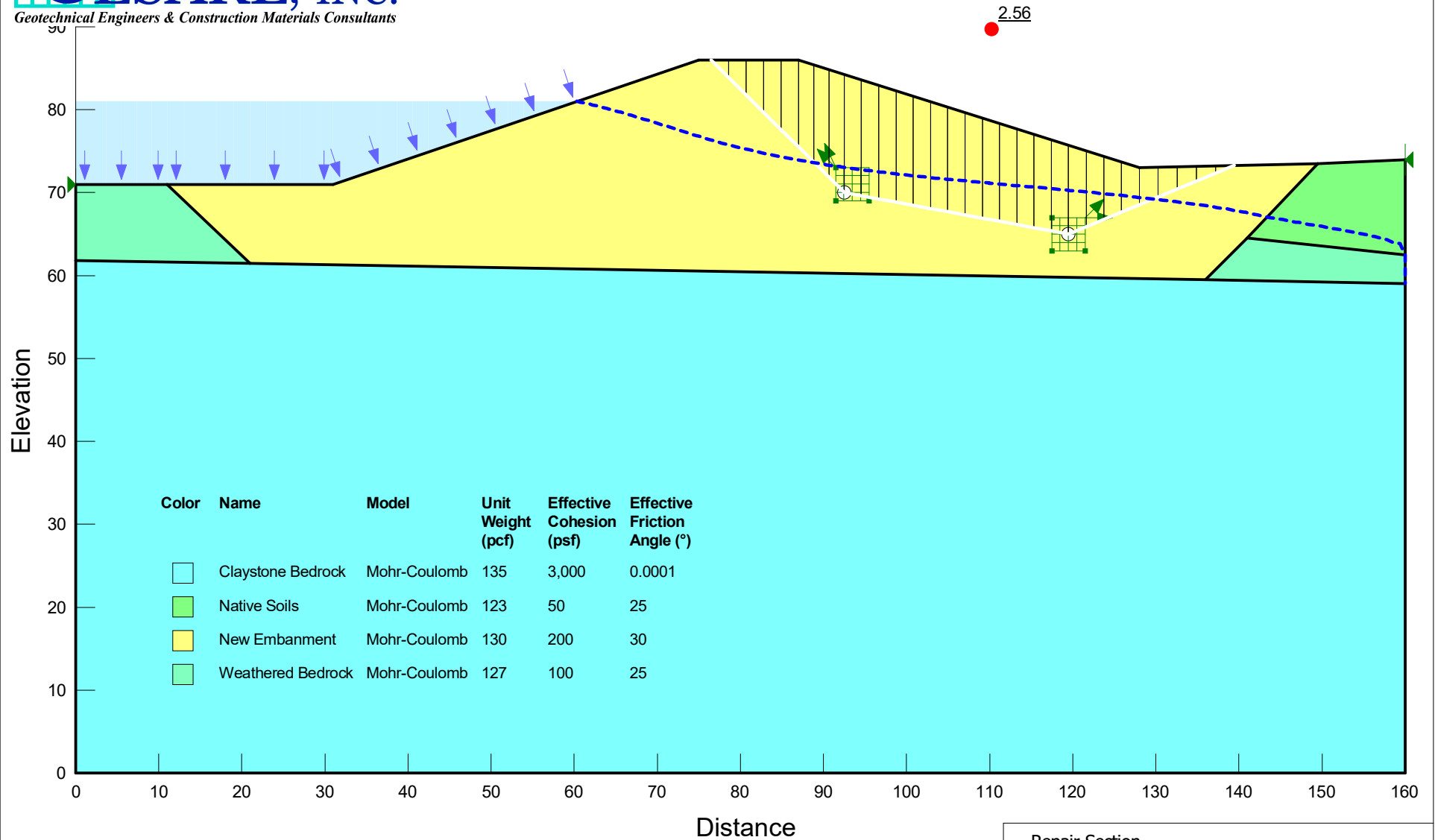


Repair Section
Full Steady State Seepage
Downstream Circular Failure Pseudo Seismic
Critical Failure Surface



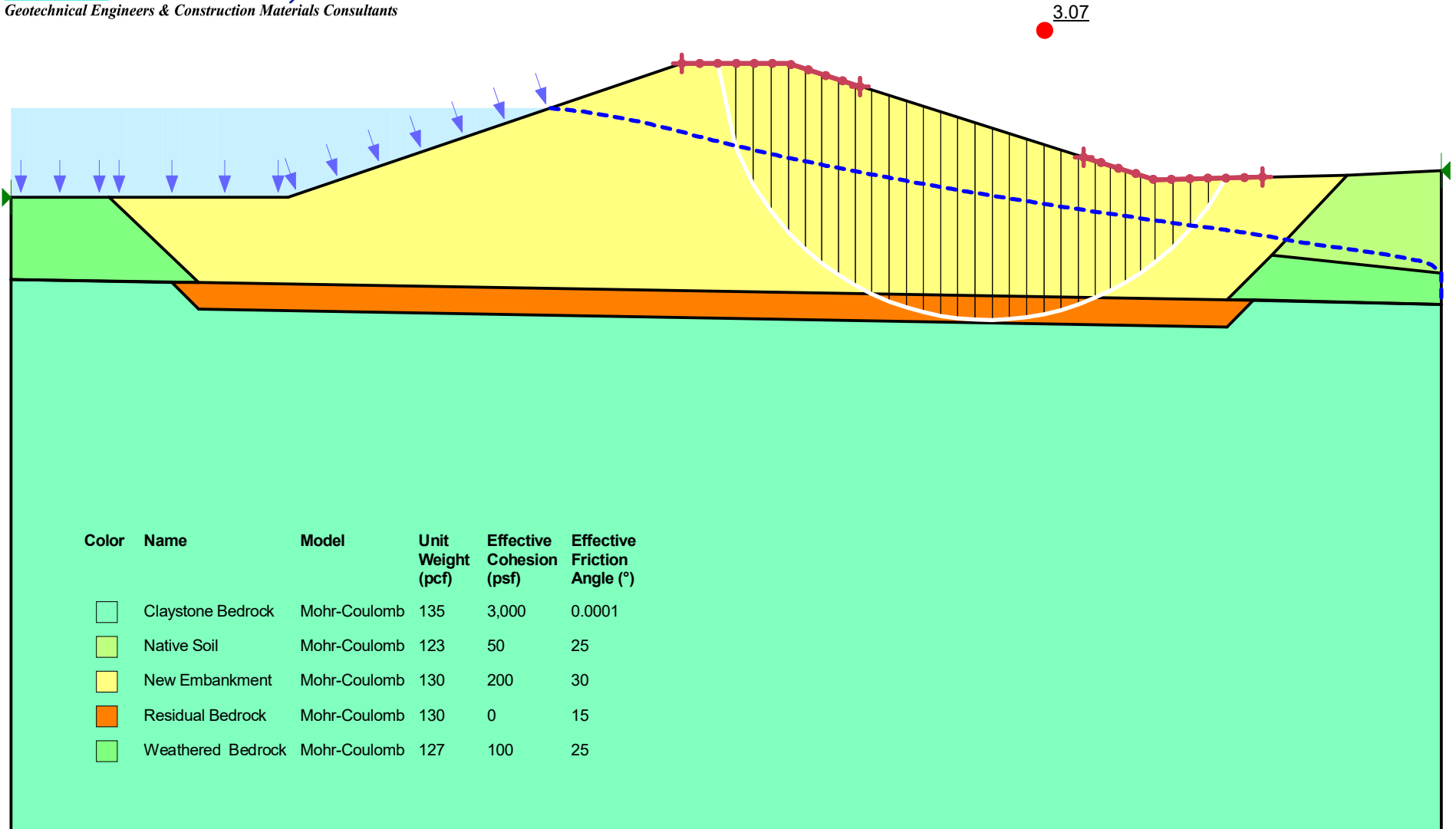
Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062



- Repair Section
- Full Steady State Seepage
- Downstream Block Failure Pseudo Seismic
- Critical Failure Surface

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Claystone Bedrock	Mohr-Coulomb	135	3,000	0.0001
	Native Soil	Mohr-Coulomb	123	50	25
	New Embankment	Mohr-Coulomb	130	200	30
	Residual Bedrock	Mohr-Coulomb	130	0	15
	Weathered Bedrock	Mohr-Coulomb	127	100	25

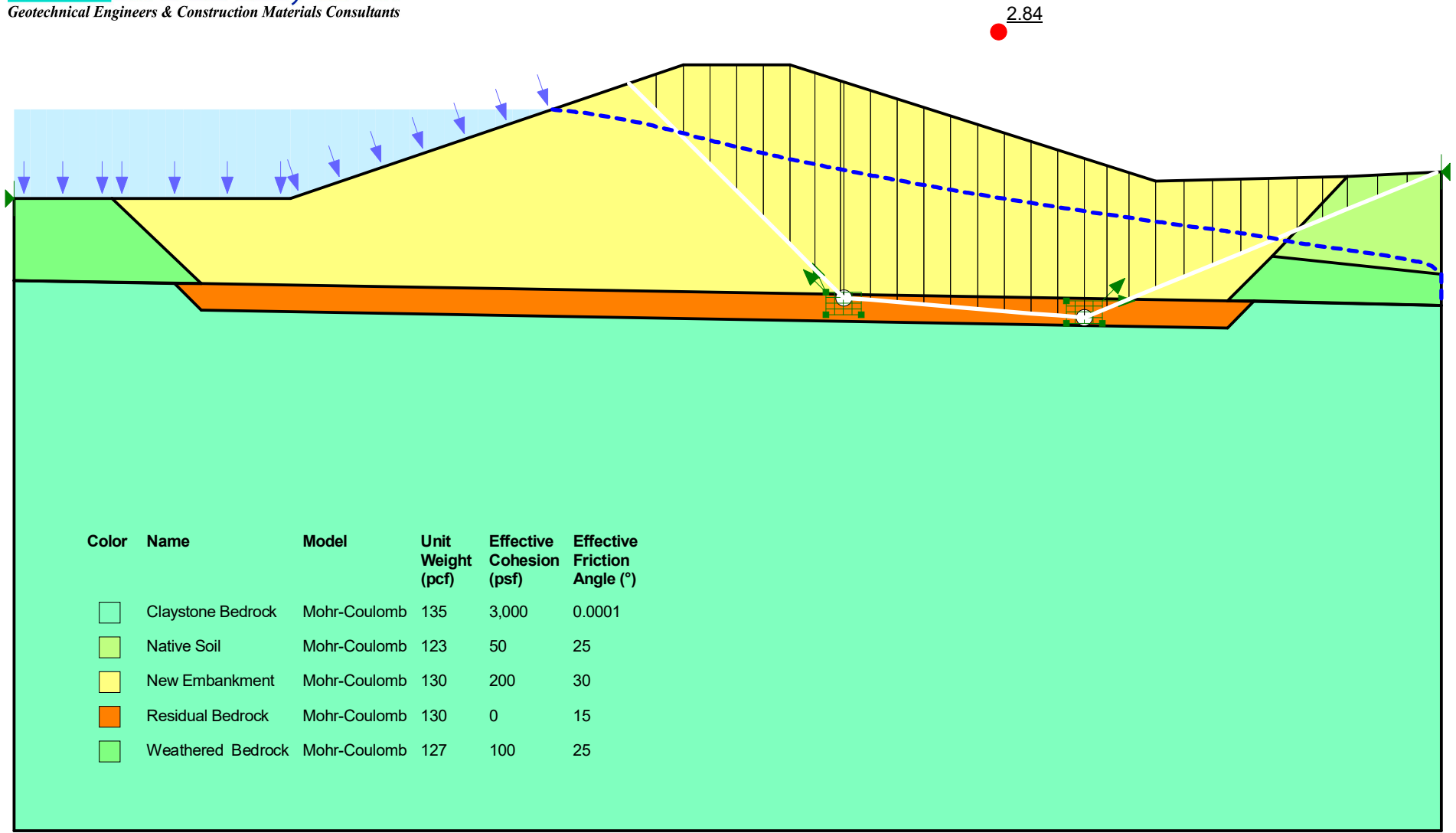
Repair Section

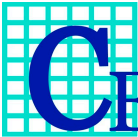
Full Steady State Seepage

Downstream Circular Failure - Residual Bedrock

Critical Failure Surface

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**

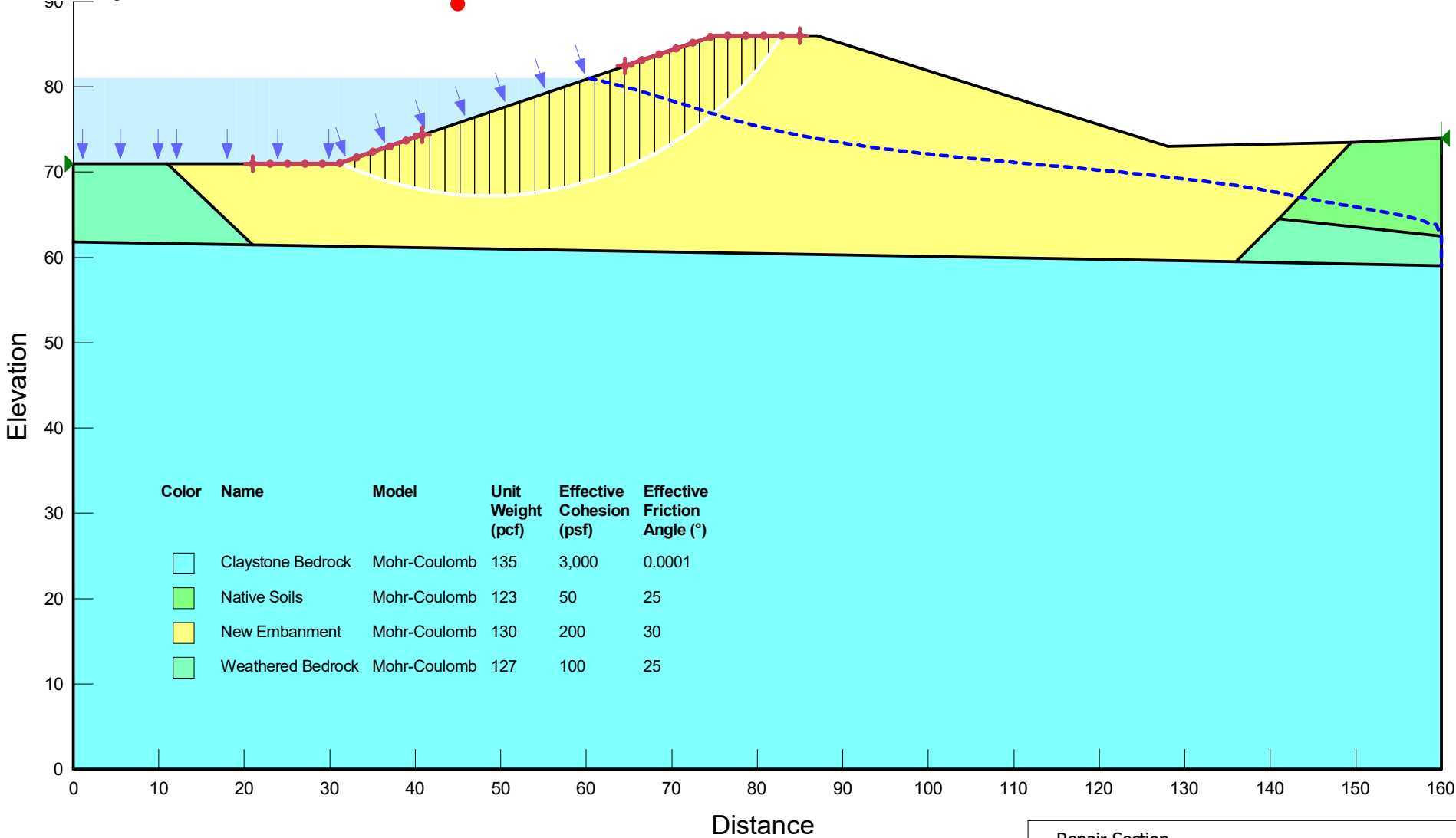




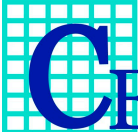
Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

3.78

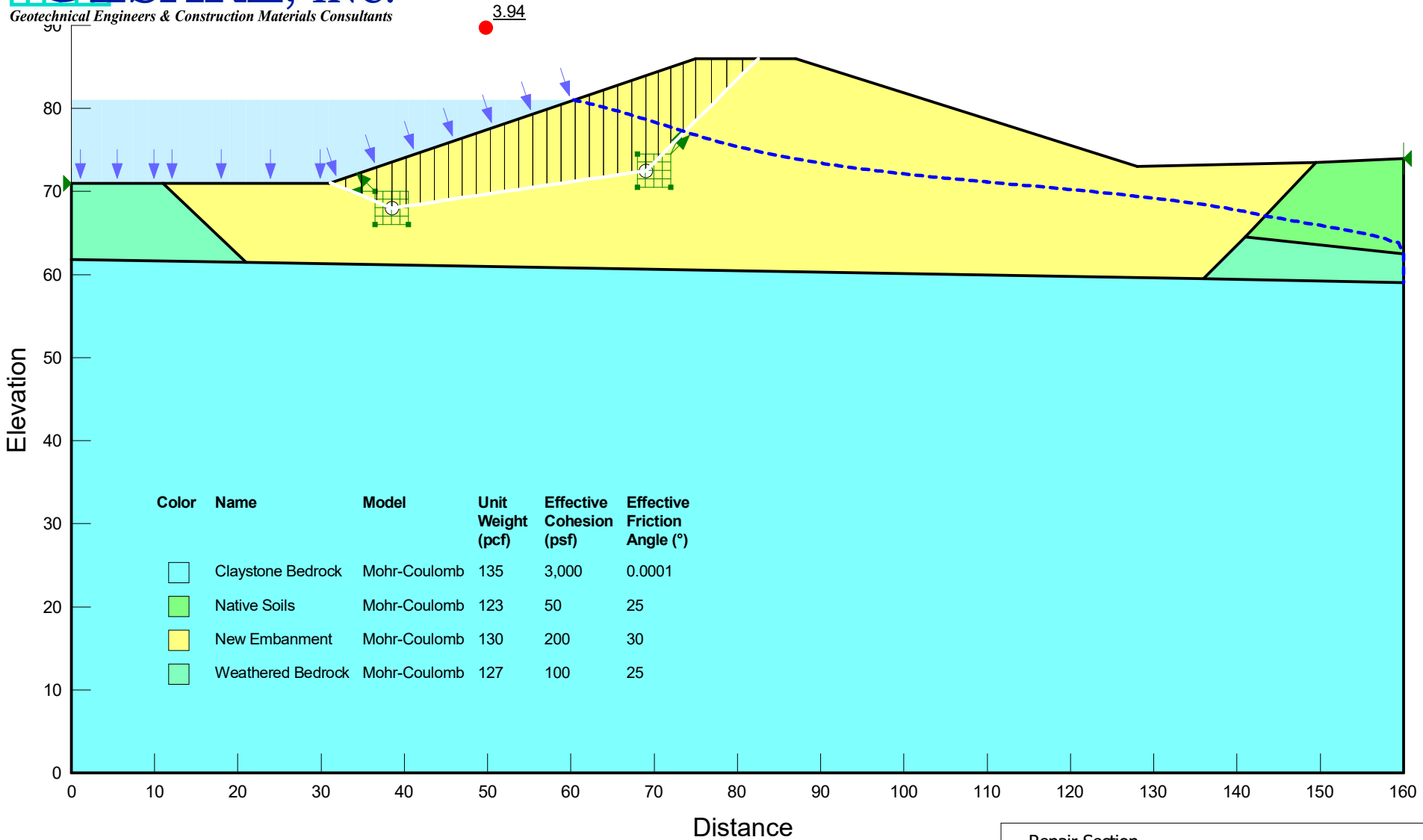


Repair Section
Full Steady State Seepage
Upstream Circular Failure
Critical Failure Surface

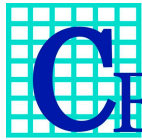


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

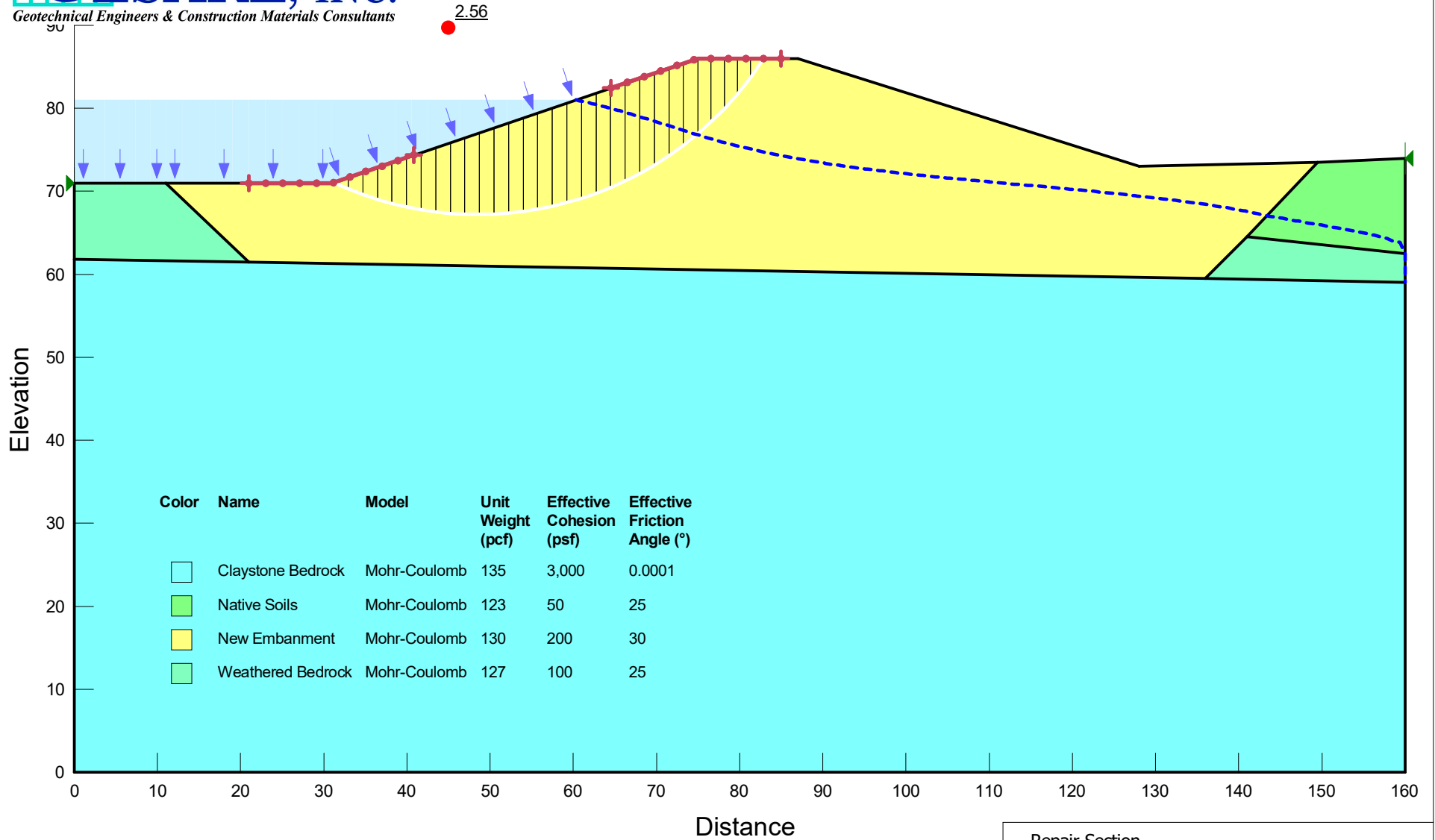


Repair Section
Full Steady State Seepage
Upstream Block Failure
Critical Failure Surface

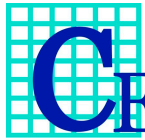


Geotechnical Engineers & Construction Materials Consultants

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**

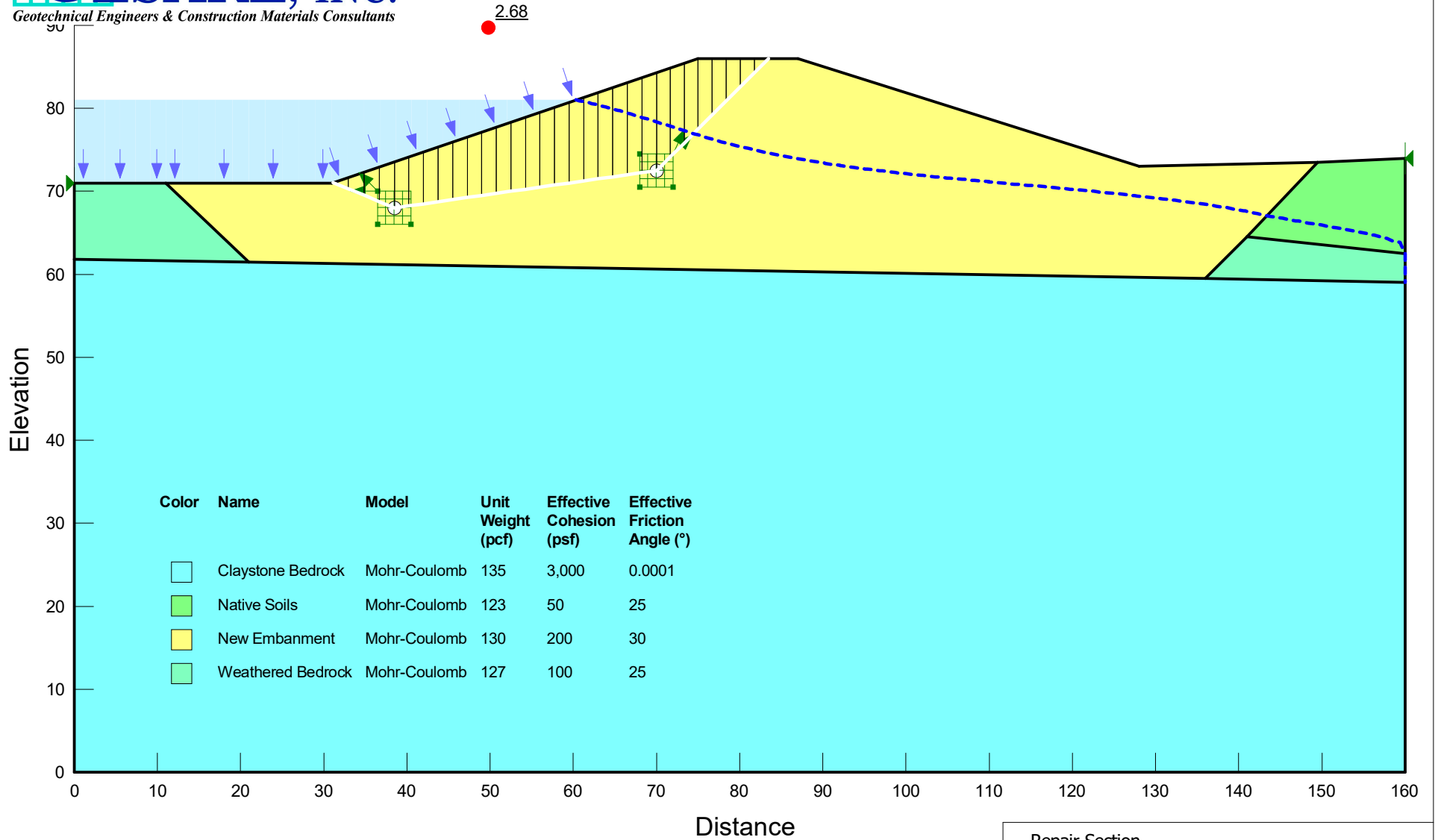


Repair Section
Full Steady State Seepage
Upstream Circular Failure - Pseudo Seismic
Critical Failure Surface

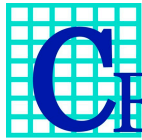


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

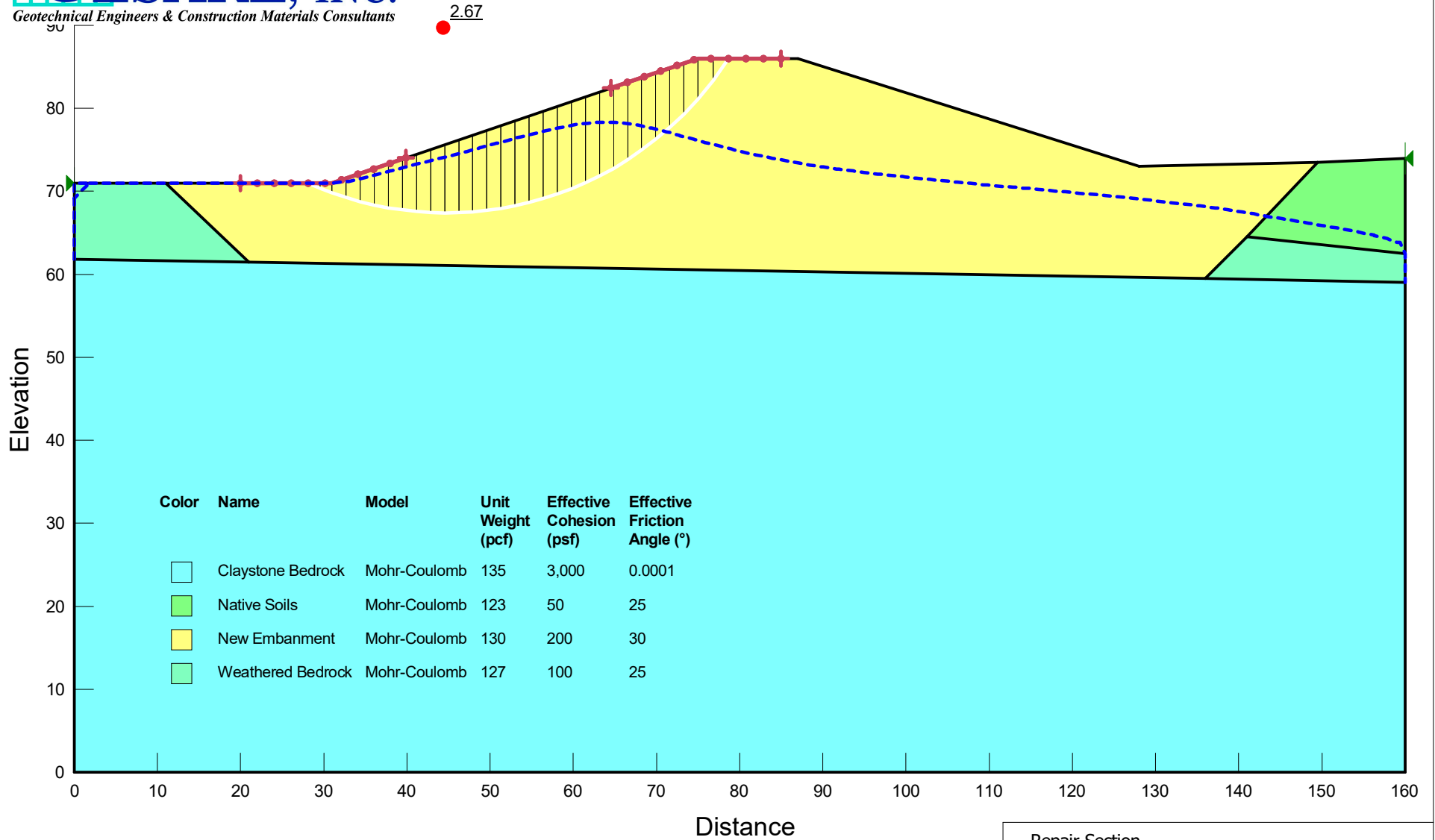


Repair Section
Full Steady State Seepage
Upstream Block Failure - Pseudo Seismic
Critical Failure Surface

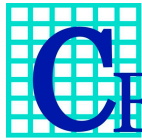


Geotechnical Engineers & Construction Materials Consultants

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**

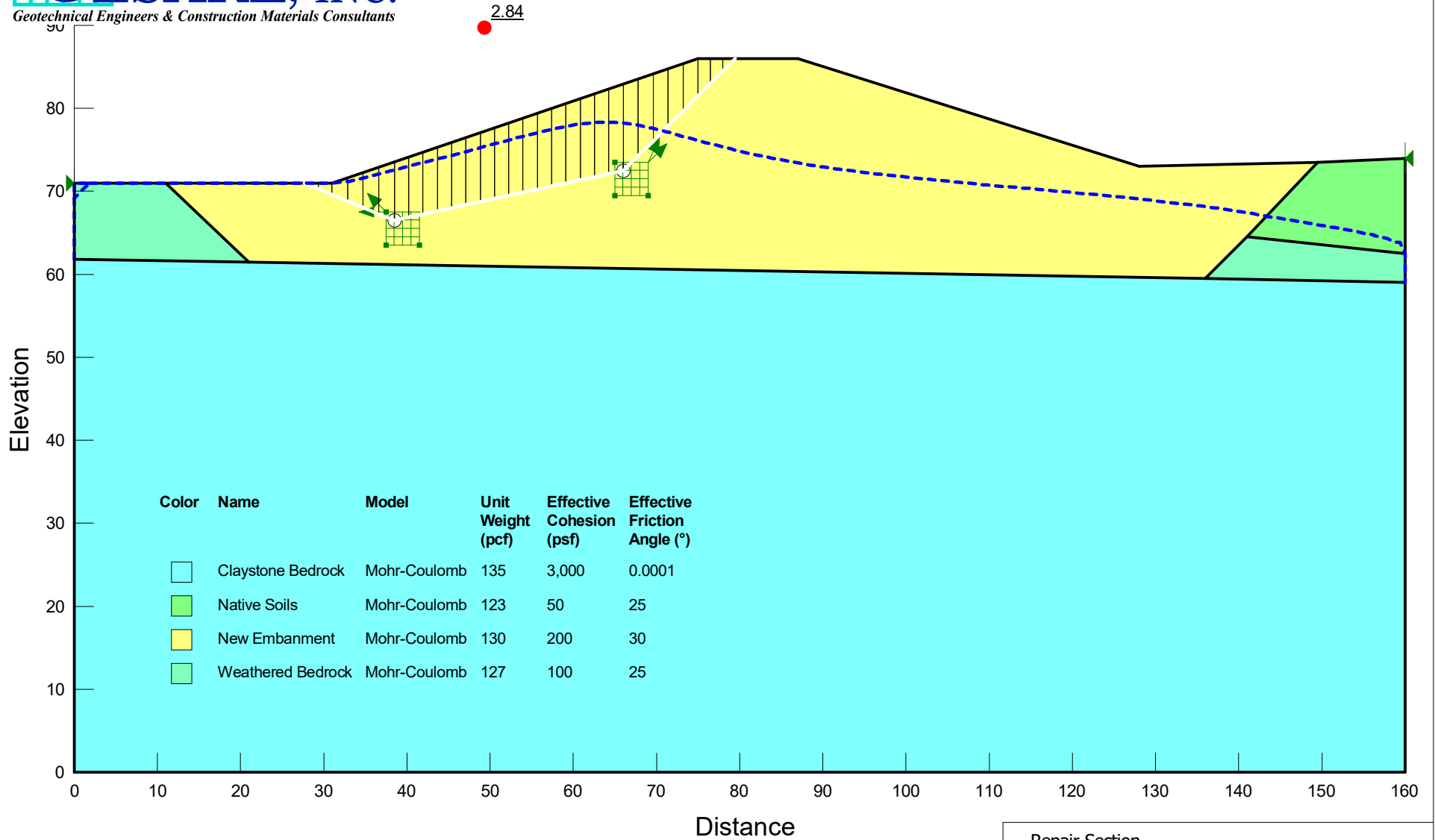


Repair Section
Rapid Drawdown Transient Seepage
Upstream Circular Failure
Lowest Critical Failure Surface of All Time Step



Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062



Repair Section
Rapid Drawdown Transient Seepage
Upstream Block Failure
Lowest Critical Failure Surface of All Time Step



May 6, 2021

J.C. York, P.E.
J&T Consulting, Inc.
305 Denver Avenue, Suite D
Fort Lupton, CO 80261

Subject: Johnstown Reservoir Outlet Structure
Outlet Structure and Access Ramp Foundations
Weld County, Colorado
Addendum No. 1
Project No. 20.3062

Dear Mr. York:

Mr. Todd Yee with J&T Consulting, Inc. (J&T) requested recommendations for a foundation design for a proposed outlet tower and access ramp for the subject project. Cesare, Inc. (Cesare) reviewed its original geotechnical engineering evaluation for the project to provide recommendation appropriate to the structures.

The outlet tower will be constructed of cast-in-place concrete located within the embankment near its upstream toe and will have a single discharge elevation within the reservoir. It will bear on straight shaft drill pier foundations embedded in competent bedrock. Cesare understands the top of piers will be at or near the contact of the competent bedrock.

A discharge pipe will extend from the outlet tower below the embankment to a water treatment plant intake pipe downstream of the embankment. The discharge pipe will be encased in concrete bearing on competent bedrock its entire length below the embankment. The existing embankment and its supporting soil will be excavated to competent bedrock contact for the discharge pipe structure.

The proposed access ramp configuration will be two parallel cast-in-place concrete cantilever retaining walls with a space of 11 feet between them. The walls will be cast in lifts and the space between will be backfilled with soil prior to the next lift being cast. The walls are planned to bear on spread footings stepping up from an elevation near the tower pier cap to the embankment crest. Since the embankment will be reconstructed from the competent bedrock contact, wall footings will bear on reconstructed embankment fill.

C FOUNDATIONS

OUTLET TOWER

The proposed structure can be supported by straight shaft drilled piers designed in accordance with the following recommendations:

- a) The tower floor should be designed as a pier cap.
- b) Piers shall have a minimum diameter of 12 inches.

- c) Piers shall have a minimum penetration of 26 feet into competent bedrock, which is considered as having blow counts of 50/12 or harder.
- d) The minimum pier shaft length is based on measuring from the bottom of the pier cap.
- e) Dead load plus full live load of the structure should be used for pier length sizing.
- f) Piers shall be designed so that dead loads are as high as reasonably practicable.
- g) Maximum allowable end bearing pressure of 25,000 pounds per square foot (psf).
- h) Allowable side shear of 2,500 psf for the portion of pier in competent bedrock.
- i) No side shear shall be used to resist downward axial load for any portion of the pier in natural soil or manmade fill.
- j) No side shear shall be used to resist upward forces within the top 3 feet of the pier shaft.
- k) Minimum dead load pressure is assumed to be zero.
- l) Piers should be reinforced their full length to resist tension forces.
- m) Piers should have a center-to-center spacing of at least 3 pier diameters when designing for vertical loading conditions or be designed as a group.
- n) Piers aligned in the direction of lateral forces should have center-to-center spacing of at least 6 pier diameters.
- o) Piers should have a maximum length to diameter ratio of about 30 for constructability and observation purposes.
- p) It is anticipated that casing will not be needed for most of the drilled shafts. Concrete should be placed as soon as possible after drilling to reduce the potential for caving soil and/or water accumulation. Drilled shafts shall not be allowed to remain open overnight.
- q) Concrete should not be placed by freefall through more than 3 inches of water, unless proper tremie techniques are utilized to place concrete from the bottom of the shaft displacing the water or the water is removed.
- r) Difficult drilling may be encountered in the hard bedrock. Rock teeth may be required for the bit. Pier penetration may not be decreased unless acceptable by the geotechnical engineer.
- s) Concrete for each pier should be formed at the top of the pier, if necessary, to achieve a uniform diameter at the top of the pier. Excess concrete or overpour resulting in enlargement of the pier shall be removed.
- t) Proper concrete mixture design for drilled shafts varies with the design stress intensity, anticipated concrete placement procedures, and spacing of the reinforcement. It is recommended that current design and construction procedures outlined by the American Concrete Institute (ACI) and the International Association of Drilled Contractors (ADSC) be followed. Per these guidelines, current practice is to use a concrete mixture design slump in the range of 5 to 7 inches if casing is to be utilized or the shaft is heavily reinforced. A design slump in the range of 7 to 9 inches with 3/4 inch maximum size aggregate is recommended if concrete is to be placed by tremie or pumping methods. Additional recommendations as outlined by ACI and ADCS should also be followed.
- u) A Cesare representative should observe pier drilling to confirm that actual subsurface conditions are consistent with those presented in this evaluation. If conditions deviate significantly, drilled pier recommendations may require modification.

C ACCESS RAMP WALL FOOTINGS

The proposed structure can be supported by continuous spread footings bearing on controlled, structural fill below frost depth in accordance with the following design recommendations:

- a) Weld County Building Code requires a design frost depth of 30 inches, as adopted at the time of this evaluation.
- b) Footings should be designed for a maximum allowable soil bearing pressure of 3,000 psf based on dead load plus full live load.
- c) Continuous footings should have a minimum width of 18 inches. Using the soil pressure recommended above, Cesare estimates the maximum settlement for the walls will be on the order of 1 inch, with differential settlement potentially on the order of 0.5 inches. Footings should be proportioned as much as practicable to reduce differential settlement.
- d) The previously presented estimated settlement will likely be differential to the outlet tower. The retaining walls should be structurally independent from the outlet tower.
- e) Steel reinforcement for continuous concrete foundation walls should be designed to span localized settlements over a 10 foot length.
- f) All soft or loose soil beneath footing areas should be densified in place, or removed and replaced with properly compacted structural fill, suitable flow fill, or concrete prior to placement of footing concrete.
- g) A Cesare representative should observe all footing excavations prior to concrete placement to evaluate if bearing conditions are consistent with those assumed to develop its recommendations.

C LATERAL EARTH PRESSURES

Lateral pressures on walls depend on the type of wall, hydrostatic pressure behind the wall, type of backfill material, and allowable wall movements. Cesare understands the location and configuration of the access ramp will necessitate design considering backfill with hydrostatic pressures. Where anticipated wall movements are greater than 0.5% of the wall height, lateral earth pressures can be estimated for an "active" condition. Where anticipated wall movement is less than approximately 0.5% of the wall height or wall movement is constrained, lateral earth pressures should be estimated for an "at rest" condition. Recommended lateral earth pressures for onsite material are provided in the following table.

The recommended values for lateral earth pressures provided in the following table are given in terms of equivalent unit weight. The equivalent unit weight multiplied by the depth below the top of the ground surface is the horizontal pressure against the wall at that depth. The resulting pressure distribution is a triangular shape. These soil pressures are for horizontal backfill with no surcharge loading and with hydrostatic pressure. If these criteria cannot be met, Cesare should be contacted for additional criteria.

Lateral Earth Pressures and Coefficients of Sliding Resistance for Onsite Material

Backfill Material Type	Location	Equivalent Unit Weight (pcf)			Coefficient of Sliding Resistance
		Active	At Rest	Passive	
Saturated sandy clay	Between access ramp walls	90	100	285	0.35

This addendum should be attached to the original report¹ and made a part thereof. Please contact Cesare with any questions or comments regarding this information.

Sincerely,
CESARE, INC.



Jonathan A. Crystal, P.E.
Project Engineer

JAC2/ksm

cc: Mr. Todd Yee, J&T Consulting, Inc., toddyee@j-tconsulting.com

¹ Geotechnical Evaluation, Johnstown Reservoir Outlet Structure, Weld County, Colorado, Project No. 20.3062, dated February 19, 2021.

FINAL DESIGN REPORT

FOR
JOHNSTOWN RESERVOIR
WELD COUNTY, COLORADO
WATER DISTRICT NO. 4
WATER DIVISION 1
DAM ID – 040132
CONSTRUCTION FILE NUMBER C-0625A

JULY 1, 2021

PREPARED FOR:



Johnstown
Colorado

450 S PARISH AVE.
JOHNSTOWN, CO 80534

PREPARED BY:



J&T Consulting, Inc.

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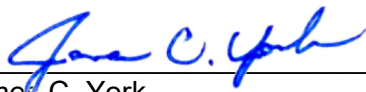
Certification Sheet

Johnstown Reservoir Repair

**Water Division 1, Water District 4
Weld County, Colorado
DAM ID – 040132
SEO File Number – C-0625A**

I, James C. York, a registered professional engineer in the State of Colorado, hereby certify that the Design Report for Johnstown Reservoir was prepared by me or under my direct supervision for the Town of Johnstown.





James C. York

Registered Professional Engineer
State of Colorado No. 36846

Approved on this ____ day of _____, 20__.

State Engineer

By: _____
Name:
Title:
PE #:

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1. INTRODUCTION

J&T Consulting, Inc. prepared this report to provide the design basis for the repair of the Johnstown Reservoir for the Town of Johnstown. Johnstown Reservoir has a high hazard classification as determined for the existing reservoir by the State Engineers Office.

2. PROJECT DESCRIPTION

The property is located on the west side of the Town of Johnstown, just north of state route highway 60. See Figure 1 for the vicinity map. The property is currently being used for recreation and water storage. There is a water treatment plant for the Town of Johnstown that uses water stored in this reservoir. The land adjacent to the reservoir is comprised of a residential neighborhood, a church, and a park. There is gravel walking path that currently surrounds the reservoir. Vegetation around the reservoir is sparse to heavy growth of native and landscaping grasses. The ground surface the reservoir is positioned on slopes towards the east. J&T Consulting has been tasked with designing and implementing a new outlet structure in accordance with current state rules and regulations.

2.1. Project Location and Ownership

The Johnstown Reservoir is owned and operated by the Town of Johnstown. The reservoir is located in Johnstown, Weld County, Colorado north of State Route Highway 60, between High Plains Blvd. and Carlson Blvd. The outlet will be constructed on the east side of the reservoir, the location of the outlet structures are shown in Figure 1. The use for the reservoir will be storage of raw water for the town's water treatment facility. The water currently entering the reservoir comes from the Home Supply Ditch just south of State Route Highway 60 and the water exits into a ditch just north-east of the reservoir.

2.2. Project Size, Type, and Hazard Classification

2.2.1. Size

Johnstown Reservoir has a 14.7 foot embankment height. The top of the embankment is at an elevation of 4,986 feet with the toe of the dam sitting at 4,971.3 feet. The reservoir covers an area of 35.78 acres. The dam is classified as 'small'

2.2.2. Type

The outlet structures will consist of an emergency spillway composed of gravel and a concrete outlet structure.

2.2.3. Hazard Classification

Hydrologic Hazard is separated into four categories as described by the State of Colorado's Department of Natural Resources in their document titled, "*Rules and Regulations for Dam Safety and Dam Construction*". The categories are as follows:

Extreme: Life loss potential of 1 or more.

High: Life loss potential of less than 1.

Significant: No life loss potential but significant damage is expected to occur.

Low: No life loss potential or significant damage is expected to occur.

The same document above that classifies Hydrologic Hazard also classifies overall dam hazard. These categories are as follows:

High hazard: A dam for which life loss is expected to result from failure of the dam.

Significant Hazard: A dam for which significant damage, but no life loss is expected to result from failure of the dam. Significant damage is defined as damage to structures where people generally live, work, or recreate, including public and private facilities. Significant damage is determined to be damage sufficient to render structures or facilities uninhabitable or inoperable.

Low Hazard: A dam for which neither life loss nor significant damage as defined for a Significant hazard dam are expected to result from failure of the dam.

No Public Hazard (NPH): A dam for which minimal damage, with no life loss, is expected to result from failure of the dam.

The Johnstown Reservoir is classified as an extreme hydraulic hazard dam and an extreme hazard dam due to structures that are located downstream of a potential breach. There is a significant risk of loss of life and damage to property. The design storm for a small dam of these hazard classifications is the PMP (Probable Maximum Precipitation).

2.3. Basin Description

Since the reservoir boundary is elevated above the surrounding land, one basin was used for the calculation of storm water runoff. Basin A incorporates the area within the high point of the gravel path directly surrounding the reservoir. A map of Basin A is included in Figure 2 below. There is no detention other than the reservoir.

The table below shows the area of Basin A along with the average flow released for the PMP (Probable Maximum Precipitation) and the PMP with the AMF (Atmospheric Moisture Factor).

Basin Flow Summary			
Basin	Area (acre)	Flow Q_{100} (cfs)	Flow Q_{107} (cfs)
A	64.43	10.77	11.52

2.4. Downstream Floodplain

The FEMA mapped floodplain is on Panel #08069C1405G. The panel is printed and shown in Appendix G; there are no special flood hazard areas for this area.

3. HYDROLOGY

According to regulations of the State Engineer's Office (SEO), the Inflow Design Flood (IDF) for a small, Extreme Hazard dam is equivalent to 100% of the Probable Maximum Precipitation (PMP) for the tributary basin. The regulations further specify the dam spillway must be able to "pass" or route the IDF through the reservoir with one foot of freeboard against the dam overtopping. This Hydrology Report demonstrates the proposed dam, spillway and reservoir configuration are capable of meeting the requirements of the SEO regulations.

The Probable Maximum Precipitation (PMP) rainfall data was determined by the Regional Extreme Precipitation Study (REPS) from the State of Colorado's Department of Natural Resources. The Surveyed, Basin A, boundary was imported into ArcGIS and the REPS toolbox was used to perform analysis. In accordance to the Guidelines for REPS, analysis of the basin was completed for 2-hr, 6-hr, and 24-hr local storms, along with a 72-hr general storm. A 72-hr Tropical Storm Synthetic Distribution was not used because the Reservoir is north of 38.5 degrees latitude.

The probable maximum precipitation event of the "72-hr General Storm Synthetic Distribution" was determined to control for the Johnstown Reservoir because it was the critical case that yielded the highest PMP value. The "local storm" depths for all durations are less than the general storm event. Areal reduction factors are not used since the basin is less than one square mile in area.

General Storm Probable Maximum Precipitation

Depth-Duration Values 100% PMP

Duration	15 min	1 hr	2 hrs	3 hrs	6 hrs	12 hrs	24 hrs	48 hrs	72 hrs
Depth (inches)	0.195	0.078	0.156	0.234	0.468	0.935	1.87	19.58	20.6

The table above displays the cumulative precipitation at defined time intervals over the duration of the 72 hour storm. This data was determined through analysis in REPS.

The PMP data for the Basin A was then converted into a flow for every 15 minute interval. This was done by taking the incremental PMP and multiplying it by the area of the basin and dividing the result by the time interval in seconds. This flow was then multiplied by 1.07 to account for the 7% atmospheric moisture factor (AMF) as per the 2020 Dam Safety Rule 7.2.4.

Since the basin has an approximate longest flow path of 0.4 miles, it was determined that there will be no approximate lag time. There are also two other possible sources of inflow other than the PMP, these include the flow from the Home Supply Ditch just south of State Route Highway 60 and the flow from the water treatment plant back into the reservoir. These flows were included in the calculations to simulate a worst case scenario. Once these inflows were determined, the total sum of the inflows was determined to be the maximum flow that would need to be routed through the reservoir.

The maximum inflow into the reservoir from the water treatment plant was provided by the Town of Johnstown as 500,000 gallons per day or 0.77 cfs. The maximum inflow from the Home Supply Ditch was calculated using Hydraflow with a water surface elevation of 5003.3 feet, which was determined to be the maximum water surface height of the ditch going into the system. The maximum inflow from the Home Supply Ditch was calculated to be 20.1 cfs.

For the PMP event, an infiltration rate of zero was used because the majority of the surface of Basin A is water and because no infiltration is conservative.

A stage-discharge table was developed for the overflow spillway and emergency spillway; they are both located below. The overflow spillways and emergency spillway are capable of discharging 15.3 cfs each for a total of 30.6 cfs and 30.0 cfs respectfully at stage 4985.0, this provides the required one foot of residual freeboard.

The volume of water from the PMP is 110.6 acre-feet with 192.8 acre-feet total with the addition of the base flow. Through routing of the event a maximum storage of 69.2 acre-feet is stored in the reservoir. The total precipitation during the 72-hour PMP storm is 20.6 inches. The contributing area, Basin A, to the dam is 64.43 acres.

The main outflow is routed through an outlet tower with a 24x24 inch sluice gate at an invert elevation of 4971 feet. The sluice gate is placed at this elevation in order to reduce the dead storage of the reservoir as much as possible. The main outflow has two 20 inch effective width weirs at elevations of 4983 feet, this elevation allowed for the maintaining of the 3 foot of normal freeboard required. The sizing of the weirs were done to maximize flow into the outlet pipe without overcoming the capacity of the pipe. Flow exiting the outlet tower is directed through pipes towards a ditch to the north-east of the reservoir.

There is also a 40 foot wide emergency spillway that has side slopes at 10:1 and an elevation of 4984.6 feet. Design of the emergency spillway ensured the base flow would not overtop the spillway. The main outlet tower is positioned on the east side of the reservoir, this water will be then directed north-east of the reservoir towards the Home Supply Ditch. The emergency spillway will remain where it currently is, on the south-east corner of the reservoir; flow through the emergency spillway will be directed into a field south-east of the reservoir and eventually back into the Home Supply Ditch that the inflow came from.

The hydrograph is located in Appendix A.

In accordance with State Engineers Office guidelines, the reservoir routing criterion is for the spillway to pass the IDF, in this case the PMF, with one foot of residual freeboard remaining at peak flood stage. The emergency overflow pipe and grating is sized to pass this. See the spreadsheet in Appendix A.

3.1. Outflow Structure

The proposed outflow structure will be composed of two 28 inch wide weirs at an elevation of 4,983 feet and a 24 inch diameter pipe at an invert elevation of 4967.97 feet. These 28 inch wide weirs are treated as 20 inch wide weirs since they have effective lengths of 20 inches when factoring in the 4, 2 inch trash rack bars covering the opening. The water will overtop the weir and enter a chamber attached to the outlet tower. Through routing it was determined that the pool elevation will reach a maximum height of 4985.0 feet. Throughout the range of elevations between, 4983.0 feet to 4985.0 feet, the weir will control the structure. Attached to the weir will be a trash rack with bar sizes of 2 inches and a spacing of 6 inches.

Four concrete caissons will be attached to the four corners directly beneath the walls of the main outflow structure. These caissons will extend 10 feet into bedrock in order to limit settlement. The outflow structure will also have a slab 1 foot thick that will extend past the walls of the structure by 6 inches on all sides.

Flow through the outflow structure will be routed through a 24 inch diameter ductile iron pipe. This pipe extends a distance of 90.76 feet with 0.5% slope. In order to limit settlement and stresses on the pipe, the pipe will be encased in concrete. This concrete will encompass the pipe throughout the length to the junction and will extend to bedrock to maintain a firm foundation.

Appendix E contains the stage discharge curve for the outlet pipe while Table 2 contains the discharge curve values. The discharge is calculated using the lesser of flow between the water that flows through the weir or the capacity of the pipe. Through analysis it was determined that in order to keep the hydraulic grade line below the top of the junction of the outlet structure, the junction should be extended upwards 4 feet. The hydraulic grade line in this case is shown in Appendix F.

3.2. Emergency Outlet Spillway

The proposed emergency spillway will be composed of a 40 foot bottom width weir at a starting elevation of 4985 feet that has side slopes of 10:1. The elevation discharge table for the emergency spillway weir is displayed in Appendix E below.

Routing of the reservoir was done using the HEC-HMS computer program of the U S Army Corps of Engineers Hydrologic Engineering Center. Using the stage-storage of the reservoir, combined with the predicted inflow as determined earlier, with the elevation discharge tables of the outflow of the emergency spillway and outflow structure, a maximum pool elevation as determined. This maximum pool elevation was determined to be 4985.0, this elevation leads to a total combined outflow of 30.6 cfs from the main outflow structure, and an outflow of 30.0 cfs from the emergency spillway.

3.3. Reservoir Stage-Area-Storage-Discharge Relationship

The stage-storage relationship for the Johnstown Reservoir is shown in Table 1. The discharge rate available from the gravity outlet pipe is shown in Table 2.

3.4. Dam Freeboard

The State required minimum normal freeboard during a PMP event is the greater of 3 feet or the wave setup and runoff from a 100 mph wind. The minimum residual freeboard during a PMP event is the greater of 1 foot or the wave setup and runoff from a 10% AEP probability wind. The defining freeboard for the normal and residual situations were 3 feet and 1 foot respectively, both of these values were maintained throughout the analysis.

4. PROJECT GEOLOGY

4.1. Regional Geology

The site is located approximately 20 miles to the East of the Rocky Mountains, in a broad area occupied by the South Platte River. The property is situated on the northern part of the Dakota-Cheyenne aquifer near the border between the Dakota-Cheyenne aquifer and the Denver aquifer.

According to Cesare, "It is located in the Great Plains Physiographic province on the Colorado Piedmont section. It is characterized by dissected bluffs, gently sloping pediments, benched alluvial terraces with valleys, and low lying interfluvial hills. Bedrock in the area is comprised of sedimentary rocks from the fluvial and lacustrine systems during the mountain building event during the

Paleogene and from the continental seaway during the Cretaceous.”

4.2. Site Geology

Cesare describes the soil on as “eolian sediment, windblown deposits comprised of loess, clay, and silt mixtures. These sediments are Quaternary Middle Holocene and Upper Pleistocene in age, and are generally 3 to 15 feet thick.”

5. GEOTECHNICAL INVESTIGATION & LABORATORY ANALYSES

Cesare, Inc. performed field investigations in December 2020. The data is included with this report. Bore holes were located in the location of the toe, dam crest, and interior of the proposed reservoir location. Three bore holes were drilled to an approximate depth of 40 feet along the dam centerline. One boring was drilled to a depth of 25 feet at the downstream toe of the dam embankment.

5.1. Geotechnical Investigation

A total of four boreholes were dug to depths of 26 to 40 feet. The material consisted of clay, clayey sand, and claystone. Bedrock was encountered at 14 to 23 feet deep and extended to the full depth of the bore holes. Bedrock was consistently a hard claystone.

5.2. Ground Water

Groundwater was encountered during drilling at 8 to 18 feet deep. One day after drilling, the water level was measured 5 to 16 feet deep. The geotechnical analysis is included in Appendix H.

5.3. Laboratory Data

The subsurface data was analyzed by Cesare, Inc. for potential seepage loss and slope stability parameters. The borings were located in the field by a surveyor prior to drilling. Samples were taken at set intervals to be able to classify the material in all bore holes.

6. GEOTECHNICAL ANALYSIS & DESIGN

6.1.1. Wave Run-up

Wave Run-up for the reservoir was determined based on multiple factors, including, fetch distance and wind velocity over the water. Analysis used the prescriptive design standard wind velocity of 100 mph and a fetch length of 0.413 miles. The calculated wave run-up was 1.10 feet. The calculations are shown below in Appendix C.

6.1.2. Wind Setup

The wind setup calculations were determined based on the fetch distance, wind velocity, and average depth of water along the fetch. Based on these factors it was determined that there would be 0.23 feet of wind setup. Calculations for the wind setup are shown within Appendix C below.

6.1.3. Freeboard Design

Determination of the required freeboard depths was based off of rules 7.4.2.2.1 and 7.4.2.2.2. For the 100 mph design wind speed, the resulting wind setup and wave run-up was 1.33 feet. This lead to a minimum normal freeboard depth to be 3 feet. For the minimum residual freeboard a 10 percent AEP wind speed of 22 mph was used in the calculations. This led to a total wave run-up and wind setup of 0.25 feet, so the 1 foot minimum residual freeboard depth was used.

6.2. General Embankment

The material used for the construction of the temporary cofferdam will be taken from offsite and will be a clay material. The embankment will be extended to meet the desired slope of 3:1, the material used in this process will be the same offsite clay material. Mixing of the material will be conducted to ensure homogeneity in soil composition prior to placement and compaction of the fill. Water will also be added to the soil if necessary. This is to meet the desired water content that will result in the necessary soil compaction as specified by Cesare. It is estimated that there will be approximately 6 inches of consolidation during construction. The in-situ material may settle due to the additional pressure of the dam.

6.3. Project Seismicity

No active faults have been identified in the area of the project that would require consideration for surface rupture. Analysis of seismicity must factor in using at least 50% of the peak acceleration but no less than 0.05g. In order to be conservative, 0.1g was used in the calculations.

6.4. Stability Analysis Maximum Section

The material properties below were used by Cesare, Inc. during the stability analysis at four sections along the dam. These are based on material laboratory testing results from the soils sampled during boring.

Design Hydraulic Conductivities

Material	Saturated Hydraulic Conductivity (cm/sec)	Saturated Hydraulic Conductivity (ft/sec)
Existing embankment fill	1.70 x E-6	5.54 x E-8
New embankment fill	4.97 x E-7	1.64 x E-8
Native clay soils	7.07 x E-7	2.32 x E-8
Weathered claystone	1.0 x E-8	3.3 x E-10
Unweathered claystone	1.0 x E-5*	3.3 x E-7*

*Horizontal conductivity. Vertical is one order of magnitude less.

Stability Analysis Strength Parameters

Material	Friction Angle (degrees)	Cohesion (psf)
Existing embankment fill	30	100
New embankment fill	30	200
Native clay soil	25	50
Weathered claystone	25	100
Unweathered claystone	0	3000
Residual claystone	15	0

Stability Analyses Results

Section	Analysis	Factor of Safety		Required Factor of Safety
		Block	Circular	
Existing	Full, stead state upstream	2.54	2.47	1.5
	Full, steady state upstream, pseudo seismic	1.71	1.67	1.0
	Full, steady state downstream	1.81	1.73	1.5
	Full, steady state downstream, pseudo seismic	1.34	1.27	1.0
	Transient upstream	1.82	1.74	1.2*
Repaired	Full, steady state upstream	3.94	3.78	1.5
	Full, steady state upstream, pseudo seismic	2.68	2.56	1.0
	Full, steady state downstream	3.50	3.29	1.5
	Full, steady state downstream, pseudo seismic	2.56	2.41	1.0
	Full, steady state downstream, residual bedrock strength	2.84	3.07	1.1**
	Transient upstream	2.84	2.67	1.2*

*Lowest factor of safety.

**Case by case determination

7. RESERVOIR FACILITY DESIGN

The reservoir will be filled via gravity up to elevation 4,983 feet. The reservoir can be drained down to an elevation of 4,971.3 feet. Since the reservoir's lowest point is at an elevation of 4970.3 feet, the resulting reservoir dead storage is 0.52 acre-feet. The proposed total storage to the normal high water line is approximately 311.77 acre-feet.

7.1. Outlet Works & Reservoir Fill

The reservoir is filled from two separate pipes, the first being a pipe that flows from the Home Supply Ditch on the south side of State Route Highway 60, this pipeline enters the reservoir on the southwest side. The other inflow to the reservoir comes from backflow from the water treatment plant, this pipeline meets the reservoir on the south east side.

From analysis it was determined that the inflow pipe from the ditch could provide a maximum inflow of 20.1 cfs. The Town of Johnstown also provided the maximum inflow of the water treatment plant into the reservoir of 0.77 cfs.

If the top 5 feet of water in the reservoir needs to be released in 5 days, as a High hazard dam, the required flow rate is 17.1 cfs. This calculation is from the normal water surface level. This is easily achieved through the outlet pipes in the outlet tower. See Table 3 for the 5-day discharge calculations.

The outlet works consists of an outlet tower which has one 24"x24" sluice gate to control the flow of water into the 24 inch diameter outlet pipe. Structural calculations for the tower and baffled rundown structure are included in Appendix I.

8. CONCLUSION

The proposed dam and reservoir has been designed to the standards established by the State Engineer's Office. The following summarizes the Engineer's Opinion of Cost based on expenses from other similar dams and available information:

Phase 1 Cost Summary

<u>Item</u>	<u>Estimated Cost</u>
Reservoir Repair Construction	\$662,625
Construction Engineering and Materials Testing	\$66,300
Total Phase 1 Construction Cost Estimate	\$728,925

Phase 2 Cost Summary

<u>Item</u>	<u>Estimated Cost</u>
Reservoir Repair Construction	\$176,330
Construction Engineering and Materials Testing	\$17,600
Total Phase 2 Construction Cost Estimate	\$193,930

References

- Colorado Department of Natural Resources. Division of Water Resources, Office of the State Engineer, Colorado Dam Safety Branch. *Rules and Regulations for Dam Safety and Dam Construction*. Denver, CO. January 1, 2020.
- Colorado Department of Natural Resources. Division of Water Resources, Office of the State Engineer, Colorado Dam Safety Branch. *Guidelines for Hazard Classification*. Denver, CO. November 15, 2010
- Design Standards No. 13 Embankment Dams Chapter 2, Embankment Design, The United States Department of the Interior, Bureau of Reclamation, December 2012.
- Design Standards No. 13 Embankment Dams Chapter 3, Foundation Surface Treatment, The United States Department of the Interior, Bureau of Reclamation, July 2012.
- Design Standards No. 13 Embankment Dams Chapter 10, Embankment Construction, The United States Department of the Interior, Bureau of Reclamation, March 1987.
- United States Department of the Interior: Bureau of Reclamation. *Design of Small Dams*, Third Edition. Washington, D.C. 1987.

Table 1. Reservoir Stage Storage

JOHNSTOWN RESERVOIR STAGE STORAGE					
Contour Elevation (ft)	Stage (ft)	Contour Area (ac)	Incremental Volume Conic (ac-ft)	Cumulative Volume Conic (ac-ft)	Notes
4971.3	0	0.03	0	0	
4971.5	0.2	0.36	0.03	0.03	
4972	0.7	2.28	0.21	0.66	
4972.5	1.2	3.89	0.37	2.2	
4973	1.7	17.2	1.69	9.45	
4973.5	2.2	20.07	1.98	18.81	
4974	2.7	22.19	2.2	29.38	
4974.5	3.2	23.96	2.38	40.93	
4975	3.7	25.51	2.54	53.31	
4975.5	4.2	26.91	2.68	66.42	
4976	4.7	28.42	2.82	80.24	
4976.5	5.2	30.2	3	94.88	
4977	5.7	31.46	3.14	110.35	
4977.5	6.2	32.1	3.2	126.25	
4978	6.7	32.53	3.25	142.41	
4978.5	7.2	32.91	3.29	158.78	
4979	7.7	33.19	3.32	175.31	
4979.5	8.2	33.51	3.35	191.98	
4980	8.7	33.77	3.38	208.81	
4980.5	9.2	33.97	3.39	225.74	
4981	9.7	34.15	3.41	242.77	
4981.5	10.2	34.33	3.43	259.89	
4982	10.7	34.5	3.45	277.1	
4982.5	11.2	34.67	3.46	294.39	
4983	11.7	34.83	3.48	311.77	Normal Water Surface
4983.5	12.2	34.99	3.5	329.22	
4984	12.7	35.15	3.51	346.76	
4984.5	13.2	35.31	3.53	364.37	
4985	13.7	35.46	3.54	382.06	Maximum Water Surface
4985.5	14.2	35.62	3.56	399.83	
4986	14.7	35.78	3.58	417.68	

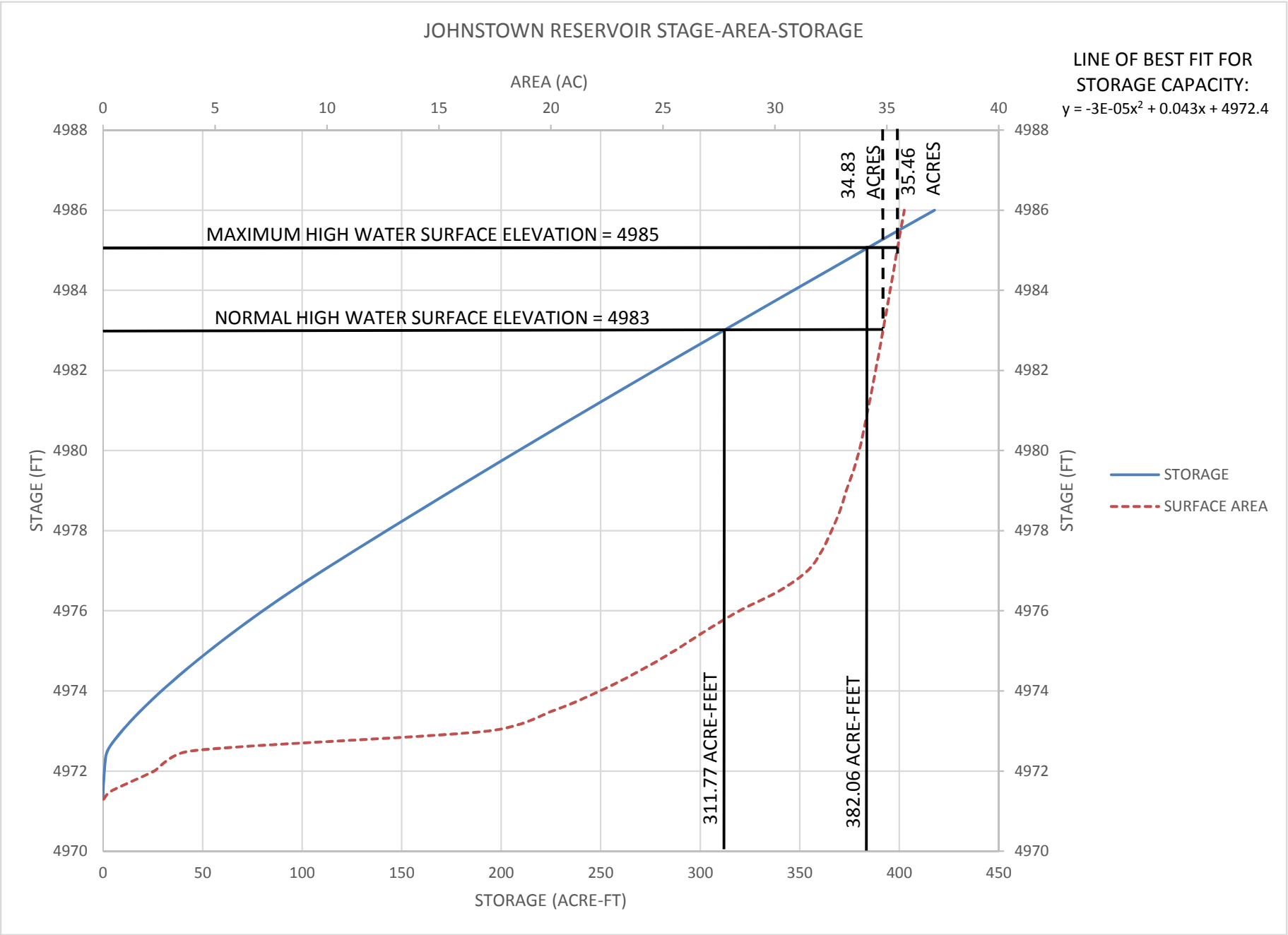


Table 2. Reservoir 24-inch Diameter Outlet Pipe and Discharge

Johnstown Reservoir Spillway Weirs and Pipe Rating Table

Orifice flow through pipe

$$Q = 0.6A(2gh)^{0.5}$$

Variable	Description	Value	Unit
Q =	flow rate	varies	cfs
A =	24" Ø Spillway Pipe	3.14	sq-ft
g =	gravitational acceleration	32.2	ft/sec ²
h =	height of water above grate	varies	ft

Weir Flow Equation

$$Q = CLH^{1.5}$$

Variable	Description	Value	Unit
Q =	flow rate	varies	cfs
C =	Weir Coefficient	3.33	
L =	Weir Length	varies	ft
H =	Height of Water	varies	ft

Reduction of Weir Lengths for Trash Racks

Bar Spacing = 6 in = 0.5000 ft

Bar Width = 2 in = 0.1667 ft

Weir No.	Weir Length (ft)	Bars Across	Bar Length (ft)	Weir Length Adjusted For Bars (ft)	Reduction For Blockage (%)	Net Weir Length (ft)
1 (W1)	2.33	4	0.667	1.67	0%	1.67
2 (W2)	2.33	4	0.667	1.67	0%	1.67

Johnstown Reservoir Spillway Weirs and Pipe Rating Table

Elevation	H	Q ₁ (W1)	Q ₂ (W2)	Q ₁ +Q ₂	Q _p (Pipe)	Q (Flow)
4983.0	0.0	0.00	0.00	0.00	58.65	0.00
4983.1	0.1	0.18	0.18	0.35	58.85	0.35
4983.2	0.2	0.50	0.50	0.99	59.04	0.99
4983.3	0.3	0.91	0.91	1.82	59.23	1.82
4983.4	0.4	1.40	1.40	2.81	59.43	2.81
4983.5	0.5	1.96	1.96	3.92	59.62	3.92
4983.6	0.6	2.58	2.58	5.16	59.81	5.16
4983.7	0.7	3.25	3.25	6.50	60.00	6.50
4983.8	0.8	3.97	3.97	7.94	60.19	7.94
4983.9	0.9	4.74	4.74	9.48	60.38	9.48
4984.0	1.0	5.55	5.55	11.10	60.57	11.10
4984.1	1.1	6.40	6.40	12.81	60.76	12.81
4984.2	1.2	7.30	7.30	14.59	60.95	14.59
4984.3	1.3	8.23	8.23	16.45	61.13	16.45
4984.4	1.4	9.19	9.19	18.39	61.32	18.39
4984.5	1.5	10.20	10.20	20.39	61.51	20.39
4984.6	1.6	11.23	11.23	22.46	61.69	22.46
4984.7	1.7	12.30	12.30	24.60	61.88	24.60
4984.8	1.8	13.40	13.40	26.81	62.06	26.81
4984.9	1.9	14.54	14.54	29.07	62.25	29.07
4985.0	2.0	15.70	15.70	31.40	62.43	31.40
4985.1	2.1	16.89	16.89	33.78	62.61	33.78
4985.2	2.2	18.11	18.11	36.22	62.79	36.22
4985.3	2.3	19.36	19.36	38.72	62.98	38.72
4985.4	2.4	20.64	20.64	41.27	63.16	41.27
4985.5	2.5	21.94	21.94	43.88	63.34	43.88
4985.6	2.6	23.27	23.27	46.54	63.52	46.54
4985.7	2.7	24.62	24.62	49.25	63.70	49.25
4985.8	2.8	26.00	26.00	52.01	63.88	52.01
4985.9	2.9	27.41	27.41	54.82	64.06	54.82
4986.0	3.0	28.84	28.84	57.68	64.23	57.68

JOHNSTOWN RESERVOIR OUTLET PIPE STAGE-DISCHARGE TABLE JOHNSTOWN, COLORADO	
Stage (ft)	Discharge (cfs)
4,983.0	0.00
4,983.5	3.92
4,984.0	11.10
4,984.5	20.39
4,985.0	31.40
4,985.5	43.88
4,986.0	57.68

Table 3. 5-Day Discharge

5-Day Discharge Table

Sluice Gate Dimensions	Headwater Elevation (ft)	Tailwater Elevation (ft)	Change in Elevation: Δh (ft)	Gate & Pipe Flow: Q (cfs)
24x24	4983	4976.83	6.17	29.29
24x24	4982	4976.23	5.77	28.35
24x24	4981	4975.62	5.38	27.37
24x24	4980	4975.01	4.99	26.35
24x24	4979	4974.41	4.59	25.29
24x24	4978	4973.80	4.20	24.17

$$\text{Equation: } Q = 0.6A(2g\Delta h)^{0.5}$$

Where - $A = 2.45 \text{ ft}^2$
 $g = 32.2 \text{ ft/s}^2$

Figure 1. Vicinity Map

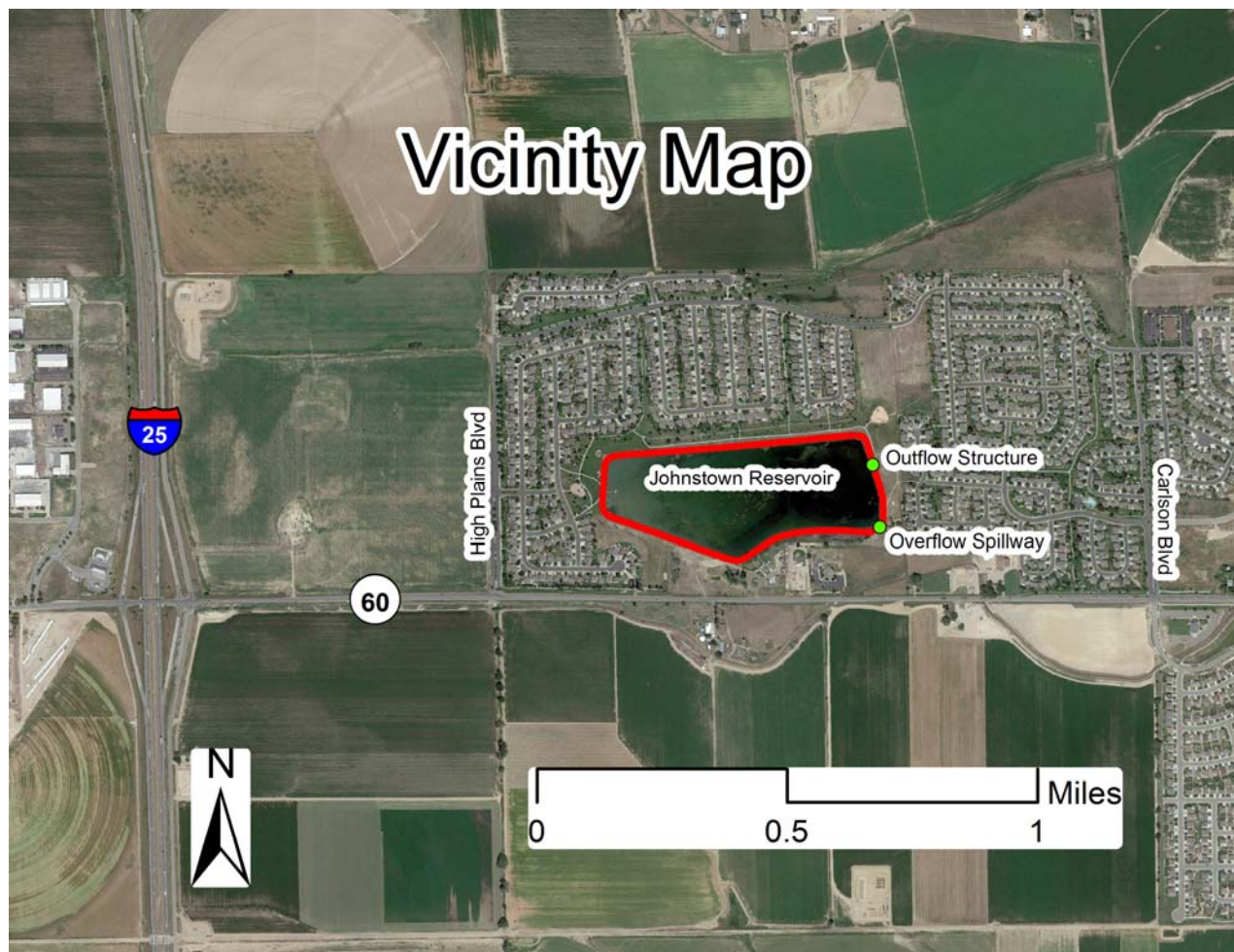
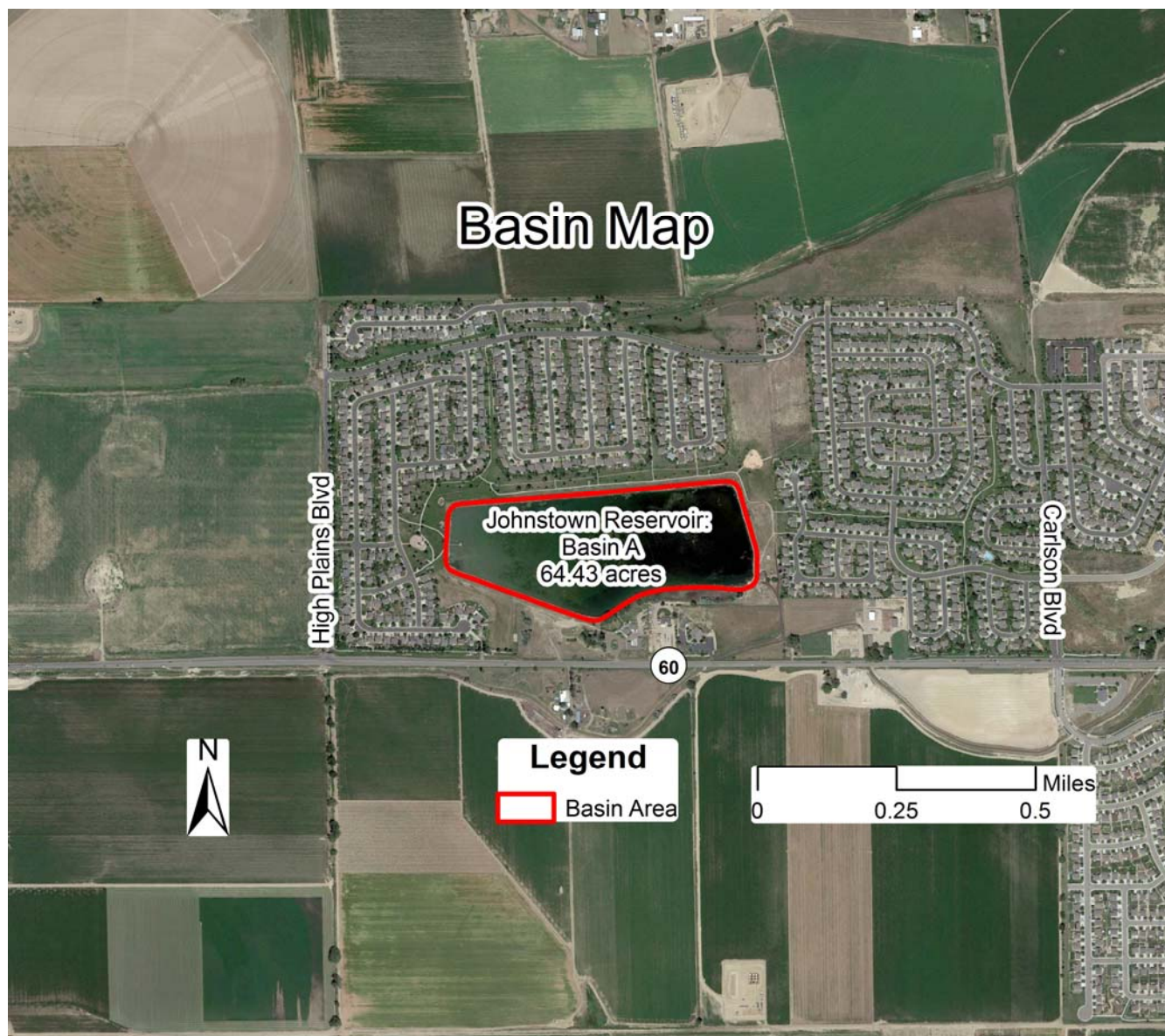
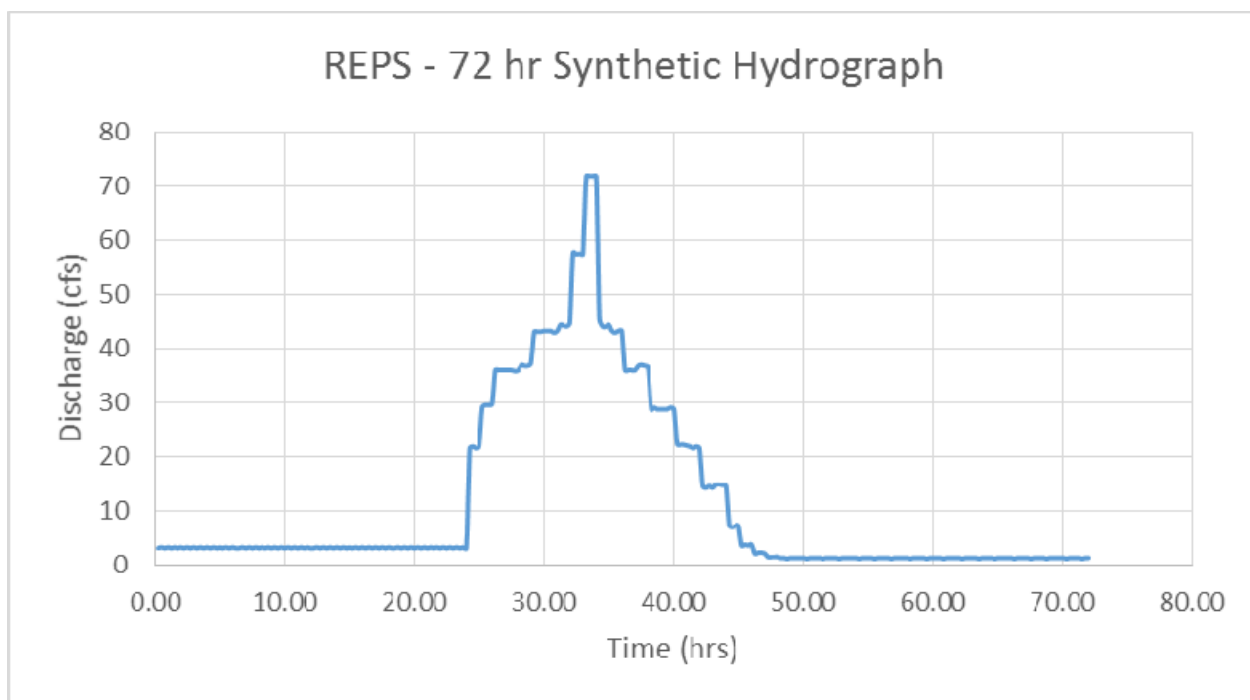


Figure 2. Basin Map



Appendix A. Hydrology



Gridded PMP Tool

Input basin outline shapefile or feature class
Basin Area

Location of "PMP_Evaluation_Tool" Folder
P:\20225 Johnstown Reservoir Repair\Drawings\REPS\GIS Exp

Output Folder
P:\20225 Johnstown Reservoir Repair\Drawings\REPS\GIS Exp

Local storm durations ***Basin area should be 100-sqmi or smaller for...

☒ 01
☒ 02
☐ 03
☐ 04
☐ 05
☒ 06
☐ 12
☒ 24

Select All Unselect All Add Value

General storm durations (optional)

☐ 01
☐ 06
☐ 12
☒ 24
☒ 48
☒ 72

Select All Unselect All Add Value

Tropical storm durations (optional)

☐ 01
☐ 06
☐ 12
☒ 24
☒ 48
☒ 72

Select All Unselect All Add Value

☒ Use basin area size for areal average

Area-size to use (sqmi) (optional)

☒ Apply weighted average to border grid cells

☐ Include sub-basin averages (optional)

Sub-basin field (optional)

☒ Include depth-duration chart output

☒ Apply temporal distributions

OK Cancel Environments... Show Help >>

Storm Precipitation Totals

Storm Type	PMP 1 Hour (in)	PMP 2 Hour (in)	PMP 6 Hour (in)	PMP 24 Hour (in)	PMP 48 Hour (in)	PMP 72 Hour (in)
Local Storm	9.09	14.29	18.13	19.13	N/A	N/A
General Storm	N/A	N/A	N/A	19.89	19.85	20.6

General 72 Hour Synthetic Storm						
Timestep	Time (min)	Time (hr)	Cumulative Precipitation (in)	Incremental Precipitation (in)	Flow (cfs)	Flow with AMF (cfs)
0	0	0	0	0	0	0
1	15	0.25	0.019	0.0190	2.860265278	3.060483847
2	30	0.5	0.039	0.0200	3.010805556	3.221561945
3	45	0.75	0.058	0.0190	2.860265278	3.060483847
4	60	1	0.078	0.0200	3.010805556	3.221561945
5	75	1.25	0.097	0.0190	2.860265278	3.060483847
6	90	1.5	0.117	0.0200	3.010805556	3.221561945
7	105	1.75	0.136	0.0190	2.860265278	3.060483847
8	120	2	0.156	0.0200	3.010805556	3.221561945
9	135	2.25	0.175	0.0190	2.860265278	3.060483847
10	150	2.5	0.195	0.0200	3.010805556	3.221561945
11	165	2.75	0.214	0.0190	2.860265278	3.060483847
12	180	3	0.234	0.0200	3.010805556	3.221561945
13	195	3.25	0.253	0.0190	2.860265278	3.060483847
14	210	3.5	0.273	0.0200	3.010805556	3.221561945
15	225	3.75	0.292	0.0190	2.860265278	3.060483847
16	240	4	0.312	0.0200	3.010805556	3.221561945
17	255	4.25	0.331	0.0190	2.860265278	3.060483847
18	270	4.5	0.351	0.0200	3.010805556	3.221561945
19	285	4.75	0.370	0.0190	2.860265278	3.060483847
20	300	5	0.390	0.0200	3.010805556	3.221561945
21	315	5.25	0.409	0.0190	2.860265278	3.060483847
22	330	5.5	0.429	0.0200	3.010805556	3.221561945
23	345	5.75	0.448	0.0190	2.860265278	3.060483847
24	360	6	0.468	0.0200	3.010805556	3.221561945
25	375	6.25	0.487	0.0190	2.860265278	3.060483847
26	390	6.5	0.506	0.0190	2.860265278	3.060483847
27	405	6.75	0.526	0.0200	3.010805556	3.221561945
28	420	7	0.545	0.0190	2.860265278	3.060483847
29	435	7.25	0.565	0.0200	3.010805556	3.221561945
30	450	7.5	0.584	0.0190	2.860265278	3.060483847
31	465	7.75	0.604	0.0200	3.010805556	3.221561945
32	480	8	0.623	0.0190	2.860265278	3.060483847
33	495	8.25	0.643	0.0200	3.010805556	3.221561945
34	510	8.5	0.662	0.0190	2.860265278	3.060483847
35	525	8.75	0.682	0.0200	3.010805556	3.221561945
36	540	9	0.701	0.0190	2.860265278	3.060483847
37	555	9.25	0.721	0.0200	3.010805556	3.221561945
38	570	9.5	0.740	0.0190	2.860265278	3.060483847
39	585	9.75	0.760	0.0200	3.010805556	3.221561945
40	600	10	0.779	0.0190	2.860265278	3.060483847
41	615	10.25	0.799	0.0200	3.010805556	3.221561945
42	630	10.5	0.818	0.0190	2.860265278	3.060483847
43	645	10.75	0.838	0.0200	3.010805556	3.221561945
44	660	11	0.857	0.0190	2.860265278	3.060483847
45	675	11.25	0.877	0.0200	3.010805556	3.221561945
46	690	11.5	0.896	0.0190	2.860265278	3.060483847
47	705	11.75	0.916	0.0200	3.010805556	3.221561945
48	720	12	0.935	0.0190	2.860265278	3.060483847
49	735	12.25	0.954	0.0190	2.860265278	3.060483847
50	750	12.5	0.974	0.0200	3.010805556	3.221561945
51	765	12.75	0.993	0.0190	2.860265278	3.060483847
52	780	13	1.013	0.0200	3.010805556	3.221561945
53	795	13.25	1.032	0.0190	2.860265278	3.060483847
54	810	13.5	1.052	0.0200	3.010805556	3.221561945
55	825	13.75	1.071	0.0190	2.860265278	3.060483847
56	840	14	1.091	0.0200	3.010805556	3.221561945
57	855	14.25	1.110	0.0190	2.860265278	3.060483847
58	870	14.5	1.130	0.0200	3.010805556	3.221561945
59	885	14.75	1.149	0.0190	2.860265278	3.060483847
60	900	15	1.169	0.0200	3.010805556	3.221561945
61	915	15.25	1.188	0.0190	2.860265278	3.060483847
62	930	15.5	1.208	0.0200	3.010805556	3.221561945
63	945	15.75	1.227	0.0190	2.860265278	3.060483847
64	960	16	1.247	0.0200	3.010805556	3.221561945
65	975	16.25	1.266	0.0190	2.860265278	3.060483847
66	990	16.5	1.286	0.0200	3.010805556	3.221561945
67	1005	16.75	1.305	0.0190	2.860265278	3.060483847
68	1020	17	1.325	0.0200	3.010805556	3.221561945
69	1035	17.25	1.344	0.0190	2.860265278	3.060483847
70	1050	17.5	1.364	0.0200	3.010805556	3.221561945
71	1065	17.75	1.383	0.0190	2.860265278	3.060483847
72	1080	18	1.403	0.0200	3.010805556	3.221561945

General 72 Hour Synthetic Storm						
Timestep	Time	Time	Cumulative Precipitation	Incremental Precipitation	Flow	Flow with AMF
73	1095	18.25	1.422	0.0190	2.860265278	3.060483847
74	1110	18.5	1.441	0.0190	2.860265278	3.060483847
75	1125	18.75	1.461	0.0200	3.010805556	3.221561945
76	1140	19	1.480	0.0190	2.860265278	3.060483847
77	1155	19.25	1.500	0.0200	3.010805556	3.221561945
78	1170	19.5	1.519	0.0190	2.860265278	3.060483847
79	1185	19.75	1.539	0.0200	3.010805556	3.221561945
80	1200	20	1.558	0.0190	2.860265278	3.060483847
81	1215	20.25	1.578	0.0200	3.010805556	3.221561945
82	1230	20.5	1.597	0.0190	2.860265278	3.060483847
83	1245	20.75	1.617	0.0200	3.010805556	3.221561945
84	1260	21	1.636	0.0190	2.860265278	3.060483847
85	1275	21.25	1.656	0.0200	3.010805556	3.221561945
86	1290	21.5	1.675	0.0190	2.860265278	3.060483847
87	1305	21.75	1.695	0.0200	3.010805556	3.221561945
88	1320	22	1.714	0.0190	2.860265278	3.060483847
89	1335	22.25	1.734	0.0200	3.010805556	3.221561945
90	1350	22.5	1.753	0.0190	2.860265278	3.060483847
91	1365	22.75	1.773	0.0200	3.010805556	3.221561945
92	1380	23	1.792	0.0190	2.860265278	3.060483847
93	1395	23.25	1.812	0.0200	3.010805556	3.221561945
94	1410	23.5	1.831	0.0190	2.860265278	3.060483847
95	1425	23.75	1.851	0.0200	3.010805556	3.221561945
96	1440	24	1.870	0.0190	2.860265278	3.060483847
97	1455	24.25	2.003	0.1330	20.02185695	21.42338693
98	1470	24.5	2.138	0.1350	20.3229375	21.74554313
99	1485	24.75	2.271	0.1330	20.02185695	21.42338693
100	1500	25	2.406	0.1350	20.3229375	21.74554313
101	1515	25.25	2.586	0.1800	27.09725	28.9940575
102	1530	25.5	2.769	0.1830	27.54887083	29.47729179
103	1545	25.75	2.952	0.1830	27.54887083	29.47729179
104	1560	26	3.136	0.1840	27.69941111	29.63836989
105	1575	26.25	3.359	0.2230	33.57048195	35.92041568
106	1590	26.5	3.582	0.2230	33.57048195	35.92041568
107	1605	26.75	3.805	0.2230	33.57048195	35.92041568
108	1620	27	4.028	0.2230	33.57048195	35.92041568
109	1635	27.25	4.251	0.2230	33.57048195	35.92041568
110	1650	27.5	4.474	0.2230	33.57048195	35.92041568
111	1665	27.75	4.696	0.2220	33.41994167	35.75933758
112	1680	28	4.919	0.2230	33.57048195	35.92041568
113	1695	28.25	5.148	0.2290	34.47372361	36.88688427
114	1710	28.5	5.376	0.2280	34.32318333	36.72580617
115	1725	28.75	5.604	0.2280	34.32318333	36.72580617
116	1740	29	5.835	0.2310	34.77480417	37.20904046
117	1755	29.25	6.102	0.2670	40.19425417	43.00785196
118	1770	29.5	6.369	0.2670	40.19425417	43.00785196
119	1785	29.75	6.636	0.2670	40.19425417	43.00785196
120	1800	30	6.904	0.2680	40.34479445	43.16893006
121	1815	30.25	7.172	0.2680	40.34479445	43.16893006
122	1830	30.5	7.440	0.2680	40.34479445	43.16893006
123	1845	30.75	7.706	0.2660	40.04371389	42.84677386
124	1860	31	7.974	0.2680	40.34479445	43.16893006
125	1875	31.25	8.249	0.2750	41.39857639	44.29647674
126	1890	31.5	8.523	0.2740	41.24803611	44.13539864
127	1905	31.75	8.796	0.2730	41.09749584	43.97432054
128	1920	32	9.073	0.2770	41.69965695	44.61863293
129	1935	32.25	9.431	0.3580	53.89341945	57.66595881
130	1950	32.5	9.787	0.3560	53.59233889	57.34380261
131	1965	32.75	10.144	0.3570	53.74287917	57.50488071
132	1980	33	10.500	0.3560	53.59233889	57.34380261
133	1995	33.25	10.946	0.4460	67.14096389	71.84083136
134	2010	33.5	11.392	0.4460	67.14096389	71.84083136
135	2025	33.75	11.838	0.4460	67.14096389	71.84083136
136	2040	34	12.284	0.4460	67.14096389	71.84083136
137	2055	34.25	12.565	0.2810	42.30181806	45.26294532
138	2070	34.5	12.838	0.2730	41.09749584	43.97432054
139	2085	34.75	13.111	0.2730	41.09749584	43.97432054
140	2100	35	13.386	0.2750	41.39857639	44.29647674
141	2115	35.25	13.654	0.2680	40.34479445	43.16893006
142	2130	35.5	13.920	0.2660	40.04371389	42.84677386
143	2145	35.75	14.188	0.2680	40.34479445	43.16893006
144	2160	36	14.456	0.2680	40.34479445	43.16893006
145	2175	36.25	14.679	0.2230	33.57048195	35.92041568
146	2190	36.5	14.902	0.2230	33.57048195	35.92041568

General 72 Hour Synthetic Storm						
Timestep	Time	Time	Cumulative Precipitation	Incremental Precipitation	Flow	Flow with AMF
147	2205	36.75	15.125	0.2230	33.57048195	35.92041568
148	2220	37	15.348	0.2230	33.57048195	35.92041568
149	2235	37.25	15.576	0.2280	34.32318333	36.72580617
150	2250	37.5	15.805	0.2290	34.47372361	36.88688427
151	2265	37.75	16.033	0.2280	34.32318333	36.72580617
152	2280	38	16.259	0.2260	34.02210278	36.40364997
153	2295	38.25	16.437	0.1780	26.79616945	28.67190131
154	2310	38.5	16.617	0.1800	27.09725	28.9940575
155	2325	38.75	16.795	0.1780	26.79616945	28.67190131
156	2340	39	16.973	0.1780	26.79616945	28.67190131
157	2355	39.25	17.151	0.1780	26.79616945	28.67190131
158	2370	39.5	17.329	0.1780	26.79616945	28.67190131
159	2385	39.75	17.509	0.1800	27.09725	28.9940575
160	2400	40	17.687	0.1780	26.79616945	28.67190131
161	2415	40.25	17.825	0.1380	20.77455833	22.22877742
162	2430	40.5	17.962	0.1370	20.62401806	22.06769932
163	2445	40.75	18.099	0.1370	20.62401806	22.06769932
164	2460	41	18.235	0.1360	20.47347778	21.90662122
165	2475	41.25	18.370	0.1350	20.3229375	21.74554313
166	2490	41.5	18.503	0.1330	20.02185695	21.42338693
167	2505	41.75	18.638	0.1350	20.3229375	21.74554313
168	2520	42	18.771	0.1330	20.02185695	21.42338693
169	2535	42.25	18.861	0.0900	13.548625	14.49702875
170	2550	42.5	18.949	0.0880	13.24754445	14.17487256
171	2565	42.75	19.039	0.0900	13.548625	14.49702875
172	2580	43	19.127	0.0880	13.24754445	14.17487256
173	2595	43.25	19.219	0.0920	13.84970556	14.81918495
174	2610	43.5	19.311	0.0920	13.84970556	14.81918495
175	2625	43.75	19.402	0.0910	13.69916528	14.65810685
176	2640	44	19.492	0.0900	13.548625	14.49702875
177	2655	44.25	19.537	0.0450	6.7743125	7.248514375
178	2670	44.5	19.580	0.0430	6.473231945	6.926358181
179	2685	44.75	19.625	0.0450	6.7743125	7.248514375
180	2700	45	19.670	0.0450	6.7743125	7.248514375
181	2715	45.25	19.692	0.0220	3.311886111	3.543718139
182	2730	45.5	19.715	0.0230	3.462426389	3.704796236
183	2745	45.75	19.737	0.0220	3.311886111	3.543718139
184	2760	46	19.760	0.0230	3.462426389	3.704796236
185	2775	46.25	19.773	0.0130	1.957023611	2.094015264
186	2790	46.5	19.787	0.0140	2.107563889	2.255093361
187	2805	46.75	19.801	0.0140	2.107563889	2.255093361
188	2820	47	19.814	0.0130	1.957023611	2.094015264
189	2835	47.25	19.823	0.0090	1.3548625	1.449702875
190	2850	47.5	19.832	0.0090	1.3548625	1.449702875
191	2865	47.75	19.841	0.0090	1.3548625	1.449702875
192	2880	48	19.850	0.0090	1.3548625	1.449702875
193	2895	48.25	19.858	0.0080	1.204322222	1.288624778
194	2910	48.5	19.866	0.0080	1.204322222	1.288624778
195	2925	48.75	19.873	0.0070	1.053781944	1.127546681
196	2940	49	19.881	0.0080	1.204322222	1.288624778
197	2955	49.25	19.889	0.0080	1.204322222	1.288624778
198	2970	49.5	19.897	0.0080	1.204322222	1.288624778
199	2985	49.75	19.905	0.0080	1.204322222	1.288624778
200	3000	50	19.913	0.0080	1.204322222	1.288624778
201	3015	50.25	19.920	0.0070	1.053781944	1.127546681
202	3030	50.5	19.928	0.0080	1.204322222	1.288624778
203	3045	50.75	19.936	0.0080	1.204322222	1.288624778
204	3060	51	19.944	0.0080	1.204322222	1.288624778
205	3075	51.25	19.952	0.0080	1.204322222	1.288624778
206	3090	51.5	19.959	0.0070	1.053781944	1.127546681
207	3105	51.75	19.967	0.0080	1.204322222	1.288624778
208	3120	52	19.975	0.0080	1.204322222	1.288624778
209	3135	52.25	19.983	0.0080	1.204322222	1.288624778
210	3150	52.5	19.991	0.0080	1.204322222	1.288624778
211	3165	52.75	19.998	0.0070	1.053781944	1.127546681
212	3180	53	20.006	0.0080	1.204322222	1.288624778
213	3195	53.25	20.014	0.0080	1.204322222	1.288624778
214	3210	53.5	20.022	0.0080	1.204322222	1.288624778
215	3225	53.75	20.030	0.0080	1.204322222	1.288624778
216	3240	54	20.038	0.0080	1.204322222	1.288624778
217	3255	54.25	20.045	0.0070	1.053781944	1.127546681
218	3270	54.5	20.053	0.0080	1.204322222	1.288624778
219	3285	54.75	20.061	0.0080	1.204322222	1.288624778
220	3300	55	20.069	0.0080	1.204322222	1.288624778

General 72 Hour Synthetic Storm						
Timestep	Time	Time	Cumulative Precipitation	Incremental Precipitation	Flow	Flow with AMF
221	3315	55.25	20.077	0.0080	1.204322222	1.288624778
222	3330	55.5	20.084	0.0070	1.053781944	1.127546681
223	3345	55.75	20.092	0.0080	1.204322222	1.288624778
224	3360	56	20.100	0.0080	1.204322222	1.288624778
225	3375	56.25	20.108	0.0080	1.204322222	1.288624778
226	3390	56.5	20.116	0.0080	1.204322222	1.288624778
227	3405	56.75	20.123	0.0070	1.053781944	1.127546681
228	3420	57	20.131	0.0080	1.204322222	1.288624778
229	3435	57.25	20.139	0.0080	1.204322222	1.288624778
230	3450	57.5	20.147	0.0080	1.204322222	1.288624778
231	3465	57.75	20.155	0.0080	1.204322222	1.288624778
232	3480	58	20.163	0.0080	1.204322222	1.288624778
233	3495	58.25	20.170	0.0070	1.053781944	1.127546681
234	3510	58.5	20.178	0.0080	1.204322222	1.288624778
235	3525	58.75	20.186	0.0080	1.204322222	1.288624778
236	3540	59	20.194	0.0080	1.204322222	1.288624778
237	3555	59.25	20.202	0.0080	1.204322222	1.288624778
238	3570	59.5	20.209	0.0070	1.053781944	1.127546681
239	3585	59.75	20.217	0.0080	1.204322222	1.288624778
240	3600	60	20.225	0.0080	1.204322222	1.288624778
241	3615	60.25	20.233	0.0080	1.204322222	1.288624778
242	3630	60.5	20.241	0.0080	1.204322222	1.288624778
243	3645	60.75	20.248	0.0070	1.053781944	1.127546681
244	3660	61	20.256	0.0080	1.204322222	1.288624778
245	3675	61.25	20.264	0.0080	1.204322222	1.288624778
246	3690	61.5	20.272	0.0080	1.204322222	1.288624778
247	3705	61.75	20.280	0.0080	1.204322222	1.288624778
248	3720	62	20.288	0.0080	1.204322222	1.288624778
249	3735	62.25	20.295	0.0070	1.053781944	1.127546681
250	3750	62.5	20.303	0.0080	1.204322222	1.288624778
251	3765	62.75	20.311	0.0080	1.204322222	1.288624778
252	3780	63	20.319	0.0080	1.204322222	1.288624778
253	3795	63.25	20.327	0.0080	1.204322222	1.288624778
254	3810	63.5	20.334	0.0070	1.053781944	1.127546681
255	3825	63.75	20.342	0.0080	1.204322222	1.288624778
256	3840	64	20.350	0.0080	1.204322222	1.288624778
257	3855	64.25	20.358	0.0080	1.204322222	1.288624778
258	3870	64.5	20.366	0.0080	1.204322222	1.288624778
259	3885	64.75	20.373	0.0070	1.053781944	1.127546681
260	3900	65	20.381	0.0080	1.204322222	1.288624778
261	3915	65.25	20.389	0.0080	1.204322222	1.288624778
262	3930	65.5	20.397	0.0080	1.204322222	1.288624778
263	3945	65.75	20.405	0.0080	1.204322222	1.288624778
264	3960	66	20.413	0.0080	1.204322222	1.288624778
265	3975	66.25	20.420	0.0070	1.053781944	1.127546681
266	3990	66.5	20.428	0.0080	1.204322222	1.288624778
267	4005	66.75	20.436	0.0080	1.204322222	1.288624778
268	4020	67	20.444	0.0080	1.204322222	1.288624778
269	4035	67.25	20.452	0.0080	1.204322222	1.288624778
270	4050	67.5	20.459	0.0070	1.053781944	1.127546681
271	4065	67.75	20.467	0.0080	1.204322222	1.288624778
272	4080	68	20.475	0.0080	1.204322222	1.288624778
273	4095	68.25	20.483	0.0080	1.204322222	1.288624778
274	4110	68.5	20.491	0.0080	1.204322222	1.288624778
275	4125	68.75	20.498	0.0070	1.053781944	1.127546681
276	4140	69	20.506	0.0080	1.204322222	1.288624778
277	4155	69.25	20.514	0.0080	1.204322222	1.288624778
278	4170	69.5	20.522	0.0080	1.204322222	1.288624778
279	4185	69.75	20.530	0.0080	1.204322222	1.288624778
280	4200	70	20.538	0.0080	1.204322222	1.288624778
281	4215	70.25	20.545	0.0070	1.053781944	1.127546681
282	4230	70.5	20.553	0.0080	1.204322222	1.288624778
283	4245	70.75	20.561	0.0080	1.204322222	1.288624778
284	4260	71	20.569	0.0080	1.204322222	1.288624778
285	4275	71.25	20.577	0.0080	1.204322222	1.288624778
286	4290	71.5	20.584	0.0070	1.053781944	1.127546681
287	4305	71.75	20.592	0.0080	1.204322222	1.288624778
288	4320	72	20.600	0.0080	1.204322222	1.288624778

Appendix B: Soil Type Map



United States
Department of
Agriculture

NRCS

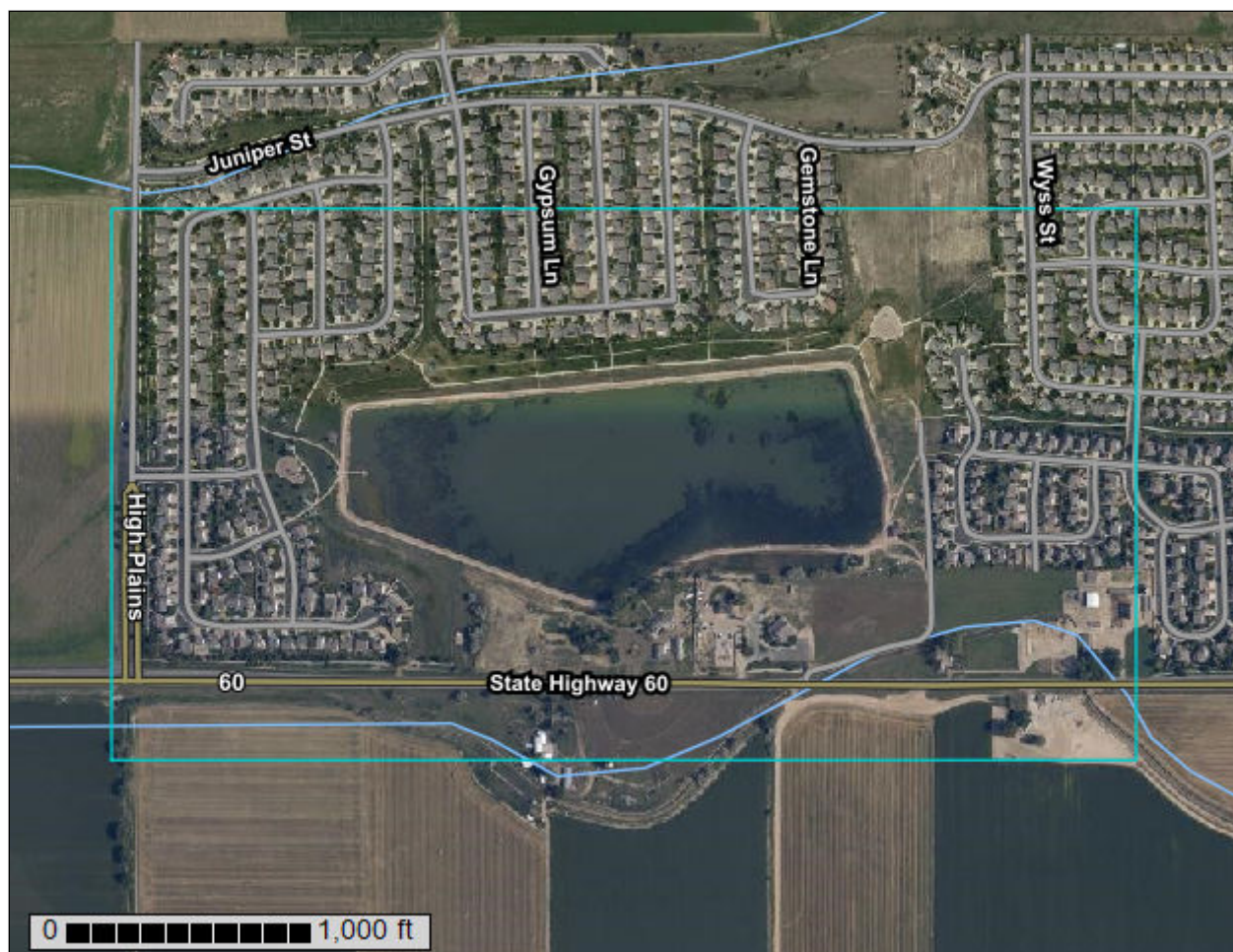
Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Item #13.

Custom Soil Resource Report for Weld County, Colorado, Southern Part

Johnstown Reservoir



Custom Soil Resource Report Soil Map

Item #13.



MAP LEGEND**Area of Interest (AOI)**
 Area of Interest (AOI)
Soils
 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points
Special Point Features
 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features
Water Features
 Streams and Canals
Transportation
 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads
Background
 Aerial Photography
MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weld County, Colorado, Southern Part
Survey Area Data: Version 19, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 19, 2018—Aug 12, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
15	Colby loam, 1 to 3 percent slopes	4.9	2.3%
16	Colby loam, 3 to 5 percent slopes	25.6	11.8%
42	Nunn clay loam, 1 to 3 percent slopes	0.0	0.0%
79	Weld loam, 1 to 3 percent slopes	152.6	70.2%
82	Wiley-Colby complex, 1 to 3 percent slopes	0.1	0.0%
85	Water	34.2	15.7%
Totals for Area of Interest		217.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Appendix C. Wave Run-up and Wind Setup Calculations

USBR DESIGN STD 13, CHAPTER 6, APPENDIX B: WAVE RUNUP + SETUP ANALYSIS FOR FREEBOARD DESIGN
 =user entry

bold red = spreadsheet calculation based on DS 13 Ch. 6, Appendix B
B.1 Determine reservoir fetch and average depth, B.3 Determine design wind speed (ref: Rule 7.4.2.2)

D= ft, average depth of water along fetch (reasonable approximation with more emphasis given to depths close to the dam)
 VMPPH= (mi/hr) wind velocity over water. User can input any desired windspeed. Prescriptive design standard 100 mph per Rule 7.2.2.1, see Table 1 for 10% Pwh per Rule 7.2.2.2)
 F= miles, fetch. See App. B.1, pg. B-1 & B-2

B.3.6 Determine minimum duration required to generate maximum wave height

t_{min}= **0.22** hours [DS 13 Ch 6 App. B, Eq 1] (NOTE: PFARA returns likelihood of a given over-water wind speed for this duration)

B.4.1. Calculate significant wave height (Eq. 2): defined as the average of the highest one-third of the waves in a wave field

H_s= **2.57** ft

B.4.2 Calculate wave period (Eq. 4):

T= **1.89** sec

B.4.2 Calculate deep water wave length (Eq. 3):

L= **18.25** ft NOTE: Assumes reservoir depth > 1/2*L.

B.4.3 Determine wave runup: vertical distance between the maximum level attained by the rush of water up the slope and the still water elevation

upstream slope (xH:1v)=
 alpha= **0.322** radians, upstream slope angle
 sp= **0.14** steepness of the peak waves (Eq. 6)
 epsilon_p= **0.89** surf similarity factor, (Eq. 5)

The computation of runup, R, follows the following equation:

$$R = H_s \left(A \zeta_p^{\gamma_r} + C \right) \gamma_r \gamma_b \gamma_h \gamma_\beta \quad [\text{Equation 8}]$$

A= **1.6** Coefficient depending on epsilon_p (see Table B-4)
 C= **0** Coefficient depending on epsilon_p (see Table B-4)
 Upstream slope mat'l= **Drop down list**
 gamma-r **0.55** Table B-3, pg B-11
 gamma-b for non-bermed slope, see pg B-11
 gamma-h for Rayleigh distributed waves, reduction factor for influence of shallow water conditions (1.0 is conservative)
 gamma-beta reduction factor for direction of fetch incident to dam axis (1.0 for fetch perpendicular to dam axis)
 R= **1.10** ft, wave runup (Eq. 8)

B.4.4 Determine wind setup: vertical rise in the stillwater level on the leeward side of a water body due to wind stresses on the surface of the water

S= **0.23** ft, wind setup (Eq. 9)

Calculate Total wave runup + wind setup:

R+S= **1.33** ft Spreadsheet calcs checked against USBR DS 13 Ch. 6 App. C example - OK.

Table 1: 10% Probability of Non-Excedence (PWH)

PFARA Station	Station I.D.	Over Water Wind Velocity (mph)			
		10% Probability of Non-Excedence (Pwh)			
		Fetch Length			
		0.5 mile	1.0 mile	1.5 mile	2 mile
Aurora/Buckley	CO23036	18	18.5	19	19
Alamosa	CO23061	22.5	23	23.5	24
Denver/Sta Gage	CO23062	22	23	24.6	26
Eagle	CO23062	23	24	25	26
Grand Junction	CO23066	19.5	20	21	22
La Junta	CO23067	18	19	20	21
Pueblo	CO23068	18	19	20	20
Trinidad	CO23070	22	23	24	24
Akron	CO24015	26	27	28	29
Denver	CO93032	19	20	21	21
Colorado Springs	CO93037	20	21	23	23
Pueblo	CO93058	20	20.2	21	22
USAFA	CO93065	21	22	22.5	23
Fort Carson	CO93065	20	20.5	21	22

* Wind Velocity Calculated using PRARA Program

Table B-2. Common wave height relationships

Percent of total number of waves in series averaged to compute specific wave height (H)	Ratio of specific wave height, H, to average wave height, H_{ave} (H/ H_{ave})	Ratio of specific wave height, H, to significant wave height H_s (H/ H_s)	Percent of waves exceeding specific wave height (H)
1	2.66	1.67	0.4
5	2.24	1.40	2
10	2.03	1.27	4
20	1.80	1.12	8
25	1.71	1.07	10
30	1.64	1.02	12
33.33	1.60	1.00	13
40	1.52	0.95	16
50	1.42	0.89	20
75	1.20	0.75	32
100	1.00	0.62	46

concrete
riprap

Table B-4. Values for variables A and C of the runup equation [16b]

ξ -Limits	A	C
$\xi_p \leq 2.5$	1.6	0
$2.5 < \xi_p < 9$	-0.2	4.5

Table B-3. Surface roughness reduction factor (valid for $1 < \xi_p < 3-4$) [16b]

Type of slope surface	γ_r
Smooth, concrete, asphalt	1.0
Smooth block revetment	1.0
Grass (3 centimeters in length)	0.90 – 1.0
One layer of rock, diameter D_r ($H_o/D_r = 1.5 - 3.0$)	0.55 – 0.6
Two or more layers of rock, ($H_o/D_r = 1.5 - 6.0$)	0.50 – 0.55

USBR DESIGN STD 13, CHAPTER 6, APPENDIX B: WAVE RUNUP + SETUP ANALYSIS FOR FREEBOARD DESIGN
 =user entry

bold red = spreadsheet calculation based on DS 13 Ch. 6, Appendix B
B.1 Determine reservoir fetch and average depth, B.3 Determine design wind speed (ref: Rule 7.4.2.2)

D= ft, average depth of water along fetch (reasonable approximation with more emphasis given to depths close to the dam)
 VMPPH= (mi/hr) wind velocity over water. User can input any desired windspeed. Prescriptive design standard 100 mph per Rule 7.2.2.1, see Table 1 for 10% Pwh per Rule 7.2.2.2)
 F= miles, fetch. See App. B.1, pg. B-1 & B-2

B.3.6 Determine minimum duration required to generate maximum wave height

t_{min}= **0.36** hours [DS 13 Ch 6 App. B, Eq 1] (NOTE: PFARA returns likelihood of a given over-water wind speed for this duration)

B.4.1. Calculate significant wave height (Eq. 2): defined as the average of the highest one-third of the waves in a wave field

H_s= **0.42** ft

B.4.2 Calculate wave period (Eq. 4):

T= **1.03** sec

B.4.2 Calculate deep water wave length (Eq. 3):

L= **5.42** ft NOTE: Assumes reservoir depth > 1/2*L.

B.4.3 Determine wave runup: vertical distance between the maximum level attained by the rush of water up the slope and the still water elevation

upstream slope (xH:1v)=
 alpha= **0.322** radians, upstream slope angle
 sp= **0.08** steepness of the peak waves (Eq. 6)
 epsilon_p= **1.20** surf similarity factor, (Eq. 5)

The computation of runup, R, follows the following equation:

$$R = H_s \left(A \zeta_p^{\gamma_r} + C \right) \gamma_r \gamma_b \gamma_h \gamma_\beta \quad [\text{Equation 8}]$$

A= **1.6** Coefficient depending on epsilon_p (see Table B-4)
 C= **0** Coefficient depending on epsilon_p (see Table B-4)
 Upstream slope mat'l= **Drop down list**
 gamma-r **0.55** Table B-3, pg B-11
 gamma-b for non-bermed slope, see pg B-11
 gamma-h for Rayleigh distributed waves, reduction factor for influence of shallow water conditions (1.0 is conservative)
 gamma-beta reduction factor for direction of fetch incident to dam axis (1.0 for fetch perpendicular to dam axis)
 R= **0.24** ft, wave runup (Eq. 8)

B.4.4 Determine wind setup: vertical rise in the stillwater level on the leeward side of a water body due to wind stresses on the surface of the water

S= **0.01** ft, wind setup (Eq. 9)

Calculate Total wave runup + wind setup:

R+S= **0.25** ft Spreadsheet calcs checked against USBR DS 13 Ch. 6 App. C example - OK.

Table 1: 10% Probability of Non-Excedence (PWH)

PFARA Station	Station I.D.	Over Water Wind Velocity (mph)			
		10% Probability of Non-Excedence (Pwh)			
		Fetch Length			
		0.5 mile	1.0 mile	1.5 mile	2 mile
Aurora/Buckley	CO23036	18	18.5	19	19
Alamosa	CO23061	22.5	23	23.5	24
Denver/Sta Gage	CO23062	22	23	24.6	26
Eagle	CO23062	23	24	25	26
Grand Junction	CO23066	19.5	20	21	22
La Junta	CO23067	18	19	20	21
Pueblo	CO23068	18	19	20	20
Trinidad	CO23070	22	23	24	24
Akron	CO24015	26	27	28	29
Denver	CO93032	19	20	21	21
Colorado Springs	CO93037	20	21	23	23
Pueblo	CO93058	20	20.2	21	22
USAFA	CO93065	21	22	22.5	23
Fort Carson	CO93065	20	20.5	21	22

* Wind Velocity Calculated using PRARA Program

Table B-2. Common wave height relationships

Percent of total number of waves in series averaged to compute specific wave height (H)	Ratio of specific wave height, H, to average wave height, H_{ave} (H/ H_{ave})	Ratio of specific wave height, H, to significant wave height H_s (H/ H_s)	Percent of waves exceeding specific wave height (H)
1	2.66	1.67	0.4
5	2.24	1.40	2
10	2.03	1.27	4
20	1.80	1.12	8
25	1.71	1.07	10
30	1.64	1.02	12
33.33	1.60	1.00	13
40	1.52	0.95	16
50	1.42	0.89	20
75	1.20	0.75	32
100	1.00	0.62	46

concrete
riprap

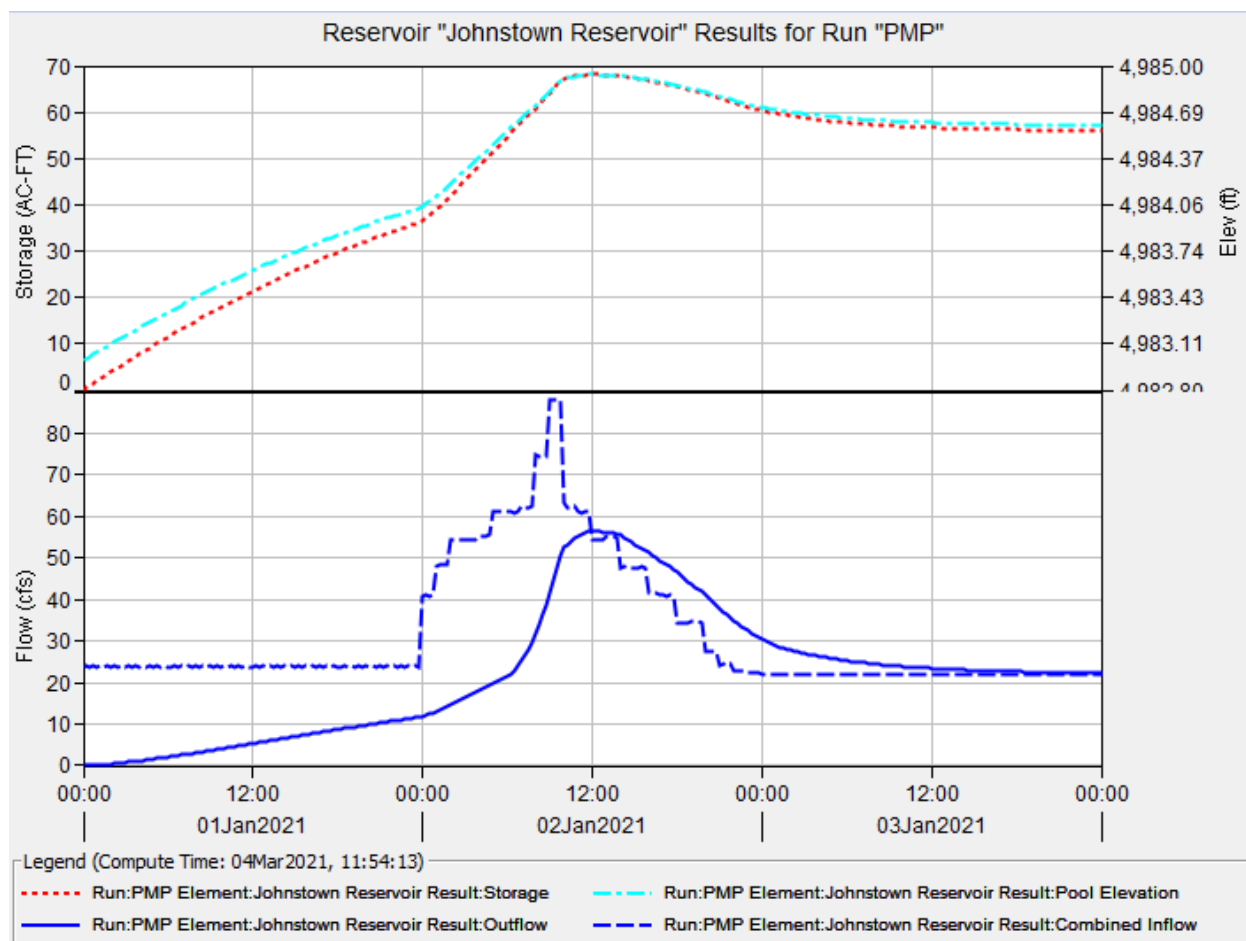
Table B-4. Values for variables A and C of the runup equation [16b]

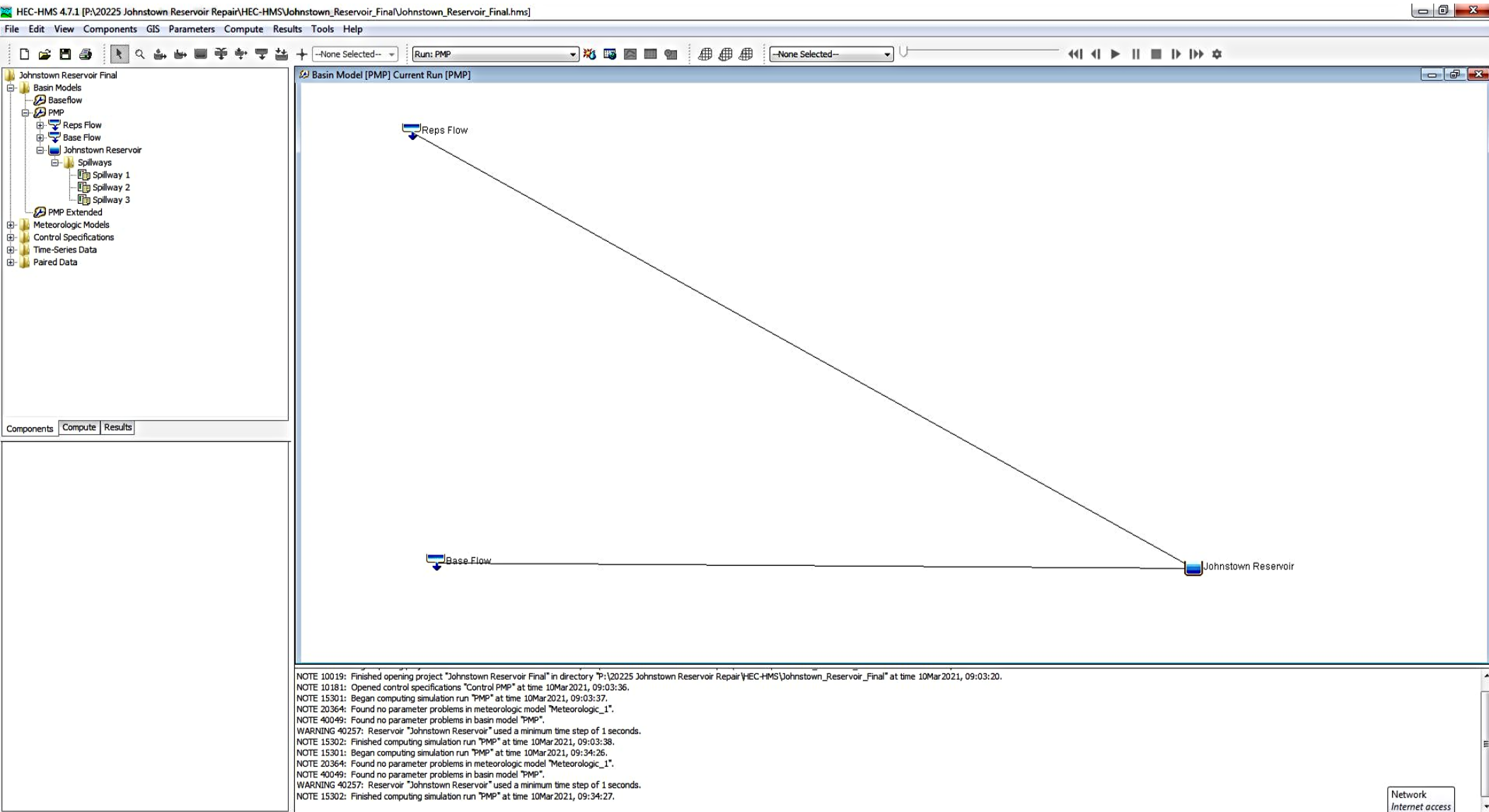
ξ -Limits	A	C
$\xi_p \leq 2.5$	1.6	0
$2.5 < \xi_p < 9$	-0.2	4.5

Table B-3. Surface roughness reduction factor (valid for $1 < \xi_p < 3-4$) [16b]

Type of slope surface	γ_r
Smooth, concrete, asphalt	1.0
Smooth block revetment	1.0
Grass (3 centimeters in length)	0.90 – 1.0
One layer of rock, diameter D_r ($H_o/D_r = 1.5 - 3.0$)	0.55 – 0.6
Two or more layers of rock, ($H_o/D_r = 1.5 - 6.0$)	0.50 – 0.55

Appendix D. HEC-HMS Results





Project: Johnstown_Reservoir_Final

Simulation Run: PMP

Simulation Start: 31 December 2020, 24:00

Simulation End: 3 January 2021, 24:00

HMS Version: 4.7.1

Executed: 08 March 2021, 19:05

Global Results Summary

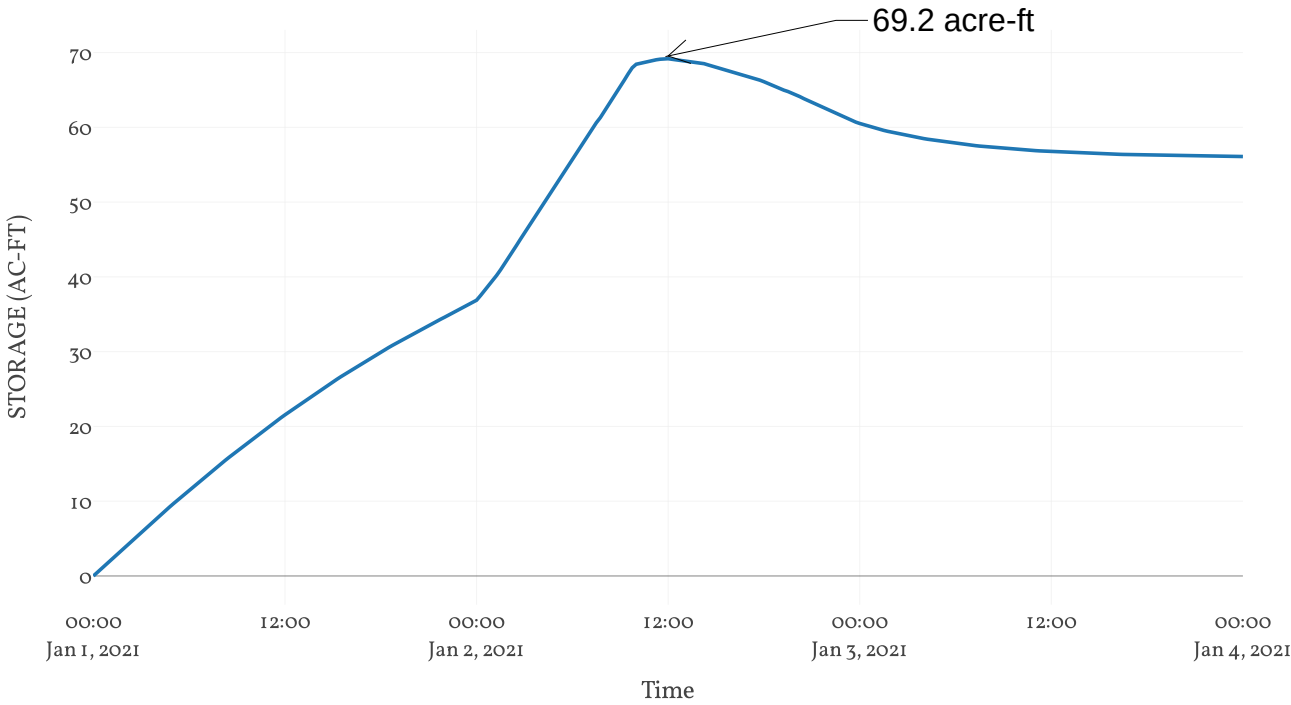
Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume ()
Reps Flow	Not specified	71.84	02Jan2021, 09:00	Not specified
Base Flow	Not specified	20.88	31Dec2020, 24:00	Not specified
Johnstown Reservoir	Not specified	60.69	02Jan2021, 11:45	Not specified

Reservoir: Johnstown Reservoir

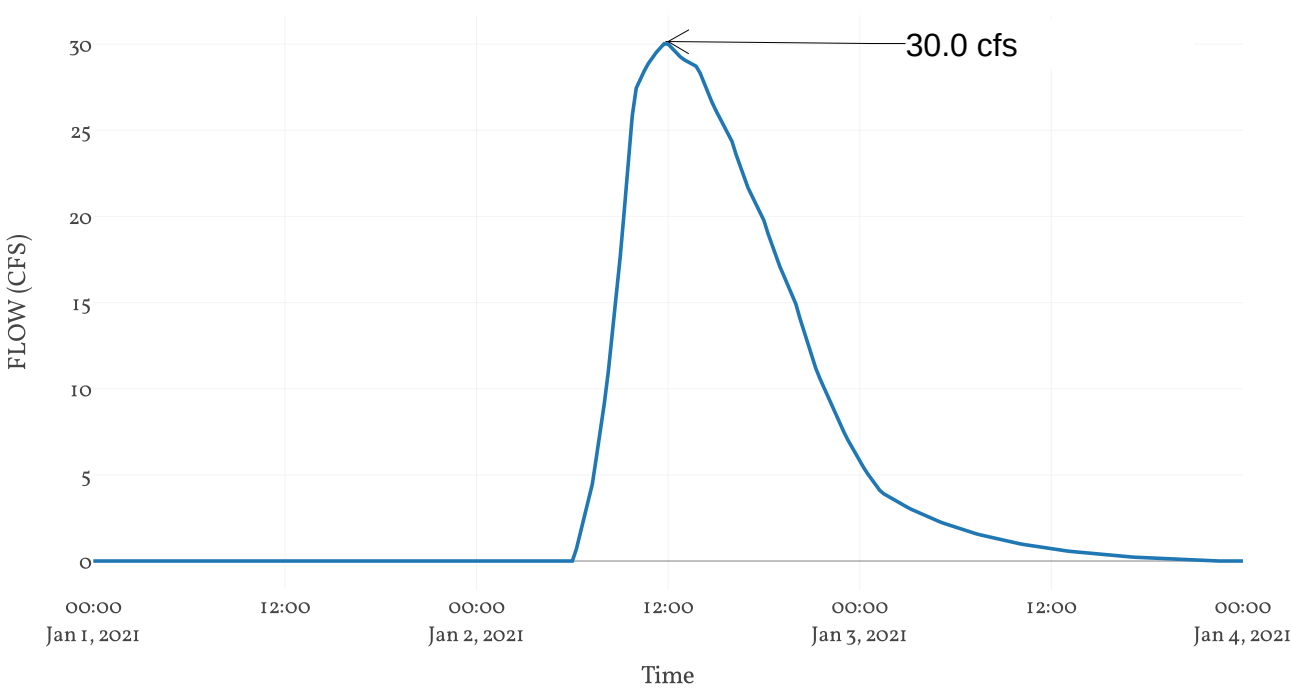
Results: Johnstown Reservoir

Peak Discharge (CFS)	60.69
Time of Peak Discharge	02Jan2021, 11:45
Peak Inflow (CFS)	92.72
Time of Peak Inflow	02Jan2021, 09:00
Inflow Volume (AC - FT)	192.78
Maximum Storage (AC - FT)	69.18
Peak Elevation (FT)	4984.97
Discharge Volume (AC - FT)	136.69

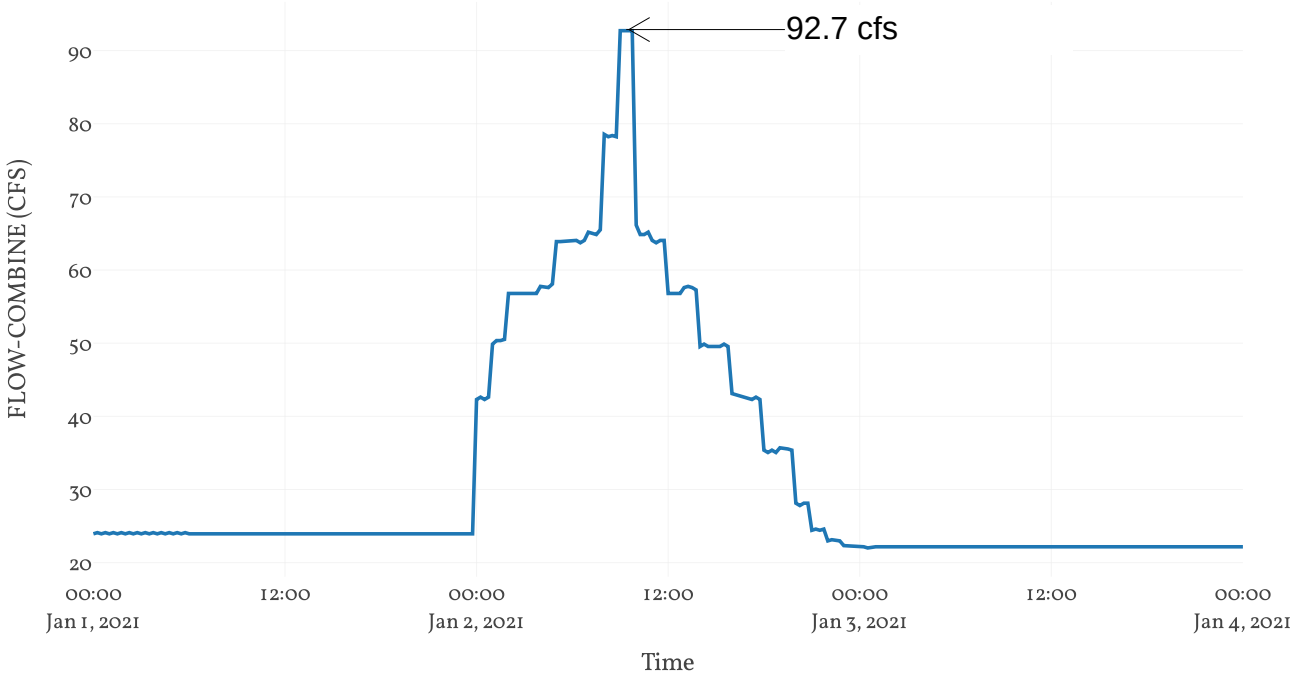
Storage



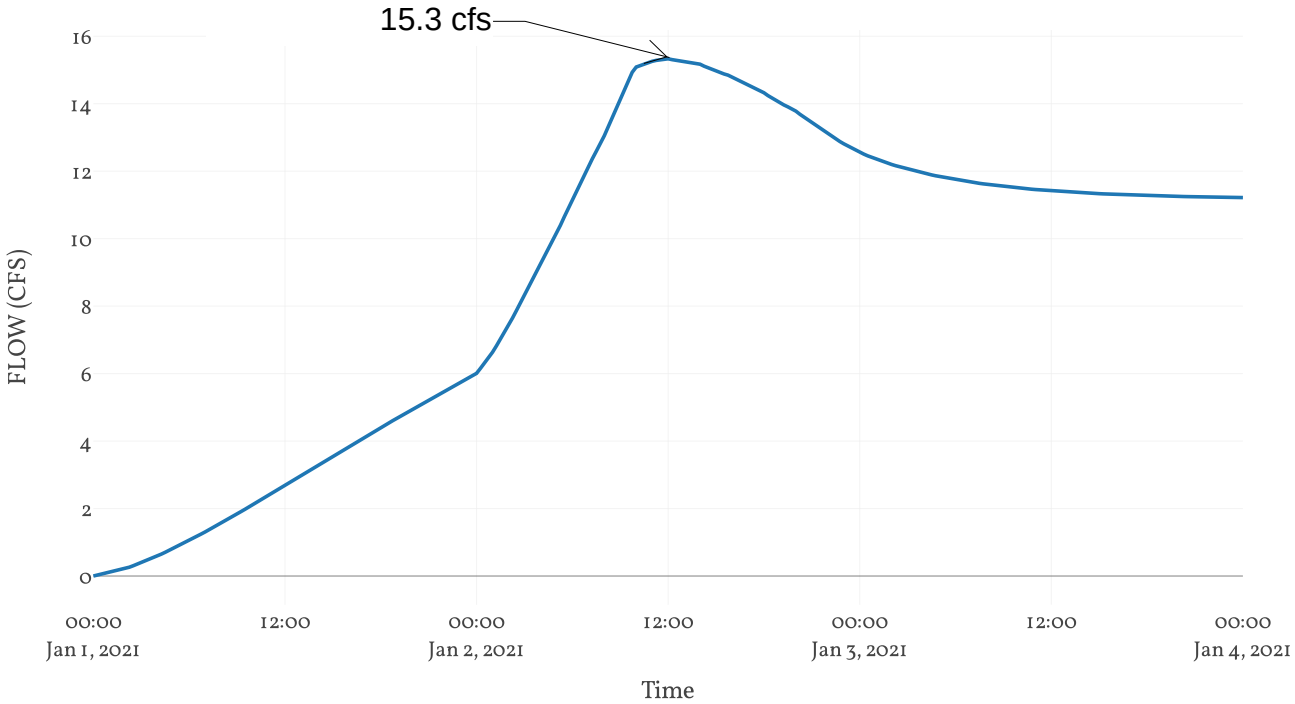
Overflow Spillway



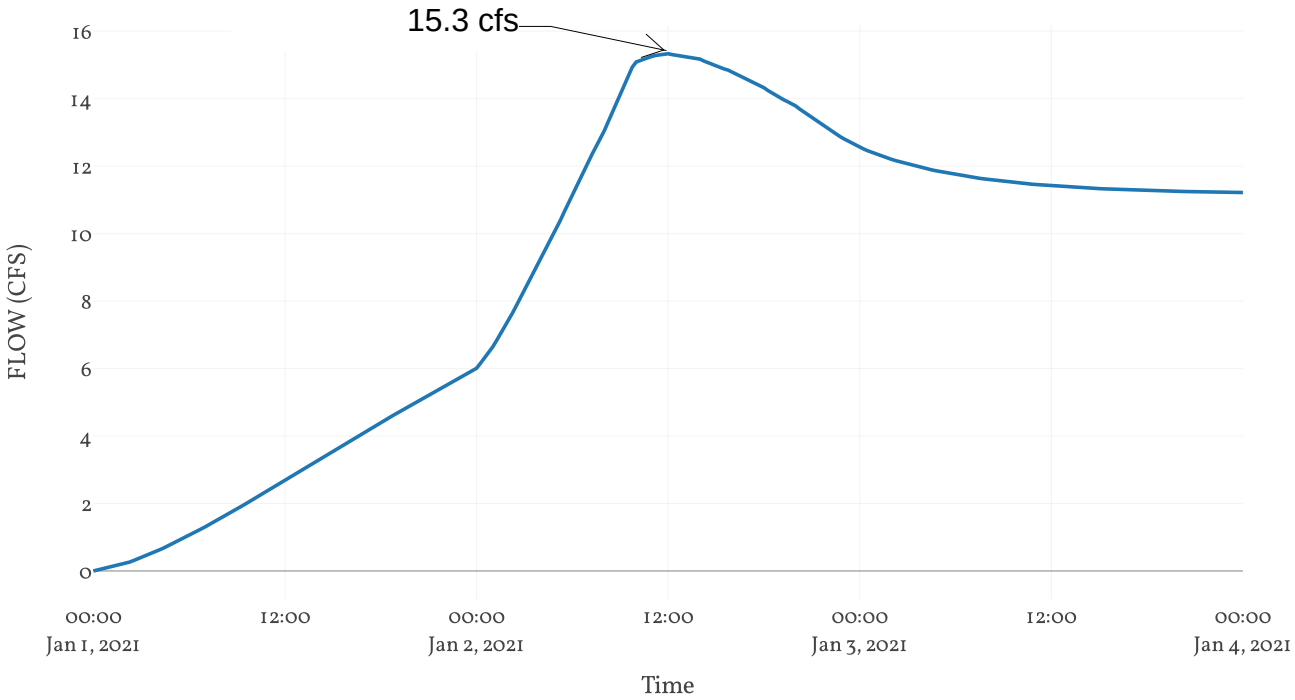
Combined Inflow



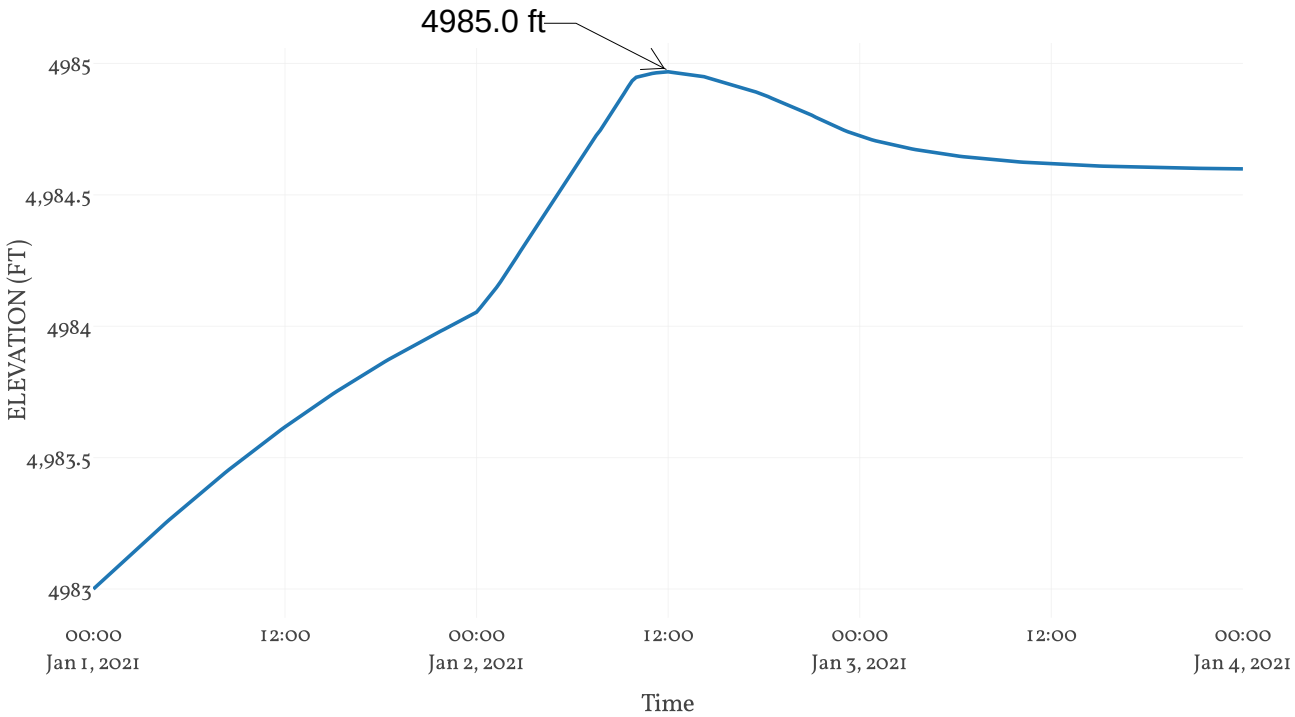
Outlet Spillway 1

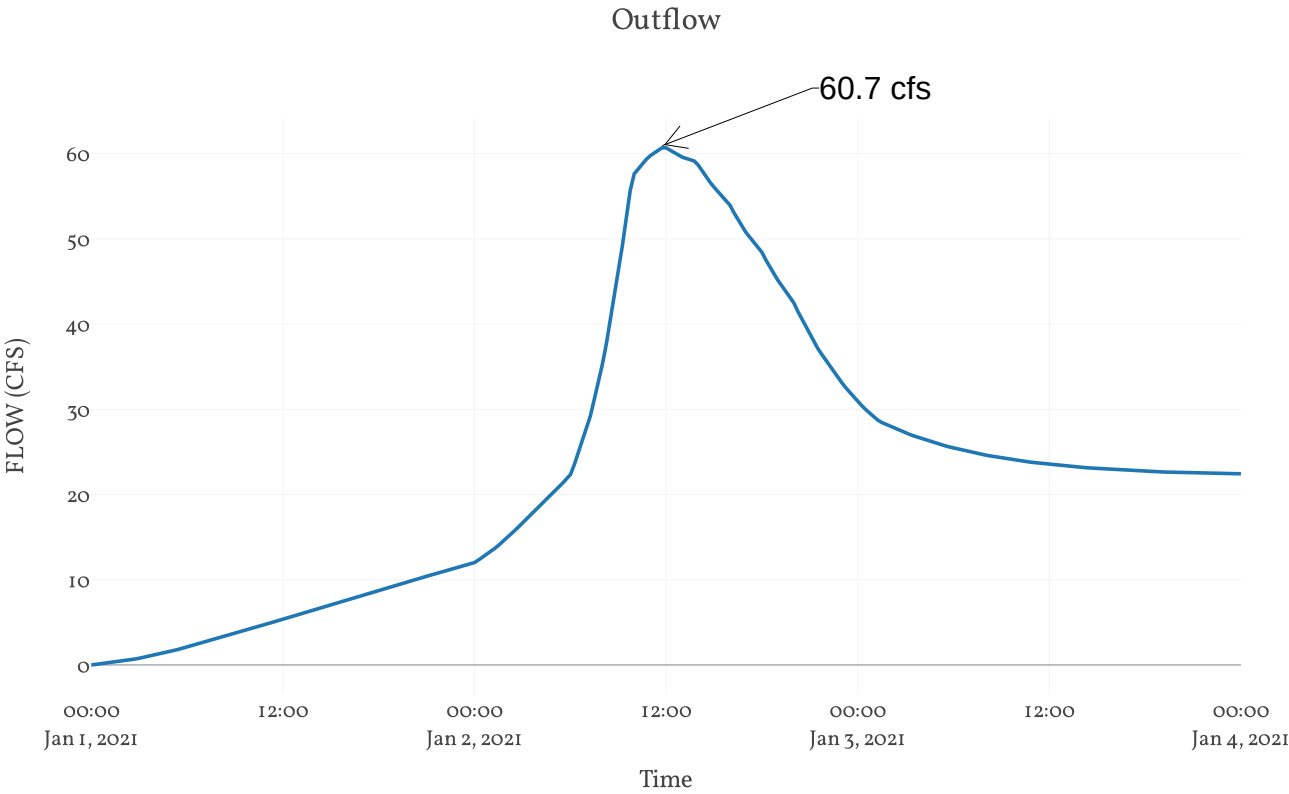


Outlet Spillway 2



Pool Elevation





Time	Hour	Spillway 1 Outflow	Spillway 2 Outflow	Combined Outflow	PMP Inflow	Baseflow Inflow	Combined Inflow	Reservoir Stage Storage	Storage
0:00	0	0	0	0	2.9	20.9	23.7	4983	0
0:15	0.25	0	0	0	3	20.9	23.9	4983	0.5
0:30	0.5	0.1	0	0.1	2.9	20.9	23.7	4983	1
0:45	0.75	0.1	0	0.1	3	20.9	23.9	4983	1.5
1:00	1	0.2	0	0.2	2.9	20.9	23.7	4983.1	2
1:15	1.25	0.2	0	0.2	3	20.9	23.9	4983.1	2.4
1:30	1.5	0.3	0	0.3	2.9	20.9	23.7	4983.1	2.9
1:45	1.75	0.3	0	0.3	3	20.9	23.9	4983.1	3.4
2:00	2	0.4	0	0.4	2.9	20.9	23.7	4983.1	3.9
2:15	2.25	0.5	0	0.5	3	20.9	23.9	4983.1	4.4
2:30	2.5	0.6	0	0.6	2.9	20.9	23.7	4983.1	4.9
2:45	2.75	0.7	0	0.7	3	20.9	23.9	4983.2	5.3
3:00	3	0.8	0	0.8	2.9	20.9	23.7	4983.2	5.8
3:15	3.25	0.8	0	0.8	3	20.9	23.9	4983.2	6.3
3:30	3.5	0.9	0	0.9	2.9	20.9	23.7	4983.2	6.8
3:45	3.75	1	0	1	3	20.9	23.9	4983.2	7.2
4:00	4	1.1	0	1.1	2.9	20.9	23.7	4983.2	7.7
4:15	4.25	1.2	0	1.2	3	20.9	23.9	4983.2	8.2
4:30	4.5	1.4	0	1.4	2.9	20.9	23.7	4983.2	8.6
4:45	4.75	1.5	0	1.5	3	20.9	23.9	4983.3	9.1
5:00	5	1.6	0	1.6	2.9	20.9	23.7	4983.3	9.6
5:15	5.25	1.7	0	1.7	3	20.9	23.9	4983.3	10
5:30	5.5	1.8	0	1.8	2.9	20.9	23.7	4983.3	10.5
5:45	5.75	1.9	0	1.9	3	20.9	23.9	4983.3	10.9
6:00	6	2	0	2	2.9	20.9	23.7	4983.3	11.4
6:15	6.25	2.2	0	2.2	2.9	20.9	23.7	4983.3	11.8
6:30	6.5	2.3	0	2.3	3	20.9	23.9	4983.4	12.3
6:45	6.75	2.4	0	2.4	2.9	20.9	23.7	4983.4	12.7
7:00	7	2.5	0	2.5	3	20.9	23.9	4983.4	13.2
7:15	7.25	2.6	0	2.6	2.9	20.9	23.7	4983.4	13.6
7:30	7.5	2.8	0	2.8	3	20.9	23.9	4983.4	14
7:45	7.75	2.9	0	2.9	2.9	20.9	23.7	4983.4	14.5
8:00	8	3	0	3	3	20.9	23.9	4983.4	14.9
8:15	8.25	3.2	0	3.2	2.9	20.9	23.7	4983.4	15.3
8:30	8.5	3.3	0	3.3	3	20.9	23.9	4983.5	15.8
8:45	8.75	3.4	0	3.4	2.9	20.9	23.7	4983.5	16.2
9:00	9	3.6	0	3.6	3	20.9	23.9	4983.5	16.6
9:15	9.25	3.7	0	3.7	2.9	20.9	23.7	4983.5	17
9:30	9.5	3.8	0	3.8	3	20.9	23.9	4983.5	17.4
9:45	9.75	4	0	4	2.9	20.9	23.7	4983.5	17.8
10:00	10	4.1	0	4.1	3	20.9	23.9	4983.5	18.3
10:15	10.25	4.2	0	4.2	2.9	20.9	23.7	4983.5	18.7
10:30	10.5	4.4	0	4.4	3	20.9	23.9	4983.5	19.1
10:45	10.75	4.5	0	4.5	2.9	20.9	23.7	4983.6	19.5
11:00	11	4.7	0	4.7	3	20.9	23.9	4983.6	19.9
11:15	11.25	4.8	0	4.8	2.9	20.9	23.7	4983.6	20.3
11:30	11.5	4.9	0	4.9	3	20.9	23.9	4983.6	20.6
11:45	11.75	5.1	0	5.1	2.9	20.9	23.7	4983.6	21
12:00	12	5.2	0	5.2	2.9	20.9	23.7	4983.6	21.4
12:15	12.25	5.3	0	5.3	3	20.9	23.9	4983.6	21.8
12:30	12.5	5.5	0	5.5	2.9	20.9	23.7	4983.6	22.2

Time	Hour	Spillway 1 Outflow	Spillway 2 Outflow	Combined Outflow	PMP Inflow	Baseflow Inflow	Combined Inflow	Reservoir Stage Storage	Storage
12:45	12.75	5.6	0	5.6	3	20.9	23.9	4983.6	22.6
13:00	13	5.8	0	5.8	2.9	20.9	23.7	4983.7	22.9
13:15	13.25	5.9	0	5.9	3	20.9	23.9	4983.7	23.3
13:30	13.5	6	0	6	2.9	20.9	23.7	4983.7	23.7
13:45	13.75	6.2	0	6.2	3	20.9	23.9	4983.7	24
14:00	14	6.3	0	6.3	2.9	20.9	23.7	4983.7	24.4
14:15	14.25	6.5	0	6.5	3	20.9	23.9	4983.7	24.8
14:30	14.5	6.6	0	6.6	2.9	20.9	23.7	4983.7	25.1
14:45	14.75	6.7	0	6.7	3	20.9	23.9	4983.7	25.5
15:00	15	6.9	0	6.9	2.9	20.9	23.7	4983.7	25.8
15:15	15.25	7	0	7	3	20.9	23.9	4983.7	26.2
15:30	15.5	7.2	0	7.2	2.9	20.9	23.7	4983.8	26.5
15:45	15.75	7.3	0	7.3	3	20.9	23.9	4983.8	26.9
16:00	16	7.4	0	7.4	2.9	20.9	23.7	4983.8	27.2
16:15	16.25	7.6	0	7.6	3	20.9	23.9	4983.8	27.5
16:30	16.5	7.7	0	7.7	2.9	20.9	23.7	4983.8	27.9
16:45	16.75	7.8	0	7.8	3	20.9	23.9	4983.8	28.2
17:00	17	8	0	8	2.9	20.9	23.7	4983.8	28.5
17:15	17.25	8.1	0	8.1	3	20.9	23.9	4983.8	28.9
17:30	17.5	8.3	0	8.3	2.9	20.9	23.7	4983.8	29.2
17:45	17.75	8.4	0	8.4	3	20.9	23.9	4983.8	29.5
18:00	18	8.5	0	8.5	2.9	20.9	23.7	4983.9	29.8
18:15	18.25	8.7	0	8.7	2.9	20.9	23.7	4983.9	30.1
18:30	18.5	8.8	0	8.8	3	20.9	23.9	4983.9	30.4
18:45	18.75	8.9	0	8.9	2.9	20.9	23.7	4983.9	30.8
19:00	19	9.1	0	9.1	3	20.9	23.9	4983.9	31.1
19:15	19.25	9.2	0	9.2	2.9	20.9	23.7	4983.9	31.4
19:30	19.5	9.3	0	9.3	3	20.9	23.9	4983.9	31.7
19:45	19.75	9.5	0	9.5	2.9	20.9	23.7	4983.9	32
20:00	20	9.6	0	9.6	3	20.9	23.9	4983.9	32.3
20:15	20.25	9.7	0	9.7	2.9	20.9	23.7	4983.9	32.5
20:30	20.5	9.9	0	9.9	3	20.9	23.9	4983.9	32.8
20:45	20.75	10	0	10	2.9	20.9	23.7	4983.9	33.1
21:00	21	10.1	0	10.1	3	20.9	23.9	4984	33.4
21:15	21.25	10.2	0	10.2	2.9	20.9	23.7	4984	33.7
21:30	21.5	10.4	0	10.4	3	20.9	23.9	4984	34
21:45	21.75	10.5	0	10.5	2.9	20.9	23.7	4984	34.2
22:00	22	10.6	0	10.6	3	20.9	23.9	4984	34.5
22:15	22.25	10.7	0	10.7	2.9	20.9	23.7	4984	34.8
22:30	22.5	10.9	0	10.9	3	20.9	23.9	4984	35.1
22:45	22.75	11	0	11	2.9	20.9	23.7	4984	35.3
23:00	23	11.1	0	11.1	3	20.9	23.9	4984	35.6
23:15	23.25	11.2	0	11.2	2.9	20.9	23.7	4984	35.9
23:30	23.5	11.4	0	11.4	3	20.9	23.9	4984	36.1
23:45	23.75	11.5	0	11.5	2.9	20.9	23.7	4984	36.4
0:00	24	11.7	0	11.7	20	20.9	40.9	4984.1	36.8
0:15	24.25	12	0	12	20.3	20.9	41.2	4984.1	37.4
0:30	24.5	12.2	0	12.2	20	20.9	40.9	4984.1	38
0:45	24.75	12.5	0	12.5	20.3	20.9	41.2	4984.1	38.6
1:00	25	12.9	0	12.9	27.1	20.9	48	4984.1	39.3
1:15	25.25	13.2	0	13.2	27.5	20.9	48.4	4984.1	40

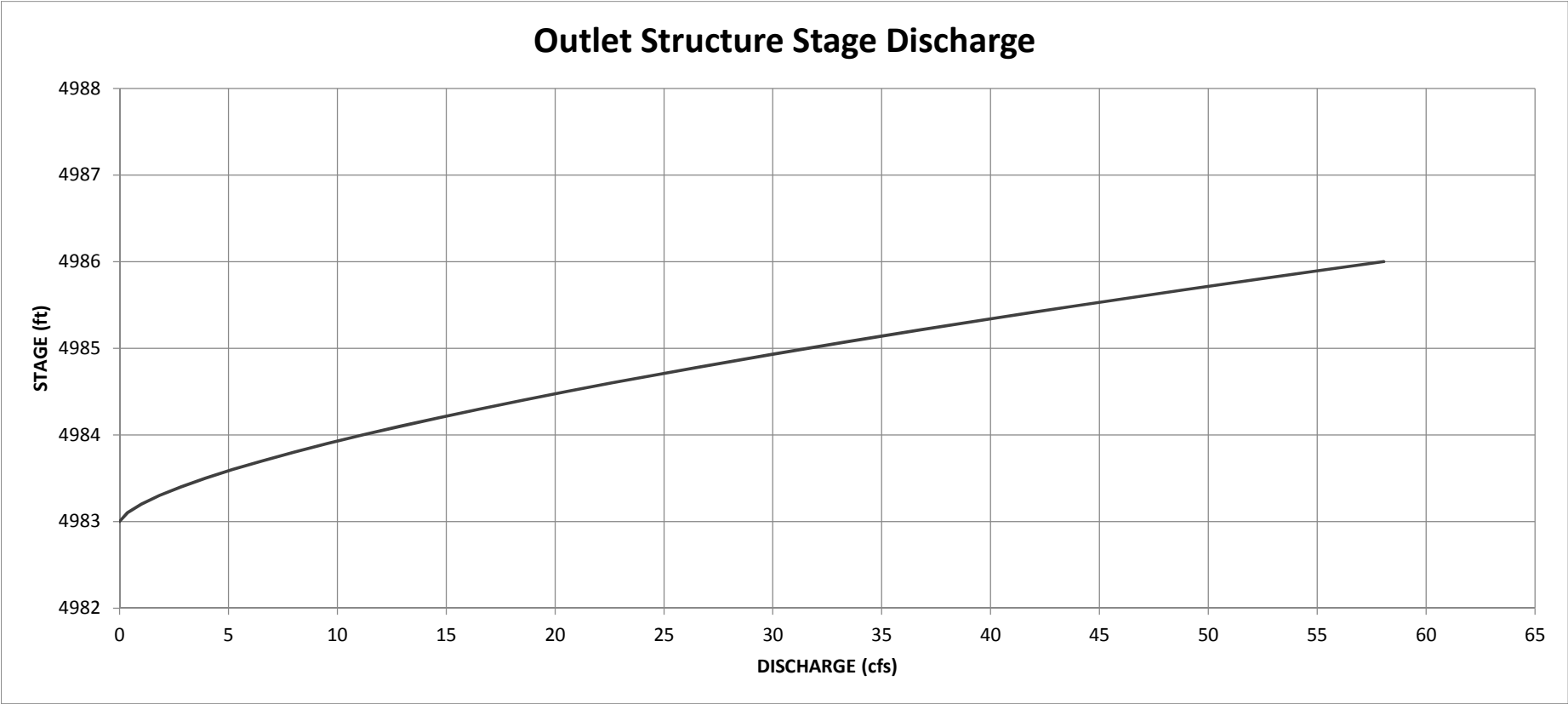
Time	Hour	Spillway 1 Outflow	Spillway 2 Outflow	Combined Outflow	PMP Inflow	Baseflow Inflow	Combined Inflow	Reservoir Stage Storage	Storage
1:30	25.5	13.6	0	13.6	27.5	20.9	48.4	4984.2	40.7
1:45	25.75	13.9	0	13.9	27.7	20.9	48.6	4984.2	41.4
2:00	26	14.3	0	14.3	33.6	20.9	54.4	4984.2	42.2
2:15	26.25	14.7	0	14.7	33.6	20.9	54.4	4984.2	43
2:30	26.5	15.2	0	15.2	33.6	20.9	54.4	4984.3	43.8
2:45	26.75	15.6	0	15.6	33.6	20.9	54.4	4984.3	44.6
3:00	27	16	0	16	33.6	20.9	54.4	4984.3	45.4
3:15	27.25	16.4	0	16.4	33.6	20.9	54.4	4984.3	46.2
3:30	27.5	16.8	0	16.8	33.4	20.9	54.3	4984.3	47
3:45	27.75	17.2	0	17.2	33.6	20.9	54.4	4984.4	47.8
4:00	28	17.7	0	17.7	34.5	20.9	55.4	4984.4	48.6
4:15	28.25	18.1	0	18.1	34.3	20.9	55.2	4984.4	49.3
4:30	28.5	18.5	0	18.5	34.3	20.9	55.2	4984.4	50.1
4:45	28.75	18.9	0	18.9	34.8	20.9	55.7	4984.5	50.9
5:00	29	19.4	0	19.4	40.2	20.9	61.1	4984.5	51.7
5:15	29.25	19.8	0	19.8	40.2	20.9	61.1	4984.5	52.5
5:30	29.5	20.3	0	20.3	40.2	20.9	61.1	4984.5	53.4
5:45	29.75	20.8	0	20.8	40.3	20.9	61.2	4984.5	54.2
6:00	30	21.3	0	21.3	40.3	20.9	61.2	4984.6	55
6:15	30.25	21.7	0	21.7	40.3	20.9	61.2	4984.6	55.9
6:30	30.5	22.2	0.6	22.8	40	20.9	60.9	4984.6	56.7
6:45	30.75	22.7	1.5	24.1	40.3	20.9	61.2	4984.6	57.4
7:00	31	23.1	2.3	25.4	41.4	20.9	62.3	4984.7	58.2
7:15	31.25	23.6	3.2	26.7	41.2	20.9	62.1	4984.7	58.9
7:30	31.5	24	4	28	41.1	20.9	62	4984.7	59.7
7:45	31.75	24.4	5.4	29.8	41.7	20.9	62.6	4984.7	60.4
8:00	32	24.9	7.1	32	53.9	20.9	74.8	4984.7	61.1
8:15	32.25	25.4	8.9	34.3	53.6	20.9	74.5	4984.8	62
8:30	32.5	25.9	10.7	36.6	53.7	20.9	74.6	4984.8	62.8
8:45	32.75	26.4	12.5	38.9	53.6	20.9	74.5	4984.8	63.6
9:00	33	26.9	14.9	41.8	67.1	20.9	88	4984.8	64.4
9:15	33.25	27.5	17.6	45	67.1	20.9	88	4984.9	65.3
9:30	33.5	28	20	48	67.1	20.9	88	4984.9	66.2
9:45	33.75	28.5	22.4	50.9	67.1	20.9	88	4984.9	67
10:00	34	28.8	24.1	52.9	42.3	20.9	63.2	4984.9	67.5
10:15	34.25	28.9	24.8	53.7	41.1	20.9	62	4984.9	67.7
10:30	34.5	29	25.3	54.4	41.1	20.9	62	4984.9	67.8
10:45	34.75	29.1	25.9	55	41.4	20.9	62.3	4984.9	68
11:00	35	29.2	26.3	55.5	40.3	20.9	61.2	4984.9	68.1
11:15	35.25	29.3	26.7	56	40	20.9	60.9	4984.9	68.2
11:30	35.5	29.4	27.1	56.4	40.3	20.9	61.2	4984.9	68.3
11:45	35.75	29.4	27.4	56.8	40.3	20.9	61.2	4984.9	68.4
12:00	36	29.4	27.5	56.9	33.6	20.9	54.4	4984.9	68.4
12:15	36.25	29.4	27.3	56.7	33.6	20.9	54.4	4984.9	68.4
12:30	36.5	29.4	27.1	56.5	33.6	20.9	54.4	4984.9	68.3
12:45	36.75	29.3	27	56.3	33.6	20.9	54.4	4984.9	68.3
13:00	37	29.3	26.9	56.2	34.3	20.9	55.2	4984.9	68.3
13:15	37.25	29.3	26.8	56.1	34.5	20.9	55.4	4984.9	68.3
13:30	37.5	29.3	26.8	56.1	34.3	20.9	55.2	4984.9	68.2
13:45	37.75	29.3	26.7	56	34	20.9	54.9	4984.9	68.2
14:00	38	29.2	26.4	55.6	26.8	20.9	47.7	4984.9	68.1

Time	Hour	Spillway 1 Outflow	Spillway 2 Outflow	Combined Outflow	PMP Inflow	Baseflow Inflow	Combined Inflow	Reservoir Stage Storage	Storage
14:15	38.25	29.1	25.8	55	27.1	20.9	48	4984.9	68
14:30	38.5	29	25.4	54.4	26.8	20.9	47.7	4984.9	67.8
14:45	38.75	29	24.9	53.8	26.8	20.9	47.7	4984.9	67.7
15:00	39	28.9	24.5	53.3	26.8	20.9	47.7	4984.9	67.6
15:15	39.25	28.8	24.1	52.9	26.8	20.9	47.7	4984.9	67.5
15:30	39.5	28.7	23.7	52.5	27.1	20.9	48	4984.9	67.4
15:45	39.75	28.7	23.4	52.1	26.8	20.9	47.7	4984.9	67.3
16:00	40	28.6	22.9	51.5	20.8	20.9	41.7	4984.9	67.1
16:15	40.25	28.5	22.2	50.7	20.6	20.9	41.5	4984.9	66.9
16:30	40.5	28.3	21.6	49.9	20.6	20.9	41.5	4984.9	66.7
16:45	40.75	28.2	21.1	49.4	20.5	20.9	41.4	4984.9	66.6
17:00	41	28.1	20.7	48.8	20.3	20.9	41.2	4984.9	66.4
17:15	41.25	28	20.2	48.3	20	20.9	40.9	4984.9	66.3
17:30	41.5	28	19.8	47.8	20.3	20.9	41.2	4984.9	66.1
17:45	41.75	27.9	19.4	47.3	20	20.9	40.9	4984.9	66
18:00	42	27.7	18.9	46.6	13.5	20.9	34.4	4984.9	65.8
18:15	42.25	27.6	18.2	45.8	13.2	20.9	34.1	4984.9	65.5
18:30	42.5	27.5	17.5	45	13.5	20.9	34.4	4984.9	65.3
18:45	42.75	27.3	16.9	44.2	13.2	20.9	34.1	4984.9	65.1
19:00	43	27.2	16.4	43.6	13.9	20.9	34.7	4984.8	64.9
19:15	43.25	27.1	15.9	43	13.9	20.9	34.7	4984.8	64.7
19:30	43.5	27	15.4	42.4	13.7	20.9	34.6	4984.8	64.6
19:45	43.75	26.9	15	41.8	13.5	20.9	34.4	4984.8	64.4
20:00	44	26.8	14.3	41.1	6.8	20.9	27.7	4984.8	64.2
20:15	44.25	26.6	13.6	40.2	6.5	20.9	27.4	4984.8	63.9
20:30	44.5	26.4	12.9	39.3	6.8	20.9	27.7	4984.8	63.7
20:45	44.75	26.3	12.2	38.5	6.8	20.9	27.7	4984.8	63.4
21:00	45	26.1	11.5	37.6	3.3	20.9	24.2	4984.8	63.2
21:15	45.25	26	10.9	36.9	3.5	20.9	24.3	4984.8	62.9
21:30	45.5	25.8	10.4	36.2	3.3	20.9	24.2	4984.8	62.7
21:45	45.75	25.7	9.9	35.5	3.5	20.9	24.3	4984.8	62.4
22:00	46	25.5	9.4	34.9	2	20.9	22.8	4984.8	62.2
22:15	46.25	25.4	8.8	34.2	2.1	20.9	23	4984.8	61.9
22:30	46.5	25.2	8.4	33.6	2.1	20.9	23	4984.8	61.7
22:45	46.75	25.1	7.9	33	2	20.9	22.8	4984.8	61.5
23:00	47	25	7.5	32.4	1.4	20.9	22.2	4984.7	61.3
23:15	47.25	24.8	7	31.9	1.4	20.9	22.2	4984.7	61.1
23:30	47.5	24.7	6.6	31.3	1.4	20.9	22.2	4984.7	60.9
23:45	47.75	24.6	6.2	30.8	1.4	20.9	22.2	4984.7	60.7
0:00	48	24.5	5.8	30.4	1.2	20.9	22.1	4984.7	60.5
0:15	48.25	24.4	5.5	29.9	1.2	20.9	22.1	4984.7	60.4
0:30	48.5	24.3	5.1	29.5	1.1	20.9	21.9	4984.7	60.2
0:45	48.75	24.2	4.8	29	1.2	20.9	22.1	4984.7	60.1
1:00	49	24.1	4.5	28.7	1.2	20.9	22.1	4984.7	59.9
1:15	49.25	24.1	4.2	28.3	1.2	20.9	22.1	4984.7	59.8
1:30	49.5	24	4	28	1.2	20.9	22.1	4984.7	59.7
1:45	49.75	23.9	3.9	27.8	1.2	20.9	22.1	4984.7	59.5
2:00	50	23.8	3.7	27.6	1.1	20.9	21.9	4984.7	59.4
2:15	50.25	23.8	3.6	27.4	1.2	20.9	22.1	4984.7	59.3
2:30	50.5	23.7	3.5	27.2	1.2	20.9	22.1	4984.7	59.2
2:45	50.75	23.7	3.4	27	1.2	20.9	22.1	4984.7	59.1

Time	Hour	Spillway 1 Outflow	Spillway 2 Outflow	Combined Outflow	PMP Inflow	Baseflow Inflow	Combined Inflow	Reservoir Stage Storage	Storage
3:00	51	23.6	3.2	26.8	1.2	20.9	22.1	4984.7	59
3:15	51.25	23.5	3.1	26.7	1.1	20.9	21.9	4984.7	58.9
3:30	51.5	23.5	3	26.5	1.2	20.9	22.1	4984.7	58.8
3:45	51.75	23.4	2.9	26.3	1.2	20.9	22.1	4984.7	58.7
4:00	52	23.4	2.8	26.2	1.2	20.9	22.1	4984.7	58.6
4:15	52.25	23.3	2.7	26.1	1.2	20.9	22.1	4984.7	58.6
4:30	52.5	23.3	2.6	25.9	1.1	20.9	21.9	4984.7	58.5
4:45	52.75	23.2	2.5	25.8	1.2	20.9	22.1	4984.7	58.4
5:00	53	23.2	2.5	25.7	1.2	20.9	22.1	4984.7	58.3
5:15	53.25	23.1	2.4	25.5	1.2	20.9	22.1	4984.7	58.2
5:30	53.5	23.1	2.3	25.4	1.2	20.9	22.1	4984.7	58.2
5:45	53.75	23.1	2.2	25.3	1.2	20.9	22.1	4984.7	58.1
6:00	54	23	2.2	25.2	1.1	20.9	21.9	4984.7	58
6:15	54.25	23	2.1	25.1	1.2	20.9	22.1	4984.7	58
6:30	54.5	23	2	25	1.2	20.9	22.1	4984.7	57.9
6:45	54.75	22.9	1.9	24.9	1.2	20.9	22.1	4984.6	57.9
7:00	55	22.9	1.9	24.8	1.2	20.9	22.1	4984.6	57.8
7:15	55.25	22.9	1.8	24.7	1.1	20.9	21.9	4984.6	57.7
7:30	55.5	22.8	1.8	24.6	1.2	20.9	22.1	4984.6	57.7
7:45	55.75	22.8	1.7	24.5	1.2	20.9	22.1	4984.6	57.6
8:00	56	22.8	1.6	24.4	1.2	20.9	22.1	4984.6	57.6
8:15	56.25	22.7	1.6	24.3	1.2	20.9	22.1	4984.6	57.5
8:30	56.5	22.7	1.5	24.2	1.1	20.9	21.9	4984.6	57.5
8:45	56.75	22.7	1.5	24.2	1.2	20.9	22.1	4984.6	57.5
9:00	57	22.7	1.4	24.1	1.2	20.9	22.1	4984.6	57.4
9:15	57.25	22.6	1.4	24	1.2	20.9	22.1	4984.6	57.4
9:30	57.5	22.6	1.3	24	1.2	20.9	22.1	4984.6	57.3
9:45	57.75	22.6	1.3	23.9	1.2	20.9	22.1	4984.6	57.3
10:00	58	22.6	1.3	23.8	1.1	20.9	21.9	4984.6	57.3
10:15	58.25	22.5	1.2	23.8	1.2	20.9	22.1	4984.6	57.2
10:30	58.5	22.5	1.2	23.7	1.2	20.9	22.1	4984.6	57.2
10:45	58.75	22.5	1.1	23.6	1.2	20.9	22.1	4984.6	57.2
11:00	59	22.5	1.1	23.6	1.2	20.9	22.1	4984.6	57.1
11:15	59.25	22.5	1.1	23.5	1.1	20.9	21.9	4984.6	57.1
11:30	59.5	22.4	1	23.5	1.2	20.9	22.1	4984.6	57.1
11:45	59.75	22.4	1	23.4	1.2	20.9	22.1	4984.6	57
12:00	60	22.4	1	23.4	1.2	20.9	22.1	4984.6	57
12:15	60.25	22.4	0.9	23.3	1.2	20.9	22.1	4984.6	57
12:30	60.5	22.4	0.9	23.3	1.1	20.9	21.9	4984.6	56.9
12:45	60.75	22.4	0.9	23.2	1.2	20.9	22.1	4984.6	56.9
13:00	61	22.4	0.9	23.2	1.2	20.9	22.1	4984.6	56.9
13:15	61.25	22.3	0.8	23.2	1.2	20.9	22.1	4984.6	56.9
13:30	61.5	22.3	0.8	23.1	1.2	20.9	22.1	4984.6	56.9
13:45	61.75	22.3	0.8	23.1	1.2	20.9	22.1	4984.6	56.8
14:00	62	22.3	0.8	23.1	1.1	20.9	21.9	4984.6	56.8
14:15	62.25	22.3	0.7	23	1.2	20.9	22.1	4984.6	56.8
14:30	62.5	22.3	0.7	23	1.2	20.9	22.1	4984.6	56.8
14:45	62.75	22.3	0.7	23	1.2	20.9	22.1	4984.6	56.8
15:00	63	22.3	0.7	22.9	1.2	20.9	22.1	4984.6	56.7
15:15	63.25	22.2	0.7	22.9	1.1	20.9	21.9	4984.6	56.7
15:30	63.5	22.2	0.6	22.9	1.2	20.9	22.1	4984.6	56.7

Time	Hour	Spillway 1 Outflow	Spillway 2 Outflow	Combined Outflow	PMP Inflow	Baseflow Inflow	Combined Inflow	Reservoir Stage Storage	Storage
15:45	63.75	22.2	0.6	22.8	1.2	20.9	22.1	4984.6	56.7
16:00	64	22.2	0.6	22.8	1.2	20.9	22.1	4984.6	56.7
16:15	64.25	22.2	0.6	22.8	1.2	20.9	22.1	4984.6	56.7
16:30	64.5	22.2	0.6	22.8	1.1	20.9	21.9	4984.6	56.6
16:45	64.75	22.2	0.5	22.7	1.2	20.9	22.1	4984.6	56.6
17:00	65	22.2	0.5	22.7	1.2	20.9	22.1	4984.6	56.6
17:15	65.25	22.2	0.5	22.7	1.2	20.9	22.1	4984.6	56.6
17:30	65.5	22.2	0.5	22.7	1.2	20.9	22.1	4984.6	56.6
17:45	65.75	22.2	0.5	22.6	1.2	20.9	22.1	4984.6	56.6
18:00	66	22.1	0.5	22.6	1.1	20.9	21.9	4984.6	56.6
18:15	66.25	22.1	0.5	22.6	1.2	20.9	22.1	4984.6	56.5
18:30	66.5	22.1	0.4	22.6	1.2	20.9	22.1	4984.6	56.5
18:45	66.75	22.1	0.4	22.6	1.2	20.9	22.1	4984.6	56.5
19:00	67	22.1	0.4	22.5	1.2	20.9	22.1	4984.6	56.5
19:15	67.25	22.1	0.4	22.5	1.1	20.9	21.9	4984.6	56.5
19:30	67.5	22.1	0.4	22.5	1.2	20.9	22.1	4984.6	56.5
19:45	67.75	22.1	0.4	22.5	1.2	20.9	22.1	4984.6	56.5
20:00	68	22.1	0.4	22.5	1.2	20.9	22.1	4984.6	56.5
20:15	68.25	22.1	0.4	22.5	1.2	20.9	22.1	4984.6	56.5
20:30	68.5	22.1	0.4	22.5	1.1	20.9	21.9	4984.6	56.5
20:45	68.75	22.1	0.4	22.4	1.2	20.9	22.1	4984.6	56.4
21:00	69	22.1	0.3	22.4	1.2	20.9	22.1	4984.6	56.4
21:15	69.25	22.1	0.3	22.4	1.2	20.9	22.1	4984.6	56.4
21:30	69.5	22.1	0.3	22.4	1.2	20.9	22.1	4984.6	56.4
21:45	69.75	22.1	0.3	22.4	1.2	20.9	22.1	4984.6	56.4
22:00	70	22.1	0.3	22.4	1.1	20.9	21.9	4984.6	56.4
22:15	70.25	22.1	0.3	22.4	1.2	20.9	22.1	4984.6	56.4
22:30	70.5	22.1	0.3	22.4	1.2	20.9	22.1	4984.6	56.4
22:45	70.75	22.1	0.3	22.3	1.2	20.9	22.1	4984.6	56.4
23:00	71	22.1	0.3	22.3	1.2	20.9	22.1	4984.6	56.4
23:15	71.25	22	0.3	22.3	1.1	20.9	21.9	4984.6	56.4
23:30	71.5	22	0.3	22.3	1.2	20.9	22.1	4984.6	56.4
23:45	71.75	22	0.3	22.3	1.2	20.9	22.1	4984.6	56.4
0:00	72	22	0.3	22.3	1.2	20.9	22.1	4984.6	56.4

Appendix E. Stage Discharge

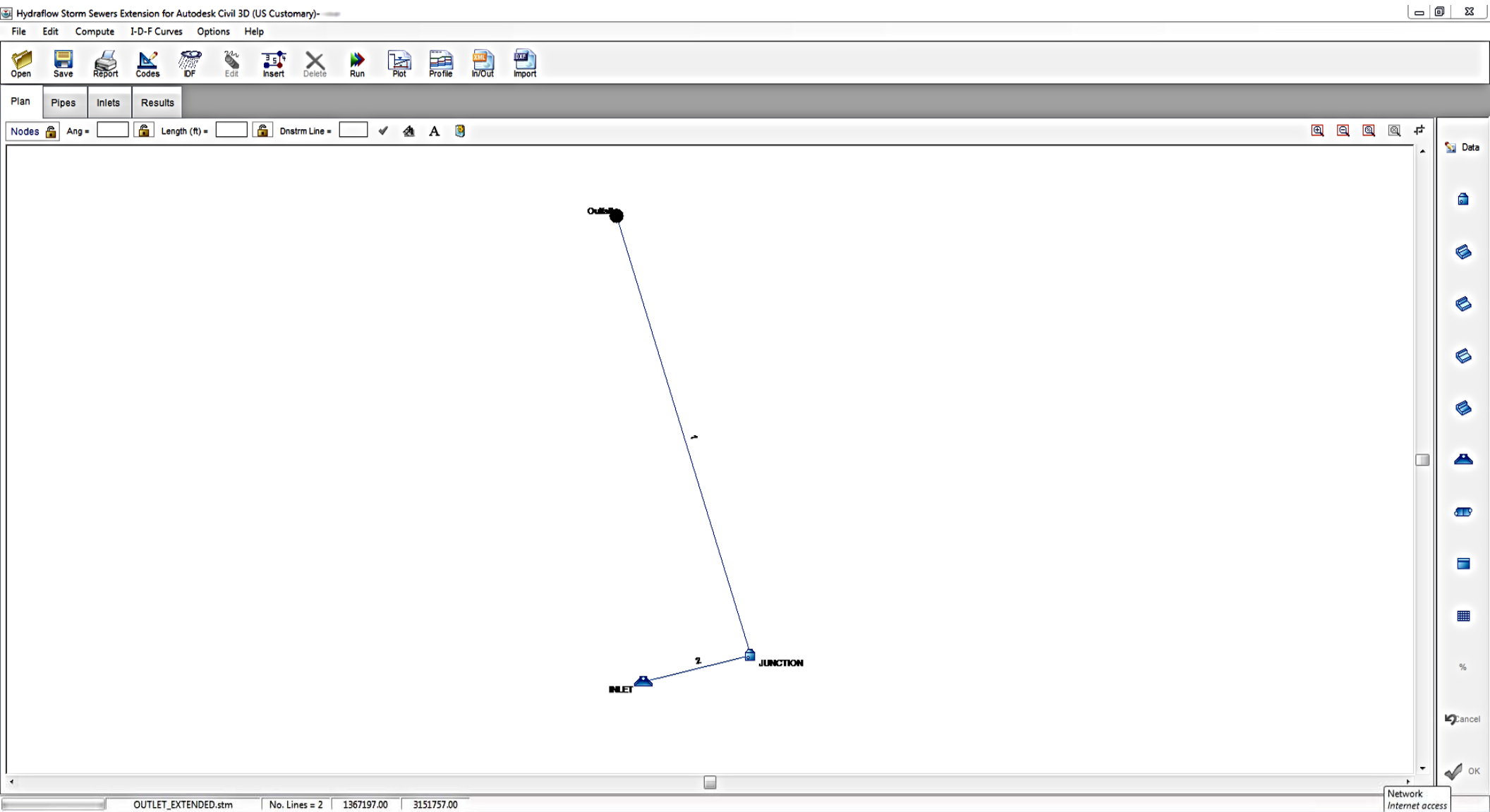


20 Inch Wide Weir Discharge Table

Stage (ft)	Depth (ft)	Q (cfs)	A (sqft)
4983	0	0.000	0
4983.1	0.1	0.175	0.17
4983.2	0.2	0.496	0.33
4983.3	0.3	0.912	0.5
4983.4	0.4	1.404	0.67
4983.5	0.5	1.962	0.83
4983.6	0.6	2.579	1
4983.7	0.7	3.25	1.17
4983.8	0.8	3.971	1.33
4983.9	0.9	4.738	1.5
4984	1	5.55	1.67
4984.1	1.1	6.403	1.83
4984.2	1.2	7.295	2
4984.3	1.3	8.226	2.17
4984.4	1.4	9.193	2.33
4984.5	1.5	10.2	2.5
4984.6	1.6	11.23	2.67
4984.7	1.7	12.3	2.83
4984.8	1.8	13.4	3
4984.9	1.9	14.53	3.17
4985	2	15.7	3.33
4985.1	2.1	16.89	3.5
4985.2	2.2	18.11	3.67
4985.3	2.3	19.36	3.83
4985.4	2.4	20.63	4
4985.5	2.5	21.94	4.17
4985.6	2.6	23.27	4.33
4985.7	2.7	24.62	4.5
4985.8	2.8	26	4.67
4985.9	2.9	27.41	4.83
4986	3	28.84	5

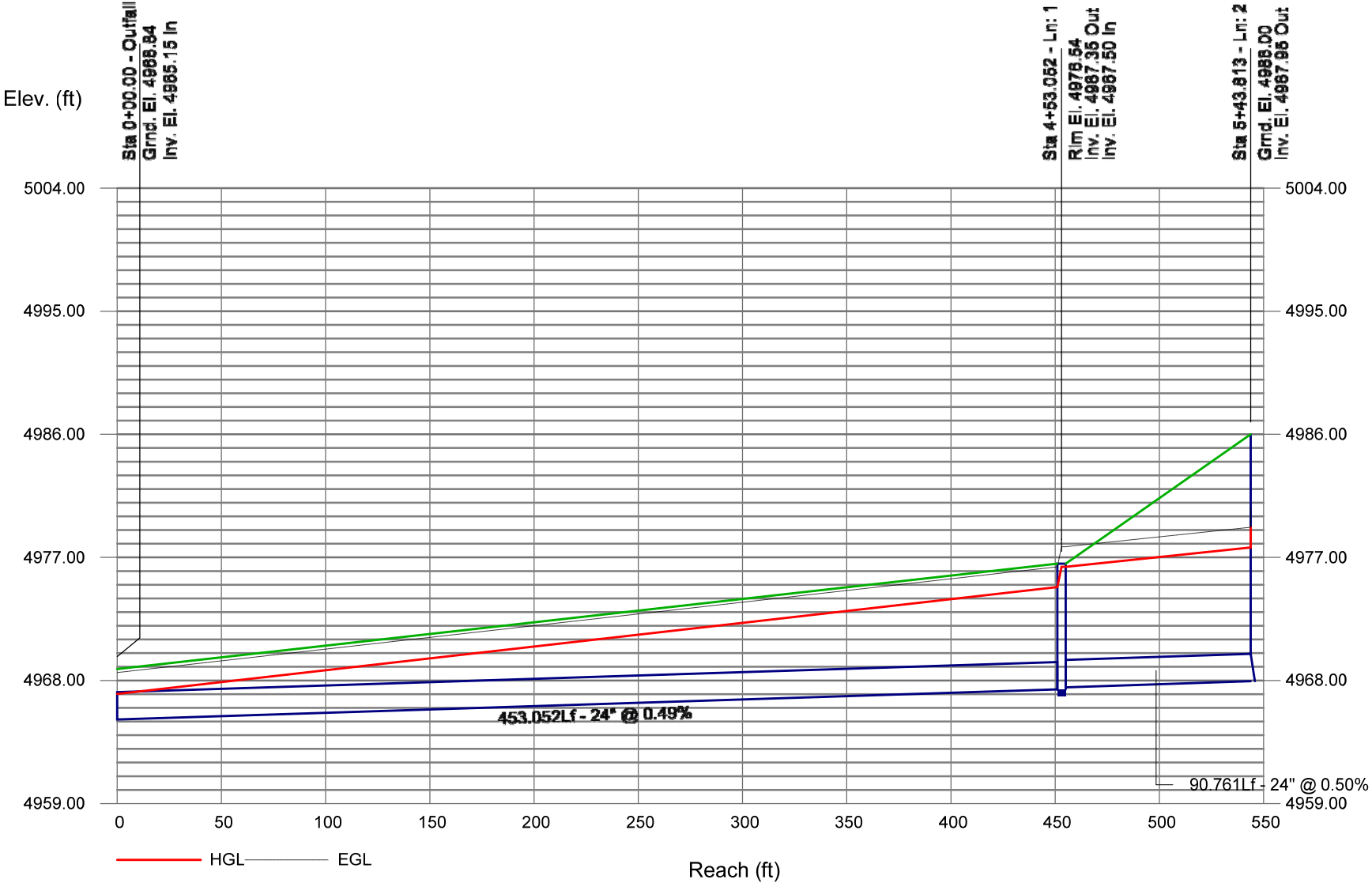
40 Foot Wide Weir Discharge Table			
Stage (ft)	Depth (ft)	Q (cfs)	A (sqft)
4984.6	0	0.000	0
4984.7	0.1	4.000	4.1
4984.8	0.2	11.535	8.4
4984.9	0.3	21.598	12.9
4985	0.4	33.879	17.6
4985.1	0.5	48.225	22.5
4985.2	0.6	64.546	27.6
4985.3	0.7	82.789	32.9
4985.4	0.8	102.924	38.4
4985.5	0.9	124.930	44.1
4985.6	1	148.800	50
4985.7	1.1	174.530	56.1
4985.8	1.2	202.123	62.4
4985.9	1.3	231.583	68.9
4986	1.4	262.920	75.6

Appendix F. Storm Sewer Calculations



Storm Sewer Profile

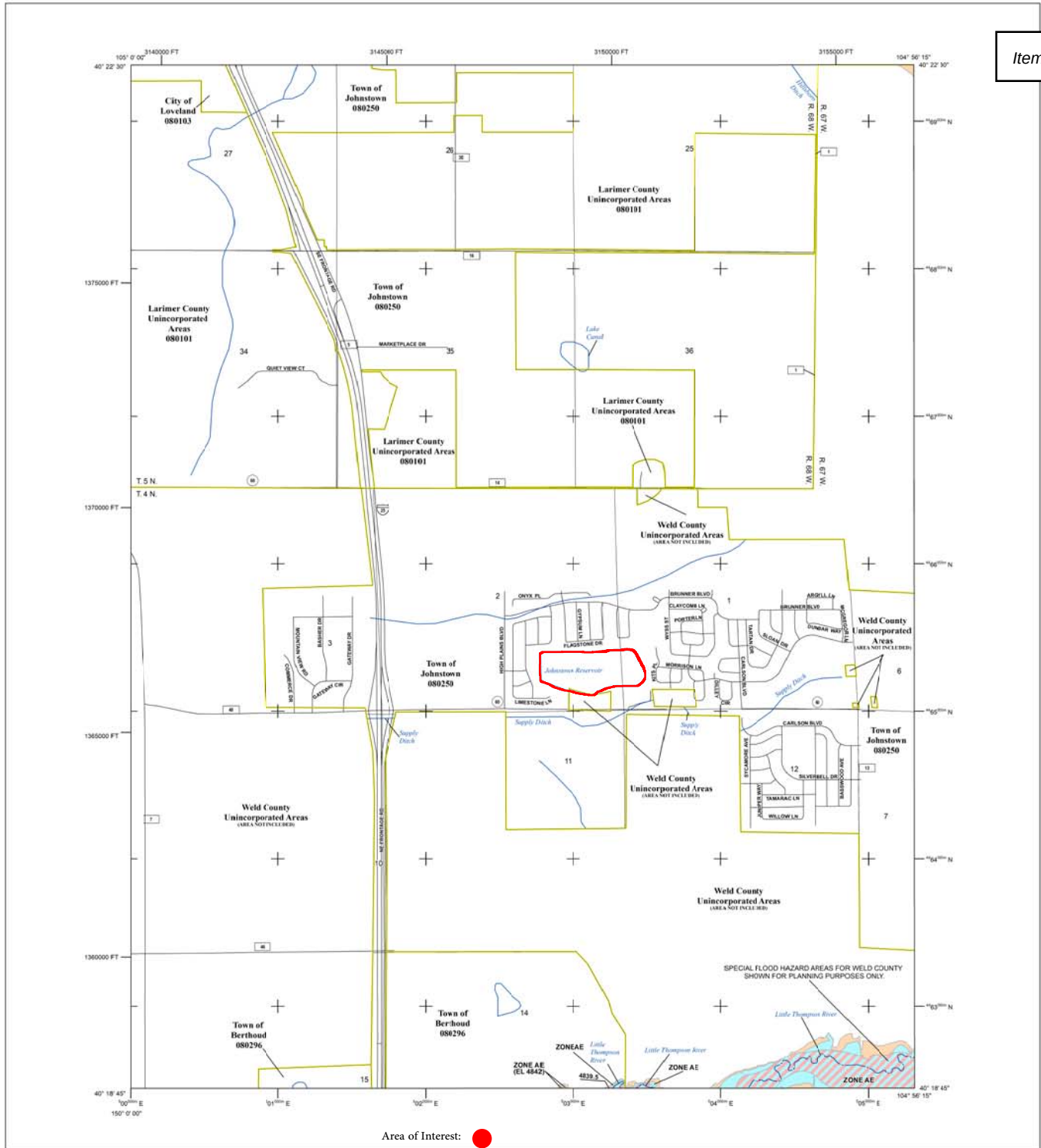
Item #13.



Line No.	Line ID	Flow Rate	Line Size (Rise x Span)	Line Type	Line Length	Invert Elev. Down	Invert Elev. Up	Line Slope	HGL Down	HGL Up	Minor Loss
		(cfs)	(in)		(ft)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)
1	Pipe - (4)	30.60	24	Cir	453.052	4965.15	4967.35	0.49	4967.02	4974.83*	1.48
2	Pipe - (3)	30.60	24	Cir	90.761	4967.50	4967.95	0.50	4976.31	4977.73*	1.48
Notes: *Surcharged (HGL above crown).											

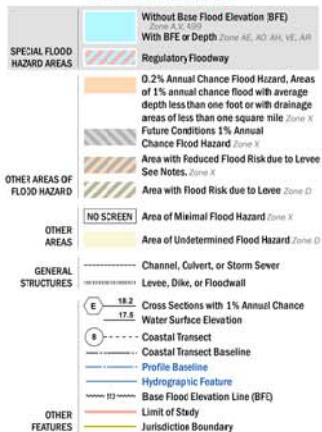
[illegible]

Appendix G. FEMA Floodplain



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)



NOTES TO USERS

For information and questions about the Flood Insurance Rate Map (FIRM), available products associated with the FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information Exchange at 1-877-FEMA-8468 (1-877-366-8468) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously released Letters of Map Change, Flood Insurance Study Report, and/or digital versions of this map. Any of these products can be ordered or obtained directly from the website.

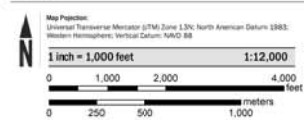
Communities receiving aid on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM notes. These may be obtained directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-658-6620.

Base map information shown on the FIRM was derived from the National Flood Hazard Layer (NFHL), dated 2013 and digital data provided by Larimer County GIS Department, dated 2015.

SCALE



PANEL LOCATOR



FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

LARIMER COUNTY, COLORADO
and Incorporated Areas

PANEL 1405 or 1420

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
BERTHOLD, TOWN OF	080296	1405	G
JOHNSTOWN, TOWN OF	080250	1405	G
LOVELAND, CITY OF	080103	1405	G
LARIMER COUNTY	080101	1405	G

VERSION NUMBER
2.5

MAP NUMBER
08069C1405

MAP REVISION
JANUARY 15, 2021

Appendix H. Geotechnical Report



GEOTECHNICAL EVALUATION

Johnstown Reservoir Outlet Structure
Weld County, Colorado



Report Prepared for:

**J.C. York, P.E.
J&T Consulting, Inc.
305 Denver Avenue, Suite D
Fort Lupton, CO 80621**

**Project No. 20.3062
February 19, 2021**

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GEOTECHNICAL EVALUATION

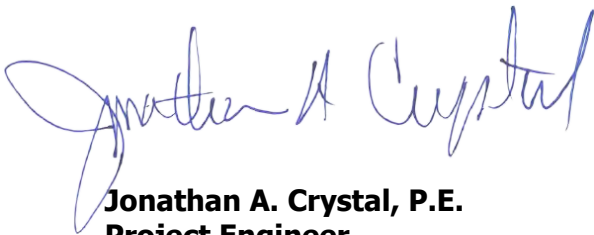
Johnstown Reservoir Outlet Structure
Weld County, Colorado

Report Prepared for:

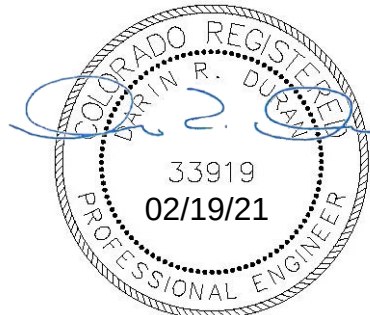
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**Project No. 20.3062
February 19, 2021**

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FIGURE

VICINITY MAP..... FIGURE 1

APPENDICES

FIELD EXPLORATION APPENDIX A
LABORATORY TESTING APPENDIX B
SLOPE STABILITY RESULTS APPENDIX C

COMMON ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ABC	aggregate base course
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
ADSC	Association of Drilled Contractors
AI	Asphalt Institute
APM	asphalt paving material
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
bgs	below ground surface
CDOT	Colorado Department of Transportation
CBR	California Bearing Ratio
CFR	Code of Federal Regulations
CGS	Colorado Geological Survey
CKD	cement of kiln dust stabilized subgrade
CMU	concrete masonry unit
CSEO	Colorado State Engineer's Office
CTB	cement treated base course
deg	degree
EDLA	equivalent daily load application
e_m	edge moisture variation distance
EPS	expanded polystyrene
ESAL	equivalent single axle loads
f'_c	specified compressive strength of concrete at the age of 28 days
F_a	seismic site coefficient
FHWA	Federal Highway Administration
FS	factor of safety
F_v	seismic site coefficient
GSA	global stability analysis
GVW	gross vehicle weight
IBC	International Building Code
ICC-ES	International Code Council Evaluation Services, Inc.
IRC	International Residential Code
kip	1,000 pounds-force
km	kilometer
LTS	lime treated subgrade
MDD	maximum dry density
mg/L	milligrams per liter
MGPEC	Metropolitan Government Pavement Engineers Council
mm	millimeter
M_r	resilient modulus
MSE	mechanically stabilized earth
mV	millivolts
NAPA	National Asphalt Pavement Association
N_{DESIGN}	design gyrations

OSHA Occupational Safety and Health Administration
OMC..... optimum moisture content
OWTS onsite wastewater treatment system
PCA..... Portland Cement Association
PCC..... portland cement concrete
pcf pounds per cubic foot
pci..... pounds per cubic inch
pH..... power of hydrogen
psf pounds per square foot
psi..... pounds per square inch
PT post-tension
RAP..... recycled asphalt pavement
S_s..... mapped spectral accelerations for short periods
UBC Uniform Building Code
USGS United States Geological Survey

1. PURPOSE

1.1 GENERAL

Cesare, Inc. (Cesare) completed a geotechnical evaluation of the outlet structure replacement location of the existing Johnstown Reservoir in Weld County, Colorado. The purpose of the project is to replace the existing outlet structure due to leakage in the fall of 2020.

1.2 SCOPE OF SERVICES

Cesare's proposed scope of services is detailed in Cesare's Proposal Agreement No. F201001.

2. SUMMARY OF FINDINGS AND CONCLUSIONS

This section is intended as a summary only and does not include design details. The report should be read in its entirety and utilized for design.

- C Cesare encountered a surface layer of granular material about 1 foot thick, which was likely base course used for a travel surface on the dam. Below the base course, the borings encountered about 8 to 16 feet of fill overlying weathered claystone in Borings B-1, B-2, and B-4 or native clays in Boring B-3. Claystone bedrock was encountered below the weathered claystone and clays at a depth of about 23 feet in B-1, B-2, and B-3 and 13 feet in B-4, extending to the remaining depths explored. A zone of about 1 foot of granular material was encountered in B-4 at a depth of about 9 feet, directly overlying the weathered claystone. The granular material may be pipe or structure bedding.
- C The embankment is over 100 years old and little is known of its design or construction.
- C The new outlet is anticipated to be a cast iron pipe (CIP) encased in concrete bearing on undisturbed competent claystone bedrock.

3. RESERVOIR HISTORY

Cesare understands the reservoir is on the order of 100 years old. Little is known of its design or construction. A new outlet was constructed in about 1952 for emergency discharge. Design documents for the new outlet were available; however, as-built documents were not available. The outlet began leaking in the fall of 2020, requiring emergency repair of the outlet.

4. PROJECT DESCRIPTION

The project consists of open cut excavating through the existing embankment, removing the existing outlet works, and constructing a more vigorous outlet structure. In addition, the repair will include localized grading to direct ponded water to the outlet structure intake. The grading will require excavating the existing soil up to an estimated 3 feet at the upstream dam toe. Some regrading of the existing embankment is planned, with a planned crest elevation of 4,984 feet and the maximum storage elevation of 4,981 feet. An outlet tower inside the reservoir will allow discharge from the reservoir.

Cesare understands normal operation is providing water for the treatment plant, which is understood to be low discharge rates CSEO requires a minimum design rapid drawdown of 1 foot, per day, for 5 days.

5. GEOLOGIC CONDITIONS

The soil onsite is described as eolian sediment, windblown deposits comprised of loess, clay, and silt mixtures. These sediments are Quaternary Middle Holocene and Upper Pleistocene in age, and generally 3 to 15 feet thick¹.

6. SITE CONDITIONS

Johnstown Reservoir is about 38 acres in area, roughly rectangular, and located in the southwest quarter of Section 1 and extends into the southeast quarter of Section 2, Township 4 North, and Range 68 West in Weld County. More specifically, the reservoir is north of State Highway 60 (SH60) and about 1 mile east of the Interstate Highway 25 (I25) intersection with SH60 and about 2-1/2 miles west of Johnstown, Colorado. The site location is shown in the vicinity map presented in Figure 1. The reservoir is bounded by an open space setback, with residential properties and a church bordering the outer open space perimeter on all sides.

The reservoir is positioned on an east sloping, low topographic ridge with the ground surface to the north and south sloping downwards to the northeast and southeast. Vegetation consists of a sparse to heavy growth of native and landscaping grasses. Cesare noted no bodies of water outside the reservoir in the vicinity of the site at the time of its field exploration. The reservoir water surface level was low, only a few feet deep, due to the leakage and subsequent CSEO decree.

7. FIELD EXPLORATION

Subsurface conditions were explored on December 2, 2020 by drilling four borings at the locations indicated in the boring location plan presented in Appendix A. Three borings were drilled to about 40 feet in depth along the existing dam centerline. One boring at the embankment downstream toe near the existing outlet was drilled to about 25 feet in depth. Graphical logs of the subsurface conditions observed, locations of sampling, and further explanation of the exploration performed are presented in the boring logs and accompanying key to symbols contained in Appendix A.

8. LABORATORY TESTING

Cesare personnel returned samples obtained during field exploration to its laboratory where professional staff visually classified them and assigned testing to selected samples to evaluate pertinent engineering properties. Laboratory tests performed are listed in Table 8.1. Further discussion of laboratory testing and laboratory test results are presented in Appendix B.

TABLE 8.1. Laboratory Testing Performed

Laboratory Test	To Evaluate
Grain size analysis	Grain size distribution for classification purposes.
Atterberg limits	Soil plasticity for classification purposes.
Moisture density relationships	Evaluate the relationship of moisture content, compactive effort, and compacted density.
In situ moisture and density	Evaluate in situ moisture content and density
Water soluble sulfate content	Potential reaction of the soil with cementitious material.

¹ Palkovic, M.J., Morgan, M.L., 2017, Geologic Map of the Johnstown Quadrangle, Larimer and Weld Counties, Colorado, Colorado Geologic Survey.

9. SUBSURFACE CONDITIONS

Cesare's borings encountered:

- Existing embankment fill to depths of about 8 to 16 feet in Borings B-1 through B-3.
- Existing fill, likely pipe backfill for the outlet installed in 1953, to 9 feet in B-4. Granular material found at the bottom of the fill and directly overlying weathered bedrock is likely pipe bedding for the outlet.
- Native clay below the fill in B-3 that extended to a depth of 23 feet.
- Weathered claystone bedrock in B-1, B-2, and B-4 below the fill.
- Claystone bedrock at depths of about 23 feet in B-1 through B-3 and about 13 feet in B-4.
- Groundwater at depths of 15, 18, 14 and 8 feet in Borings B-1 through B-4, respectively, at the time of drilling.
- Groundwater at depths of 15, 14-1/2, 13, and 4-1/2 feet in Borings B-1 through B-4, respectively, 1 day after drilling,.
- Borings B-1 through B-4 caved to depths of 38, 37, 27, and 16-1/2 feet immediately after drilling.

These observations represent conditions at the time of field exploration and may not be indicative of other times or other locations. Groundwater in the embankment can be expected to fluctuate and will be primarily influenced by height of water in the reservoir. Regional groundwater can be influenced by variations in seasons, weather, precipitation, drainage, vegetation, landscaping, and irrigation. Discontinuous zones of perched water may exist or develop within the overburden material and/or upper zones of the bedrock. Cesare's field explorations were performed during the fall when regional groundwater levels are usually lowest. Regional groundwater levels may be higher in the spring and early summer.

10. EMBANKMENT ANALYSIS

The CSEO considers the embankment as stable in its present configuration. Cesare's evaluation is intended to verify the embankment's stability at the repair location, considering the existing conditions and post repair conditions.

10.1 EMBANKMENT CONFIGURATIONS

10.1.1 Existing Configuration

The existing embankment at the outlet repair location has a crest width of about 12 feet wide at an elevation of about 4,986 feet. The upstream and downstream embankment slopes are about 3:1, horizontal to vertical. The upstream slope is about 11 feet high from its present toe and the downstream slope is about 13 feet high. The present downstream slope has a localized steepened slope of about 1-1/2:1 at its toe.

10.1.2 Repair Configuration

The final embankment will have a 12 foot wide crest width at an elevation of 4,986 feet. The upstream and downstream slopes are planned for 3:1. Excavation planned for the pond bottom at the embankment toe at the outlet is expected to extend to about elevation 4,971 feet, about 15 feet from the crest at that location.

10.2 MATERIAL PARAMETERS

Cesare based the stability analysis and seepage parameters on its field and laboratory test results, and experience with similar projects.

10.2.1 Seepage Analysis

Cesare used permeability values based on its experience and the laboratory classification, moisture density relationship, and in situ physical characteristics results. Due to the dam's age, the seepage parameters for the various materials will remain consistent, with the only modification being the fill placed in the repair section. The fill is expected to be of lower permeability than the existing material considering its compaction by modern earthwork equipment, as opposed to the equipment likely used when the embankment was first constructed.

No in situ permeability testing was performed. The upper portion of claystone in the Front Range typically exhibits permeabilities somewhat higher than expected for this material. This higher permeability is likely relating to fracture flow, at least in the unweathered claystone. Packer tests in unweathered claystone typically exhibit nonuniform permeability, indicating fracture flow in the fresher claystone is unlikely to be uniform below the embankment. Work by Zhang² (2013) and others indicates claystone fractures tend to close under increased loading and when wetted. Although the upper bedrock has likely gained the maximum moisture it is capable of under the existing conditions, Cesare believes a conservative approach considering fracture flow during the reservoir life is appropriate.

The material requiring seepage parameters for analysis includes the existing and new fill soil, native soil, weathered bedrock, and unweathered bedrock; the values for which are presented in Table 10.1. The values presented for embankment material and weathered bedrock are based on laboratory test results previously described. The permeability of the unweathered bedrock considers Packer test results from similar projects and research into published rates for the local claystone bedrock.

TABLE 10.1. Design Hydraulic Conductivities

Material	Saturated Hydraulic Conductivity (cm/sec)	Saturated Hydraulic Conductivity (ft/sec)
Existing embankment fill	1.70 x E-6	5.54 x E-8
New embankment fill	4.97 x E -7	1.64 x E-8
Native clay soils	7.07 x E-7	2.32 x E-8
Weathered claystone	1.0 x E-8	3.3 x E-10
Unweathered claystone	1.0 x E-5*	3.3 x E-7*

* Horizontal conductivity. Vertical is one order of magnitude less.

10.2.2 Strength Parameters

Based on Cesare's testing and judgement, strength parameters assigned to embankment material are presented in Table 10.2.

² Zhang, C.L., Experimental evidence for self-sealing of fractures in claystone. J. Phys. Chem. Earth (2011), doi:10.1016/ j.pce.2011.07.030.

TABLE 10.2. Stability Analysis Strength Parameters

Material	Friction Angle (degrees)	Cohesion (psf)
Existing embankment fill	30	100
New embankment fill	30	200
Native clay soil	25	50
Weathered claystone	25	100
Unweathered claystone	0	3000
Residual claystone	15	0

10.3 SEISMIC DESIGN

The "Rules and Regulations for Dam Safety and Dam Construction" (2007) indicate a pseudostatic analysis for embankment dams is acceptable, for the following cases:

"5.9.2.3.1 The embankment is to be mechanically compacted to at least 95% of the maximum standard Proctor density, ASTM D698, or at least 90% of the maximum modified Proctor density, ASTM D1557 or at least 70% relative density per ASTM D4253 and ASTM D4254, if Proctor testing is not appropriate; no materials prone to liquefaction are present in the foundation and the design peak bedrock acceleration is 0.20g or less; or

5.9.2.3.2 The embankment is to be mechanically compacted to at least 95% of the maximum standard Proctor density, ASTM D698, or at least 90% of the maximum modified Proctor density, ASTM D1557; potentially submerged portions of the embankment except for internal drain elements are constructed of clayey material; the dam is constructed on clayey soil or bedrock foundation and peak bedrock acceleration is 0.35g or less; and

5.9.2.3.3 All static stability safety factor requirements of these Rules are met; minimum freeboard requirements of these Rules are met; and the pseudostatic coefficient selected for analysis must be at least 50% of the design peak bedrock acceleration, but not less than 0.05g and the factor of safety under pseudostatic analysis shall be 1.0 or greater. In determining the factor of safety for pseudostatic analysis, a search for the critical failure surface shall be made."

The analysis requirement includes using at least 50% of the peak acceleration, but not less than 0.05g. Cesare used 0.1g in that this value is customarily used and is suitably conservative.

10.4 STABILITY AND SEEPAGE RESULTS

Cesare analyzed the repair zone for seepage and stability, considering both existing and repaired conditions. Analysis included steady state seepage at full pool surface elevation for both upstream and downstream slopes and rapid drawdown on the upstream face by means of a transient analysis. The rapid drawdown discharge rate was 17 cfs, which has a relative equivalence of 1 foot of drawdown, per day. Cesare also analyzed the downstream slope at full pool, considering a pseudo seismic force and considering residual bedrock strength. These scenarios meet the CSEO

requirements (2020). Results of Cesare's stability analyses are presented in Table 10.3 and include the CSEO's requirements.

TABLE 10.3. Stability Analyses Results

Section	Analysis	Factor of Safety		Required Factor of Safety
		Block	Circular	
Existing	Full, steady state upstream	2.54	2.47	1.5
	Full, steady state upstream, pseudo seismic	1.71	1.67	1.0
	Full, steady state downstream	1.81	1.73	1.5
	Full, steady state downstream, pseudo seismic	1.34	1.27	1.0
	Transient upstream	1.82	1.74	1.2*
Repaired	Full, steady state upstream	3.94	3.78	1.5
	Full, steady state upstream, pseudo seismic	2.68	2.56	1.0
	Full, steady state downstream	3.50	3.29	1.5
	Full, steady state downstream, pseudo seismic	2.56	2.41	1.0
	Full, steady state downstream, residual bedrock strength	2.84	3.07	1.1**
	Transient upstream	2.84	2.67	1.2*

* Lowest factor of safety.

**Case by case determination.

10.5 SETTLEMENT

Cesare did not perform a settlement analysis on the embankment. The embankment at the repair section is estimated to be about 33 feet from the embankment crest to its contact with competent bedrock. Considering this and Cesare's experience with timed consolidation results, Cesare estimates less than about 1/2 foot of embankment consolidation during construction. This consolidation typically occurs rapidly in clays with sand contents similar to the clays encountered at this site in both existing embankment and native soil. Settlement may be complete by the end of embankment construction, however, Cesare recommends a minimum of 1/2 foot of camber to account for unforeseen conditions. The bedrock supporting the embankment is unlikely to consolidate or deflect.

11. CONSTRUCTION CONSIDERATIONS

11.1 GROUNDWATER CONTROL

Groundwater was measured within the lower portion of existing fill in Boring B-1, in the weathered bedrock in Boring B-2, and in the native clay soil in B-3. Boring B-2 was located within the anticipated repair zone; thus, will likely represent the groundwater conditions during construction. All water levels appear within the anticipated vertical extent of the repair zone. The nature of the subsurface material may result in variable rates of inflow into the open excavation; however, the difference between the existing embankment, native clays, and weathered bedrock is not expected to be large. The contractor should implement groundwater control that will minimize disturbance to foundation material, all excavation activities, and fill placement. The groundwater appeared to be within the lower portion of the area to receive fill, such that groundwater control will be required for at least a

portion of the fill placement. Saturated borrow material may require wasting. The contractor should be responsible for designing and maintaining dewatering systems. Localized sumps may be adequate.

Surface drainage should be prevented from entering or flooding excavations and from causing uncontrolled erosion on excavated slopes. The contractor should be responsible for controlling surface drainage and meeting applicable local, state, and federal regulations.

11.2 EXCAVATIONS

11.2.1 General Considerations

The relative ease or difficulty of the excavation of the material onsite is not anticipated to vary greatly, both horizontally and with depth. Material ranged from existing embankment fill, unconsolidated native deposits, and weathered bedrock exhibiting single digit blow counts that should be readily excavated. Excavation should stop at competent bedrock contact. Excavation using rippers or tracked vehicles should stop before reaching final foundation surface as discussed in Section **11.3 FOUNDATION PREPARATION**. Blasting of foundation material will not be allowed.

11.2.2 Embankment Foundations

Soil and weathered bedrock should be excavated to remove soft and compressible material to contact of competent bedrock to provide proper support for the new outlet pipe and its encasement. The excavated soil and weathered bedrock may be used as fill for these areas, provided it is free of organics or other deleterious material. The side slopes excavated into the existing embankment should be benched at minimum vertical intervals of 1 foot and horizontal intervals of 2 feet, as fill is placed. At least the upper 6 inches of exposed embankment soil on the excavation slope benches should be moistened and compacted similar to the repair fill soil.

11.2.3 Fill Material

The soil excavated from the repair area is intended for use as repair embankment construction. The weathered claystone bedrock can also be used for embankment.

11.2.4 Moisture Conditioning

The embankment material should be conditioned in the required excavation area to within $\pm 2\%$ of optimum moisture content according to ASTM D698. Based on laboratory results, Cesare estimates most of the soil to be excavated is well over its optimum moisture content. Moistening material may be required and can be accomplished through mixing on grade; however, drying of the excavated material will likely be required. Variable moisture contents exist naturally and the contractor should design a program to moisten or dry the material to produce uniform moisture contents in the embankment material. Application of water should be carefully controlled to avoid overwatering or drying of the borrow material.

11.2.5 Temporary Cuts

Temporary cuts in the existing embankment, native soil, and weathered bedrock material should not exceed slopes of 2 horizontal to 1 vertical (2:1). Construction materials should not be stored adjacent to the slope crest, which would result in surcharging the slope and reducing its stability. Temporary cuts in competent bedrock material should not exceed slopes of 1:1. Steeper slopes may require

bracing or other stabilization methods to provide safe working conditions. The contractor should be responsible for designing and maintaining construction slopes. All slopes should be protected from runoff due to precipitation events. Methods of slope stabilization should comply with applicable state, local, and federal regulations.

11.3 FOUNDATION PREPARATION

Where claystone bedrock will be used for embankment and outlet pipe foundation, precautions should be considered for construction. Claystone bedrock tends to air slake upon exposure and drying. The foundation in the outlet line alignment and outlet structure should be protected from losing moisture, freezing, and effects of weathering. To accomplish this, Cesare recommends that a temporary cover of a few feet of unexcavated material be left in place until construction is ready to proceed. Final excavation, preparation, and backfilling must be done in small sections so that work can be completed before the foundation is damaged from drying. Within 10 hours of exposing the final foundation surface, surveying, inspection, foundation preparation, and placement of protective coatings or fill should take place. Experience gained during construction may allow for variations in this. Use of concrete mud mats should be considered for bedrock protection in outlet structure and other structure areas that must be left open for extended periods of time.

Exposed finished surfaces should be kept from drying or slaking. Temporary plastic may be effective in limited areas. If exposed surfaces dry out, become desiccated, slake, or are loosened or disturbed, the affected material should be removed just prior to fill or structure placement. Cesare's experience has shown that metal tracked equipment should be kept off the final excavated surface. Rubber tired equipment should be used for the final excavation to foundation grade.

11.4 OUTLET PIPE

The outlet pipe should bear on competent bedrock encased in reinforced concrete. The depth to bedrock in the outlet location will require on the order of 2 to 6 feet of excavation below the pipe invert to contact competent bedrock. The bedrock will likely be exposed for sufficient time to allow desiccation and cracking. Thus, a mud mat should be placed on it and below the encasement. The encasement's longitudinal sides should have slopes of 1 to 10, horizontal to vertical, from the bearing surface. A collar should surround the encasement on all four sides by at least 12 inches of filter material meeting the project requirements. The filter material should extend along the encasement at least 5 feet.

12. SOLUBLE SULFATE CONTENT

Water soluble sulfate contents of 0.01% and 0.0% were measured on samples of native and fill clays. Results are summarized in Appendix B. The PCA publication titled, *Design and Control of Concrete Mixtures* 2002 and the ACI publication titled *Building Code Requirements for Structural Concrete and Commentary* consider this range negligible for water soluble sulfate exposure. Recommendations for all concrete which will be in contact with or within 6 inches of these soils are shown in Table 12.1.

TABLE 12.1. Information from ACI 318-08 - Table 4.3.1

Water Soluble Sulfates (%)	Exposure Class	Maximum (w/cm)*	Minimum f_c , (psi)	Cementitious materials† (types)			Calcium Chloride Admixture
				ASTM C150	ASTM C595	ASTM C1157	
<0.10	S0	N/A	2,500	No type restriction	No type restriction	No type restriction	No restriction
$0.10 \leq$ to <0.20	S1 Moderate	0.50	4,000	II [‡]	IP (MS) IS (<70) (MS)	MS	No restriction
≤ 0.20 to ≤ 2.00	S2 Severe	0.45	4,500	V [§]	IP (HS) IS (<70) (HS)	HS	Not permitted
>2.00	S3 Very Severe	0.45	4,500	V + pozzolan or slag	IP (HS)+pozzolan or slag or IS (<70) (HS)+pozzolan or slag	HS+pozzolan or slag	Not permitted

*For lightweight concrete, see ACI 318-08 4.1.2.

†Alternative combinations of cementitious materials of those listed in Table 4.3.1 shall be permitted when tested for sulfate resistance and meeting the criteria in ACI 318-08 4.5.1.

‡For seawater exposure, other types of Portland cements with tricalcium aluminate (C_3A) contents up to 10 percent are permitted if the w/cm does not exceed 0.40.

§Other available types of cement such as Type III or Type I are permitted in Exposure Classes S1 or S2 if the C_3A contents are less than 8 or 5 percent, respectively.

|| The amount of the specific source of the pozzolan or slag to be used shall not be less than the amount that has been determined by service record to improve sulfate resistance when used in concrete containing Type V cement. Alternatively, the amount of the specific source of the pozzolan or slag to be used shall not be less than the amount tested in accordance with ASTM C1012 and meeting the criteria in ACI 318-08 4.5.1.

Refer to ACI 318-08 R4.3.1 for further interpretation of this table.

13. GEOTECHNICAL RISK

The concept of risk is an important aspect of any geotechnical evaluation. The primary reason for this is that the analytical methods used by geotechnical engineers are generally empirical and must be tempered by engineering judgment and experience, therefore, the solutions or recommendations presented in any geotechnical evaluation should not be considered risk free, and more importantly, are not a guarantee that the interaction between the soil and the proposed construction will perform as predicted, desired, or intended. The engineering recommendations presented in the preceding sections constitute Cesare's best estimate of those measures that are necessary to help the structure perform in a satisfactory manner based on the information generated during this evaluation, training, and experience in working with these conditions.

14. LIMITATIONS

This document has been prepared as an instrument of service for the exclusive use of J&T Consulting, Inc. for the specific application to the project as discussed herein and has been prepared in accordance with geotechnical engineering practices generally accepted in the state of Colorado at the date of its preparation. No warranties, either expressed or implied, are intended or made. This document should not be assumed to contain information for other parties or other purposes.

The findings of this evaluation are valid as of the date its preparation. Changes in the conditions of

a property can occur with the passage of time, whether due to natural processes or the works of people on this or adjacent properties. Standards of practice evolve in engineering and changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this evaluation may be invalidated wholly or partially by changes outside of Cesare's control, therefore, this evaluation is subject to review and should not be relied upon without such review after a period of 3 years.

In the event that changes, including but not limited to, the nature, type, design, size, elevation, or location of the project or project elements as outlined in this report are made, the conclusions and recommendations contained in this report shall not be considered valid unless Cesare reviews the changes and either confirms or modifies the conclusions of this report in writing.

Cesare should be retained to review final plans and specifications that are developed for proposed construction to judge whether the recommendations presented in this report and any addenda have been appropriately interpreted and incorporated in the project plans and specifications as intended.

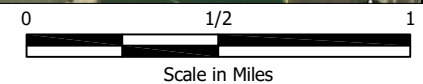
The exploration locations for this evaluation were selected to obtain a reasonably accurate depiction of underground conditions for design purposes and these locations are often modified based on accessibility and the presence of underground or overhead utility conflicts. Variations from the soil conditions encountered are possible. These variations may necessitate modifications to Cesare's design recommendations, therefore, Cesare should be retained to observe subsurface conditions, once exposed, to evaluate whether they are consistent with the conditions encountered during Cesare's exploration and that the recommendations of this evaluation remain valid. If parties other than Cesare perform these observations and judgements, they must accept responsibility to judge whether the recommendations in this report remain appropriate.

Cesare's scope of services for this report did not include either specifically, or by implication, any environmental assessment of the site or identification of contaminated or hazardous material or conditions.

Cesare should be retained during construction to observe and/or test the following:

- ☒ completed excavations.
- ☒ placement and compaction of fill.
- ☒ proposed import or onsite fill material.

Cesare offers many other construction observations, materials engineering, and testing services and can be contacted to discuss further.



BASEMAP FROM GOOGLE EARTH PRO©.

PROJECT NO:	20.3062		
PROJECT NAME:	Johnstown Reservoir Outlet Structure		
DRAWN BY:	RCK	CHECKED BY:	JAC2
DWG DATE:	12.15.2020	REV. DATE:	--

FIGURE 1
Vicinity Map

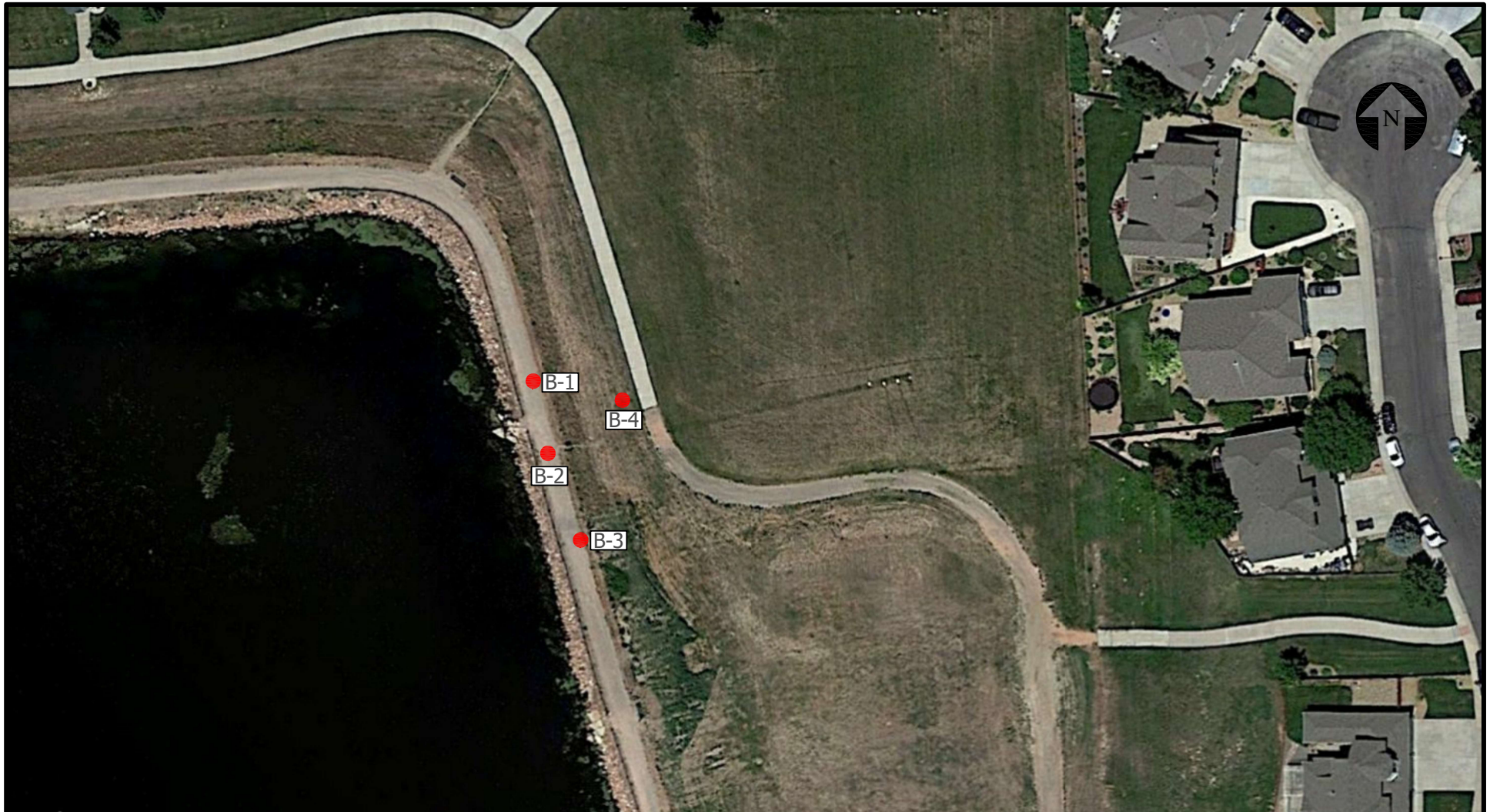


APPENDIX A

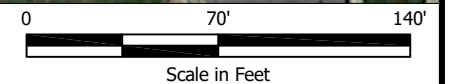
Field Exploration

FIELD EXPLORATION

Samples of the subsoil were obtained at this site using a modified California sampler which was driven into the soil by dropping a 140 pound hammer through a free fall of 30 inches. The modified California sampler is a 2-1/2 inch outside diameter by 2 inch inside diameter device lined with brass tubes. The procedure to drive the modified California sampler into the soil and to record the number of blows required to do so is known as a penetration test. The number of blows required for the sampler to penetrate 12 inches gives an indication of the relative stiffness of cohesive soil, relative density of non-cohesive soil, and relative hardness of sedimentary bedrock material encountered. Bulk samples were collected from cuttings generated during drilling. Locations of sampling and penetration test results are presented on the boring logs and key to symbols/legend contained in this appendix.



LEGEND: B-1 BORING LOCATIONS

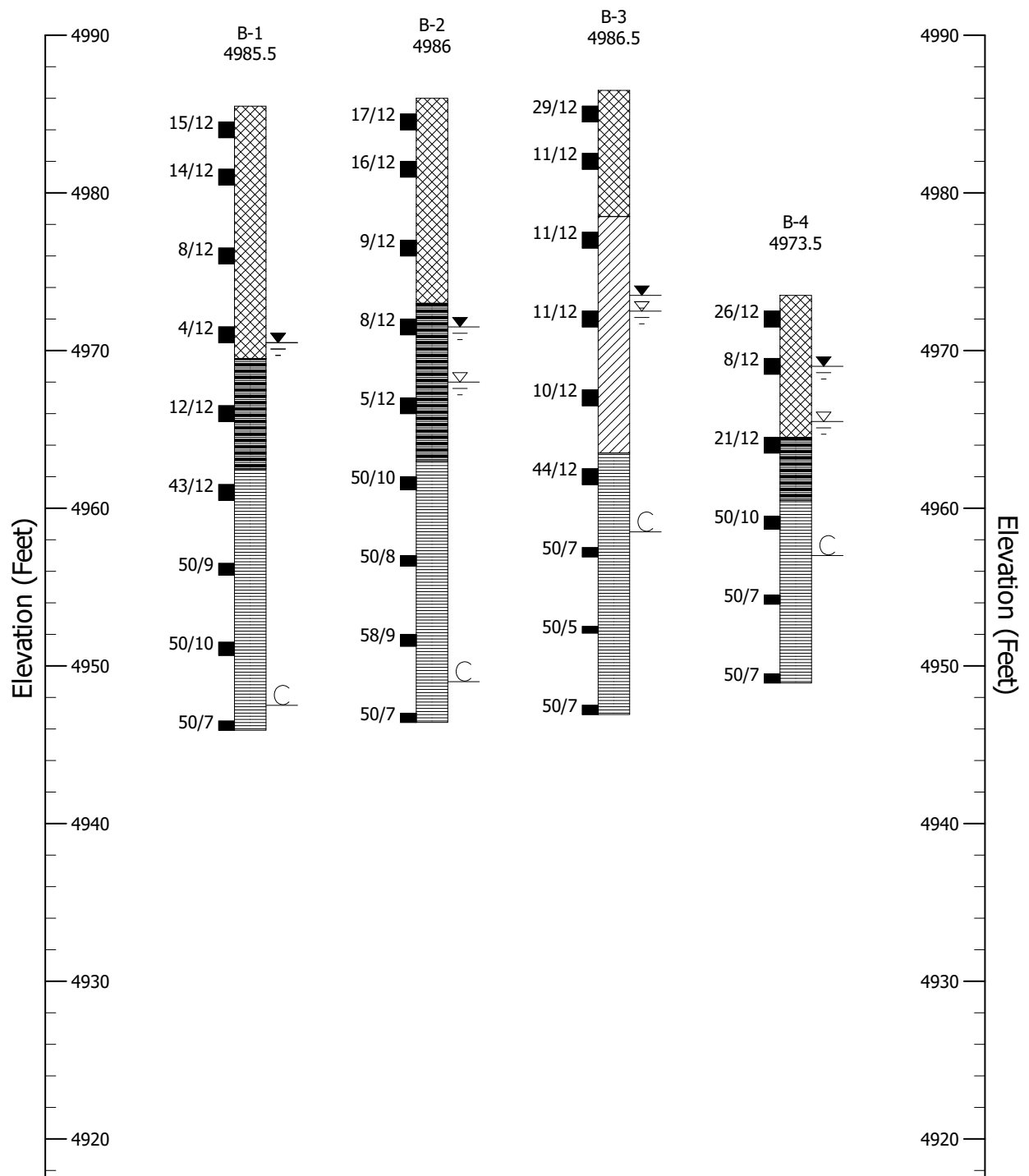


BASEMAP FROM GOOGLE EARTH PRO©.

PROJECT NO:	20.3062		
PROJECT NAME:	Johnstown Reservoir Outlet Structure		
DRAWN BY:	RCK	CHECKED BY:	JAC2
DWG DATE:	12.16.2020	REV. DATE:	--

BORING LOCATION PLAN

CESARE, INC
Geotechnical Engineers & Construction Materials Consultants



BORING LOGS

PROJECT NO:	20.3062
PROJECT NAME:	Johnstown Reservoir Outlet Structure
DWG DATE:	2/10/2021



KEY TO SYMBOLS

Symbol Description

Strata symbols



FILL: CLAY, lean, to with sand, stiff to very stiff, moist, brown, olive (CL, A-7-6, A-6); POSSIBLE PIPE BEDDING: SAND, open graded medium sand size, wet, medium dense, dark gray (SP, A-1-b); SURFACE TRAVEL COURSE: SAND, clayey, with gravel, slightly moist, dense, (SC, A-6).



CLAY, moist, stiff, brown (CL, A-6, A-7-6).



WEATHERED CLAYSTONE, moist to very moist, soft to very stiff, light to dark olive.



CLAYSTONE, moist, hard to very hard, light to dark olive, olive tan, olive brown, olive gray.

Misc. Symbols



Water level during drilling



Water level 1 day after drilling.

Soil Samplers



Modified California sample

Notes:

1. 15/12 indicates 15 blows with a 140-pound hammer falling 30 inches were required to drive a modified California barrel sampler 12 inches.
 2. Exploratory borings B-1 through B-4 were drilled on December 2, 2020 using a CME-55 drill rig equipped with 4-inch diameter continuous flight solid stem auger.
 3. Relative elevations of borings B-1 through B-4 were provided by J&T Consulting from project survey.
 4. Groundwater was encountered at depths of 15, 18, 14, and 8 feet below ground surface in borings B-1 through B-4, respectively, during drilling. Groundwater was measured at depths of 15, 14-1/2, 13, and 4-1/2 feet below ground surface in borings B-1 through B-4, respectively, 1 day after drilling. Borings were grouted solid at the completion of the latter groundwater measurement.
 5. Contacts between soil units are approximate and may be gradational.
 6. These logs are subject to the limitations, conclusions, and recommendations in this report.
- Project No. 20.3062.



APPENDIX B

Laboratory Testing

SUMMARY OF LABORATORY TEST RESULTS

Johnstown Reservoir Outlet Structure

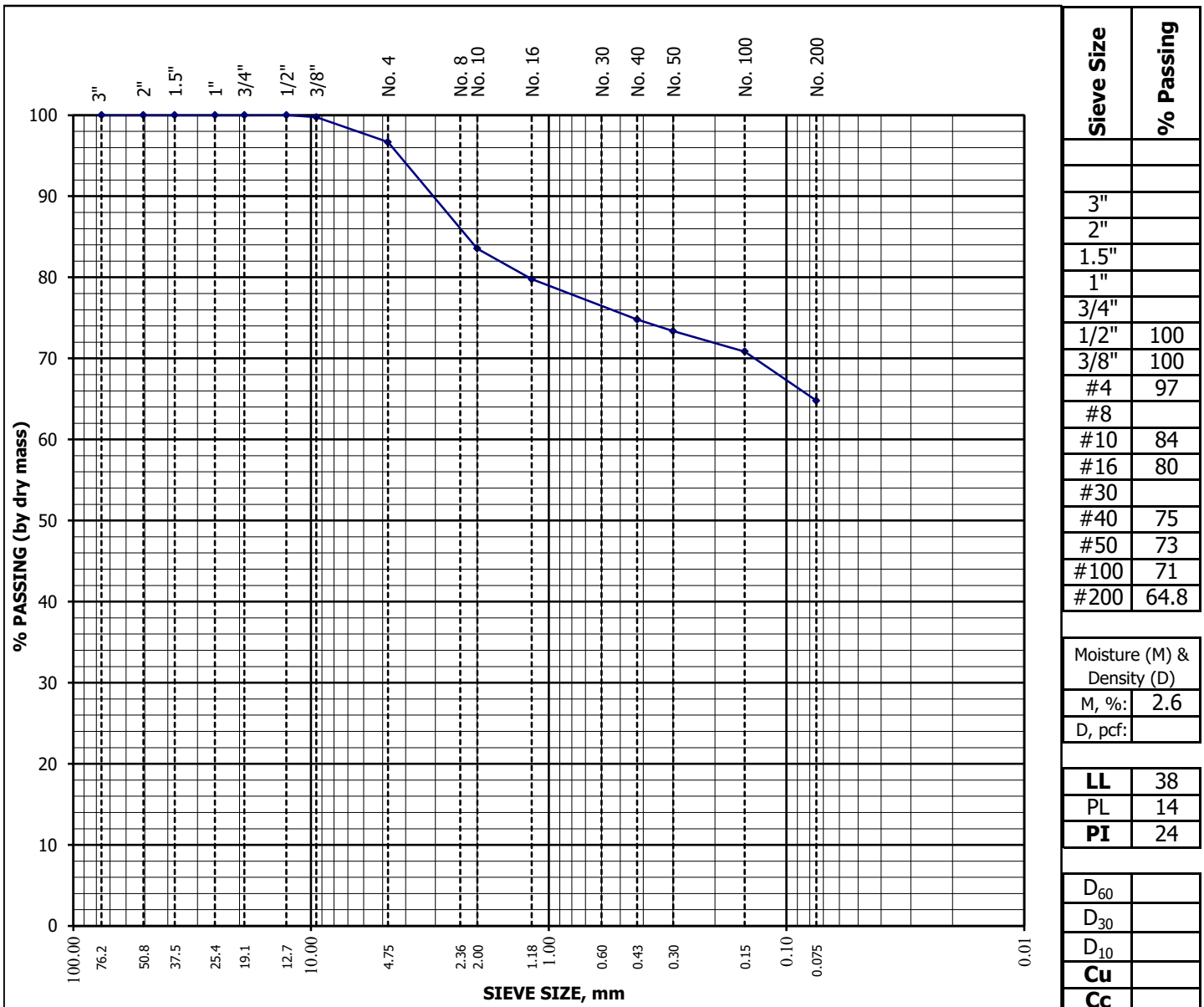
Project No. 20.3062

Sample Location		Natural Dry Density (pcf)	Natural Moisture Content (%)	Standard Proctor		Water Soluble Sulfates (%)	Gradation			Atterberg Limits		Material Type
Boring	Depth (feet)			Maximum Dry Density (pcf)	Optimum Moisture Content (%)		Gravel (%)	Sand (%)	Silt/Clay (%)	Liquid Limit (%)	Plasticity Index (%)	
B-1	0 to 5		2.6	114.4	15.2		3	30	64.8	38	24	FILL: CLAY, sandy, lean (A-6(13))
B-1	1	109.0	17.7				2	8	90.3	47	32	FILL: CLAY, lean (A-7-6(30))
B-1	4	109.2	19.1					12	88.0	37	24	FILL: CLAY, lean (A-6(20))
B-1	9	94.8	27.5					8	91.9	43	28	FILL: CLAY, lean (A-7-6(26))
B-2	0 to 5		2.0	120.2	11.9		9	39	47.3	30	16	FILL: SAND, clayey (A-6(4))
B-2	1	106.2	20.0				2	8	89.6	47	33	FILL: CLAY, lean (A-7-6(30))
B-2	4	109.6	19.5					12	87.8	43	29	FILL: CLAY, lean (A-7-6(25))
B-2	9	99.6	25.5					8	91.7	44	29	FILL: CLAY, lean (A-7-6(27))
B-2	14	96.6	27.3			0.01						WEATHERED CLAYSTONE: CLAY, lean (A-7-6)
B-3	1	116.5	15.4				6	12	82	44	29	FILL: CLAY, lean, with sand (CL, A-7-6(23))
B-3	4	103.7	18.4				2	19	79	46	30	FILL: CLAY, lean, with sand (CL, A-7-6(23))
B-3	9	96.4	27.5					10	90	42	27	CLAY, lean (A-7-6(24))
B-3	14	101.9	24.9									WEATHERED CLAYSTONE: CLAY, lean (A-7-6)
B-4	4					0.00						FILL: CLAY, lean (CL, A-7-6)

GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 16-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. De Los Santos
Lab ID Number: 2021425 Reviewer: J. Crystal
Sample Location: B-1 at 0' to 5'
Visual Description: CLAY, sandy, brown

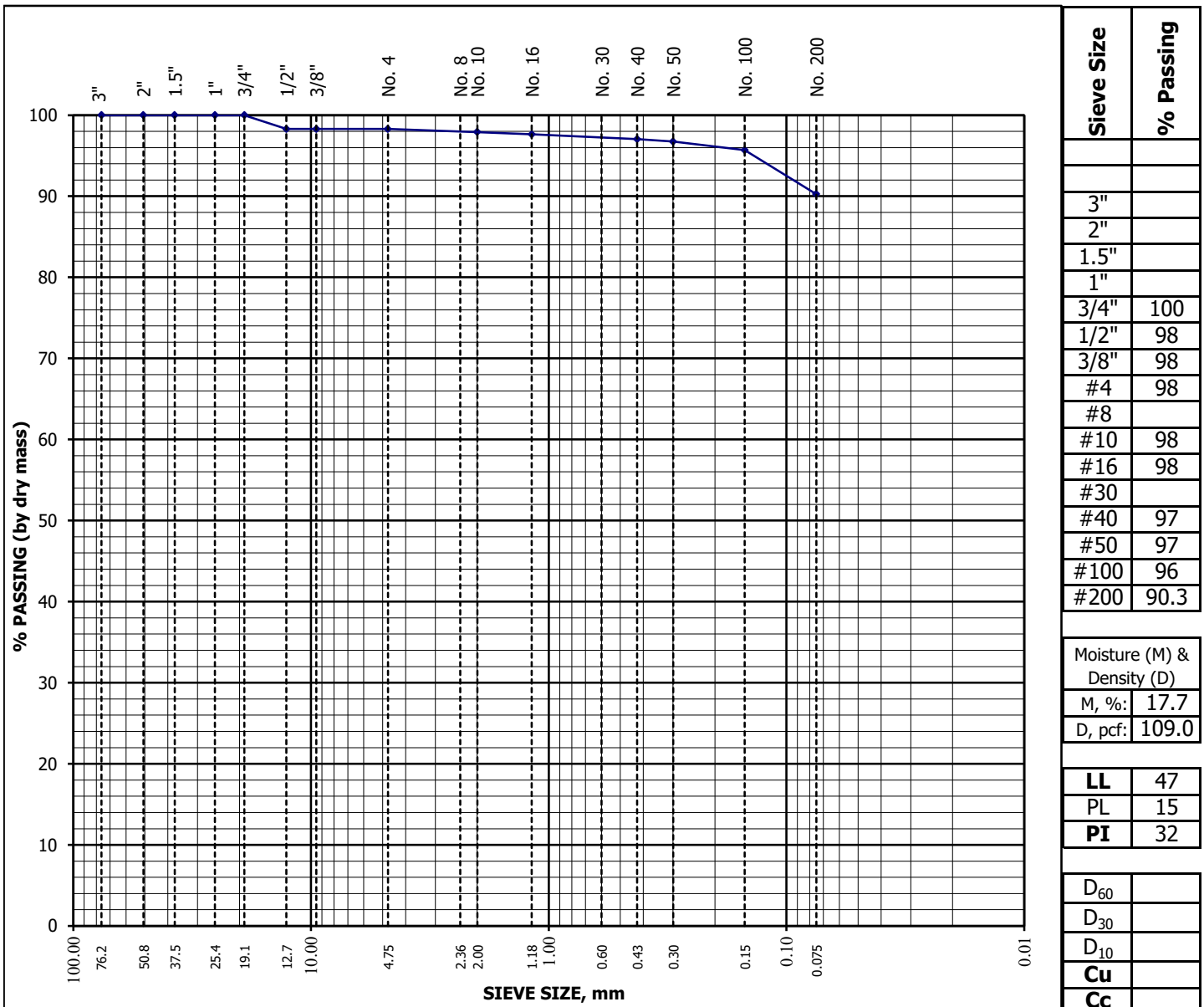
AASHTO M 145 Classification: A-6 **Group Index:** 13
Unified Soil Classification System
(ASTM D 2487): (CL) **Sandy lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021426 Reviewer: J. Crystal
Sample Location: B-1 at 1'
Visual Description: CLAY, brown

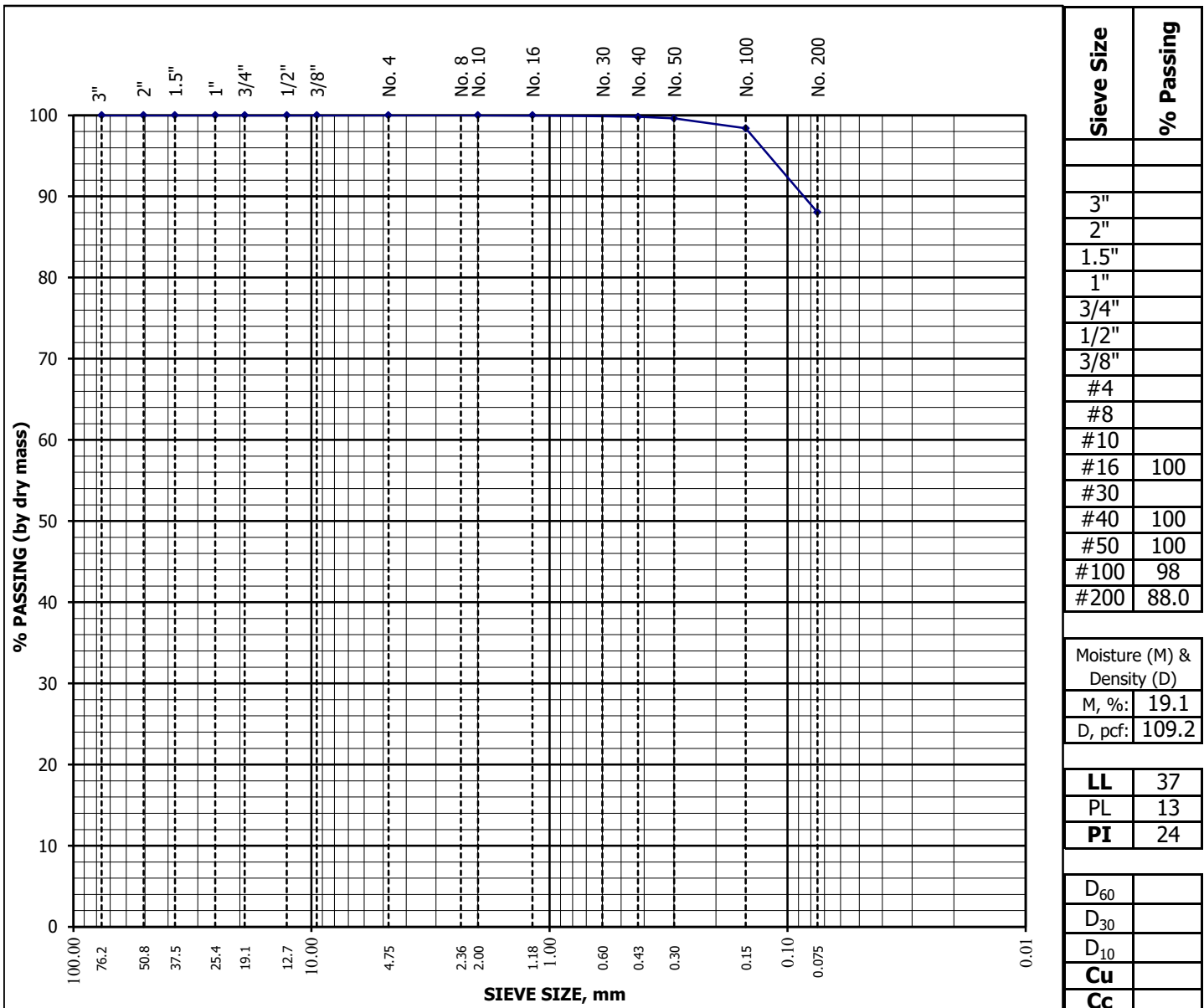
AASHTO M 145 Classification: A-7-6 **Group Index:** 30
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021427 Reviewer: J. Crystal
Sample Location: B-1 at 4'
Visual Description: CLAY, brown

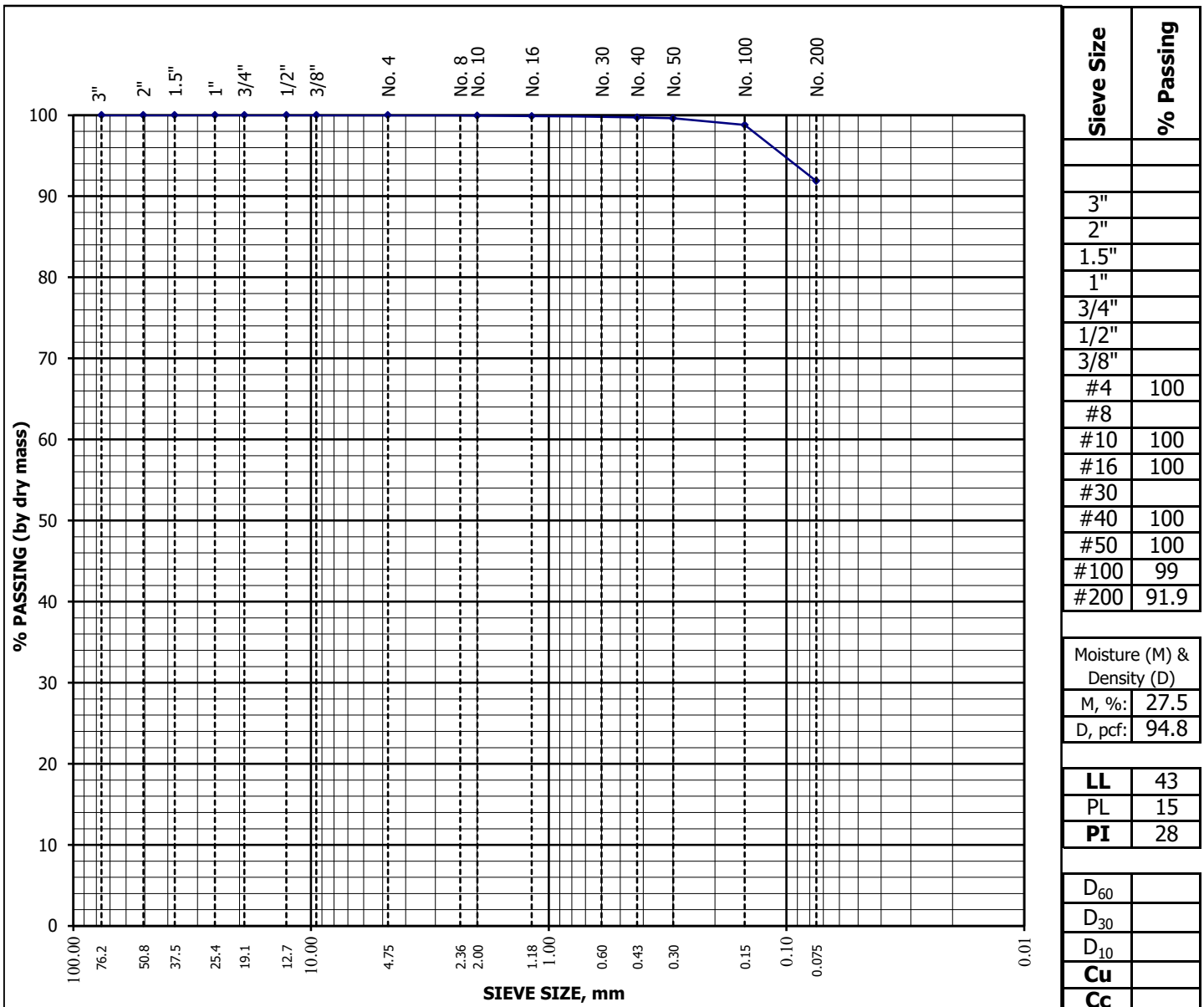
AASHTO M 145 Classification: A-6 **Group Index:** 20
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021428 Reviewer: J. Crystal
Sample Location: B-1 at 9'
Visual Description: CLAY, brown

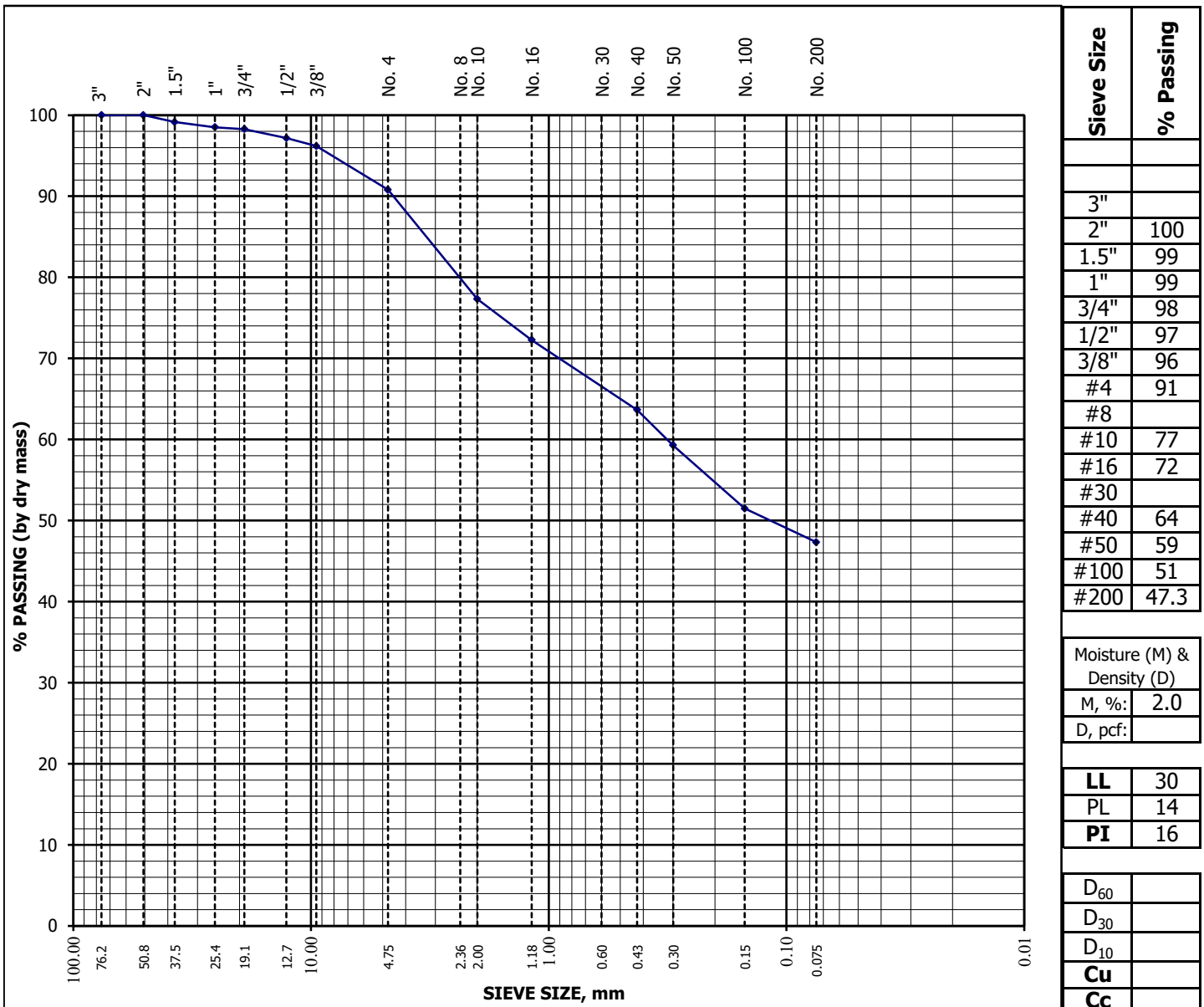
AASHTO M 145 Classification: A-7-6 **Group Index:** 26
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 16-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. De Los Santos
Lab ID Number: 2021429 Reviewer: J. Crystal
Sample Location: B-2 at 0' to 5'
Visual Description: SAND, clayey, brown

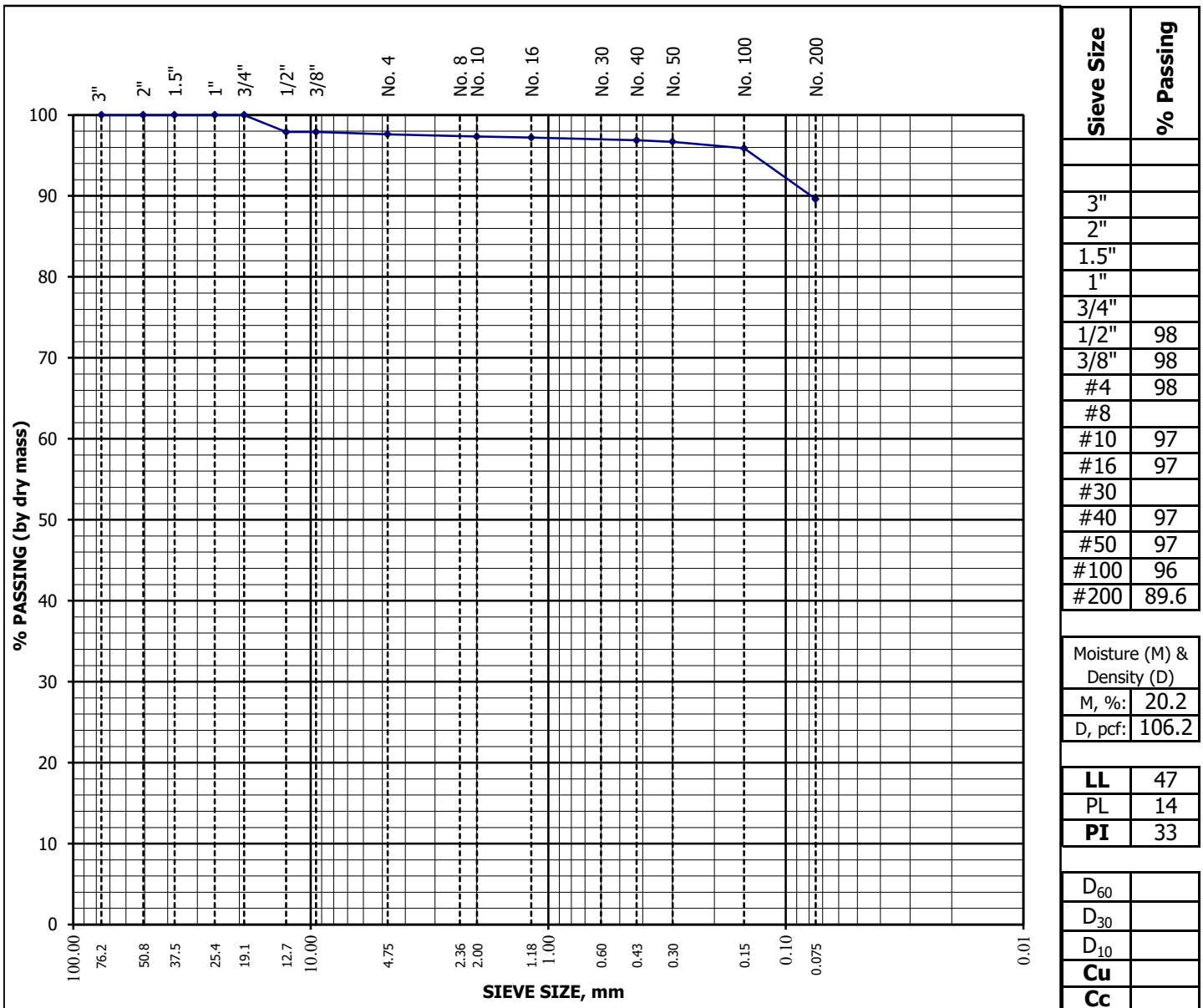
AASHTO M 145 Classification: A-6 **Group Index:** 4
Unified Soil Classification System
(ASTM D 2487): (SC) **Clayey Sand**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021430 Reviewer: J. Crystal
Sample Location: B-2 at 1'
Visual Description: CLAY, brown

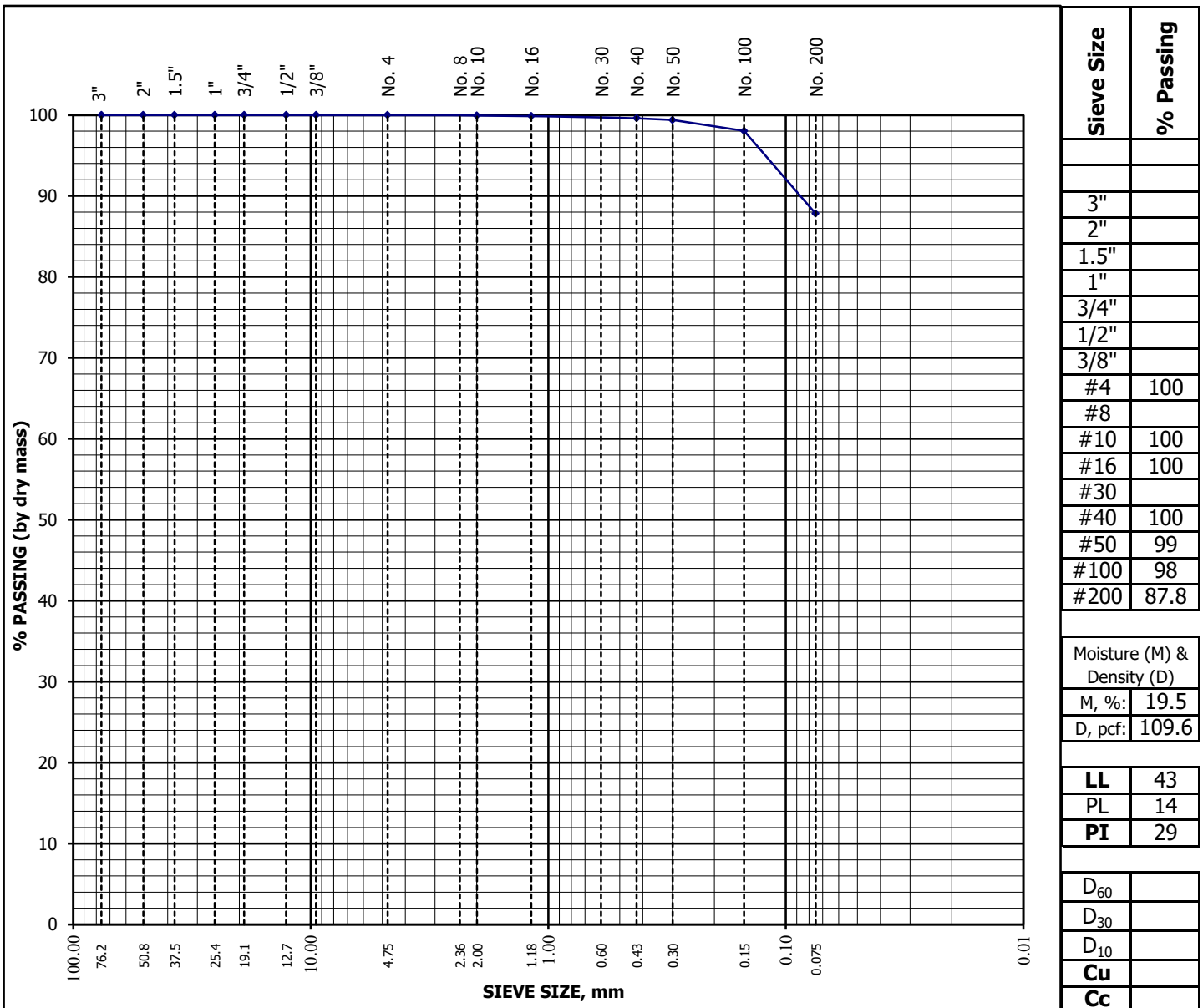
AASHTO M 145 Classification: A-7-6 **Group Index:** 30
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021431 Reviewer: J. Crystal
Sample Location: B-2 at 4'
Visual Description: CLAY, brown

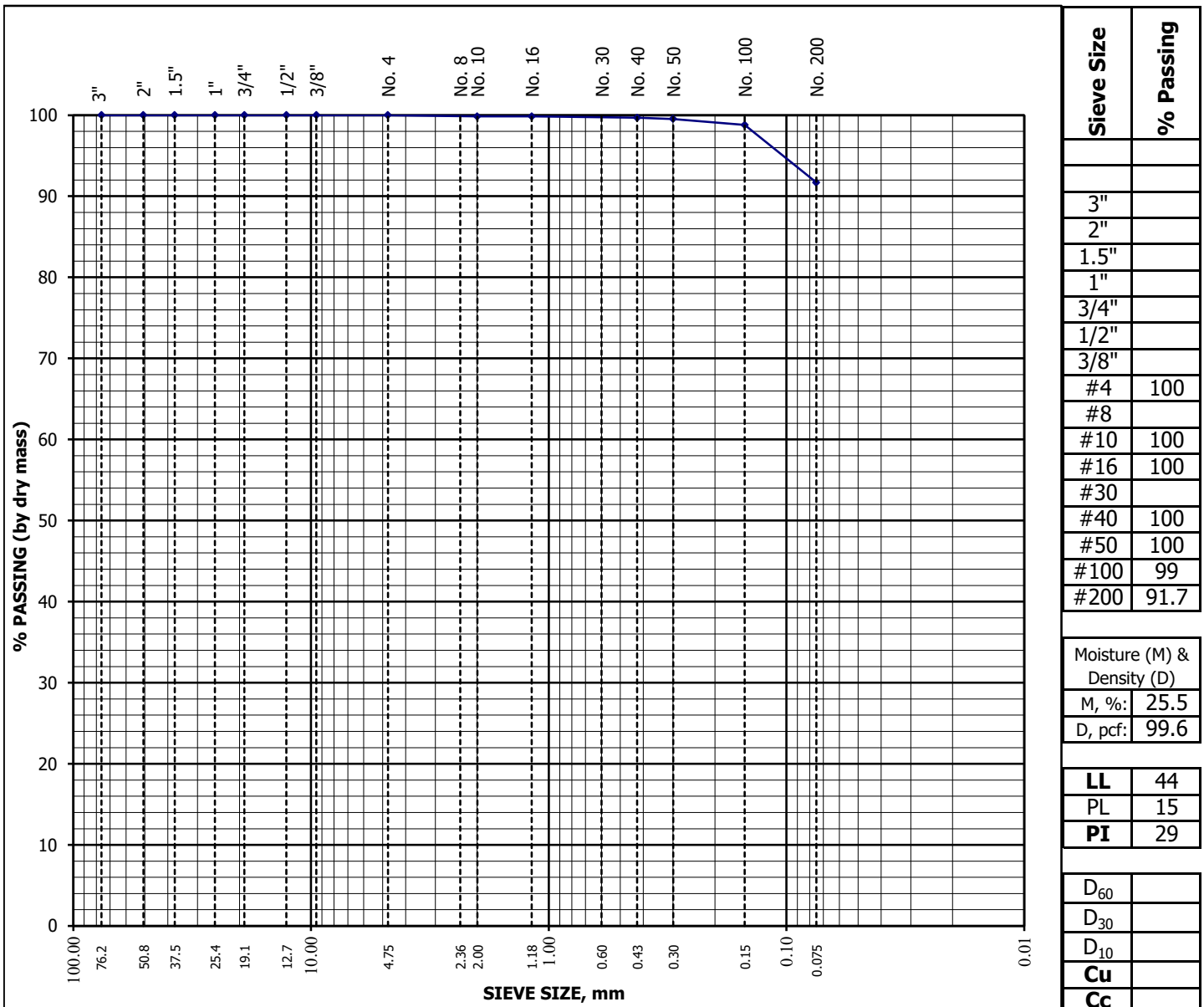
AASHTO M 145 Classification: A-7-6 **Group Index:** 25
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021432 Reviewer: J. Crystal
Sample Location: B-2 at 9'
Visual Description: CLAY, brown

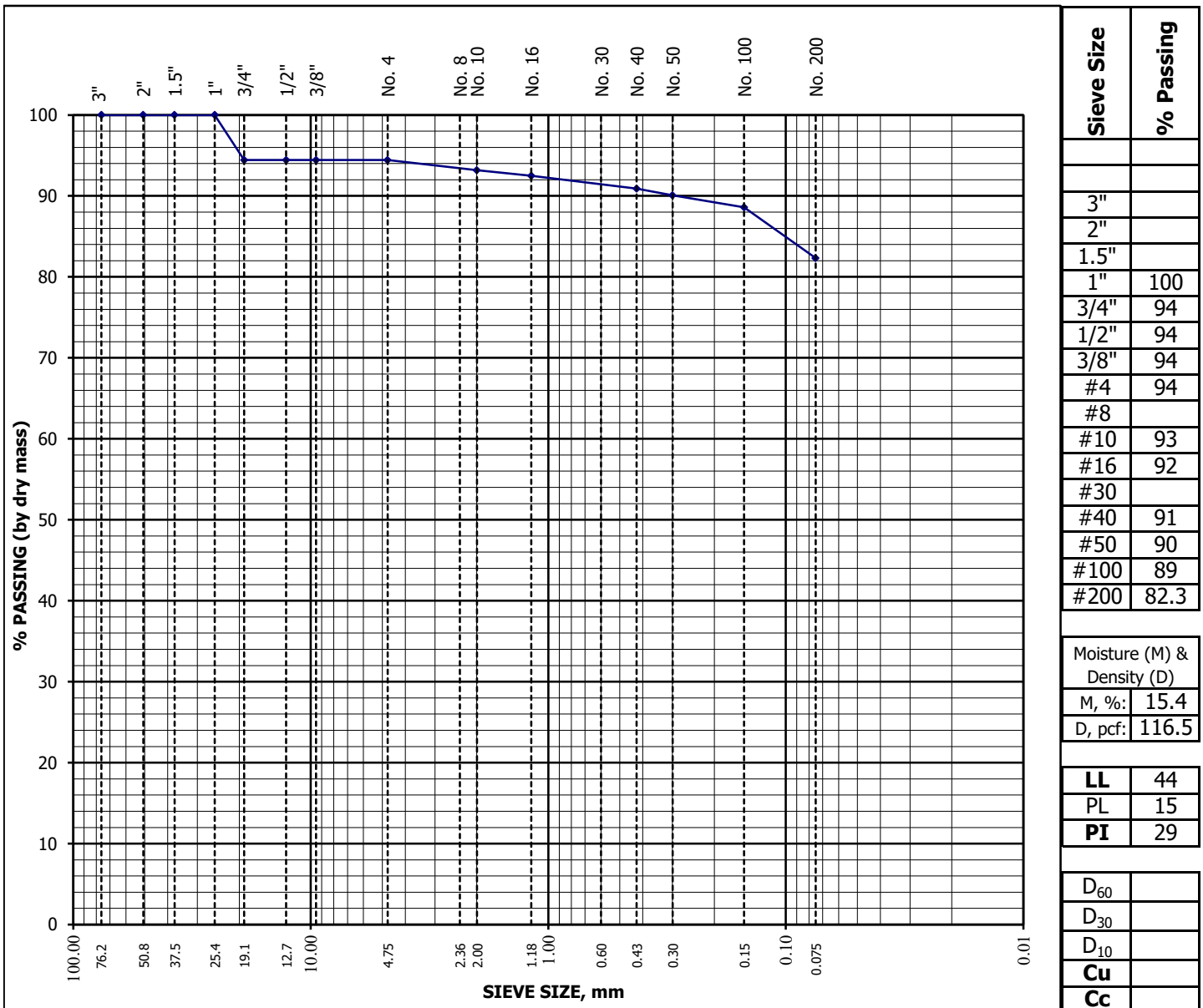
AASHTO M 145 Classification: A-7-6 **Group Index:** 27
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021435 Reviewer: J. Crystal
Sample Location: B-3 at 1'
Visual Description: CLAY, with sand, brown

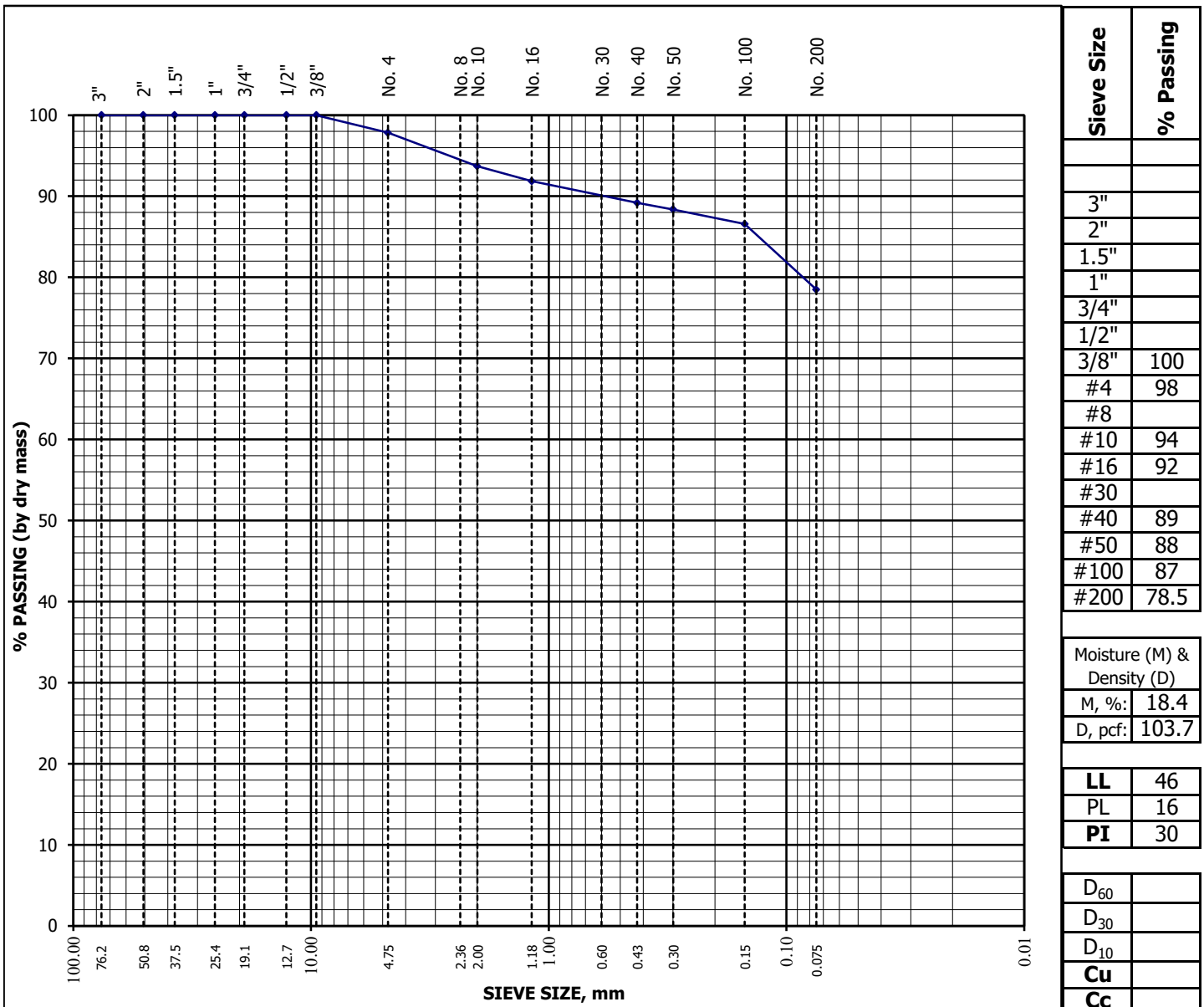
AASHTO M 145 Classification: A-7-6 **Group Index:** 23
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay with sand**



GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021435 Reviewer: J. Crystal
Sample Location: B-3 at 4'
Visual Description: CLAY, with sand, brown

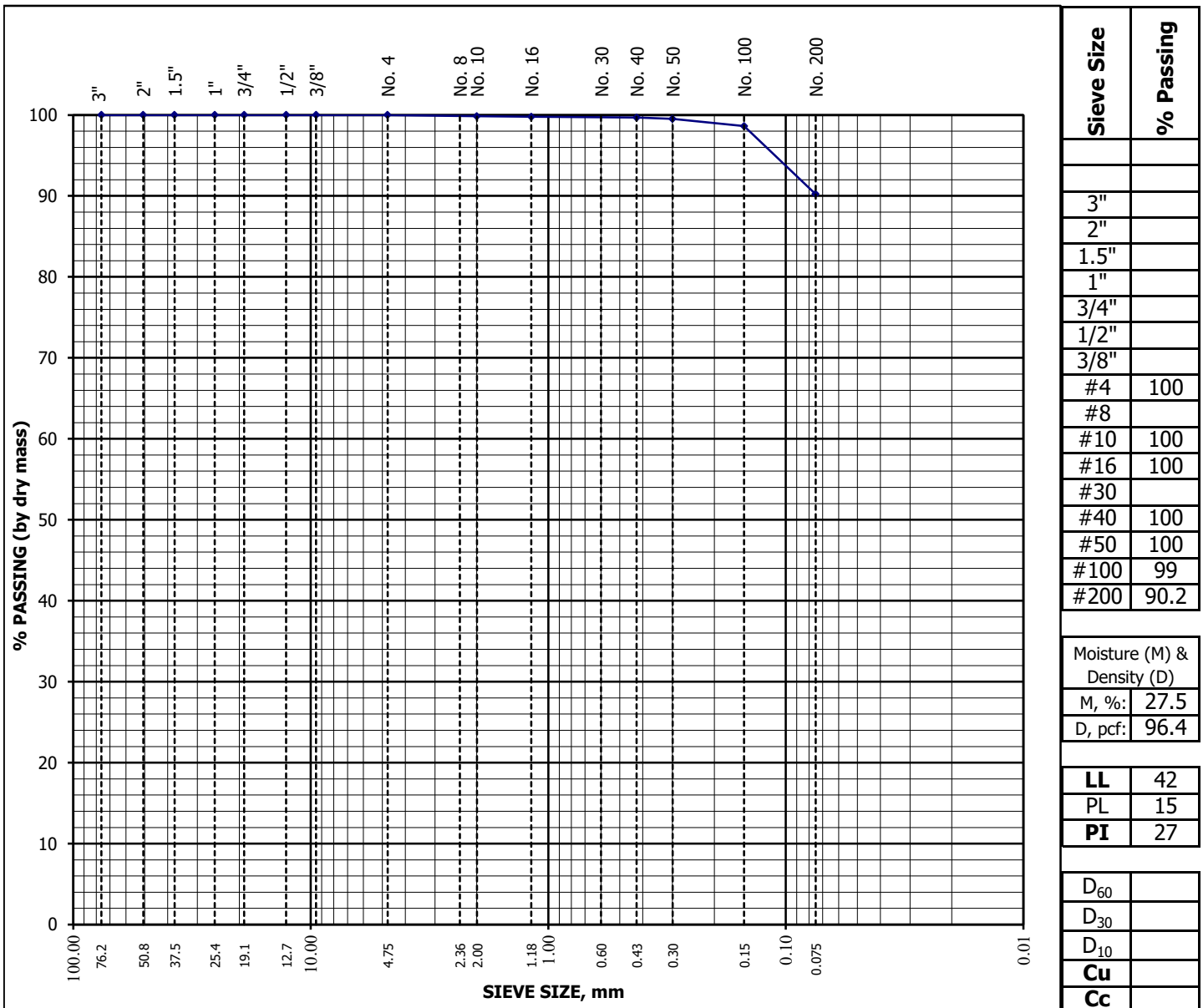
AASHTO M 145 Classification: A-7-6 **Group Index:** 23
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay with sand**



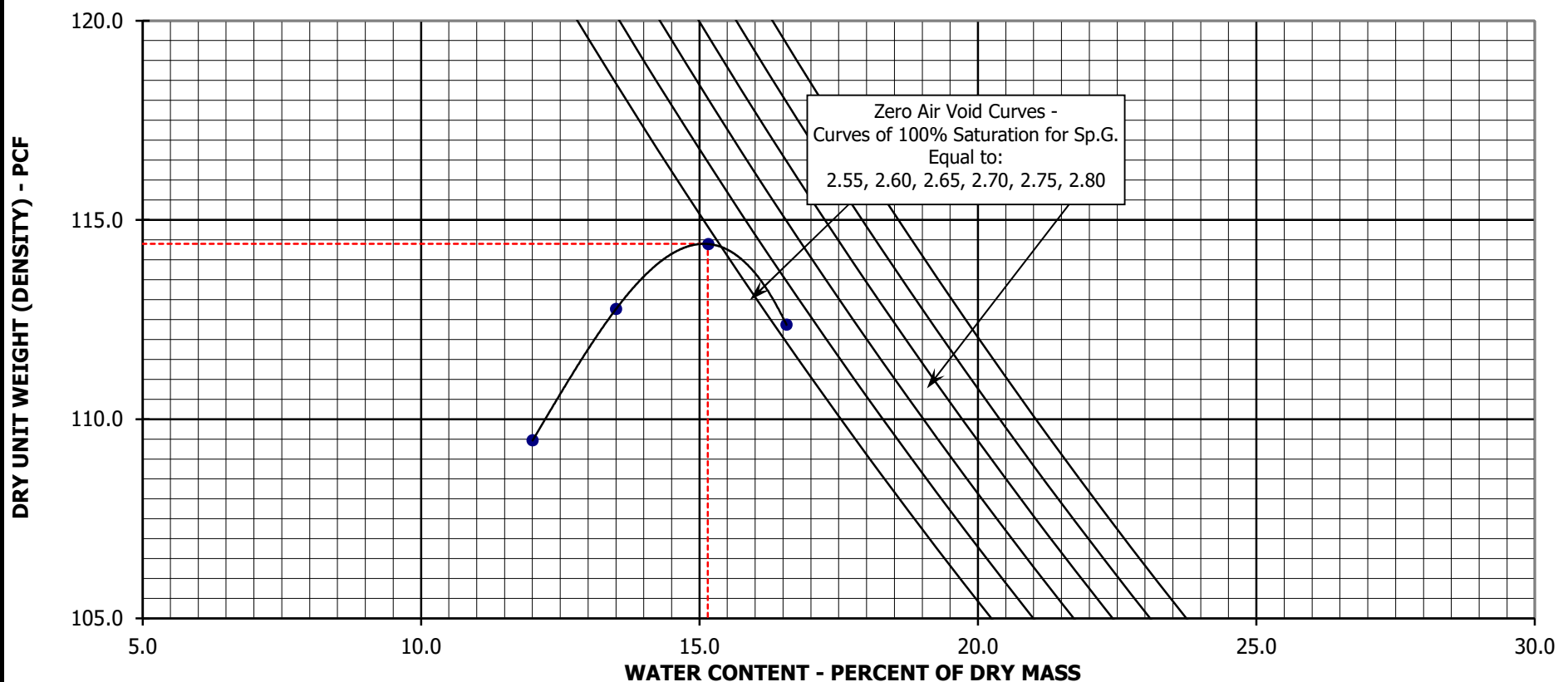
GRADATION PLOT - SOIL & AGGREGATE

Project Number: 20.3062, J&T Consulting, Inc. Date: 9-Dec-20
Project Name: Johnstown Reservoir Outlet Structure Technician: J. Holiman
Lab ID Number: 2021436 Reviewer: J. Crystal
Sample Location: B-3 at 9'
Visual Description: CLAY, brown

AASHTO M 145 Classification: A-7-6 **Group Index:** 24
Unified Soil Classification System
(ASTM D 2487): (CL) **Lean clay**

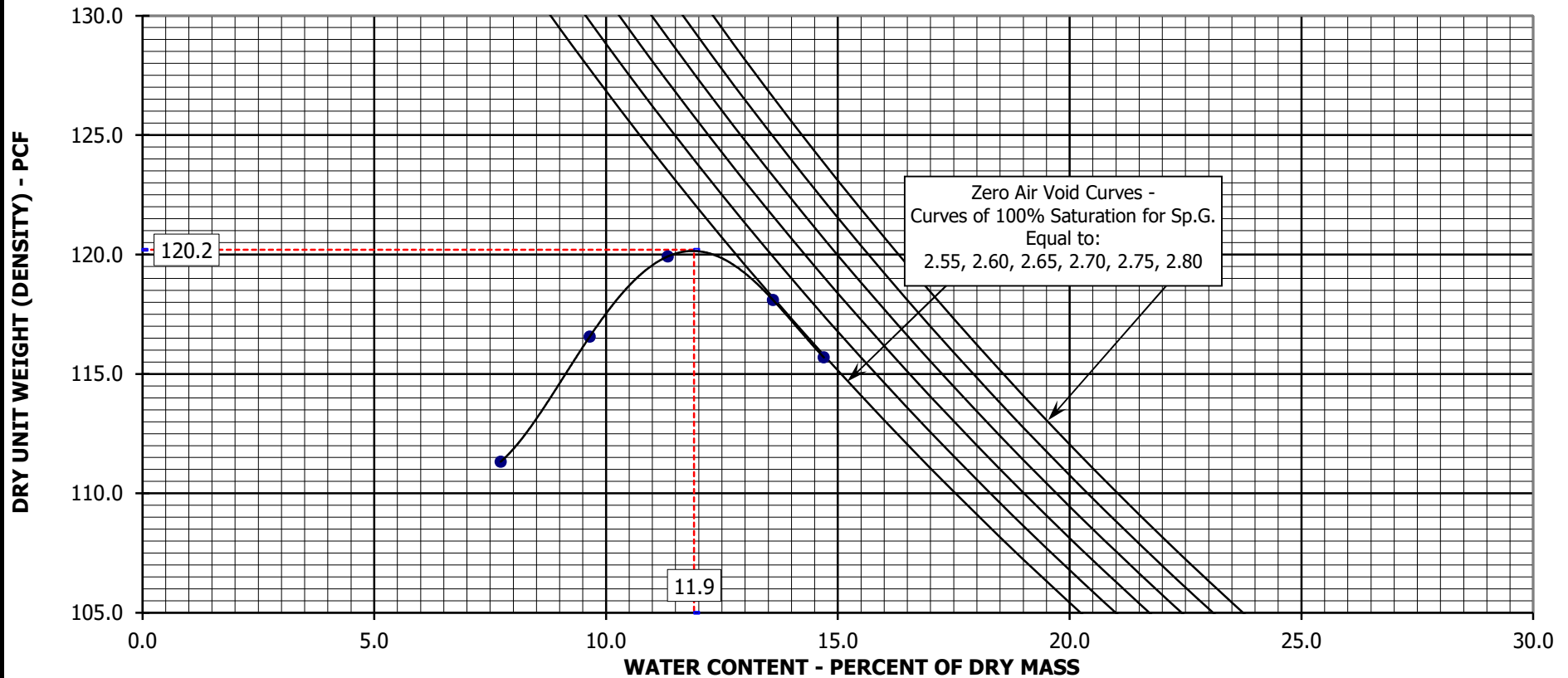


Laboratory Maximum Dry Unit Weight (Density): 114.4 pcf
Laboratory Optimum Moisture Content (OMC): 15.2 %



Sample Location	Depth (ft)	LL	PL	PI	-#200 (%)	Soil Description & Classification	Moisture/Density Relationship (Proctor) Test
B-1	0 to 5	38	14	24	64.8	Visual: CLAY, sandy, brown AASHTO: A-6(13) USCS: CLAY, sandy, lean	Project Number: 20.3062, J&T Consulting, Inc. Project Name: Johnstown Reservoir Outlet Structure Drawn By: K. Lang Checked By: J. Crystal Date: 21-Dec-20 Tested by: J. De Los Santos Date: 18-Dec-20 Lab ID Number: 2021425

Laboratory Maximum Dry Unit Weight (Density): 120.2 pcf
Laboratory Optimum Moisture Content (OMC): 11.9 %



Sample Location	Depth (ft)	LL	PL	PI	-#200 (%)	Soil Description & Classification	Moisture/Density Relationship (Proctor) Test
B-2	0 to 5	30	14	16	47.3	Visual: SAND, clayey, brown AASHTO: A-6(4) USCS: (SC) Sandy clay	Project Number: 20.3062, J&T Consulting, Inc. Project Name: Johnstown Reservoir Outlet Structure Drawn By: K. Lang Tested by: J. De Los Santos Checked By: J. Crystal Date: 18-Dec-20 Date: 21-Dec-20 Lab ID Number: 2021429

SOIL CHEMICAL TESTS

Project Number: 20.3062, J&T Consulting, Inc. Date: 11-Feb-21
 Project Name: Johnstown Reservoir Outlet Structure Technician: G. Hoyos
 Lab ID Number: 212211 Reviewer: J. Crystal
 Sample Location: B-2 at 14'
 Visual Description: CLAY, sandy, brown

Dish+Wet Soil (g): _____
 Dish+Dry Soil (g): _____
 Dish Wt. (g): _____
 Air Dried Moisture
 Content (%): _____

Water Soluble Sulfate (Colorado Procedure CP-L-2103)

Dilution	Reading, mg/L	Concentration, ppm	Concentration, %
100:1	1.0	100	0.01

pH (ASTM D 4972, 20g of -#10)

pH Meter Reading: _____

Water Soluble Chloride (HACH Method 8113, 100g of -#10)

Dilution	Reading (mg/L)	Result (mg/L)

Resistivity (AASHTO T 288, -#10)

Readings (ohm*cm)

Lowest Resistivity

SOIL CHEMICAL TESTS

Project Number: 20.3062, J&T Consulting, Inc. Date: 11-Feb-21
 Project Name: Johnstown Reservoir Outlet Structure Technician: G. Hoyos
 Lab ID Number: 212212 Reviewer: J. Crystal
 Sample Location: B-4 at 4'
 Visual Description: CLAYSTONE, sandy, brown

Dish+Wet Soil (g): _____
 Dish+Dry Soil (g): _____
 Dish Wt. (g): _____
 Air Dried Moisture
 Content (%): _____

Water Soluble Sulfate (Colorado Procedure CP-L-2103)

Dilution	Reading, mg/L	Concentration, ppm	Concentration, %
100:1	0.0	0	0.00

pH (ASTM D 4972, 20g of -#10)

pH Meter Reading: _____

Water Soluble Chloride (HACH Method 8113, 100g of -#10)

Dilution	Reading (mg/L)	Result (mg/L)

Resistivity (AASHTO T 288, -#10)

Readings (ohm*cm)

Lowest Resistivity



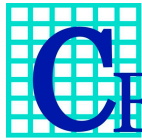
APPENDIX C

Slope Stability Results



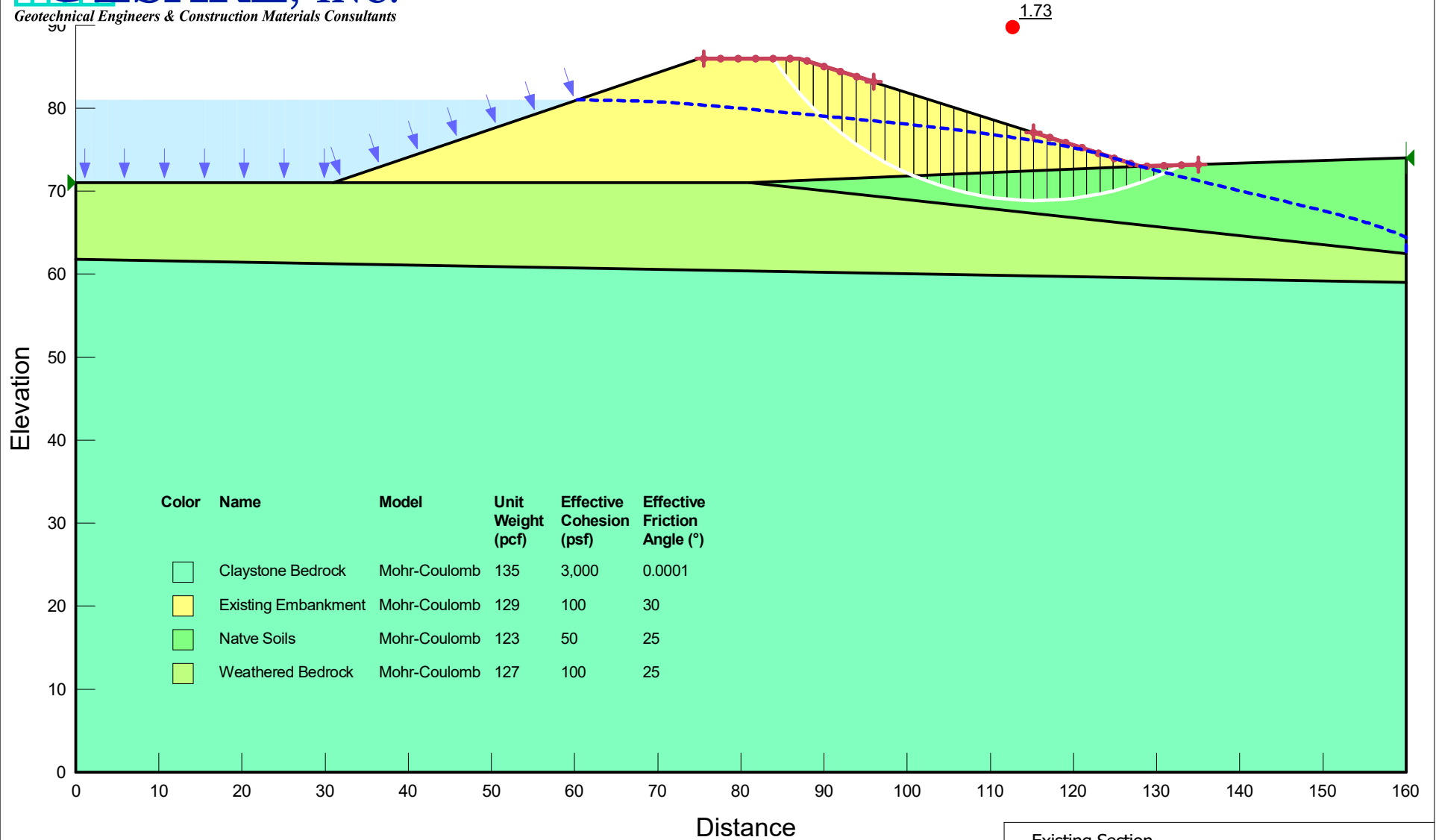
APPENDIX C

Slope Stability Results Existing



Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

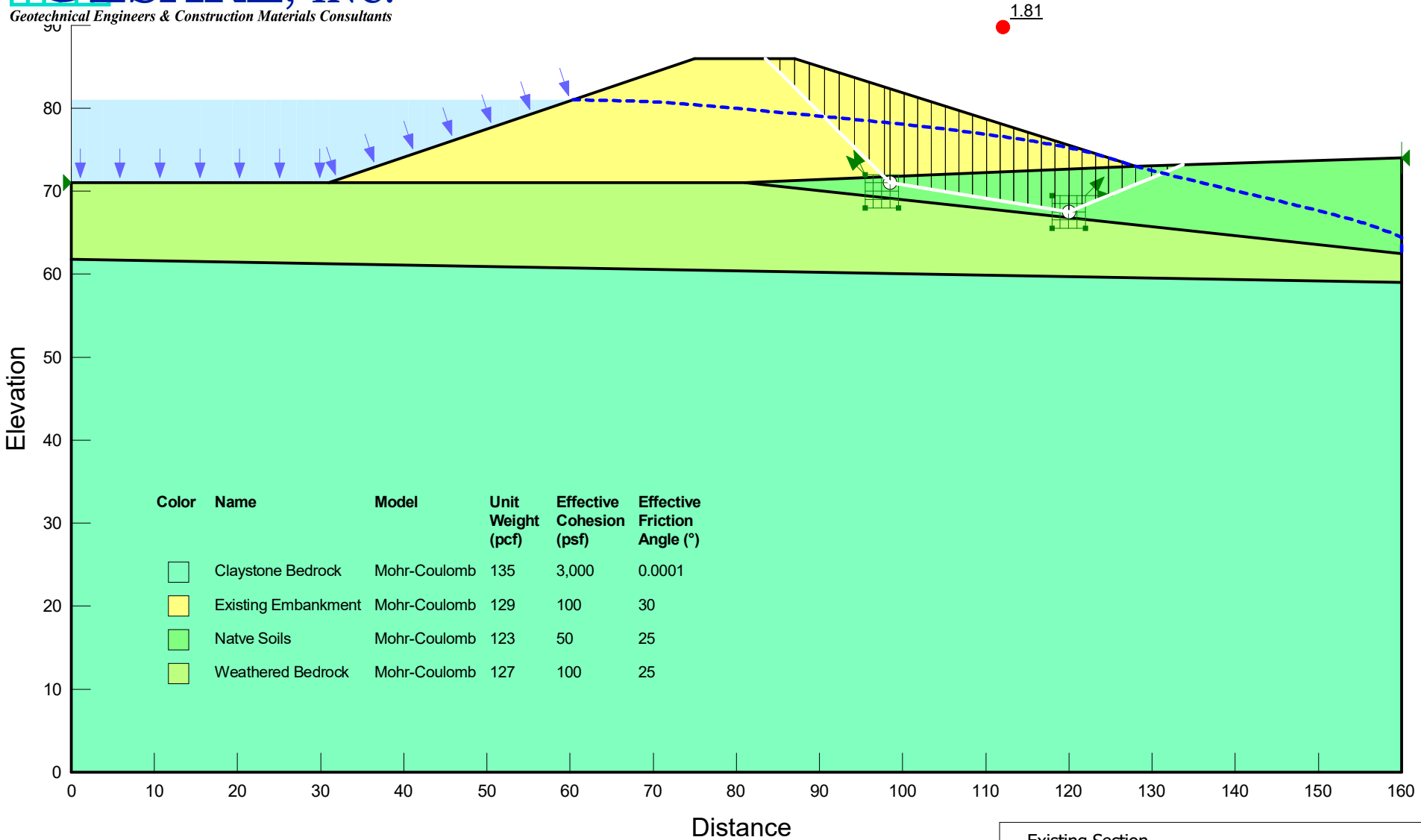


Existing Section
Full Reservoir Steady State Seepage
Downstream Circular Failure
Critical Failure Surface

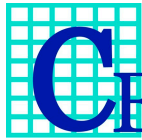


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

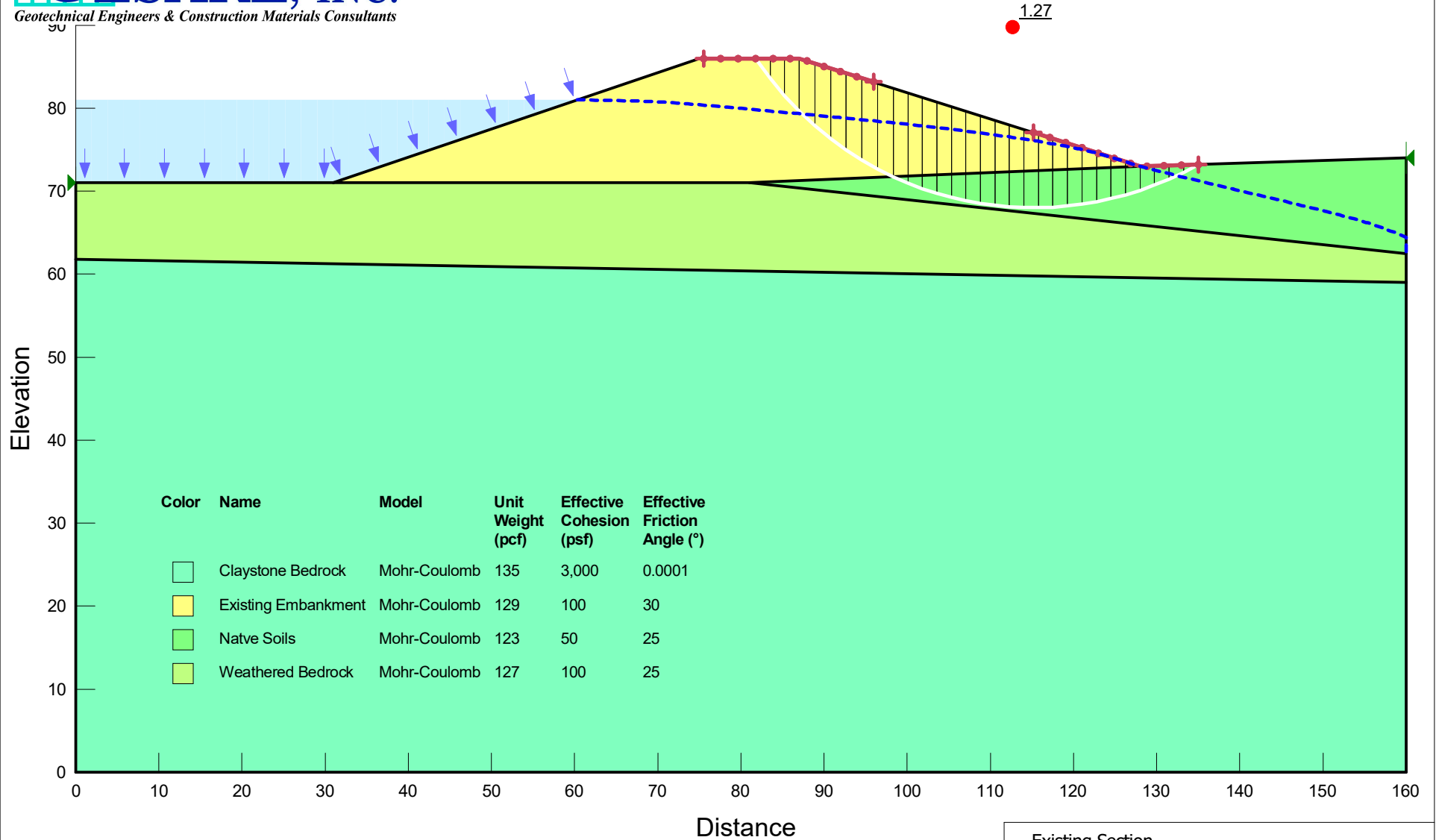


Existing Section
Full Reservoir Steady State Seepage
Downstream Block Failure
Critical Failure Surface

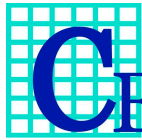


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

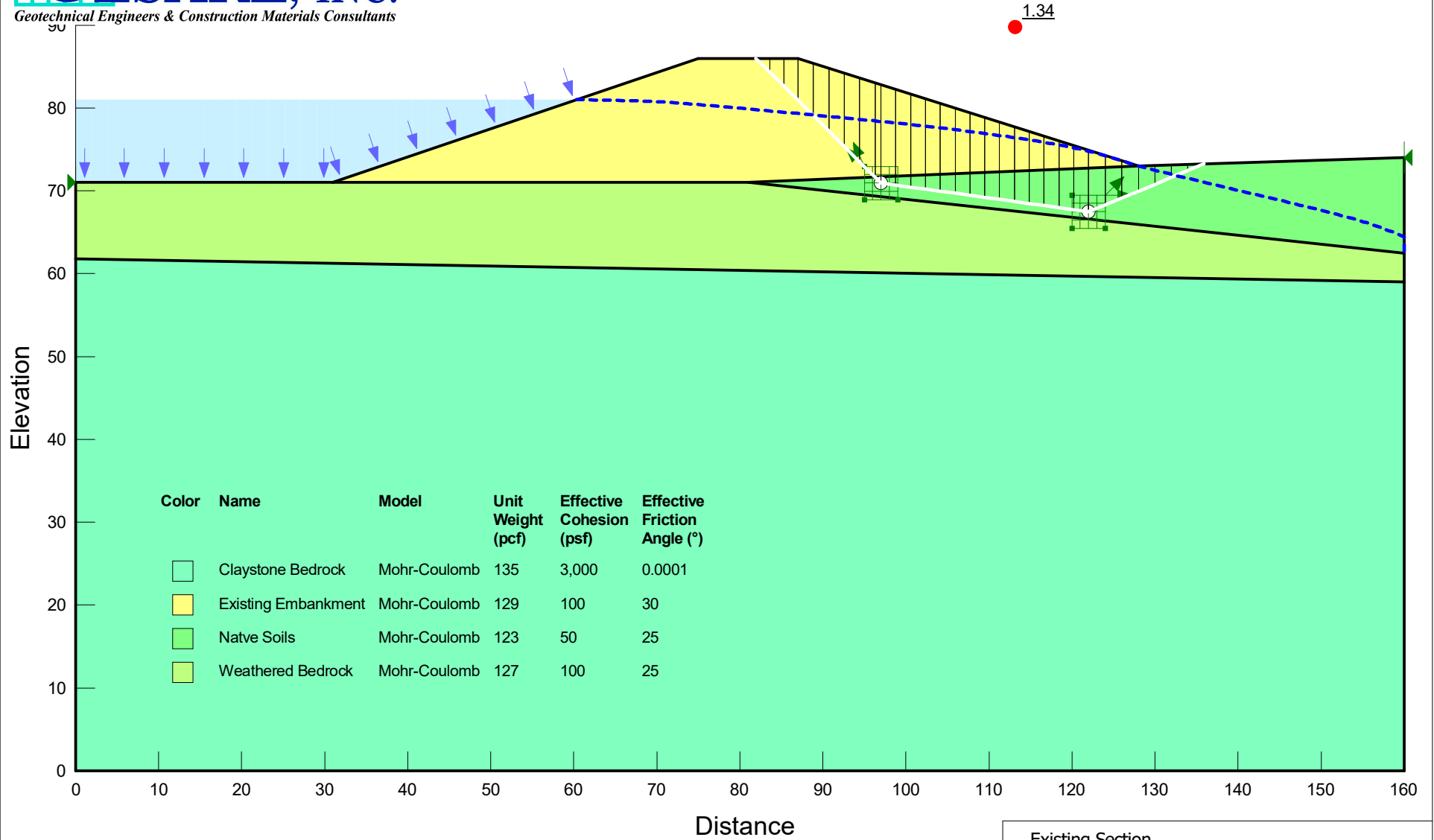


Existing Section
Full Reservoir Steady State Seepage
Downstream Circular Failure - Pseudo Seismic
Critical Failure Surface

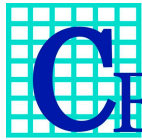


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

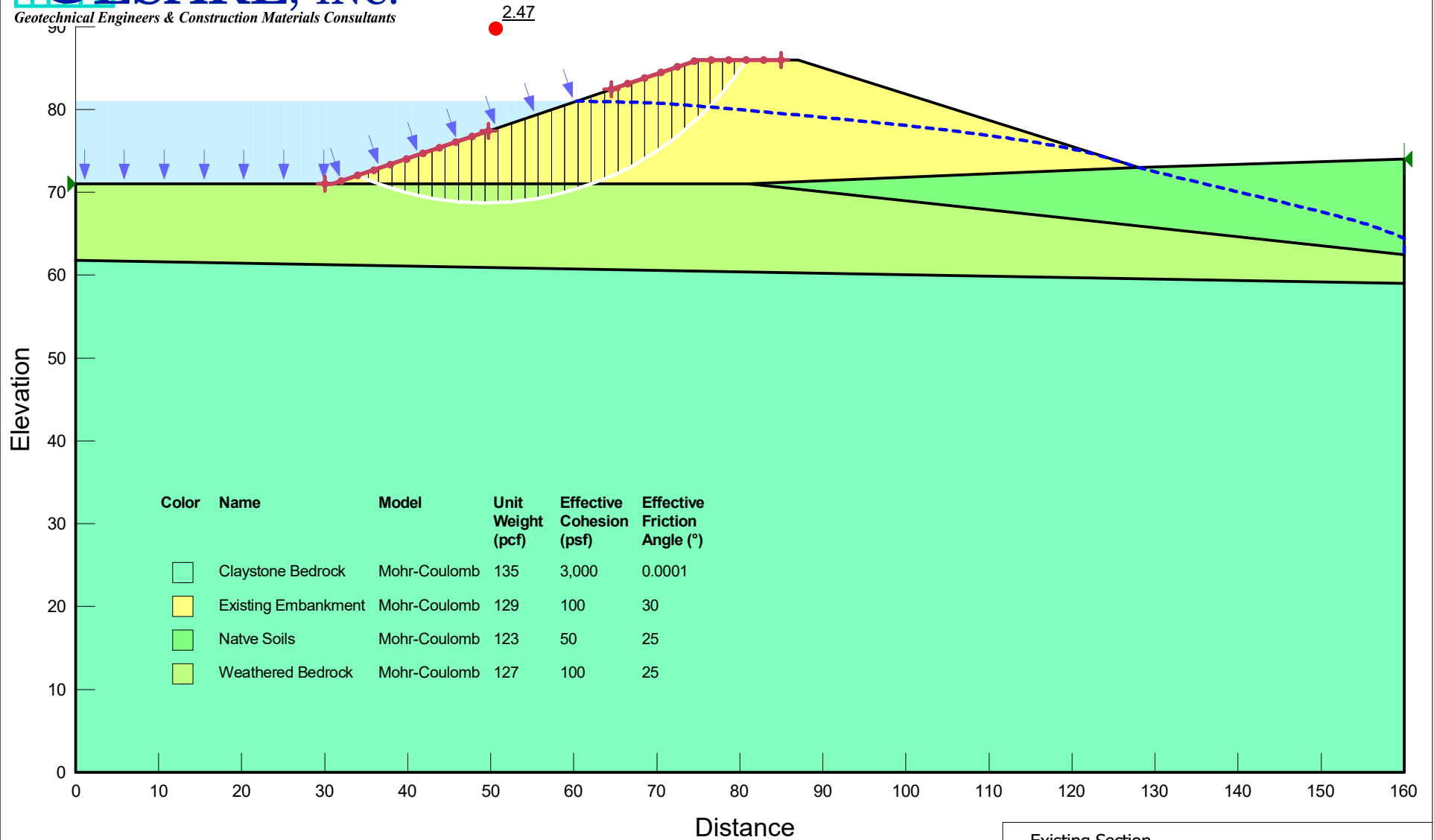


Existing Section
Full Reservoir Steady State Seepage
Downstream Block Failure - Pseudo Seismic
Critical Failure Surface

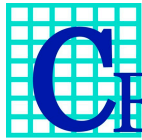


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

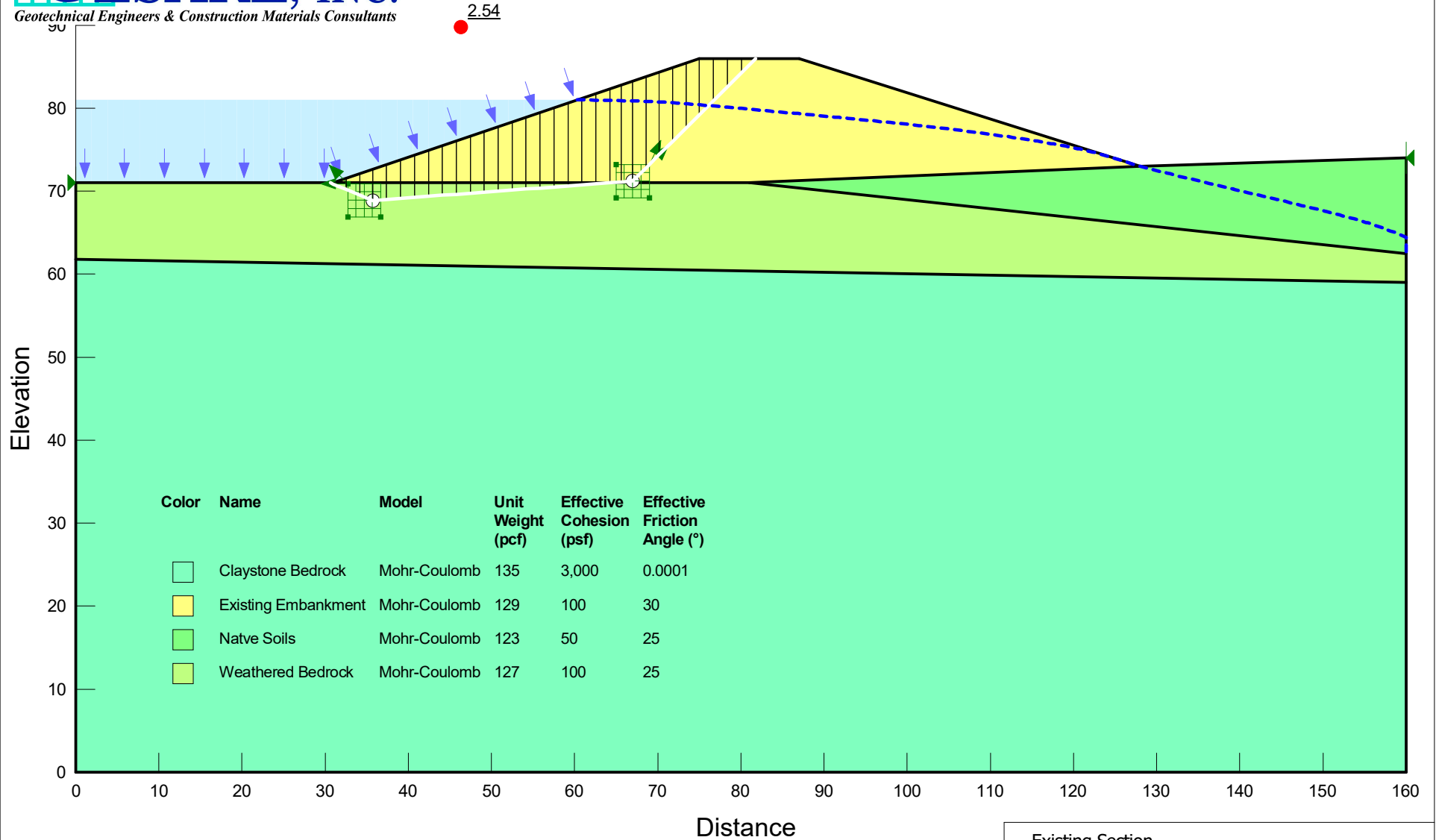


Existing Section
Full Reservoir Steady State Seepage
Upstream Circular Failure
Critical Failure Surface

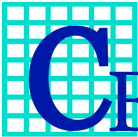


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

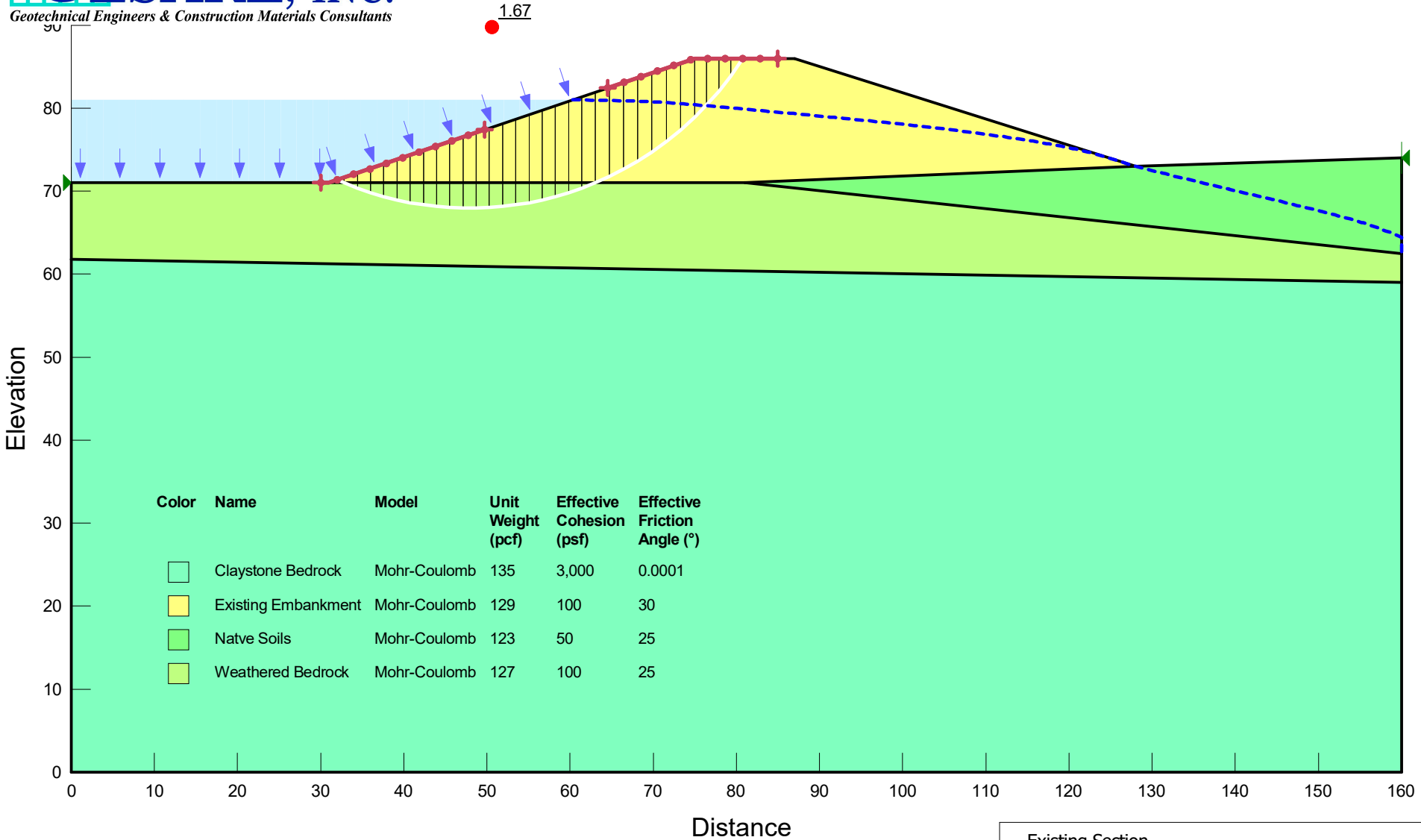


Existing Section
Full Reservoir Steady State Seepage
Upstream Block Failure
Critical Failure Surface

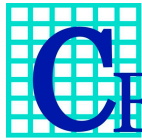


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

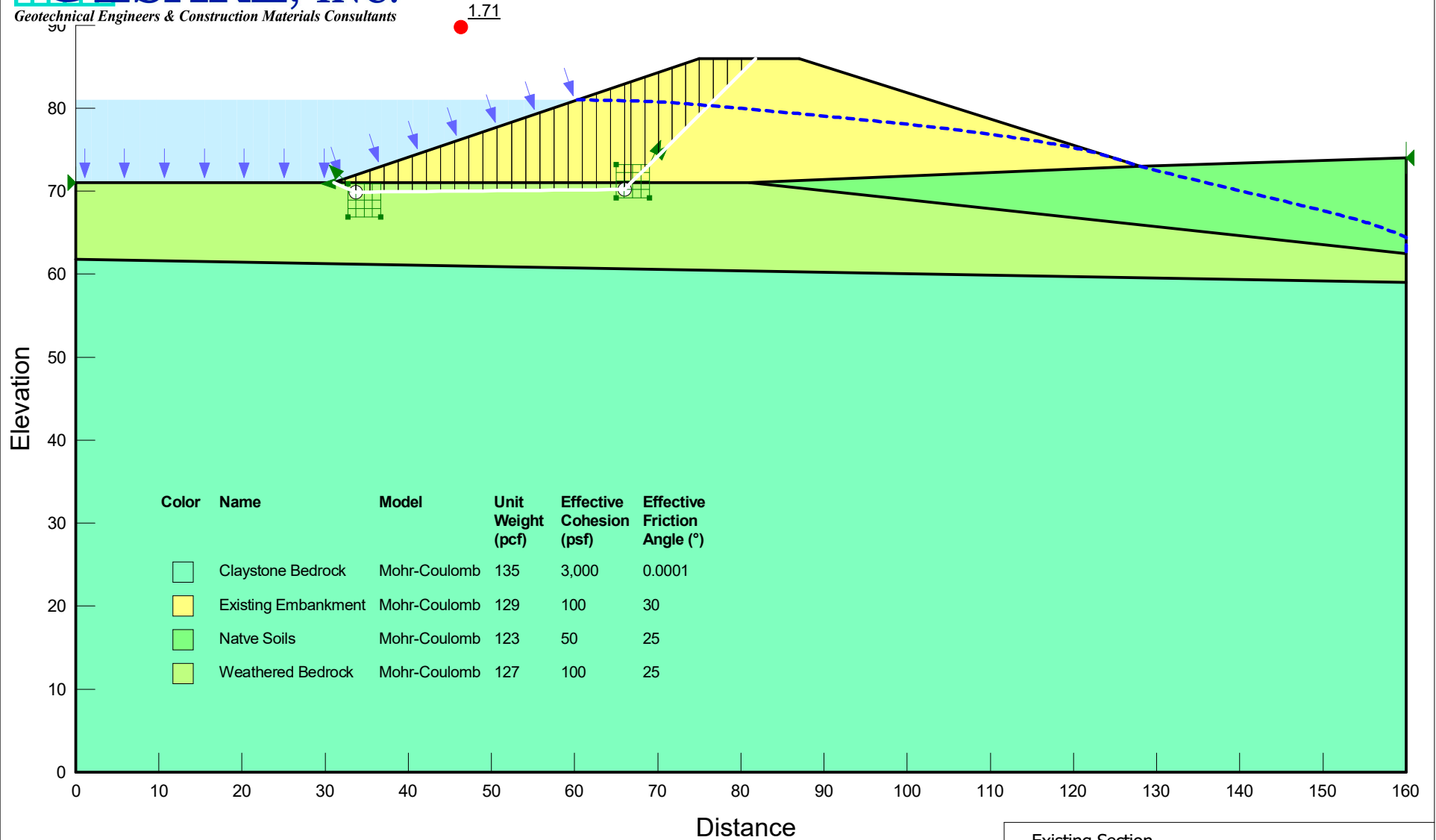


Existing Section
Steady State Seepage
Upstream Circular Failure - Pseudo Seismic
Critical Failure Surface

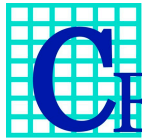


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

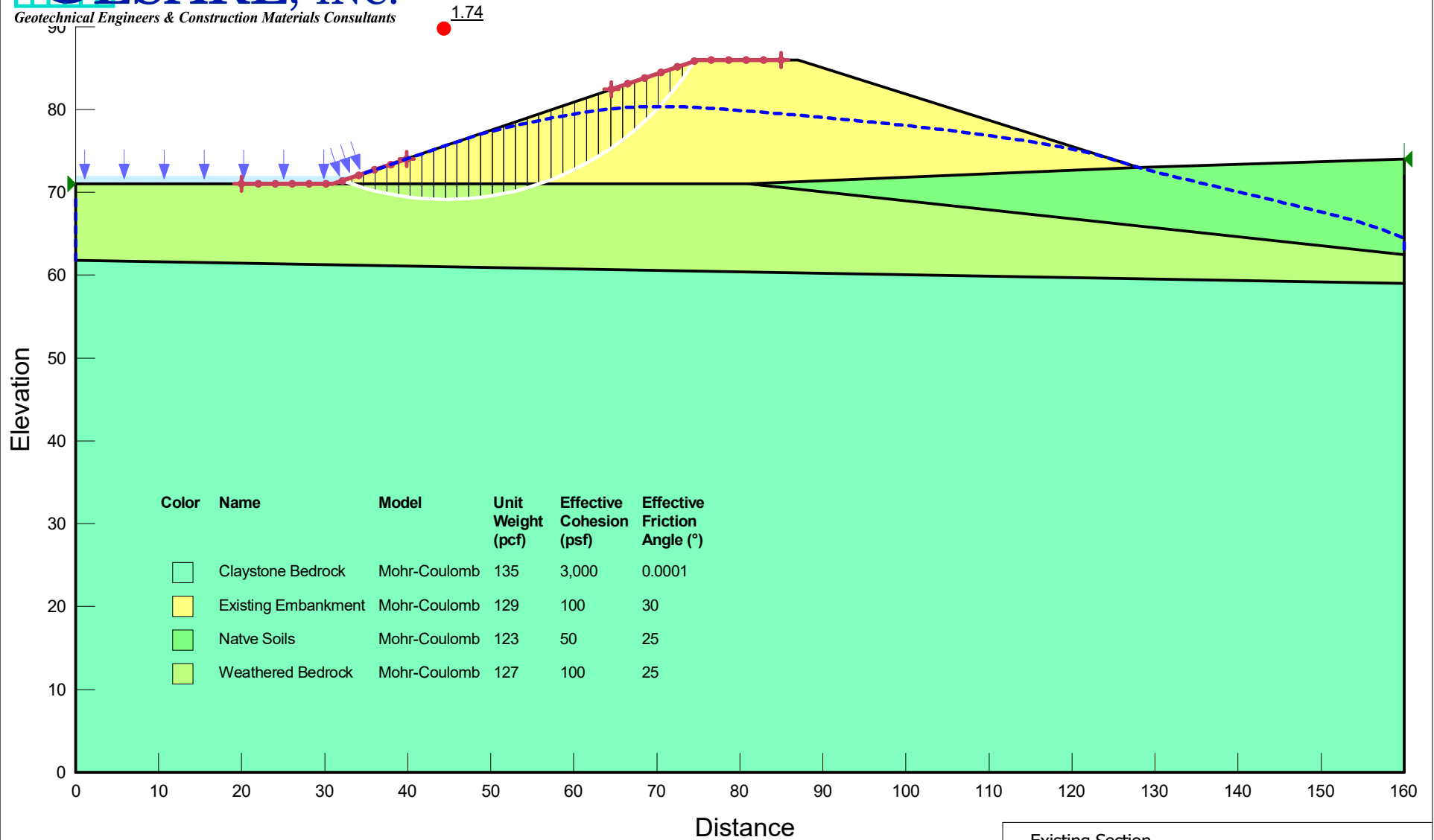


Existing Section
Steady State Seepage
Upstream Block Failure - Pseudo Seismic
Critical Failure Surface



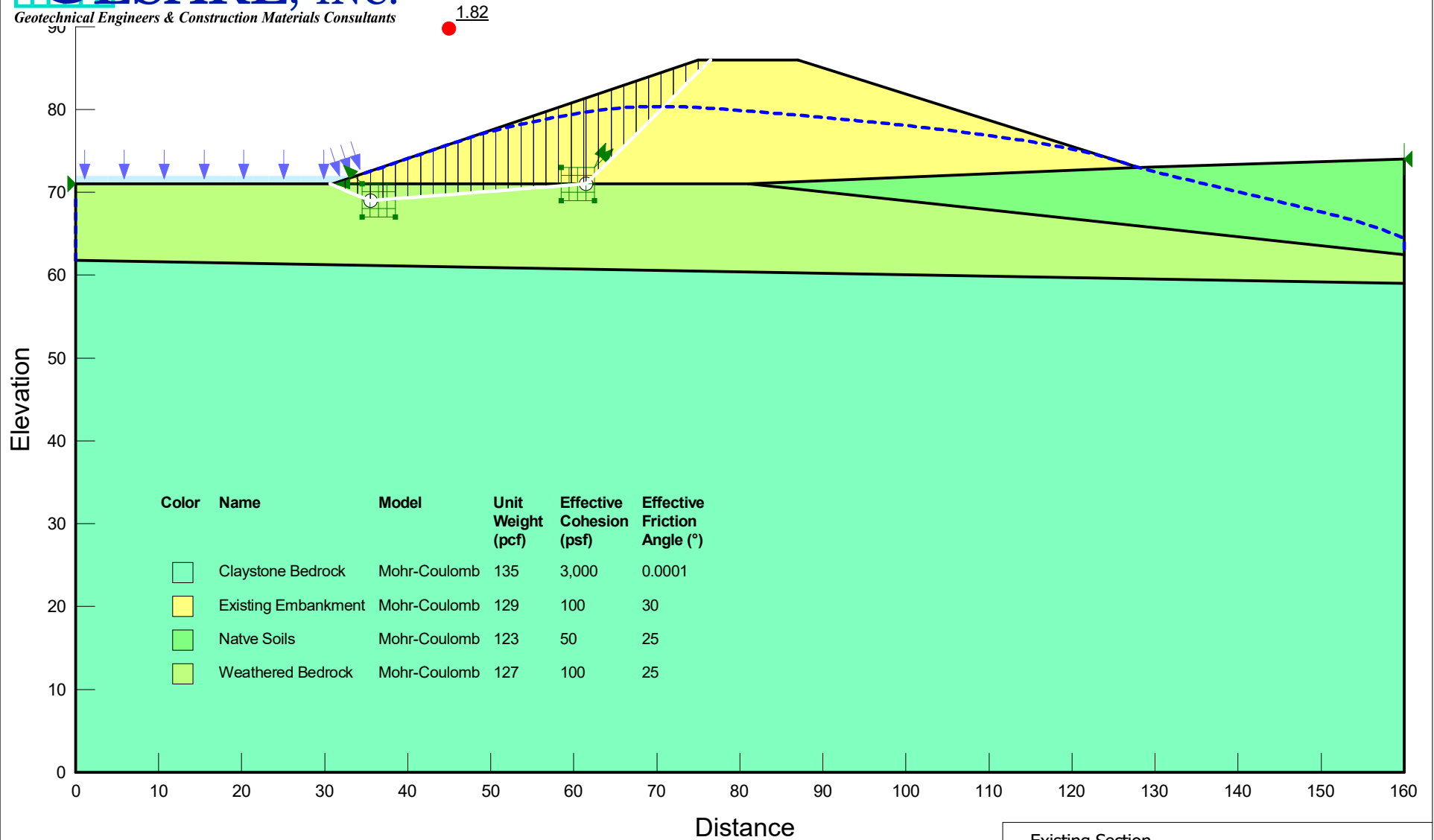
CESARE, INC.
Geotechnical Engineers & Construction Materials Consultants

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**



Existing Section
Rapid Drawdown Transient Seepage
Upstream Circular Failure
Lowest Critical Failure Surface of All Time Step

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**



Existing Section
Rapid Drawdown Transient Seepage
Upstream Block Failure
Lowest Critical Failure Surface of All Time Step



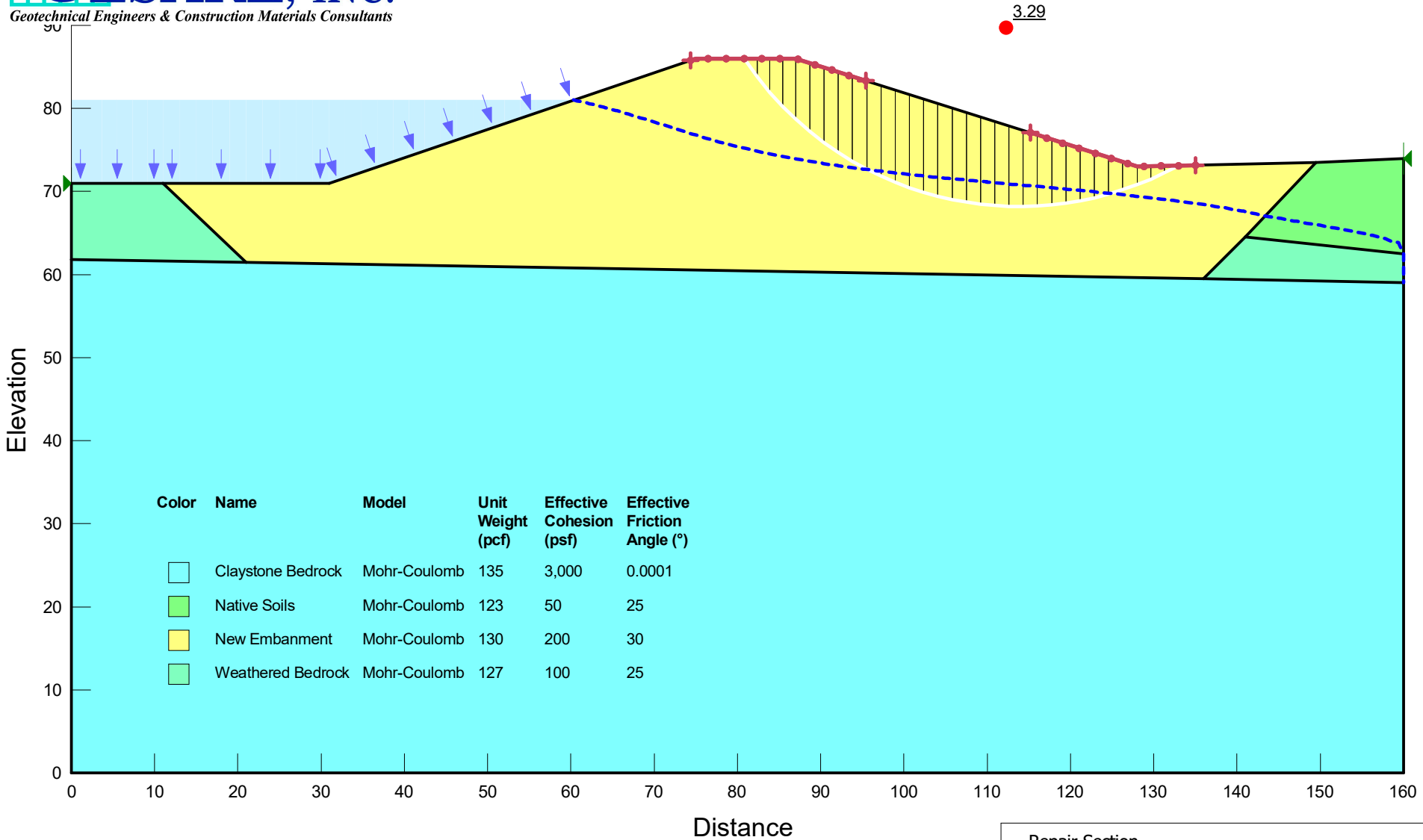
APPENDIX C

Slope Stability Results
Repaired

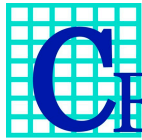


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

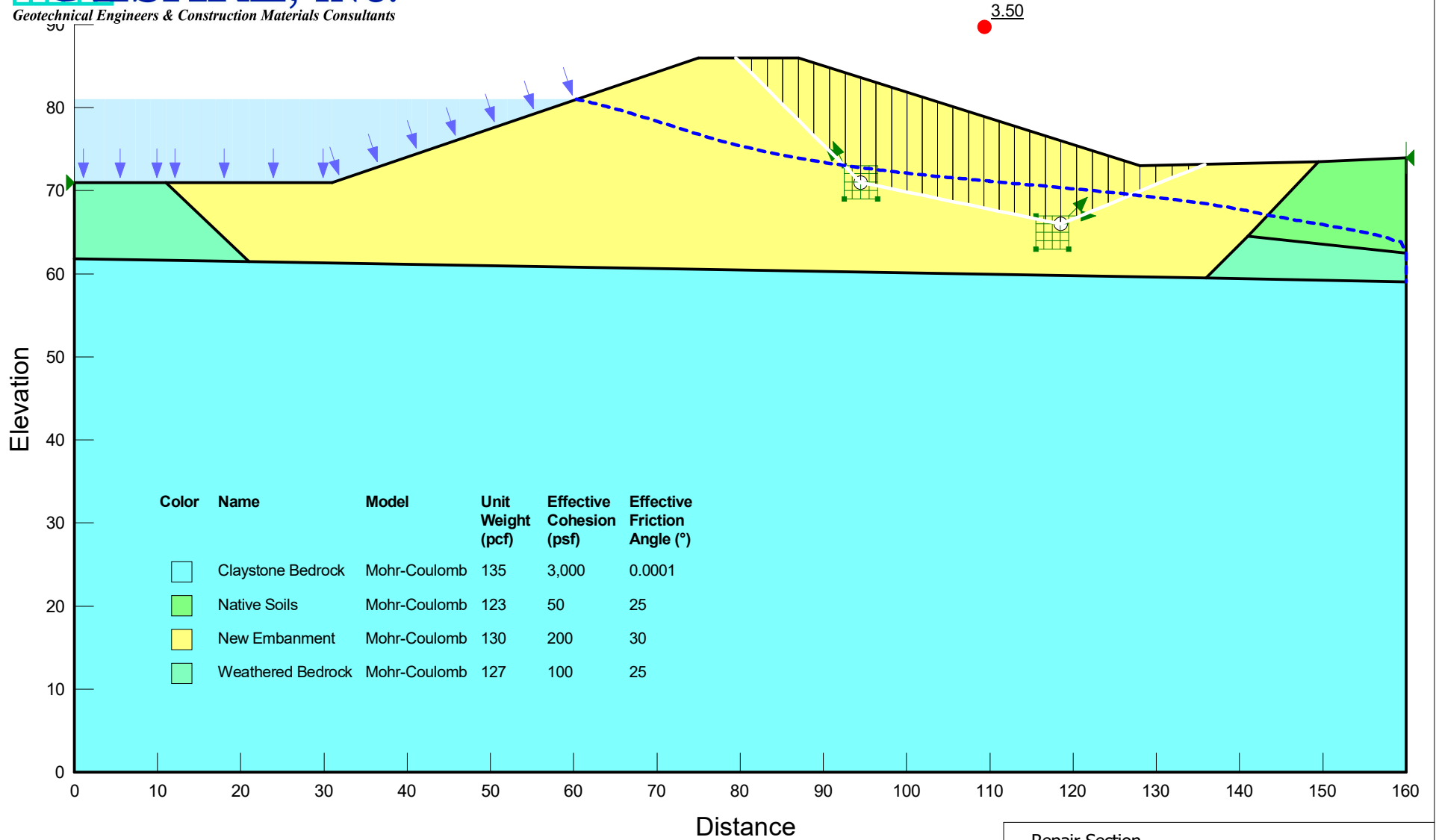


Repair Section
Full Steady State Seepage
Downstream Circular Failure
Critical Failure Surface

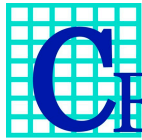


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure Project No. 20.3062

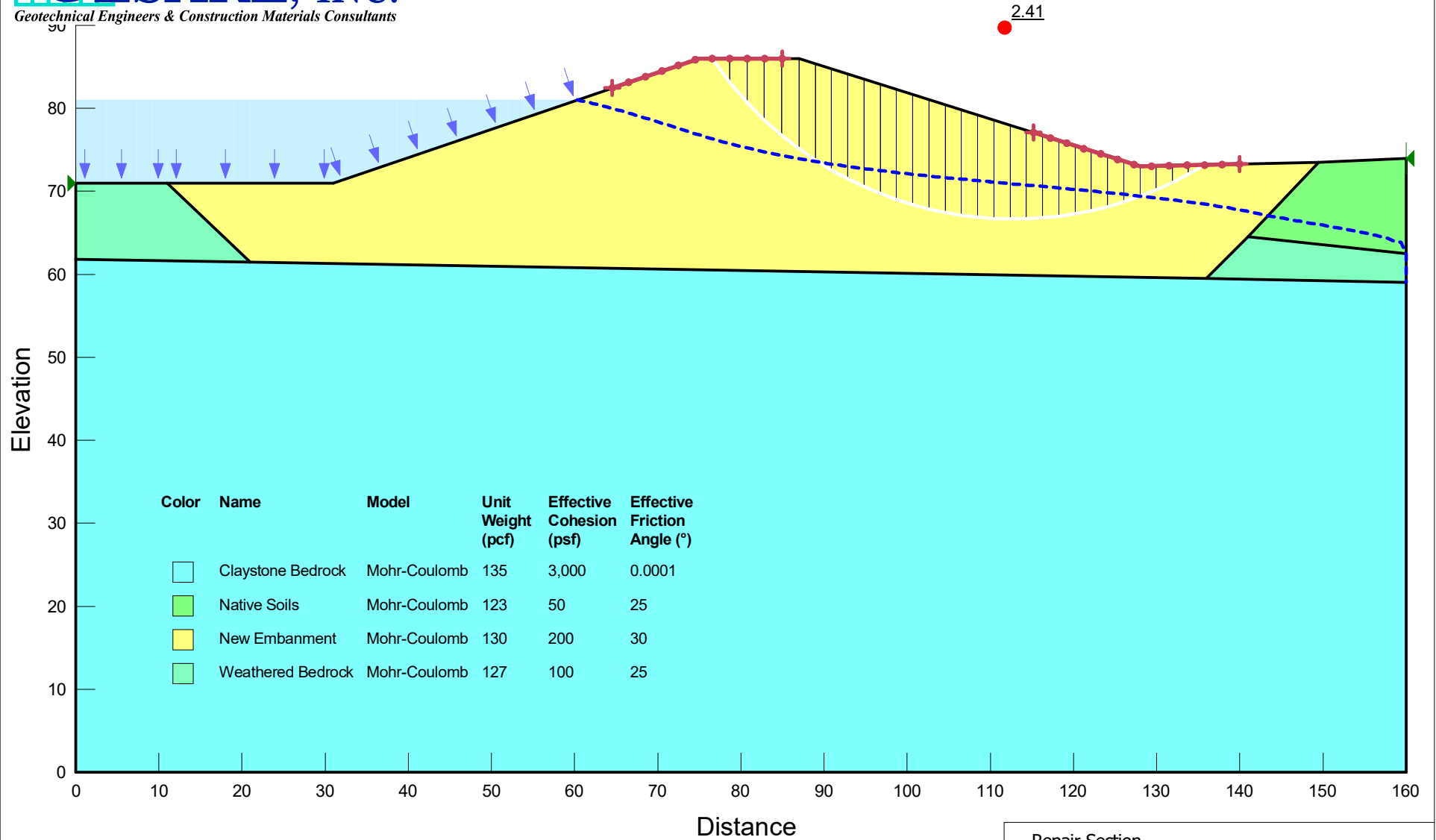


Repair Section
Full Steady State Seepage
Downstream Block Failure
Critical Failure Surface

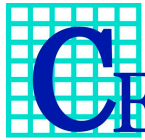


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

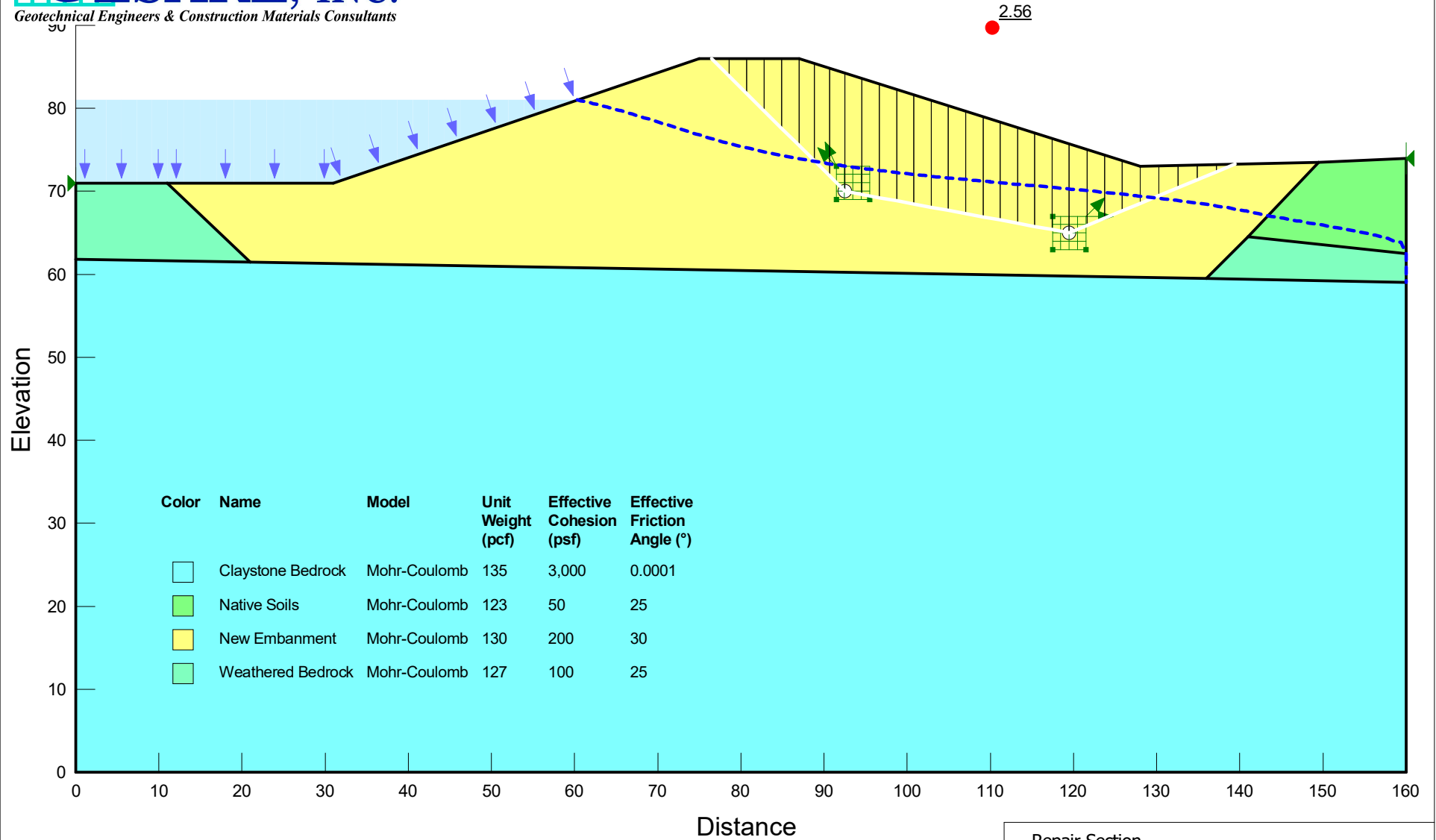


Repair Section
Full Steady State Seepage
Downstream Circular Failure Pseudo Seismic
Critical Failure Surface



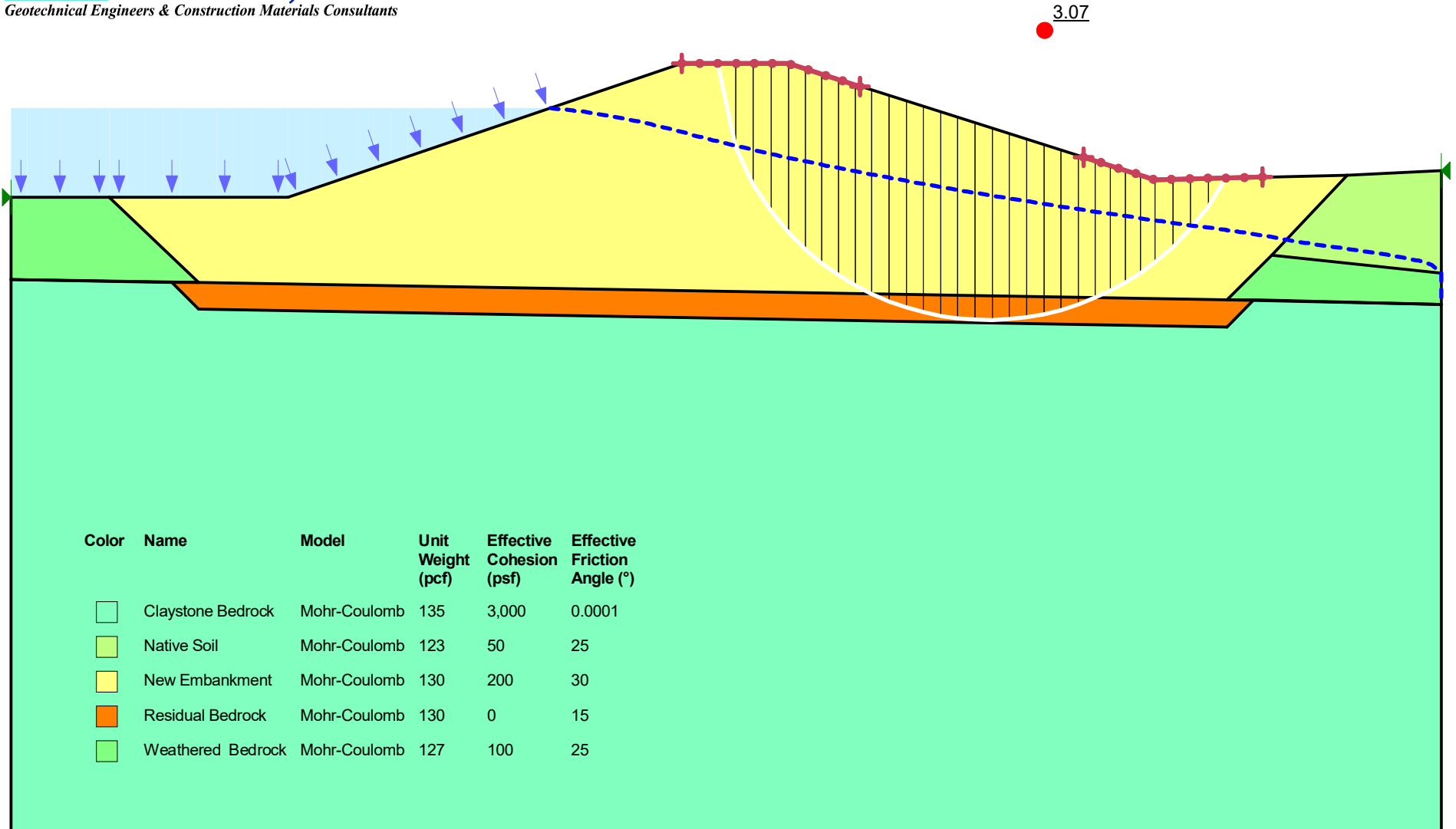
Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062



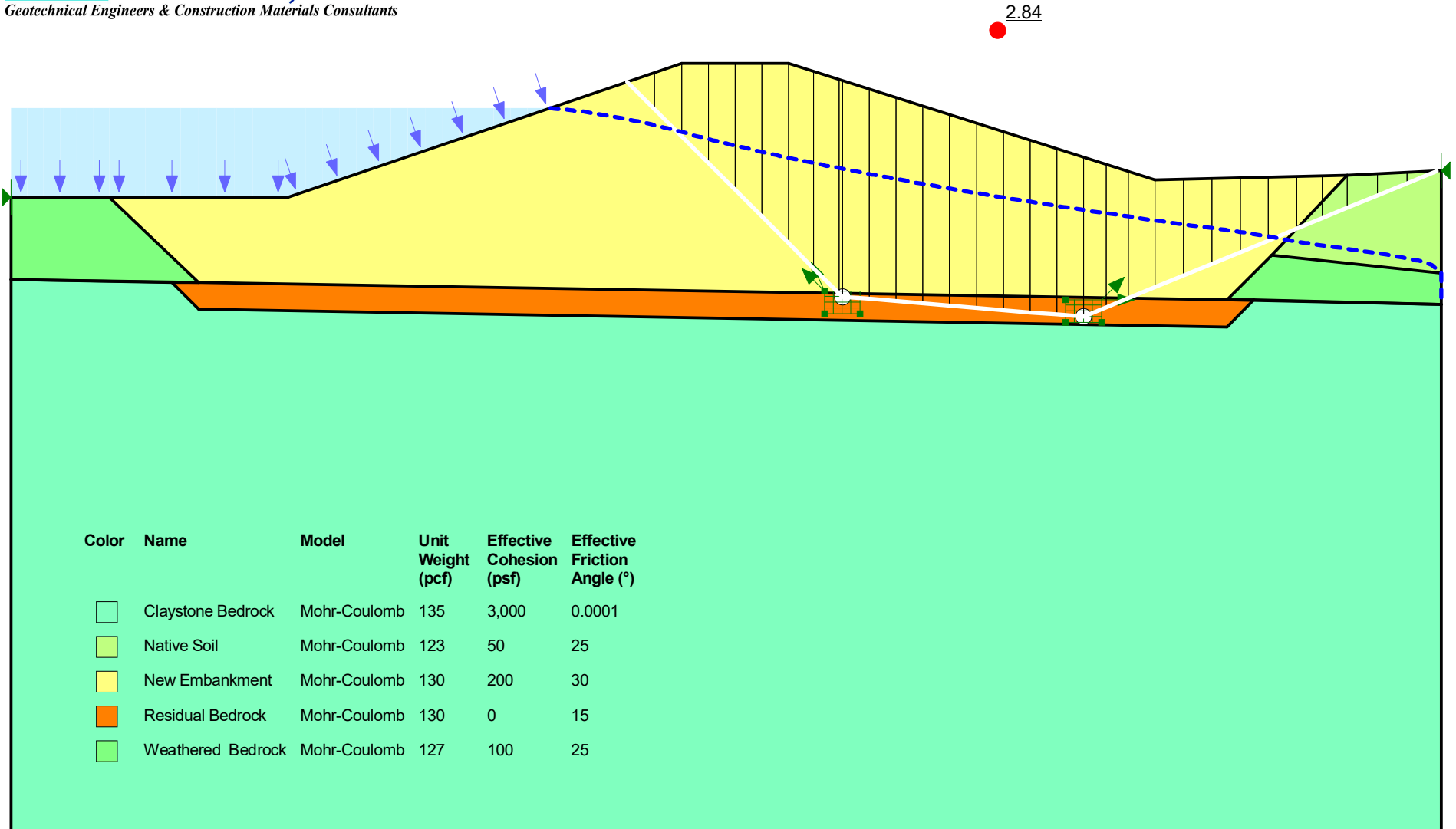
- Repair Section
- Full Steady State Seepage
- Downstream Block Failure Pseudo Seismic
- Critical Failure Surface

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**



Repair Section
Full Steady State Seepage
Downstream Circular Failure - Residual Bedrock
Critical Failure Surface

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**



Color	Name	Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Claystone Bedrock	Mohr-Coulomb	135	3,000	0.0001
	Native Soil	Mohr-Coulomb	123	50	25
	New Embankment	Mohr-Coulomb	130	200	30
	Residual Bedrock	Mohr-Coulomb	130	0	15
	Weathered Bedrock	Mohr-Coulomb	127	100	25

Repair Section

Full Steady State Seepage

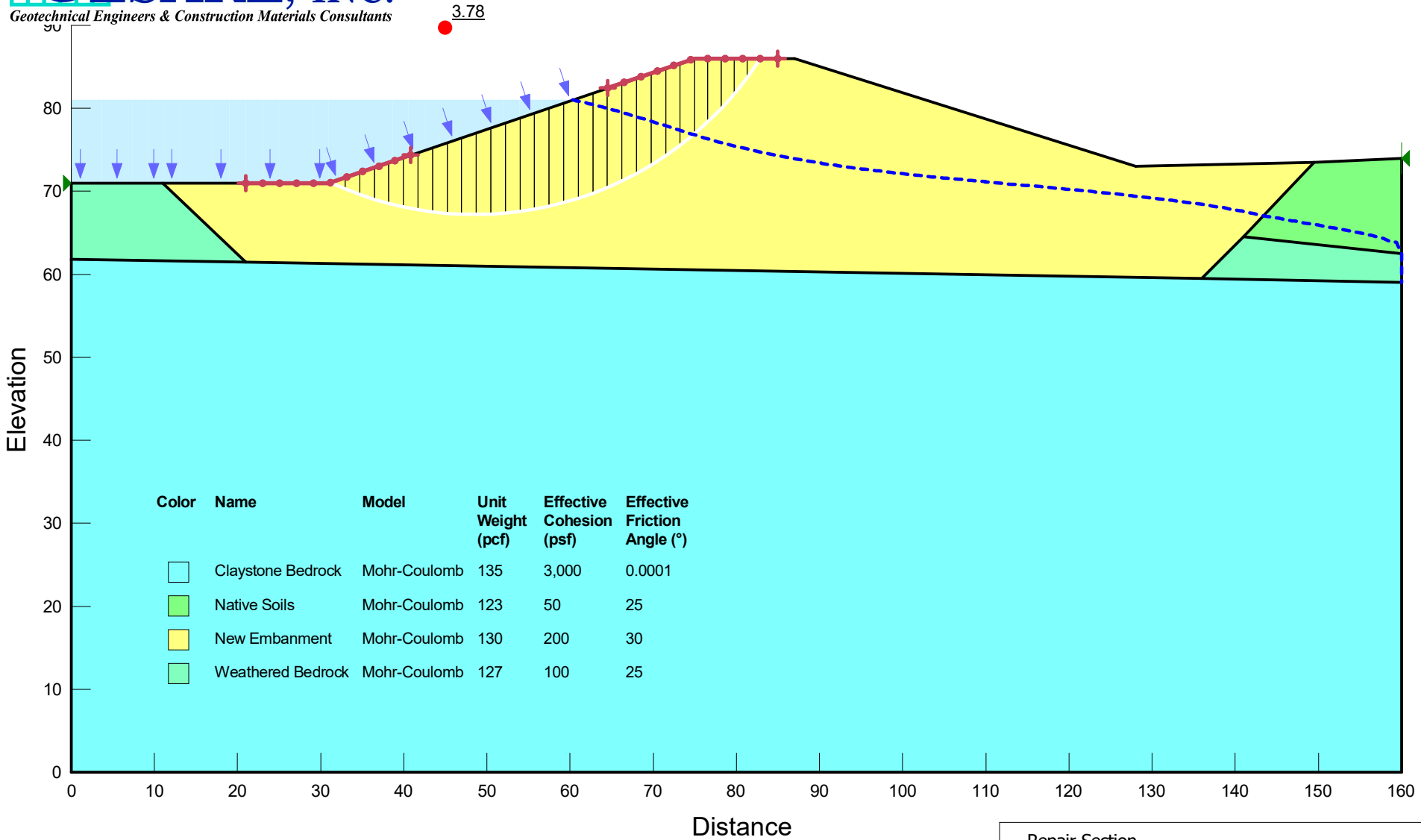
Downstream Block Failure - Residual Bedrock

Critical Failure Surface

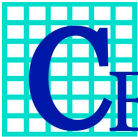


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

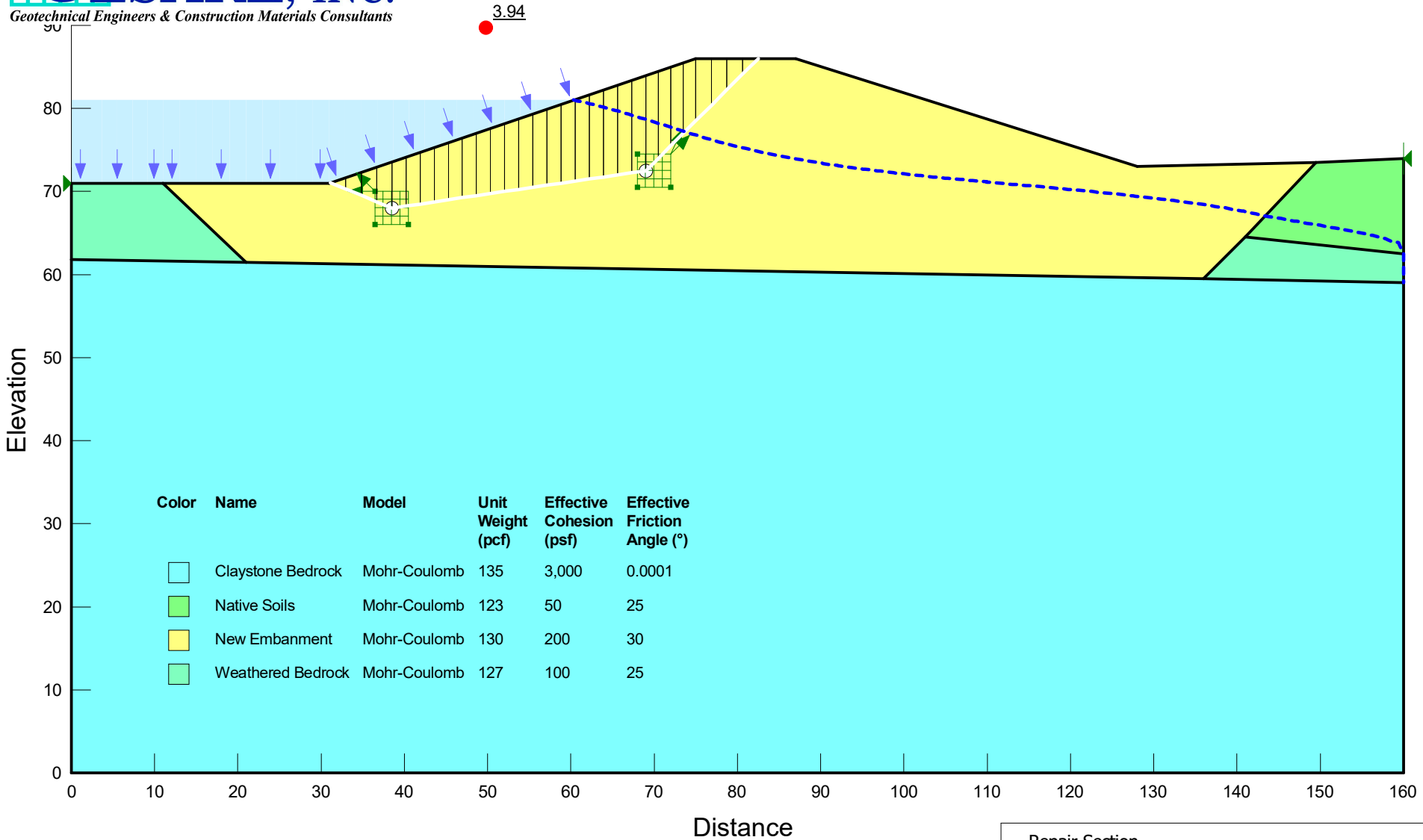


Repair Section
Full Steady State Seepage
Upstream Circular Failure
Critical Failure Surface

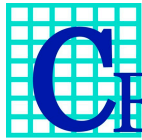


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

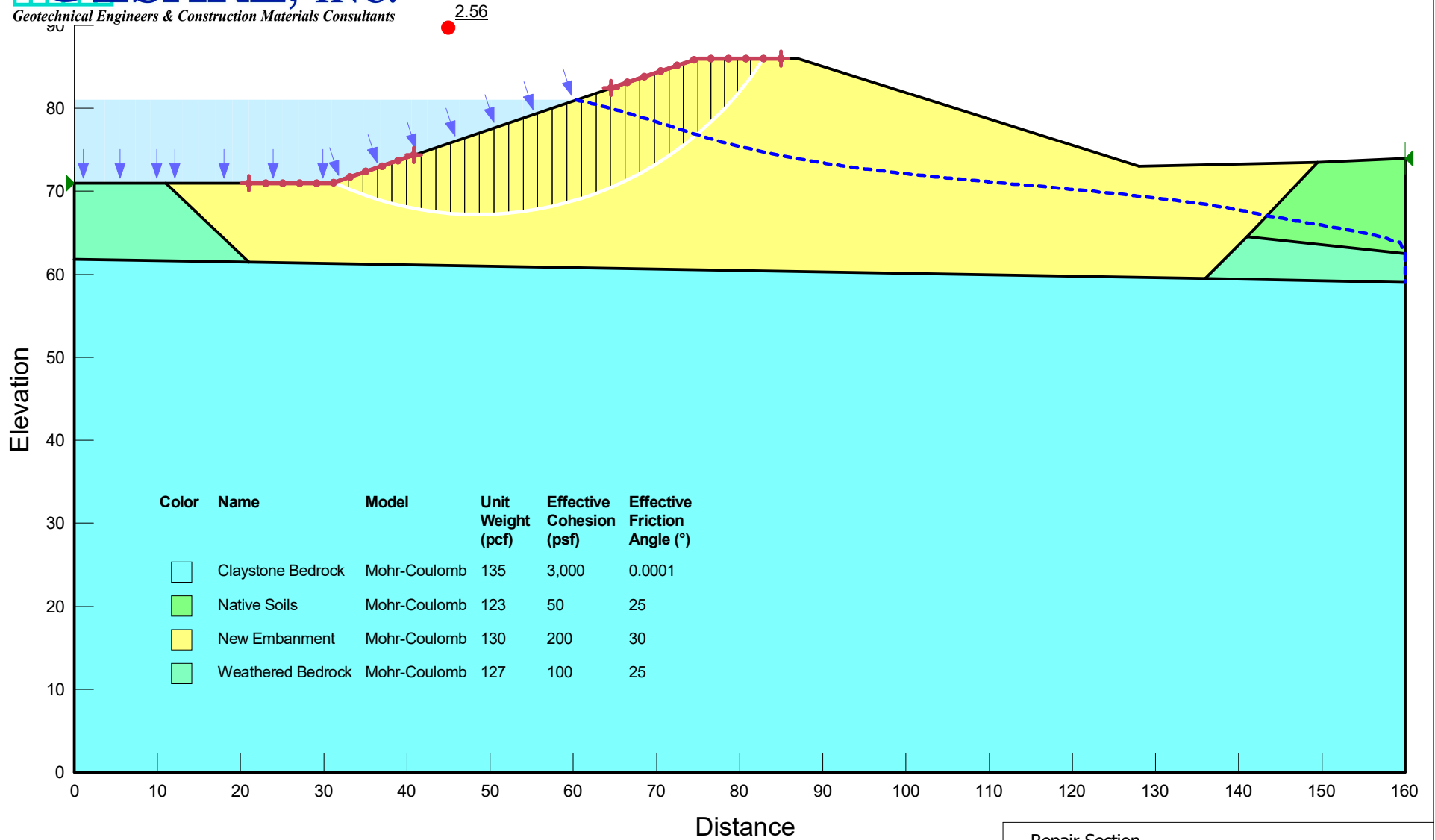


Repair Section
Full Steady State Seepage
Upstream Block Failure
Critical Failure Surface

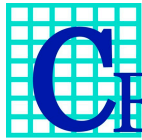


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Johnstown Reservoir Outlet Structure
Project No. 20.3062

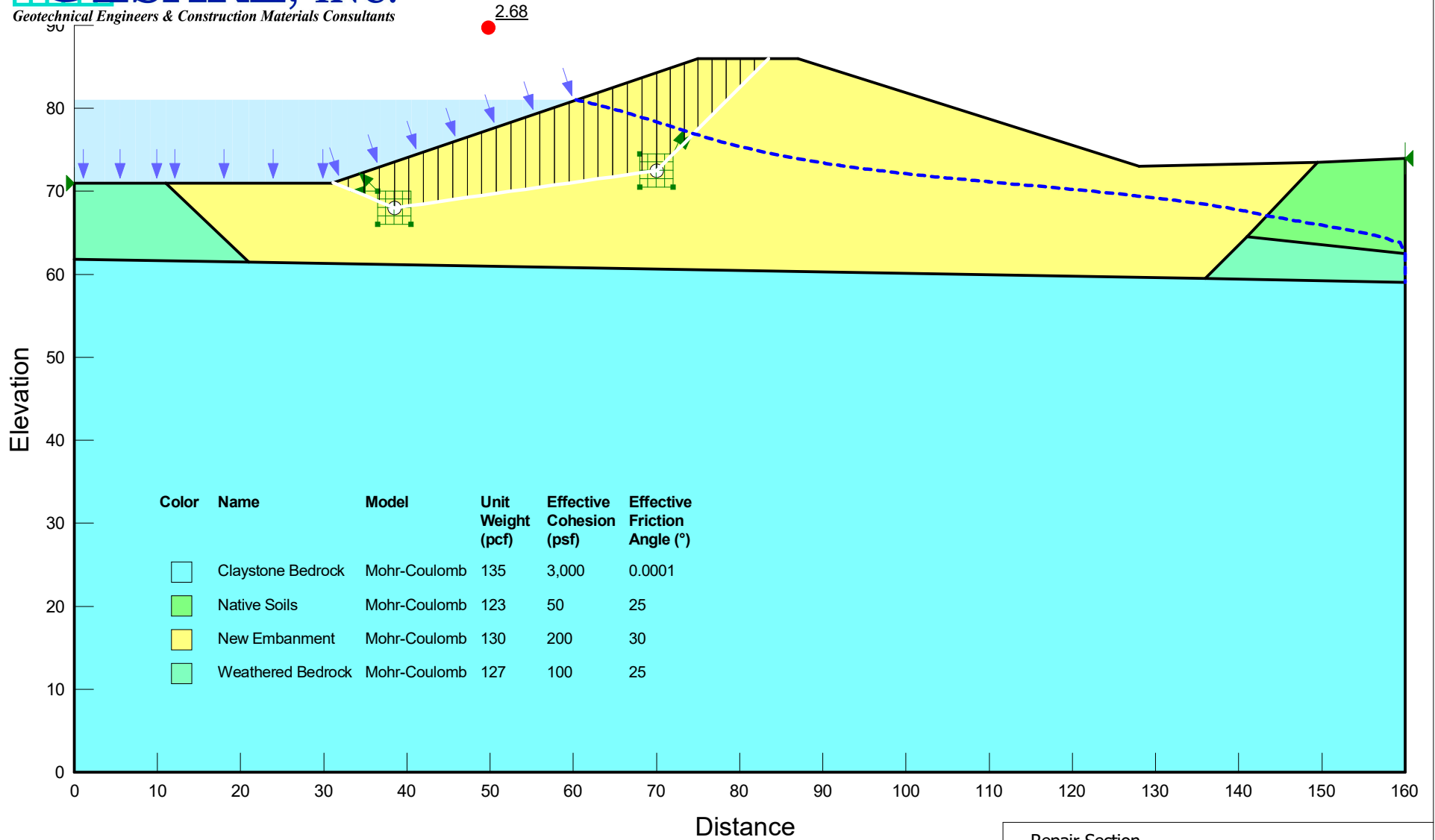


Repair Section
Full Steady State Seepage
Upstream Circular Failure - Pseudo Seismic
Critical Failure Surface

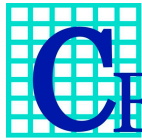


Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062

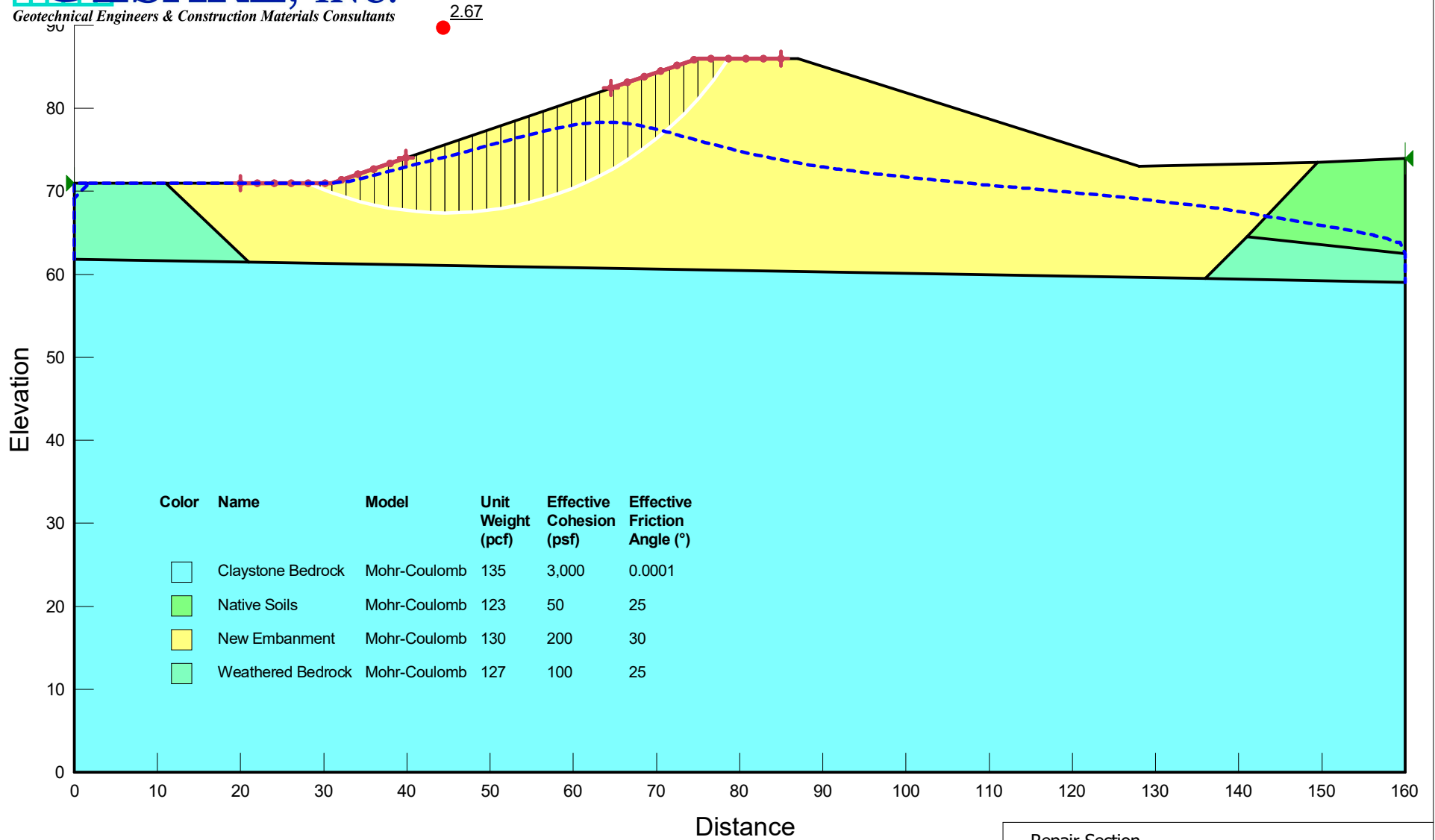


Repair Section
Full Steady State Seepage
Upstream Block Failure - Pseudo Seismic
Critical Failure Surface

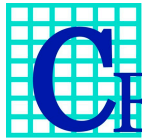


CESARE, INC.
Geotechnical Engineers & Construction Materials Consultants

**Johnstown Reservoir Outlet Structure
Project No. 20.3062**

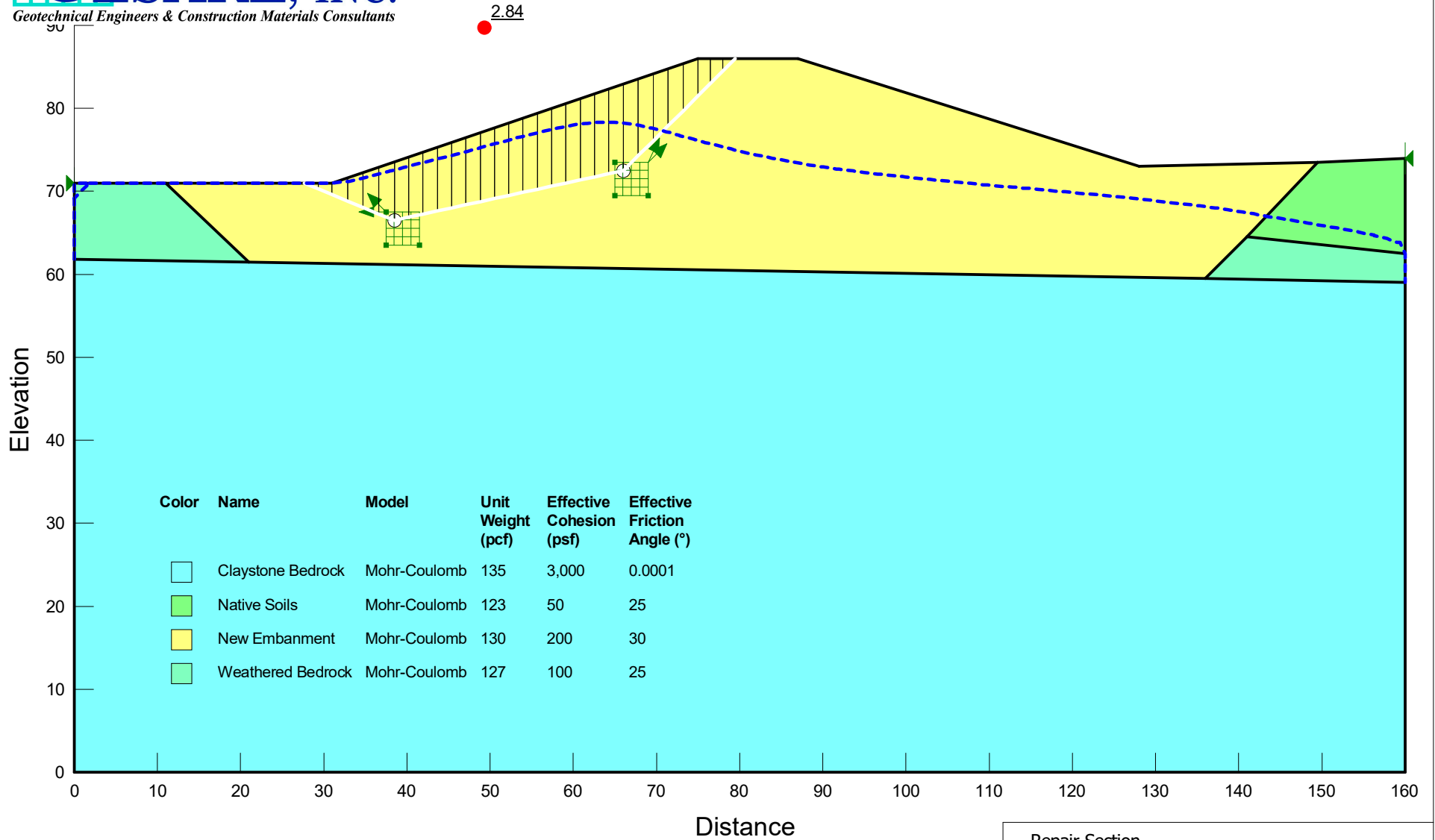


Repair Section
Rapid Drawdown Transient Seepage
Upstream Circular Failure
Lowest Critical Failure Surface of All Time Step



Geotechnical Engineers & Construction Materials Consultants

Johnstown Reservoir Outlet Structure
Project No. 20.3062



Repair Section

Rapid Drawdown Transient Seepage

Upstream Block Failure

Lowest Critical Failure Surface of All Time Step



May 6, 2021

J.C. York, P.E.
J&T Consulting, Inc.
305 Denver Avenue, Suite D
Fort Lupton, CO 80261

Subject: Johnstown Reservoir Outlet Structure
Outlet Structure and Access Ramp Foundations
Weld County, Colorado
Addendum No. 1
Project No. 20.3062

Dear Mr. York:

Mr. Todd Yee with J&T Consulting, Inc. (J&T) requested recommendations for a foundation design for a proposed outlet tower and access ramp for the subject project. Cesare, Inc. (Cesare) reviewed its original geotechnical engineering evaluation for the project to provide recommendation appropriate to the structures.

The outlet tower will be constructed of cast-in-place concrete located within the embankment near its upstream toe and will have a single discharge elevation within the reservoir. It will bear on straight shaft drill pier foundations embedded in competent bedrock. Cesare understands the top of piers will be at or near the contact of the competent bedrock.

A discharge pipe will extend from the outlet tower below the embankment to a water treatment plant intake pipe downstream of the embankment. The discharge pipe will be encased in concrete bearing on competent bedrock its entire length below the embankment. The existing embankment and its supporting soil will be excavated to competent bedrock contact for the discharge pipe structure.

The proposed access ramp configuration will be two parallel cast-in-place concrete cantilever retaining walls with a space of 11 feet between them. The walls will be cast in lifts and the space between will be backfilled with soil prior to the next lift being cast. The walls are planned to bear on spread footings stepping up from an elevation near the tower pier cap to the embankment crest. Since the embankment will be reconstructed from the competent bedrock contact, wall footings will bear on reconstructed embankment fill.

C FOUNDATIONS

OUTLET TOWER

The proposed structure can be supported by straight shaft drilled piers designed in accordance with the following recommendations:

- a) The tower floor should be designed as a pier cap.
- b) Piers shall have a minimum diameter of 12 inches.

- c) Piers shall have a minimum penetration of 26 feet into competent bedrock, which is considered as having blow counts of 50/12 or harder.
- d) The minimum pier shaft length is based on measuring from the bottom of the pier cap.
- e) Dead load plus full live load of the structure should be used for pier length sizing.
- f) Piers shall be designed so that dead loads are as high as reasonably practicable.
- g) Maximum allowable end bearing pressure of 25,000 pounds per square foot (psf).
- h) Allowable side shear of 2,500 psf for the portion of pier in competent bedrock.
- i) No side shear shall be used to resist downward axial load for any portion of the pier in natural soil or manmade fill.
- j) No side shear shall be used to resist upward forces within the top 3 feet of the pier shaft.
- k) Minimum dead load pressure is assumed to be zero.
- l) Piers should be reinforced their full length to resist tension forces.
- m) Piers should have a center-to-center spacing of at least 3 pier diameters when designing for vertical loading conditions or be designed as a group.
- n) Piers aligned in the direction of lateral forces should have center-to-center spacing of at least 6 pier diameters.
- o) Piers should have a maximum length to diameter ratio of about 30 for constructability and observation purposes.
- p) It is anticipated that casing will not be needed for most of the drilled shafts. Concrete should be placed as soon as possible after drilling to reduce the potential for caving soil and/or water accumulation. Drilled shafts shall not be allowed to remain open overnight.
- q) Concrete should not be placed by freefall through more than 3 inches of water, unless proper tremie techniques are utilized to place concrete from the bottom of the shaft displacing the water or the water is removed.
- r) Difficult drilling may be encountered in the hard bedrock. Rock teeth may be required for the bit. Pier penetration may not be decreased unless acceptable by the geotechnical engineer.
- s) Concrete for each pier should be formed at the top of the pier, if necessary, to achieve a uniform diameter at the top of the pier. Excess concrete or overpour resulting in enlargement of the pier shall be removed.
- t) Proper concrete mixture design for drilled shafts varies with the design stress intensity, anticipated concrete placement procedures, and spacing of the reinforcement. It is recommended that current design and construction procedures outlined by the American Concrete Institute (ACI) and the International Association of Drilled Contractors (ADSC) be followed. Per these guidelines, current practice is to use a concrete mixture design slump in the range of 5 to 7 inches if casing is to be utilized or the shaft is heavily reinforced. A design slump in the range of 7 to 9 inches with 3/4 inch maximum size aggregate is recommended if concrete is to be placed by tremie or pumping methods. Additional recommendations as outlined by ACI and ADCS should also be followed.
- u) A Cesare representative should observe pier drilling to confirm that actual subsurface conditions are consistent with those presented in this evaluation. If conditions deviate significantly, drilled pier recommendations may require modification.

C ACCESS RAMP WALL FOOTINGS

The proposed structure can be supported by continuous spread footings bearing on controlled, structural fill below frost depth in accordance with the following design recommendations:

- Weld County Building Code requires a design frost depth of 30 inches, as adopted at the time of this evaluation.
- Footings should be designed for a maximum allowable soil bearing pressure of 3,000 psf based on dead load plus full live load.
- Continuous footings should have a minimum width of 18 inches. Using the soil pressure recommended above, Cesare estimates the maximum settlement for the walls will be on the order of 1 inch, with differential settlement potentially on the order of 0.5 inches. Footings should be proportioned as much as practicable to reduce differential settlement.
- The previously presented estimated settlement will likely be differential to the outlet tower. The retaining walls should be structurally independent from the outlet tower.
- Steel reinforcement for continuous concrete foundation walls should be designed to span localized settlements over a 10 foot length.
- All soft or loose soil beneath footing areas should be densified in place, or removed and replaced with properly compacted structural fill, suitable flow fill, or concrete prior to placement of footing concrete.
- A Cesare representative should observe all footing excavations prior to concrete placement to evaluate if bearing conditions are consistent with those assumed to develop its recommendations.

C LATERAL EARTH PRESSURES

Lateral pressures on walls depend on the type of wall, hydrostatic pressure behind the wall, type of backfill material, and allowable wall movements. Cesare understands the location and configuration of the access ramp will necessitate design considering backfill with hydrostatic pressures. Where anticipated wall movements are greater than 0.5% of the wall height, lateral earth pressures can be estimated for an "active" condition. Where anticipated wall movement is less than approximately 0.5% of the wall height or wall movement is constrained, lateral earth pressures should be estimated for an "at rest" condition. Recommended lateral earth pressures for onsite material are provided in the following table.

The recommended values for lateral earth pressures provided in the following table are given in terms of equivalent unit weight. The equivalent unit weight multiplied by the depth below the top of the ground surface is the horizontal pressure against the wall at that depth. The resulting pressure distribution is a triangular shape. These soil pressures are for horizontal backfill with no surcharge loading and with hydrostatic pressure. If these criteria cannot be met, Cesare should be contacted for additional criteria.

Lateral Earth Pressures and Coefficients of Sliding Resistance for Onsite Material

Backfill Material Type	Location	Equivalent Unit Weight (pcf)			Coefficient of Sliding Resistance
		Active	At Rest	Passive	
Saturated sandy clay	Between access ramp walls	90	100	285	0.35

This addendum should be attached to the original report¹ and made a part thereof. Please contact Cesare with any questions or comments regarding this information.

Sincerely,
CESARE, INC.



Jonathan A. Crystal, P.E.
Project Engineer

JAC2/ksm

cc: Mr. Todd Yee, J&T Consulting, Inc., toddyee@j-tconsulting.com

¹ Geotechnical Evaluation, Johnstown Reservoir Outlet Structure, Weld County, Colorado, Project No. 20.3062, dated February 19, 2021.

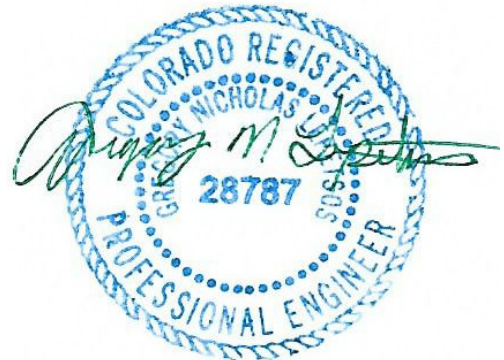
Appendix I. Structural Design Calculations

THE LEPETSOS GROUP, INC.
STRUCTURAL ENGINEERING CONSULTANTS

Tower and Abutment Analyses
Town of Johnstown
Johnstown Reservoir Repair
Weld County, Colorado
Water Division 1, Water District 4
Dam ID - 040132

Job LG-21-2259 June 27, 2021

Prepared for Todd Yee, P.E.
J&T Consulting
305 Denver Boulevard, Suite 105
Fort Lupton, CO.



Tower and Abutment Analyses

*NOTE: The current revision of this document is REV NEW.
Information contained in this document supercedes all other revisions.*

INTRODUCTION

J&T Consulting requested The Lepetsos Group, Inc perform structural analysis of two cast-in-place reinforced concrete structures for this project:

20-foot-tall 6' x 7' Tower

60-foot-long Abutment to support concrete tee bridge (by others)

ANALYSIS APPROACH

Tower

The tower was designed to be supported on four deep concrete piers per J&T Drawing Sheet 13.

The critical load case for structure stability including over-turning, and for pier and soil bearing evaluation was with the reservoir empty and the tower exposed to maximum wind loading.

The maximum over-turning moment was 42,000 ft-lbs

The minimum restoring moment was 283,050 ft-lbs

Since 283,050 ft-lbs > 42,000 ft-lbs, the piers are never in tension under empty reservoir conditions.

The vertical pier capacity was computed to be 200,276 lbs

The max pier load was computed to be 27,088 lbs

Since 200,276 lbs > 27,088 lbs OK

Buoyancy analysis was also performed.

Under a full reservoir condition, the buoyant force was computed to be 52,416 lbs

The weight of the concrete structure was reduced by 10% to determine the weight resisting buoyancy.

Structure wt = $(0.9) \times 94,350 = 84,915$ lbs.

Therefore since 84,915 lbs. > 52,416 lbs, the piers are not in tension under the full reservoir condition.

The critical load case for the tower wall design occurred with the reservoir full of water.

The long wall (20' tall by 7' wide with 5' internal dimension) was modeled using RIAS-3D finite element software.

Ultimate load factors were applied within the RISA analysis, and therefore factors of 1.0 were used in the spreadsheet.

The RISA model showed #5 rebar on 12" centers both faces, both surfaces with all appropriate end and corner splices and hooks was adequate.

The RISA-3D results and hand calculations are provided in the attachment.

Abutment

The Abutment was analyzed using hand methods.

The allowable soil bearing pressure for the continuous footing was 3,000 psf (per the Cesare Report).

The maximum applied soil pressure was computed to be 1,494 psf.

Since 3,000 psf > 1,494 psf OK

CONCLUSIONS

In my opinion, the Tower and Abutment Structures will be capable of withstanding the applied loads.

Please contact this office if you have any questions regarding these findings or if I can be of service in any way.

Regards,

(electronically signed on cover page)

Gregory N. Lepetsos, P.E., M.S.C.E.
President, The Lepetsos Group, Inc.

#5 on 12" center
all faces

2" Cover

Add interior
corner bars

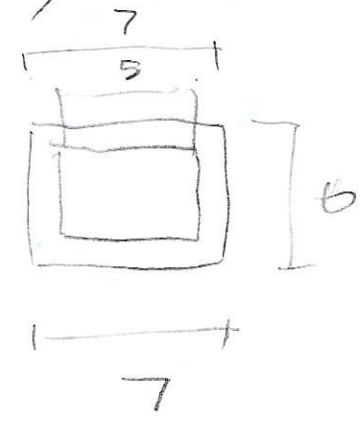
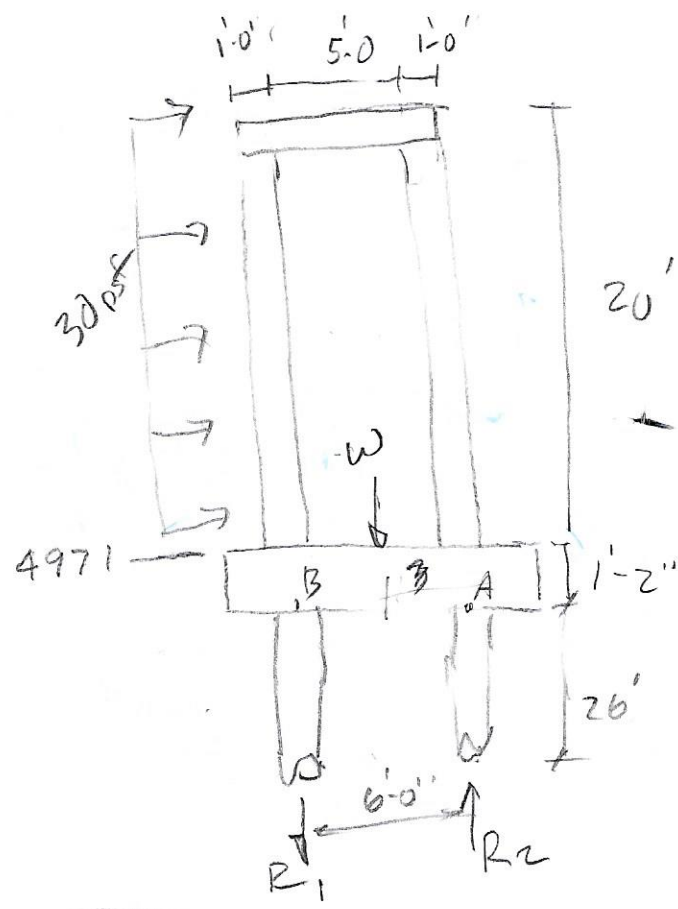
WALL
LAP SPICE

SIX (6) #5
PIER REINF.

EXTEND 3 PIER
REBAR INTO WALL

TERMINATE 3 PIER
REBAR WITH
STD HOOK

empty reservoir
Weld County



Wt = 4 walls + base + 4 piers + top

walls $2(5)(20) + 2(6)(20) = 200 + 240 = 440 \text{ ft}^3$

Base $(8 \times 7 \times 1.167) = 65 \text{ ft}^3$

piers $\frac{\pi(1)^2}{4} \times 4 \times 26 = 82 \text{ ft}^3$

top $6 \times 7 \times 1 = 42 \text{ ft}^3$

Total = 629 ft^3

wt = $629 \times 150 = 94,350 \text{ lb}$

$M_R = 94,350 \times 3 = 283,050 \text{ ft-lb}$

$M_{wind} = 30(7)(20) \times \frac{20}{2} = 42,000$

$M_{OT} = 42,000 \text{ ft-lb}$

$M_R = 283,050 \text{ ft-lb}$

$\therefore$ piers are never in uplift cond
since $283,050 >> 42,000$

$\sum M_B = 0 \quad 42000 + 94350(3) = (2)(6)(R_2)$

$R_2 = 27,088 \text{ lb}$

$R_1 = 20,087$

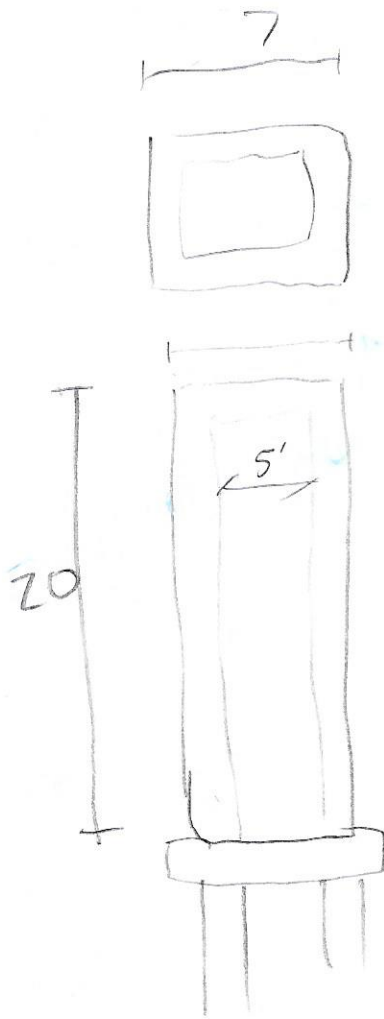
Pier area = $.785 \text{ in}^2$

allowable end bearing = $25,000 \times .785 = 19635 \text{ lb}$

Side shear = $(26-3)(\pi)(1)(2500) = 180,641 \text{ lb}$

Total pier cap = $180,641 + 19,635 = 200,276$

since $200,276 >> 27,088$



- Wind governs for overlying and pier design
- Water pressure governs for tower wall design.

$$M_x \text{ max} = 738.9$$

$$M_y \text{ max} = 1000.6$$

$$UH \text{ max man} = 1.6 (1000.6)$$

$$= 1601 \text{ lb/ft}$$

#5 @ 12" from spread steel is OK
since $13.2 \gg 1.6$

min steel per section 10.5 is not req'd because A_s provided is more than $1/3$ greater than that req'd by analysis (10.5.3)

Johnstown Tower

Bridge Abutment Footing

per note 2 LL = 50 psf

3000 psf allowable soil bearing pressure (p3)

Section A-A Double Tee

39,530 lb for 59'-4" long

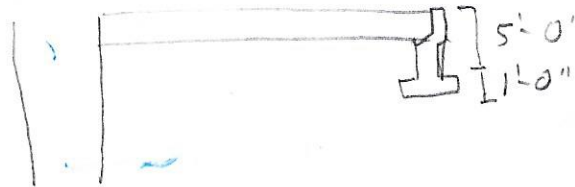
lbs

666 lb/ft

Worst case is snow load

Span = 40'

width = 6'



$$DL = (40)(666)$$

$$+ (5 \times 1 \times 6) \times 150$$

$$+ 8 \times 1 \times 2 \times 150$$

$$= 26640 + 4500 + 2400 = 33540 \text{ lb total}$$

$$LL = 6 \times 40 \times 50 = 12,000$$

$$\text{Abutment load} = \frac{(33540 + 12000)}{2} = 22770 \text{ lb}$$

USE 5% for railings

$$22770 + 5\%(22770) = 23909 \text{ lb}$$

$$\text{Footing area} = 2 \times 9 = 18$$

$$\text{Applied Soil pressure} = \frac{23909}{18} = 1494 \text{ psf}$$

Since $1494 < 3000$ OK

Double tee bearing on Tower

$$Area = (2 \text{ web}) \times 7" \times 6" = 84 \text{ in}^2$$

$$\text{bearing wt} = 21388.5$$

$$\text{pressure} = \frac{21388.5}{84} = 255 \text{ psi} \leftarrow \text{OK}$$

Date: June 27, 2021

Job	Johnstown Reservoir Tower
Client	Todd Yee/ J&T Consulting
Item	Tower Wall

Num of Bars	1	Ultimate Load Factors
Bar Size	5	DL
Bar Dia	0.625 in	LL
Single Bar Area	0.31 in ²	Applied Moments
Total Bar Area	0.31 in ²	DL

	0 k-ft
LL	1.60 k-ft

Mu = 1.6 k-ft

Beam Depth, D	12 in	Material Strengths
Beam Width, b	12 in	f'c =
Cover, c	2 in	fy =

a =	$\frac{A_s f_y}{0.85 f'_c b}$	=	0.46 in
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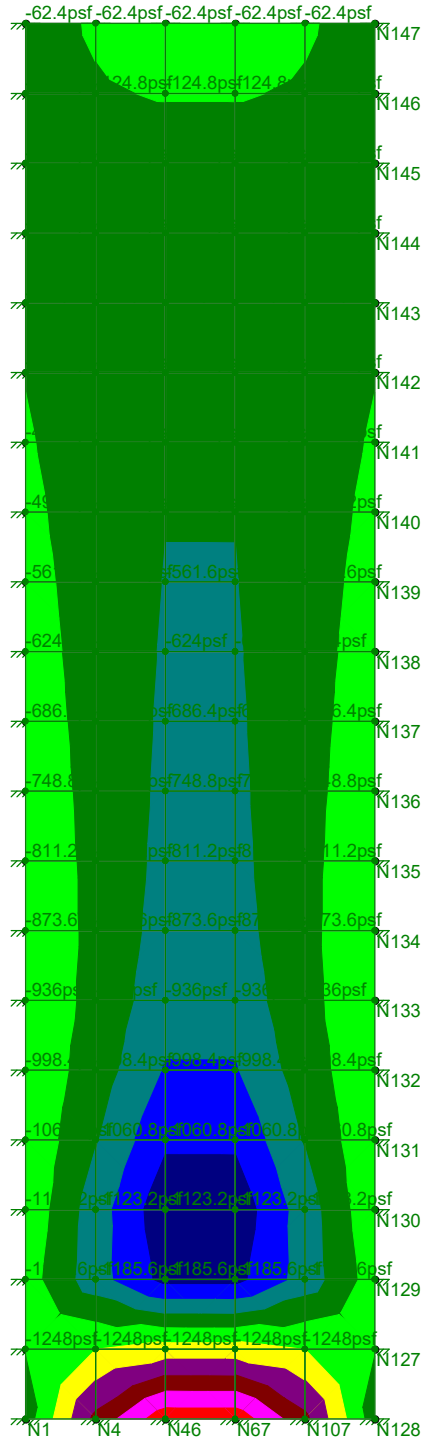
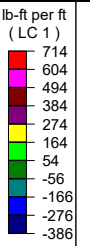
d =	(D - c - 1/2 bar dia)	=	9.69 in
-----	-----------------------	---	---------

Md =	0.9 A _s f _y [d-a/2]	=	158.4 k-in
		=	13.2 k-ft

SINCE	13.2	>	1.6	OK
-------	------	---	-----	----

ACI 318 10.5.1 Min Reinf of Flexural Members
if NO GOOD per 10.5.1, check 10.5.3

A_{s, min} = 0.367615 NO GOOD
OK



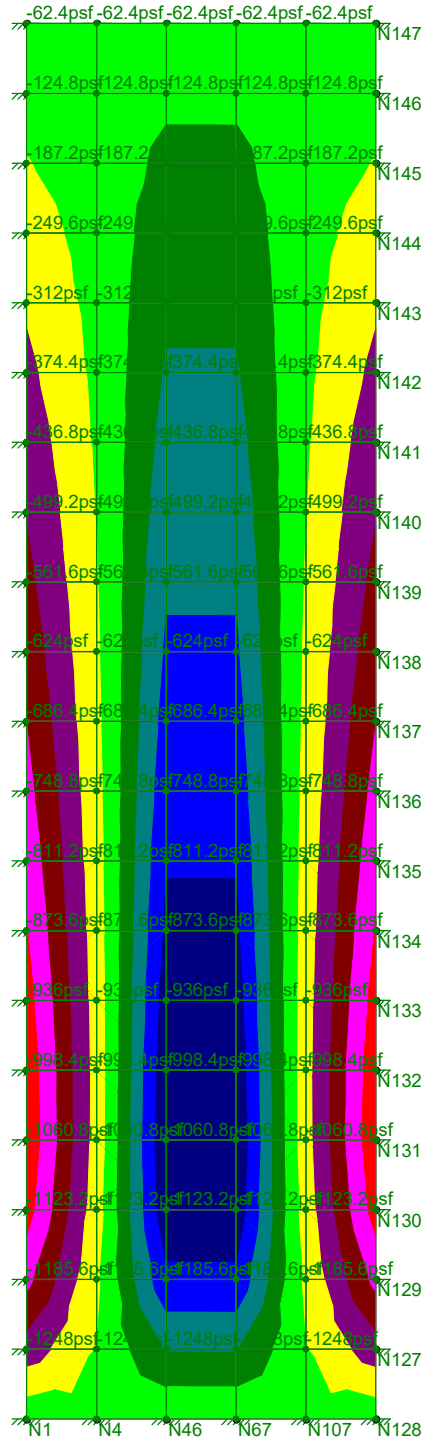
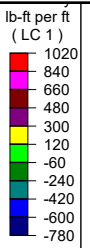
Loads: BLC 1,
Results for LC 1,

SK - 1

June 27, 2021 at 11:51 AM

untitled.r3d

Mx Moment



Loads: BLC 1,
Results for LC 1,

SK - 2

June 27, 2021 at 11:51 AM

untitled.r3d

My Moment

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISACONNECTION Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-12: ASD
Wood Code	AF&PA NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-10: ASD - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parame Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR SET ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

Global, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Om Z	1
Om X	1
Rho Z	1
Rho X	1

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]
1	gen_Conc3NW	3155	1372	.15	.6	.145
2	gen_Conc4NW	3644	1584	.15	.6	.145
3	gen_Conc3LW	2085	906	.15	.6	.11
4	gen_Conc4LW	2408	1047	.15	.6	.11
5	gen_Alum	10600	4077	.3	1.29	.173
6	gen_Steel	29000	11154	.3	.65	.49
7	RIGID	1e+6		.3	0	0

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+6	1e+6	1e+6	1e+6

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	1	0	0	
3	N3	1	1	0	0	
4	N4	1	0	0	0	
5	N5	0	2	0	0	
6	N6	1	2	0	0	
7	N7	0	3	0	0	
8	N8	1	3	0	0	
9	N9	0	4	0	0	
10	N10	1	4	0	0	
11	N11	0	5	0	0	
12	N12	1	5	0	0	
13	N13	0	6	0	0	
14	N14	1	6	0	0	
15	N15	0	7	0	0	



Company :
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Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
16	N16	1	7	0	0	
17	N17	0	8	0	0	
18	N18	1	8	0	0	
19	N19	0	9	0	0	
20	N20	1	9	0	0	
21	N21	0	10	0	0	
22	N22	1	10	0	0	
23	N23	0	11	0	0	
24	N24	1	11	0	0	
25	N25	0	12	0	0	
26	N26	1	12	0	0	
27	N27	0	13	0	0	
28	N28	1	13	0	0	
29	N29	0	14	0	0	
30	N30	1	14	0	0	
31	N31	0	15	0	0	
32	N32	1	15	0	0	
33	N33	0	16	0	0	
34	N34	1	16	0	0	
35	N35	0	17	0	0	
36	N36	1	17	0	0	
37	N37	0	18	0	0	
38	N38	1	18	0	0	
39	N39	0	19	0	0	
40	N40	1	19	0	0	
41	N41	0	20	0	0	
42	N42	1	20	0	0	
43	N45	2	1	0	0	
44	N46	2	0	0	0	
45	N48	2	2	0	0	
46	N50	2	3	0	0	
47	N52	2	4	0	0	
48	N54	2	5	0	0	
49	N56	2	6	0	0	
50	N58	2	7	0	0	
51	N60	2	8	0	0	
52	N62	2	9	0	0	
53	N64	2	10	0	0	
54	N66	2	11	0	0	
55	N68	2	12	0	0	
56	N70	2	13	0	0	
57	N72	2	14	0	0	
58	N74	2	15	0	0	
59	N76	2	16	0	0	
60	N78	2	17	0	0	
61	N80	2	18	0	0	
62	N82	2	19	0	0	
63	N84	2	20	0	0	
64	N66A	3	1	0	0	
65	N67	3	0	0	0	
66	N69	3	2	0	0	
67	N71	3	3	0	0	
68	N73	3	4	0	0	
69	N75	3	5	0	0	
70	N77	3	6	0	0	
71	N79	3	7	0	0	
72	N81	3	8	0	0	



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Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
73	N83	3	9	0	0	
74	N85	3	10	0	0	
75	N87	3	11	0	0	
76	N89	3	12	0	0	
77	N91	3	13	0	0	
78	N93	3	14	0	0	
79	N95	3	15	0	0	
80	N97	3	16	0	0	
81	N99	3	17	0	0	
82	N101	3	18	0	0	
83	N103	3	19	0	0	
84	N105	3	20	0	0	
85	N106	4	1	0	0	
86	N107	4	0	0	0	
87	N108	4	2	0	0	
88	N109	4	3	0	0	
89	N110	4	4	0	0	
90	N111	4	5	0	0	
91	N112	4	6	0	0	
92	N113	4	7	0	0	
93	N114	4	8	0	0	
94	N115	4	9	0	0	
95	N116	4	10	0	0	
96	N117	4	11	0	0	
97	N118	4	12	0	0	
98	N119	4	13	0	0	
99	N120	4	14	0	0	
100	N121	4	15	0	0	
101	N122	4	16	0	0	
102	N123	4	17	0	0	
103	N124	4	18	0	0	
104	N125	4	19	0	0	
105	N126	4	20	0	0	
106	N127	5	1	0	0	
107	N128	5	0	0	0	
108	N129	5	2	0	0	
109	N130	5	3	0	0	
110	N131	5	4	0	0	
111	N132	5	5	0	0	
112	N133	5	6	0	0	
113	N134	5	7	0	0	
114	N135	5	8	0	0	
115	N136	5	9	0	0	
116	N137	5	10	0	0	
117	N138	5	11	0	0	
118	N139	5	12	0	0	
119	N140	5	13	0	0	
120	N141	5	14	0	0	
121	N142	5	15	0	0	
122	N143	5	16	0	0	
123	N144	5	17	0	0	
124	N145	5	18	0	0	
125	N146	5	19	0	0	
126	N147	5	20	0	0	



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Plate Primary Data

	Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
1	P1	N1	N2	N3	N4	gen_Conc3NW	12
2	P2	N2	N5	N6	N3	gen_Conc3NW	12
3	P3	N5	N7	N8	N6	gen_Conc3NW	12
4	P4	N7	N9	N10	N8	gen_Conc3NW	12
5	P5	N9	N11	N12	N10	gen_Conc3NW	12
6	P6	N11	N13	N14	N12	gen_Conc3NW	12
7	P7	N13	N15	N16	N14	gen_Conc3NW	12
8	P8	N15	N17	N18	N16	gen_Conc3NW	12
9	P9	N17	N19	N20	N18	gen_Conc3NW	12
10	P10	N19	N21	N22	N20	gen_Conc3NW	12
11	P11	N21	N23	N24	N22	gen_Conc3NW	12
12	P12	N23	N25	N26	N24	gen_Conc3NW	12
13	P13	N25	N27	N28	N26	gen_Conc3NW	12
14	P14	N27	N29	N30	N28	gen_Conc3NW	12
15	P15	N29	N31	N32	N30	gen_Conc3NW	12
16	P16	N31	N33	N34	N32	gen_Conc3NW	12
17	P17	N33	N35	N36	N34	gen_Conc3NW	12
18	P18	N35	N37	N38	N36	gen_Conc3NW	12
19	P19	N37	N39	N40	N38	gen_Conc3NW	12
20	P20	N39	N41	N42	N40	gen_Conc3NW	12
21	P21	N4	N3	N45	N46	gen_Conc3NW	12
22	P22	N3	N6	N48	N45	gen_Conc3NW	12
23	P23	N6	N8	N50	N48	gen_Conc3NW	12
24	P24	N8	N10	N52	N50	gen_Conc3NW	12
25	P25	N10	N12	N54	N52	gen_Conc3NW	12
26	P26	N12	N14	N56	N54	gen_Conc3NW	12
27	P27	N14	N16	N58	N56	gen_Conc3NW	12
28	P28	N16	N18	N60	N58	gen_Conc3NW	12
29	P29	N18	N20	N62	N60	gen_Conc3NW	12
30	P30	N20	N22	N64	N62	gen_Conc3NW	12
31	P31	N22	N24	N66	N64	gen_Conc3NW	12
32	P32	N24	N26	N68	N66	gen_Conc3NW	12
33	P33	N26	N28	N70	N68	gen_Conc3NW	12
34	P34	N28	N30	N72	N70	gen_Conc3NW	12
35	P35	N30	N32	N74	N72	gen_Conc3NW	12
36	P36	N32	N34	N76	N74	gen_Conc3NW	12
37	P37	N34	N36	N78	N76	gen_Conc3NW	12
38	P38	N36	N38	N80	N78	gen_Conc3NW	12
39	P39	N38	N40	N82	N80	gen_Conc3NW	12
40	P40	N40	N42	N84	N82	gen_Conc3NW	12
41	P41	N46	N45	N66A	N67	gen_Conc3NW	12
42	P42	N45	N48	N69	N66A	gen_Conc3NW	12
43	P43	N48	N50	N71	N69	gen_Conc3NW	12
44	P44	N50	N52	N73	N71	gen_Conc3NW	12
45	P45	N52	N54	N75	N73	gen_Conc3NW	12
46	P46	N54	N56	N77	N75	gen_Conc3NW	12
47	P47	N56	N58	N79	N77	gen_Conc3NW	12
48	P48	N58	N60	N81	N79	gen_Conc3NW	12
49	P49	N60	N62	N83	N81	gen_Conc3NW	12
50	P50	N62	N64	N85	N83	gen_Conc3NW	12
51	P51	N64	N66	N87	N85	gen_Conc3NW	12
52	P52	N66	N68	N89	N87	gen_Conc3NW	12
53	P53	N68	N70	N91	N89	gen_Conc3NW	12
54	P54	N70	N72	N93	N91	gen_Conc3NW	12
55	P55	N72	N74	N95	N93	gen_Conc3NW	12
56	P56	N74	N76	N97	N95	gen_Conc3NW	12



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Plate Primary Data (Continued)

	Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
57	P57	N76	N78	N99	N97	gen_Conc3NW	12
58	P58	N78	N80	N101	N99	gen_Conc3NW	12
59	P59	N80	N82	N103	N101	gen_Conc3NW	12
60	P60	N82	N84	N105	N103	gen_Conc3NW	12
61	P61	N67	N66A	N106	N107	gen_Conc3NW	12
62	P62	N66A	N69	N108	N106	gen_Conc3NW	12
63	P63	N69	N71	N109	N108	gen_Conc3NW	12
64	P64	N71	N73	N110	N109	gen_Conc3NW	12
65	P65	N73	N75	N111	N110	gen_Conc3NW	12
66	P66	N75	N77	N112	N111	gen_Conc3NW	12
67	P67	N77	N79	N113	N112	gen_Conc3NW	12
68	P68	N79	N81	N114	N113	gen_Conc3NW	12
69	P69	N81	N83	N115	N114	gen_Conc3NW	12
70	P70	N83	N85	N116	N115	gen_Conc3NW	12
71	P71	N85	N87	N117	N116	gen_Conc3NW	12
72	P72	N87	N89	N118	N117	gen_Conc3NW	12
73	P73	N89	N91	N119	N118	gen_Conc3NW	12
74	P74	N91	N93	N120	N119	gen_Conc3NW	12
75	P75	N93	N95	N121	N120	gen_Conc3NW	12
76	P76	N95	N97	N122	N121	gen_Conc3NW	12
77	P77	N97	N99	N123	N122	gen_Conc3NW	12
78	P78	N99	N101	N124	N123	gen_Conc3NW	12
79	P79	N101	N103	N125	N124	gen_Conc3NW	12
80	P80	N103	N105	N126	N125	gen_Conc3NW	12
81	P81	N107	N106	N127	N128	gen_Conc3NW	12
82	P82	N106	N108	N129	N127	gen_Conc3NW	12
83	P83	N108	N109	N130	N129	gen_Conc3NW	12
84	P84	N109	N110	N131	N130	gen_Conc3NW	12
85	P85	N110	N111	N132	N131	gen_Conc3NW	12
86	P86	N111	N112	N133	N132	gen_Conc3NW	12
87	P87	N112	N113	N134	N133	gen_Conc3NW	12
88	P88	N113	N114	N135	N134	gen_Conc3NW	12
89	P89	N114	N115	N136	N135	gen_Conc3NW	12
90	P90	N115	N116	N137	N136	gen_Conc3NW	12
91	P91	N116	N117	N138	N137	gen_Conc3NW	12
92	P92	N117	N118	N139	N138	gen_Conc3NW	12
93	P93	N118	N119	N140	N139	gen_Conc3NW	12
94	P94	N119	N120	N141	N140	gen_Conc3NW	12
95	P95	N120	N121	N142	N141	gen_Conc3NW	12
96	P96	N121	N122	N143	N142	gen_Conc3NW	12
97	P97	N122	N123	N144	N143	gen_Conc3NW	12
98	P98	N123	N124	N145	N144	gen_Conc3NW	12
99	P99	N124	N125	N146	N145	gen_Conc3NW	12
100	P100	N125	N126	N147	N146	gen_Conc3NW	12

Joint Boundary Conditions

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N41	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N39	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
3	N37	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
4	N35	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
5	N33	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
6	N31	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
7	N29	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
8	N27	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	



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Joint Boundary Conditions (Continued)

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
9	N25	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
10	N23	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
11	N21	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
12	N19	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
13	N17	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
14	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
15	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
16	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
17	N9	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
18	N7	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
19	N5	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
20	N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
21	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
22	N4	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
23	N46	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
24	N67	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
25	N107	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
26	N128	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
27	N127	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
28	N129	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
29	N130	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
30	N131	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
31	N132	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
32	N133	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
33	N134	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
34	N135	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
35	N136	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
36	N137	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
37	N138	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
38	N139	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
39	N140	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
40	N141	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
41	N142	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
42	N143	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
43	N144	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
44	N145	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
45	N146	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
46	N147	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
47	N126	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
48	N105	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
49	N84	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
50	N42	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	

Member Distributed Loads

Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
No Data to Print ...					

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1		None								100



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Load Combinations

	Description	Solve	PDelta	S...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
1		Yes	Y		1	1															

Joint Reactions

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
1	1	N41	0	0	38.341	-29.528	-30.162	0
2	1	N39	0	0	133.845	-41.188	-119.891	0
3	1	N37	0	0	327.341	-52.421	-257.303	0
4	1	N35	0	0	521.474	-52.086	-407.559	0
5	1	N33	0	0	696.053	-48.443	-550.115	0
6	1	N31	0	0	858.424	-45.764	-683.437	0
7	1	N29	0	0	1015.531	-44.404	-811.217	0
8	1	N27	0	0	1171.009	-43.891	-936.546	0
9	1	N25	0	0	1326.269	-43.804	-1061.135	0
10	1	N23	0	0	1481.775	-43.956	-1185.837	0
11	1	N21	0	0	1637.908	-44.364	-1311.294	0
12	1	N19	0	0	1795.58	-45.13	-1438.361	0
13	1	N17	0	0	1956.621	-46.162	-1568.05	0
14	1	N15	0	0	2123.418	-46.492	-1700.198	0
15	1	N13	0	0	2296.061	-42.893	-1829.36	0
16	1	N11	0	0	2463.5	-27.81	-1935.72	0
17	1	N9	0	0	2583.364	11.79	-1970.554	0
18	1	N7	0	0	2549.889	89.284	-1844.719	0
19	1	N5	0	0	2169.745	188.727	-1457.972	0
20	1	N2	0	0	1322.483	230.695	-838.006	0
21	1	N1	0	0	581.957	223.307	-223.334	0
22	1	N4	0	0	1331.279	808.92	-207.894	0
23	1	N46	0	0	2105.318	1286.331	-98.47	0
24	1	N67	0	0	2105.318	1286.331	98.47	0
25	1	N107	0	0	1331.279	808.92	207.894	0
26	1	N128	0	0	581.957	223.307	223.334	0
27	1	N127	0	0	1322.483	230.695	838.006	0
28	1	N129	0	0	2169.745	188.727	1457.972	0
29	1	N130	0	0	2549.889	89.284	1844.719	0
30	1	N131	0	0	2583.364	11.79	1970.554	0
31	1	N132	0	0	2463.5	-27.81	1935.72	0
32	1	N133	0	0	2296.061	-42.893	1829.36	0
33	1	N134	0	0	2123.418	-46.492	1700.198	0
34	1	N135	0	0	1956.621	-46.162	1568.05	0
35	1	N136	0	0	1795.58	-45.13	1438.361	0
36	1	N137	0	0	1637.908	-44.364	1311.294	0
37	1	N138	0	0	1481.775	-43.956	1185.837	0
38	1	N139	0	0	1326.269	-43.804	1061.135	0
39	1	N140	0	0	1171.009	-43.891	936.546	0
40	1	N141	0	0	1015.531	-44.404	811.217	0
41	1	N142	0	0	858.424	-45.764	683.437	0
42	1	N143	0	0	696.053	-48.443	550.115	0
43	1	N144	0	0	521.474	-52.086	407.559	0
44	1	N145	0	0	327.341	-52.421	257.303	0
45	1	N146	0	0	133.845	-41.188	119.891	0
46	1	N147	0	0	38.341	-29.528	30.162	0
47	1	N126	0	0	91.462	-100.768	29.469	0
48	1	N105	0	0	181.351	-166.977	14.619	0
49	1	N84	0	0	181.351	-166.977	-14.619	0
50	1	N42	0	0	91.462	-100.768	-29.469	0



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Joint Reactions (Continued)

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
51	1	Totals:	0	0	65520			
52	1	COG (ft):	NC	NC	NC			

Joint Deflections

	LC	Joint Label	X [in]	Y [in]	Z [in]	X Rotation [rad]	Y Rotation [rad]	Z Rotation [rad]
1	1	N1	0	0	0	0	0	0
2	1	N2	0	0	0	0	0	0
3	1	N3	0	0	0	-1.082e-5	1.046e-5	0
4	1	N4	0	0	0	0	0	0
5	1	N5	0	0	0	0	0	0
6	1	N6	0	0	0	-7.816e-6	1.868e-5	0
7	1	N7	0	0	0	0	0	0
8	1	N8	0	0	0	-3.212e-6	2.409e-5	0
9	1	N9	0	0	0	0	0	0
10	1	N10	0	0	0	-1.697e-7	2.582e-5	0
11	1	N11	0	0	0	0	0	0
12	1	N12	0	0	0	1.259e-6	2.538e-5	0
13	1	N13	0	0	0	0	0	0
14	1	N14	0	0	0	1.75e-6	2.399e-5	0
15	1	N15	0	0	0	0	0	0
16	1	N16	0	0	0	1.838e-6	2.229e-5	0
17	1	N17	0	0	0	0	0	0
18	1	N18	0	0	0	1.804e-6	2.055e-5	0
19	1	N19	0	0	0	0	0	0
20	1	N20	0	0	0	1.758e-6	1.885e-5	0
21	1	N21	0	0	0	0	0	0
22	1	N22	0	0	0	1.728e-6	1.719e-5	0
23	1	N23	0	0	0	0	0	0
24	1	N24	0	0	0	1.713e-6	1.554e-5	0
25	1	N25	0	0	0	0	0	0
26	1	N26	0	0	0	1.708e-6	1.391e-5	0
27	1	N27	0	0	0	0	0	0
28	1	N28	0	0	0	1.71e-6	1.227e-5	0
29	1	N29	0	0	0	0	0	0
30	1	N30	0	0	0	1.727e-6	1.063e-5	0
31	1	N31	0	0	0	0	0	0
32	1	N32	0	0	0	1.776e-6	8.957e-6	0
33	1	N33	0	0	0	0	0	0
34	1	N34	0	0	0	1.88e-6	7.207e-6	0
35	1	N35	0	0	0	0	0	0
36	1	N36	0	0	0	2.044e-6	5.332e-6	0
37	1	N37	0	0	0	0	0	0
38	1	N38	0	0	0	2.15e-6	3.331e-6	0
39	1	N39	0	0	0	0	0	0
40	1	N40	0	0	0	1.77e-6	1.528e-6	0
41	1	N41	0	0	0	0	0	0
42	1	N42	0	0	0	0	0	0
43	1	N45	0	0	0	-1.774e-5	4.749e-6	0
44	1	N46	0	0	0	0	0	0
45	1	N48	0	0	0	-1.343e-5	8.94e-6	0
46	1	N50	0	0	0	-5.686e-6	1.175e-5	0
47	1	N52	0	0	0	-4.86e-7	1.277e-5	0
48	1	N54	0	0	0	2.017e-6	1.264e-5	0
49	1	N56	0	0	0	2.905e-6	1.198e-5	0
50	1	N58	0	0	0	3.081e-6	1.115e-5	0



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Joint Deflections (Continued)

	LC	Joint Label	X [in]	Y [in]	Z [in]	X Rotation [rad]	Y Rotation [rad]	Z Rotation [rad]
51	1	N60	0	0	0	3.032e-6	1.028e-5	0
52	1	N62	0	0	0	2.956e-6	9.429e-6	0
53	1	N64	0	0	0	2.905e-6	8.594e-6	0
54	1	N66	0	0	0	2.879e-6	7.771e-6	0
55	1	N68	0	0	0	2.869e-6	6.954e-6	0
56	1	N70	0	0	0	2.873e-6	6.137e-6	0
57	1	N72	0	0	0	2.903e-6	5.314e-6	0
58	1	N74	0	0	0	2.989e-6	4.474e-6	0
59	1	N76	0	0	0	3.169e-6	3.594e-6	0
60	1	N78	0	0	0	3.436e-6	2.652e-6	0
61	1	N80	0	0	0	3.604e-6	1.658e-6	0
62	1	N82	0	0	0	2.966e-6	7.604e-7	0
63	1	N84	0	0	0	0	0	0
64	1	N66A	0	0	0	-1.774e-5	-4.749e-6	0
65	1	N67	0	0	0	0	0	0
66	1	N69	0	0	0	-1.343e-5	-8.94e-6	0
67	1	N71	0	0	0	-5.686e-6	-1.175e-5	0
68	1	N73	0	0	0	-4.86e-7	-1.277e-5	0
69	1	N75	0	0	0	2.017e-6	-1.264e-5	0
70	1	N77	0	0	0	2.905e-6	-1.198e-5	0
71	1	N79	0	0	0	3.081e-6	-1.115e-5	0
72	1	N81	0	0	0	3.032e-6	-1.028e-5	0
73	1	N83	0	0	0	2.956e-6	-9.429e-6	0
74	1	N85	0	0	0	2.905e-6	-8.594e-6	0
75	1	N87	0	0	0	2.879e-6	-7.771e-6	0
76	1	N89	0	0	0	2.869e-6	-6.954e-6	0
77	1	N91	0	0	0	2.873e-6	-6.137e-6	0
78	1	N93	0	0	0	2.903e-6	-5.314e-6	0
79	1	N95	0	0	0	2.989e-6	-4.474e-6	0
80	1	N97	0	0	0	3.169e-6	-3.594e-6	0
81	1	N99	0	0	0	3.436e-6	-2.652e-6	0
82	1	N101	0	0	0	3.604e-6	-1.658e-6	0
83	1	N103	0	0	0	2.966e-6	-7.604e-7	0
84	1	N105	0	0	0	0	0	0
85	1	N106	0	0	0	-1.082e-5	-1.046e-5	0
86	1	N107	0	0	0	0	0	0
87	1	N108	0	0	0	-7.816e-6	-1.868e-5	0
88	1	N109	0	0	0	-3.212e-6	-2.409e-5	0
89	1	N110	0	0	0	-1.697e-7	-2.582e-5	0
90	1	N111	0	0	0	1.259e-6	-2.538e-5	0
91	1	N112	0	0	0	1.75e-6	-2.399e-5	0
92	1	N113	0	0	0	1.838e-6	-2.229e-5	0
93	1	N114	0	0	0	1.804e-6	-2.055e-5	0
94	1	N115	0	0	0	1.758e-6	-1.885e-5	0
95	1	N116	0	0	0	1.728e-6	-1.719e-5	0
96	1	N117	0	0	0	1.713e-6	-1.554e-5	0
97	1	N118	0	0	0	1.708e-6	-1.391e-5	0
98	1	N119	0	0	0	1.71e-6	-1.227e-5	0
99	1	N120	0	0	0	1.727e-6	-1.063e-5	0
100	1	N121	0	0	0	1.776e-6	-8.957e-6	0
101	1	N122	0	0	0	1.88e-6	-7.207e-6	0
102	1	N123	0	0	0	2.044e-6	-5.332e-6	0
103	1	N124	0	0	0	2.15e-6	-3.331e-6	0
104	1	N125	0	0	0	1.77e-6	-1.528e-6	0
105	1	N126	0	0	0	0	0	0
106	1	N127	0	0	0	0	0	0
107	1	N128	0	0	0	0	0	0

Joint Deflections (Continued)

	LC	Joint Label	X [in]	Y [in]	Z [in]	X Rotation [rad]	Y Rotation [rad]	Z Rotation [rad]
108	1	N129	0	0	0	0	0	0
109	1	N130	0	0	0	0	0	0
110	1	N131	0	0	0	0	0	0
111	1	N132	0	0	0	0	0	0
112	1	N133	0	0	0	0	0	0
113	1	N134	0	0	0	0	0	0
114	1	N135	0	0	0	0	0	0
115	1	N136	0	0	0	0	0	0
116	1	N137	0	0	0	0	0	0
117	1	N138	0	0	0	0	0	0
118	1	N139	0	0	0	0	0	0
119	1	N140	0	0	0	0	0	0
120	1	N141	0	0	0	0	0	0
121	1	N142	0	0	0	0	0	0
122	1	N143	0	0	0	0	0	0
123	1	N144	0	0	0	0	0	0
124	1	N145	0	0	0	0	0	0
125	1	N146	0	0	0	0	0	0
126	1	N147	0	0	0	0	0	0

Plate Corner Forces

	LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
1	1	P1	N1	0	0	581.957	223.307	-223.334	0
2			N2	0	0	450.85	85.519	-211.54	0
3			N3	0	0	-227.914	-121.221	114.14	0
4			N4	0	0	443.108	213.46	-88.073	0
5	1	P2	N2	0	0	871.634	145.177	-626.465	0
6			N5	0	0	990.576	91.709	-555.551	0
7			N6	0	0	-445.261	-94.129	66.604	0
8			N3	0	0	-231.349	-95.272	-153.998	0
9	1	P3	N5	0	0	1179.169	97.019	-902.421	0
10			N7	0	0	1270.074	20.549	-844.085	0
11			N8	0	0	-655.335	-81.686	7.806	0
12			N6	0	0	-670.709	-89.021	-148.942	0
13	1	P4	N7	0	0	1279.814	68.735	-1000.633	0
14			N9	0	0	1318.568	-43.718	-976.616	0
15			N10	0	0	-736.989	-66.631	-17.616	0
16			N8	0	0	-800.593	-9.565	-73.117	0
17	1	P5	N9	0	0	1264.796	55.508	-993.939	0
18			N11	0	0	1265.125	-76.743	-994	0
19			N12	0	0	-739.85	-55.541	-25.376	0
20			N10	0	0	-791.671	50.7	-17.406	0
21	1	P6	N11	0	0	1198.375	48.933	-941.72	0
22			N13	0	0	1179.728	-87.437	-953.698	0
23			N14	0	0	-704.971	-47.844	-26.029	0
24			N12	0	0	-737.132	79.591	11.344	0
25	1	P7	N13	0	0	1116.334	44.545	-875.662	0
26			N15	0	0	1090.738	-86.991	-891.989	0
27			N16	0	0	-657.144	-42.139	-24.932	0
28			N14	0	0	-676.328	87.791	22.311	0
29	1	P8	N15	0	0	1032.68	40.499	-808.209	0
30			N17	0	0	1005.575	-82.427	-825.473	0
31			N18	0	0	-607.012	-37.289	-23.922	0
32			N16	0	0	-620.043	86.254	24.948	0
33	1	P9	N17	0	0	951.047	36.265	-742.577	0



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Plate Corner Forces (Continued)

	LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
34			N19	0	0	924.215	-76.944	-759.663	0
35			N20	0	0	-557.786	-32.697	-23.345	0
36			N18	0	0	-568.675	81.347	24.723	0
37	1	P10	N19	0	0	871.365	31.814	-678.699	0
38			N21	0	0	845.078	-71.599	-695.44	0
39			N22	0	0	-509.776	-28.137	-23.088	0
40			N20	0	0	-520.267	75.82	23.985	0
41	1	P11	N21	0	0	792.831	27.235	-615.853	0
42			N23	0	0	766.928	-66.556	-632.352	0
43			N24	0	0	-462.573	-23.548	-22.994	0
44			N22	0	0	-473.185	70.515	23.441	0
45	1	P12	N23	0	0	714.847	22.6	-553.485	0
46			N25	0	0	689.132	-61.719	-569.866	0
47			N26	0	0	-415.824	-18.906	-22.98	0
48			N24	0	0	-426.555	65.517	23.151	0
49	1	P13	N25	0	0	637.136	17.915	-491.269	0
50			N27	0	0	611.436	-56.979	-507.641	0
51			N28	0	0	-369.364	-14.132	-23.078	0
52			N26	0	0	-380.008	60.724	23.015	0
53	1	P14	N27	0	0	559.573	13.088	-428.905	0
54			N29	0	0	533.652	-52.288	-445.415	0
55			N30	0	0	-323.084	-9.018	-23.458	0
56			N28	0	0	-333.341	56.05	22.953	0
57	1	P15	N29	0	0	481.88	7.884	-365.802	0
58			N31	0	0	455.31	-47.678	-382.72	0
59			N32	0	0	-276.598	-3.195	-24.443	0
60			N30	0	0	-286.192	51.476	22.975	0
61	1	P16	N31	0	0	403.114	1.914	-300.718	0
62			N33	0	0	375.217	-43.29	-318.471	0
63			N34	0	0	-228.6	3.732	-26.378	0
64			N32	0	0	-237.73	47.028	23.236	0
65	1	P17	N33	0	0	320.836	-5.153	-231.644	0
66			N35	0	0	291.011	-39.398	-250.593	0
67			N36	0	0	-175.77	11.422	-28.942	0
68			N34	0	0	-186.477	42.688	24.132	0
69	1	P18	N35	0	0	230.464	-12.688	-156.966	0
70			N37	0	0	200.106	-36.42	-176.461	0
71			N38	0	0	-112.183	16.489	-29.737	0
72			N36	0	0	-131.186	38.297	26.196	0
73	1	P19	N37	0	0	127.235	-16.001	-80.842	0
74			N39	0	0	102.388	-33.688	-96.538	0
75			N40	0	0	-32.246	8.676	-19.177	0
76			N38	0	0	-72.577	33.271	29.334	0
77	1	P20	N39	0	0	31.457	-7.5	-23.352	0
78			N41	0	0	38.341	-29.528	-30.162	0
79			N42	0	0	22.484	-23.426	-9.857	0
80			N40	0	0	-29.883	30.829	24.772	0
81	1	P21	N4	0	0	888.172	595.46	-119.821	0
82			N3	0	0	-165.999	130.163	97.977	0
83			N45	0	0	-439.278	-43.824	18.751	0
84			N46	0	0	965.105	547.478	-95.08	0
85	1	P22	N3	0	0	625.263	86.33	-58.12	0
86			N6	0	0	438.949	258.041	138.099	0
87			N48	0	0	-215.668	110.344	-214.279	0
88			N45	0	0	337.056	-85.196	-337.111	0
89	1	P23	N6	0	0	677.02	-74.891	-55.761	0
90			N8	0	0	741.749	195.204	83.614	0



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Plate Corner Forces (Continued)

	LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
91			N50	0	0	-191.54	109.159	-396.417	0
92			N48	0	0	-104.029	-218.081	-488.605	0
93	1	P24	N8	0	0	714.179	-103.953	-18.302	0
94			N10	0	0	809.072	106.252	29.591	0
95			N52	0	0	-200.008	84.257	-484.601	0
96			N50	0	0	-262.444	-165.221	-519.539	0
97	1	P25	N10	0	0	719.588	-90.322	5.431	0
98			N12	0	0	780.712	48.685	-2.834	0
99			N54	0	0	-207.53	63.111	-503.209	0
100			N52	0	0	-294.371	-95.457	-500.488	0
101	1	P26	N12	0	0	696.269	-72.735	16.866	0
102			N14	0	0	724.35	20.755	-17.206	0
103			N56	0	0	-205.117	50.734	-486.464	0
104			N54	0	0	-279.502	-49.986	-465.814	0
105	1	P27	N14	0	0	656.949	-60.702	20.924	0
106			N16	0	0	666.055	9.762	-21.747	0
107			N58	0	0	-195.053	44.396	-456.184	0
108			N56	0	0	-254.351	-27.658	-429.197	0
109	1	P28	N16	0	0	611.132	-53.877	21.731	0
110			N18	0	0	612.155	5.961	-22.309	0
111			N60	0	0	-181.062	40.997	-422.658	0
112			N58	0	0	-231.024	-18.574	-394.45	0
113	1	P29	N18	0	0	563.533	-50.019	21.508	0
114			N20	0	0	562.154	4.286	-21.794	0
115			N62	0	0	-165.572	38.652	-389.419	0
116			N60	0	0	-211.315	-15.101	-361.582	0
117	1	P30	N20	0	0	515.898	-47.409	21.154	0
118			N22	0	0	514.326	2.782	-21.262	0
119			N64	0	0	-149.734	36.518	-357.096	0
120			N62	0	0	-194.09	-13.283	-329.821	0
121	1	P31	N22	0	0	468.635	-45.16	20.909	0
122			N24	0	0	467.403	.975	-20.941	0
123			N66	0	0	-133.965	34.339	-325.451	0
124			N64	0	0	-178.073	-11.592	-298.554	0
125	1	P32	N24	0	0	421.726	-42.944	20.784	0
126			N26	0	0	420.731	-1.075	-20.799	0
127			N68	0	0	-118.381	32.13	-294.178	0
128			N66	0	0	-162.476	-9.662	-267.463	0
129	1	P33	N26	0	0	375.101	-40.742	20.764	0
130			N28	0	0	374.012	-3.184	-20.784	0
131			N70	0	0	-102.996	30.053	-263.095	0
132			N68	0	0	-146.918	-7.544	-236.398	0
133	1	P34	N28	0	0	328.692	-38.735	20.909	0
134			N30	0	0	327.03	-5.179	-20.917	0
135			N72	0	0	-87.718	28.402	-232.107	0
136			N70	0	0	-131.204	-5.4	-205.207	0
137	1	P35	N30	0	0	282.246	-37.279	21.4	0
138			N32	0	0	279.464	-6.999	-21.312	0
139			N74	0	0	-72.118	27.544	-201.058	0
140			N72	0	0	-115.193	-3.412	-173.541	0
141	1	P36	N32	0	0	234.864	-36.835	22.519	0
142			N34	0	0	230.855	-8.93	-22.128	0
143			N76	0	0	-54.921	27.545	-169.458	0
144			N74	0	0	-98.798	-1.715	-140.652	0
145	1	P37	N34	0	0	184.222	-37.49	24.374	0
146			N36	0	0	181.098	-12.207	-23.349	0
147			N78	0	0	-33.39	26.978	-136.147	0



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Plate Corner Forces (Continued)

LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
148		N76	0	0	-82.33	-.189	-105.399	0
149	1	P38	N36	0	0	125.858	-37.512	26.095
150		N38	0	0	132.185	-20.401	-24.494	0
151		N80	0	0	-3.414	20.493	-99.141	0
152		N78	0	0	-67.429	2.249	-66.902	0
153	1	P39	N38	0	0	52.576	-29.359	24.897
154		N40	0	0	85.975	-39.429	-19.333	0
155		N82	0	0	42.925	-6.242	-54.735	0
156		N80	0	0	-56.675	8.529	-26.98	0
157	1	P40	N40	0	0	-23.846	-.076	13.738
158		N42	0	0	68.978	-77.342	-19.612	0
159		N84	0	0	78.799	-69.098	-13.716	0
160		N82	0	0	-61.531	29.938	5.658	0
161	1	P41	N46	0	0	1140.212	738.853	-3.39
162		N45	0	0	-516.212	89.359	83.062	0
163		N66A	0	0	-516.212	89.359	-83.062	0
164		N67	0	0	1140.212	738.853	3.39	0
165	1	P42	N45	0	0	618.434	39.661	235.299
166		N48	0	0	-25.634	282.373	311.6	0
167		N69	0	0	-25.634	282.373	-311.6	0
168		N66A	0	0	618.434	39.661	-235.299	0
169	1	P43	N48	0	0	345.331	-174.636	391.285
170		N50	0	0	216.269	239.167	442.51	0
171		N71	0	0	216.269	239.167	-442.51	0
172		N69	0	0	345.331	-174.636	-391.285	0
173	1	P44	N50	0	0	237.715	-183.104	473.446
174		N52	0	0	292.685	155.619	491.975	0
175		N73	0	0	292.685	155.619	-491.975	0
176		N71	0	0	237.715	-183.104	-473.446	0
177	1	P45	N52	0	0	201.693	-144.419	493.114
178		N54	0	0	297.507	96.512	490.75	0
179		N75	0	0	297.507	96.512	-490.75	0
180		N73	0	0	201.693	-144.419	-493.114	0
181	1	P46	N54	0	0	189.524	-109.638	478.274
182		N56	0	0	278.476	65.162	466.301	0
183		N77	0	0	278.476	65.162	-466.301	0
184		N75	0	0	189.524	-109.638	-478.274	0
185	1	P47	N56	0	0	180.993	-88.238	449.36
186		N58	0	0	255.807	50.831	434.13	0
187		N79	0	0	255.807	50.831	-434.13	0
188		N77	0	0	180.993	-88.238	-449.36	0
189	1	P48	N58	0	0	170.27	-76.653	416.504
190		N60	0	0	235.33	44.123	400.73	0
191		N81	0	0	235.33	44.123	-400.73	0
192		N79	0	0	170.27	-76.653	-416.504	0
193	1	P49	N60	0	0	157.047	-70.02	383.511
194		N62	0	0	217.353	39.867	367.995	0
195		N83	0	0	217.353	39.867	-367.995	0
196		N81	0	0	157.047	-70.02	-383.511	0
197	1	P50	N62	0	0	142.31	-65.236	351.245
198		N64	0	0	200.89	35.945	336.053	0
199		N85	0	0	200.89	35.945	-336.053	0
200		N83	0	0	142.31	-65.236	-351.245	0
201	1	P51	N64	0	0	126.916	-60.871	319.596
202		N66	0	0	185.084	31.788	304.614	0
203		N87	0	0	185.084	31.788	-304.614	0
204		N85	0	0	126.916	-60.871	-319.596	0



Company :
Designer :
Job Number :
Model Name :

June 27, 202

Item #13.

Checked By: _____

Plate Corner Forces (Continued)

	LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
205	1	P52	N66	0	0	111.357	-56.465	288.3	0
206			N68	0	0	169.443	27.423	273.417	0
207			N89	0	0	169.443	27.423	-273.417	0
208			N87	0	0	111.357	-56.465	-288.3	0
209	1	P53	N68	0	0	95.856	-52.009	257.159	0
210			N70	0	0	153.744	23.065	242.288	0
211			N91	0	0	153.744	23.065	-242.288	0
212			N89	0	0	95.856	-52.009	-257.159	0
213	1	P54	N70	0	0	80.456	-47.718	226.014	0
214			N72	0	0	137.944	18.974	211.038	0
215			N93	0	0	137.944	18.974	-211.038	0
216			N91	0	0	80.456	-47.718	-226.014	0
217	1	P55	N72	0	0	64.966	-43.964	194.609	0
218			N74	0	0	122.234	15.331	179.302	0
219			N95	0	0	122.234	15.331	-179.302	0
220			N93	0	0	64.966	-43.964	-194.609	0
221	1	P56	N74	0	0	48.682	-41.16	162.408	0
222			N76	0	0	107.318	11.842	146.388	0
223			N97	0	0	107.318	11.842	-146.388	0
224			N95	0	0	48.682	-41.16	-162.408	0
225	1	P57	N76	0	0	29.933	-39.199	128.469	0
226			N78	0	0	94.867	6.732	111.318	0
227			N99	0	0	94.867	6.732	-111.318	0
228			N97	0	0	29.933	-39.199	-128.469	0
229	1	P58	N78	0	0	5.952	-35.96	91.731	0
230			N80	0	0	87.648	-4.888	73.643	0
231			N101	0	0	87.648	-4.888	-73.643	0
232			N99	0	0	5.952	-35.96	-91.731	0
233	1	P59	N80	0	0	-27.558	-24.135	52.478	0
234			N82	0	0	89.958	-34.624	36.138	0
235			N103	0	0	89.958	-34.624	-36.138	0
236			N101	0	0	-27.558	-24.135	-52.478	0
237	1	P60	N82	0	0	-71.352	10.927	12.94	0
238			N84	0	0	102.552	-97.879	-.903	0
239			N105	0	0	102.552	-97.879	.903	0
240			N103	0	0	-71.352	10.927	-12.94	0
241	1	P61	N67	0	0	965.105	547.478	95.08	0
242			N66A	0	0	-439.278	-43.824	-18.751	0
243			N106	0	0	-165.999	130.163	-97.977	0
244			N107	0	0	888.172	595.46	119.821	0
245	1	P62	N66A	0	0	337.056	-85.196	337.111	0
246			N69	0	0	-215.668	110.344	214.279	0
247			N108	0	0	438.949	258.041	-138.099	0
248			N106	0	0	625.263	86.33	58.12	0
249	1	P63	N69	0	0	-104.029	-218.081	488.605	0
250			N71	0	0	-191.54	109.159	396.417	0
251			N109	0	0	741.749	195.204	-83.614	0
252			N108	0	0	677.02	-74.891	55.761	0
253	1	P64	N71	0	0	-262.444	-165.221	519.539	0
254			N73	0	0	-200.008	84.257	484.601	0
255			N110	0	0	809.072	106.252	-29.591	0
256			N109	0	0	714.179	-103.953	18.302	0
257	1	P65	N73	0	0	-294.371	-95.457	500.488	0
258			N75	0	0	-207.53	63.111	503.209	0
259			N111	0	0	780.712	48.685	2.834	0
260			N110	0	0	719.588	-90.322	-5.431	0
261	1	P66	N75	0	0	-279.502	-49.986	465.814	0



Company :
Designer :
Job Number :
Model Name :

June 27, 202

Item #13.

Checked By: _____

Plate Corner Forces (Continued)

	LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
262			N77	0	0	-205.117	50.734	486.464	0
263			N112	0	0	724.35	20.755	17.206	0
264			N111	0	0	696.269	-72.735	-16.866	0
265	1	P67	N77	0	0	-254.351	-27.658	429.197	0
266			N79	0	0	-195.053	44.396	456.184	0
267			N113	0	0	666.055	9.762	21.747	0
268			N112	0	0	656.949	-60.702	-20.924	0
269	1	P68	N79	0	0	-231.024	-18.574	394.45	0
270			N81	0	0	-181.062	40.997	422.658	0
271			N114	0	0	612.155	5.961	22.309	0
272			N113	0	0	611.132	-53.877	-21.731	0
273	1	P69	N81	0	0	-211.315	-15.101	361.582	0
274			N83	0	0	-165.572	38.652	389.419	0
275			N115	0	0	562.154	4.286	21.794	0
276			N114	0	0	563.533	-50.019	-21.508	0
277	1	P70	N83	0	0	-194.09	-13.283	329.821	0
278			N85	0	0	-149.734	36.518	357.096	0
279			N116	0	0	514.326	2.782	21.262	0
280			N115	0	0	515.898	-47.409	-21.154	0
281	1	P71	N85	0	0	-178.073	-11.592	298.554	0
282			N87	0	0	-133.965	34.339	325.451	0
283			N117	0	0	467.403	.975	20.941	0
284			N116	0	0	468.635	-45.16	-20.909	0
285	1	P72	N87	0	0	-162.476	-9.662	267.463	0
286			N89	0	0	-118.381	32.13	294.178	0
287			N118	0	0	420.731	-1.075	20.799	0
288			N117	0	0	421.726	-42.944	-20.784	0
289	1	P73	N89	0	0	-146.918	-7.544	236.398	0
290			N91	0	0	-102.996	30.053	263.095	0
291			N119	0	0	374.012	-3.184	20.784	0
292			N118	0	0	375.101	-40.742	-20.764	0
293	1	P74	N91	0	0	-131.204	-5.4	205.207	0
294			N93	0	0	-87.718	28.402	232.107	0
295			N120	0	0	327.03	-5.179	20.917	0
296			N119	0	0	328.692	-38.735	-20.909	0
297	1	P75	N93	0	0	-115.193	-3.412	173.541	0
298			N95	0	0	-72.118	27.544	201.058	0
299			N121	0	0	279.464	-6.999	21.312	0
300			N120	0	0	282.246	-37.279	-21.4	0
301	1	P76	N95	0	0	-98.798	-1.715	140.652	0
302			N97	0	0	-54.921	27.545	169.458	0
303			N122	0	0	230.855	-8.93	22.128	0
304			N121	0	0	234.864	-36.835	-22.519	0
305	1	P77	N97	0	0	-82.33	-.189	105.399	0
306			N99	0	0	-33.39	26.978	136.147	0
307			N123	0	0	181.098	-12.207	23.349	0
308			N122	0	0	184.222	-37.49	-24.374	0
309	1	P78	N99	0	0	-67.429	2.249	66.902	0
310			N101	0	0	-3.414	20.493	99.141	0
311			N124	0	0	132.185	-20.401	24.494	0
312			N123	0	0	125.858	-37.512	-26.095	0
313	1	P79	N101	0	0	-56.675	8.529	26.98	0
314			N103	0	0	42.925	-6.242	54.735	0
315			N125	0	0	85.975	-39.429	19.333	0
316			N124	0	0	52.576	-29.359	-24.897	0
317	1	P80	N103	0	0	-61.531	29.938	-5.658	0
318			N105	0	0	78.799	-69.098	13.716	0



Company :
Designer :
Job Number :
Model Name :

June 27, 202

Item #13.

Checked By: _____

Plate Corner Forces (Continued)

LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
319		N126	0	0	68.978	-77.342	19.612	0
320		N125	0	0	-23.846	-0.076	-13.738	0
321	1	P81	0	0	443.108	213.46	88.073	0
322		N106	0	0	-227.914	-121.221	-114.14	0
323		N127	0	0	450.85	85.519	211.54	0
324		N128	0	0	581.957	223.307	223.334	0
325	1	P82	0	0	-231.349	-95.272	153.998	0
326		N108	0	0	-445.261	-94.129	-66.604	0
327		N129	0	0	990.576	91.709	555.551	0
328		N127	0	0	871.634	145.177	626.465	0
329	1	P83	0	0	-670.709	-89.021	148.942	0
330		N109	0	0	-655.335	-81.686	-7.806	0
331		N130	0	0	1270.074	20.549	844.085	0
332		N129	0	0	1179.169	97.019	902.421	0
333	1	P84	0	0	-800.593	-9.565	73.117	0
334		N110	0	0	-736.989	-66.631	17.616	0
335		N131	0	0	1318.568	-43.718	976.616	0
336		N130	0	0	1279.814	68.735	1000.633	0
337	1	P85	0	0	-791.671	50.7	17.406	0
338		N111	0	0	-739.85	-55.541	25.376	0
339		N132	0	0	1265.125	-76.743	994	0
340		N131	0	0	1264.796	55.508	993.939	0
341	1	P86	0	0	-737.132	79.591	-11.344	0
342		N112	0	0	-704.971	-47.844	26.029	0
343		N133	0	0	1179.728	-87.437	953.698	0
344		N132	0	0	1198.375	48.933	941.72	0
345	1	P87	0	0	-676.328	87.791	-22.311	0
346		N113	0	0	-657.144	-42.139	24.932	0
347		N134	0	0	1090.738	-86.991	891.989	0
348		N133	0	0	1116.334	44.545	875.662	0
349	1	P88	0	0	-620.043	86.254	-24.948	0
350		N114	0	0	-607.012	-37.289	23.922	0
351		N135	0	0	1005.575	-82.427	825.473	0
352		N134	0	0	1032.68	40.499	808.209	0
353	1	P89	0	0	-568.675	81.347	-24.723	0
354		N115	0	0	-557.786	-32.697	23.345	0
355		N136	0	0	924.215	-76.944	759.663	0
356		N135	0	0	951.047	36.265	742.577	0
357	1	P90	0	0	-520.267	75.82	-23.985	0
358		N116	0	0	-509.776	-28.137	23.088	0
359		N137	0	0	845.078	-71.599	695.44	0
360		N136	0	0	871.365	31.814	678.699	0
361	1	P91	0	0	-473.185	70.515	-23.441	0
362		N117	0	0	-462.573	-23.548	22.994	0
363		N138	0	0	766.928	-66.556	632.352	0
364		N137	0	0	792.831	27.235	615.853	0
365	1	P92	0	0	-426.555	65.517	-23.151	0
366		N118	0	0	-415.824	-18.906	22.98	0
367		N139	0	0	689.132	-61.719	569.866	0
368		N138	0	0	714.847	22.6	553.485	0
369	1	P93	0	0	-380.008	60.724	-23.015	0
370		N119	0	0	-369.364	-14.132	23.078	0
371		N140	0	0	611.436	-56.979	507.641	0
372		N139	0	0	637.136	17.915	491.269	0
373	1	P94	0	0	-333.341	56.05	-22.953	0
374		N120	0	0	-323.084	-9.018	23.458	0
375		N141	0	0	533.652	-52.288	445.415	0



Company :
Designer :
Job Number :
Model Name :

June 27, 202

Item #13.

Checked By: _____

Plate Corner Forces (Continued)

	LC	Plate Label	Joint	X[lb]	Y[lb]	Z[lb]	MX[lb-ft]	MY[lb-ft]	MZ[lb-ft]
376			N140	0	0	559.573	13.088	428.905	0
377	1	P95	N120	0	0	-286.192	51.476	-22.975	0
378			N121	0	0	-276.598	-3.195	24.443	0
379			N142	0	0	455.31	-47.678	382.72	0
380			N141	0	0	481.88	7.884	365.802	0
381	1	P96	N121	0	0	-237.73	47.028	-23.236	0
382			N122	0	0	-228.6	3.732	26.378	0
383			N143	0	0	375.217	-43.29	318.471	0
384			N142	0	0	403.114	1.914	300.718	0
385	1	P97	N122	0	0	-186.477	42.688	-24.132	0
386			N123	0	0	-175.77	11.422	28.942	0
387			N144	0	0	291.011	-39.398	250.593	0
388			N143	0	0	320.836	-5.153	231.644	0
389	1	P98	N123	0	0	-131.186	38.297	-26.196	0
390			N124	0	0	-112.183	16.489	29.737	0
391			N145	0	0	200.106	-36.42	176.461	0
392			N144	0	0	230.464	-12.688	156.966	0
393	1	P99	N124	0	0	-72.577	33.271	-29.334	0
394			N125	0	0	-32.246	8.676	19.177	0
395			N146	0	0	102.388	-33.688	96.538	0
396			N145	0	0	127.235	-16.001	80.842	0
397	1	P100	N125	0	0	-29.883	30.829	-24.772	0
398			N126	0	0	22.484	-23.426	9.857	0
399			N147	0	0	38.341	-29.528	30.162	0
400			N146	0	0	31.457	-7.5	23.352	0



J&T Consulting, Inc.

Town of Johnstown

Johnstown Reservoir Rehabilitation Project

11/16/2020

Professional Services Scope and Fee Summary

Task Description	Hours			Cesare, Inc.	ERC	American West	Task Subtotal
	Project Manager	Project Engineer	Senior Designer				
	J.C. York	Todd Yee, Jason Murray	C. Harmon, T. Tuttle W. Schum, B. Cowles	Geotech	Environmental (T&E and Wetlands)	Survey	
	rate	\$125	\$110	\$95			

Reservoir Design - State Engineer's Office Requirements

Task 1 - Site Survey							
Update topo to get downstream toe around reservoir and more detailed information on outlet pipe and downstream pipe	2	4	6			\$2,500	\$3,760
Screening of Threatened, Endangered and Species of Concern (TES)	2	4			\$2,000		\$2,690
Routine Onsite Wetland Delineation	2	4			\$1,500		\$2,190
Task 2 - Application to SEO	2	4					\$690
Task 3 - Construction Drawings and Specifications							
Prepare Construction Drawings - Outlet Pipe / Service Spillway / Emergency Spillway / Crest Grading (60% and 100% submittals)	12	24	48				\$8,700
Prepare Technical Specifications	6	16	24	\$3,000			\$7,790
Meet with SEO and Town of Johnstown at 60% and 100 % stage	6	6					\$1,410
Task 4 - Hydrology Report	4	16	32				\$5,300
Task 5 - Geotechnical Report (Field Investigation, Analysis)	12	12		\$21,500			\$24,320
Task 6 - Design Report	4	8	12				\$2,520
Task 7 - Instrumentation Plan	2	4	6				\$1,260
Task 8 - Cost Estimate	2	4	8				\$1,450
Task 9 - Prepare Bid Documents / Assist with Bidding	4	8	8				\$2,140
Subtotals	60	114	144	\$24,500	\$3,500	\$2,500	\$64,220

Subtotal	\$64,220
Expenses at 3%	\$1,930
Project Total	\$66,150



J&T Consulting, Inc.

Town of Johnstown

Johnstown Reservoir Repair Construction Services

8/2/2021

Professional Services Scope and Fee Summary

Task Description	Hours			Cesare Geotech Observation and Materials Testing	American West Survey	Task Subtotal
	Project Manager	Project Engineer	Senior Designer			
	J.C. York	Todd Yee, Jason Murray	T. Tuttle, K. Simpson, J. Schlagel			
	rate	\$125	\$110	\$95		

Phase 1 - Johnstown Reservoir Repair Construction - Expected 5 Month Duration

Task 1 - Conforming Construction Documents						
Construction Drawing Updates - Address Review Comments for SEO	4	8	24			\$3,660
Construction Specification Updates - Address Review Comments for SEO	4	8	10			\$2,330
Task 2 - Project Coordination/Management and Meetings						
Project Coordination/Management	30					\$3,750
Pre-Construction Conference	2					\$250
Construction Progress Meetings	20					\$2,500
Task 3 - Construction Observation and Submittals Review						
Construction Observation	40	120	160			\$33,400
Submittals Review	4	12	16			\$3,340
Task 4 - Monthly Construction Reports and General Correspondence (For Town and SEO)						
Monthly Construction Reports	4	12	16			\$3,340
Task 5 - Payment Application and Change Order Review						
Payment Application Review	8					\$1,000
Change Order Review	6					\$750
Task 6 - Geotechnical Observation and Materials Testing				\$12,000		\$12,000
Task 7 - Site Quantity Surveys and As-Built Documentation	2	6	12		\$2,500	\$4,550
Subtotals	116	150	204	\$12,000	\$2,500	\$70,870


J&T Consulting, Inc.
Town of Johnstown
Johnstown Reservoir Repair Construction Services

8/2/2021

Professional Services Scope and Fee Summary

Task Description	Hours			Cesare Geotech Observation and Materials Testing	American West Survey	Task Subtotal
	Project Manager	Project Engineer	Senior Designer			
	J.C. York	Todd Yee, Jason Murray	T. Tuttle, K. Simpson, J. Schlagel			
	rate	\$125	\$110	\$95		

Johnstown Reservoir Construction Closeout

Task 1 - Construction Closeout						
SEO Rule 10 Submittal	4	8	12			\$2,520
Subtotals	4	8	12	\$0	\$0	\$2,520

Subtotal
\$73,390

Expenses at 3% of Subtotal

\$2,200
Construction Services Total
\$75,590

TOWN OF JOHNSTOWN PROFESSIONAL SERVICES AGREEMENT

THIS PROFESSIONAL SERVICES AGREEMENT (the “Agreement”) is made and entered into this 18th day of November 2020 (the “Effective Date”) by and between the Town of Johnstown, Colorado, a Colorado home-rule municipal corporation (the “Town”) and J&T Consultants a Colorado corporation (“Contractor”) (collectively, the “Parties”).

WHEREAS, the Town desires to engage the services of Contractor and Contractor wishes to provide those services more fully described on Exhibit A, attached hereto and incorporated herein by reference (“Services”), for the Town; and

WHEREAS, the Parties wish to memorialize their contractual relationship.

NOW, THEREFORE, incorporating the foregoing Recitals herein, which are hereby acknowledged as being true and correct, and in consideration of the mutual promises, agreements, undertakings and covenants, as set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby mutually agree as follows:

SECTION 1: PARTIES

1.01 Town. The Town is a home-rule municipal corporation located in Johnstown, Colorado.

1.02 Contractor. Contractor has the background, expertise and education to provide the Services. Contractor is a private, independent business entity who will exercise discretion and judgment of an independent contractor in the performance and exercise of its rights and obligations under this Agreement. Contractor shall use its own judgment and skills in determining the method, means and manner of performing this Agreement. Contractor shall be responsible for the proper performance of this Agreement in accordance with the terms hereof and any and all applicable federal, state, and municipal laws, regulations and orders.

SECTION 2: SERVICES, TERM AND COMPENSATION

2.01 Services. Contractor agrees to perform the Services for the Town.

2.02 Term. Unless otherwise terminated in accordance with Section 5, the term of this Agreement shall be from the Effective Date through November 18, 2021, and shall not extend beyond that date absent the written approval of the Town.

2.03 Duties and Compensation. The Contractor’s duties and compensation shall be as set forth on Exhibit A. In the event of a conflict between the provisions in this Agreement and

Exhibit A, the provisions in this Agreement shall control. Payment for Services shall be provided to Contractor within thirty (30) days of Contractor providing a detailed invoice to the Town.

2.04 Background Check. The Town may, in its sole discretion, conduct a background check of Contractor, its owners and employees. Contractor agrees to execute any forms necessary to facilitate the background check.

SECTION 3: OPERATIONS

3.01 Expenses: Contractor shall not incur any expense or debt on behalf of the Town without the Town's prior written authorization.

3.02 Federal, State, and Municipal Laws and Regulations. Contractor agrees to abide confirm by all applicable federal, state, and municipal laws and regulations and rules.

SECTION 4: INSURANCE AND INDEMNITY PROVISIONS

4.01 Insurance. Contractor shall maintain and keep in force during the term of this Agreement one or more policies of liability insurance written by one or more responsible insurance carrier(s) authorized to do business in the State of Colorado, which will include protecting and indemnifying the Town in the following amounts:

- a) Comprehensive General Liability - \$1,000,000 combined aggregate
- b) Workers Compensation – as required by law

Contractor shall furnish to the Town appropriate certificates of coverage for such insurance. The Town shall be included as an additional insured on the contractor's liability policy. The insurance may not be canceled without at least fifteen (15) days' advance written notice to the Town. Any required deductible or co-insurance amount shall be paid by the Contractor.

4.02 Damage and Indemnity. Contractor assumes full responsibility for any and all damages caused by Contractor's exercise of its activities under by this Agreement. Contractor agrees that it will at all times protect, defend and indemnify and hold harmless the Town, its officers, agents, employees, tenants and their successors and assigns from and against all liabilities, losses, claims, demands, actions and court costs (including reasonable attorneys' fees), arising from or related to loss or damage to property or injury to or death to any persons resulting in any manner from the actions or failure to act of Contractor or any invitees, guests, agents, employees or subcontractors of Contractor, whether brought by any of such persons or any other person arising from Contractor's activities as authorized by this Agreement.

SECTION 5: TERMINATION

5.01 Termination. The Town or Contractor may terminate this Agreement, with or without cause, by providing thirty (30) days prior written notice to Contractor. Notwithstanding the foregoing, if the Town terminates this Agreement for cause and determines that a notice period is not in the best interests of the Town, the Town may terminate this Agreement by providing written notice to Contractor effective immediately.

SECTION 6: INDEPENDENT CONTRACTOR

6.01 Independent Contractor. Contractor understands and agrees that Contractor is an independent contractor and not an employee of the Town. The Town shall not provide benefits of any kind to Contractor. The Town shall not be responsible for withholding any portion of Contractor's compensation for the payment of Federal Insurance Contributions Act (FICA) tax, workers' compensation, or other taxes or benefits. CONTRACTOR IS NOT ENTITLED TO UNEMPLOYMENT COMPENSATION COVERAGE FROM THE TOWN. CONTRACTOR IS OBLIGATED TO PAY FEDERAL AND STATE INCOME TAX ON MONEYS PAID PURSUANT TO THIS AGREEMENT. As long as there is not a conflict of interest with the Town, Contractor may engage in any other lawful business activities during the term of this Agreement.

SECTION 7: NOTICE

7.01 Notices. All notices, demands, or other documents required or desired to be given, made or sent to either Party under this Agreement shall be made in writing, shall be deemed effective upon receipt and shall be personally delivered or mailed postage prepaid, certified mail, return receipt requested as follows:

TO THE TOWN:

Town of Johnstown
Attn: Town Clerk
450 S. Parish Avenue
Johnstown, CO 80534
Email: dseele@townofjohnstown.com

TO CONTRACTOR:

J&T Consulting, Inc.
305 Denver Ave, Suite D
Fort Lupton CO. 80621
303-857-6222

The addresses for notices may be changed by written notice given to the other Party in the manner provided above. Notice may also be sent via e-mail delivery and shall be effective upon confirmation of receipt of the email.

SECTION 8: MISCELLANEOUS

8.01 Time. Time is of the essence of this Agreement and of each covenant hereof.

8.02 Non-Appropriation of Funds. Pursuant to Section 29-1-110, C.R.S., as amended, financial obligations of the Town payable as set forth herein, after the current fiscal year, are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available. This Agreement shall be terminated effective January 1 of the first fiscal year for which funds are not appropriated.

8.03 Illegal Aliens. Contractor shall comply with the statutory provisions prohibiting employment of illegal aliens, as set forth on Exhibit B, attached hereto and incorporated herein by such reference.

8.04 Assignment; Third Party Rights. Contractor may not assign, delegate or subcontract any part of its rights, duties or obligations under this Agreement. The Parties do not intend to confer any benefit hereunder on any person or entity other than the Parties hereto.

8.05 Amendment. This Agreement may not be amended or modified except by a subsequent written instrument signed by both Parties.

8.06 Severability. If any part, term or provision of this Agreement is declared unlawful or unenforceable, the remainder of this Agreement shall remain in full force and effect, except that, in the event any state or federal governmental agency or court authoritatively determines that the relationship between the Town and Contractor is one of employment rather than independent contractor, this Agreement shall become null and void in its entirety.

8.07 Waiver. No consent or waiver, express or implied, by a Party to or of any breach or default by the other Party in the performance by the other Party of its obligations hereunder shall be deemed or construed to be a consent or waiver to or of any other breach or default by the non-defaulting Party. Failure on the part of any Party to complain of any act or failure to act or to declare any other Party in default, irrespective of how long such failure continues, shall not constitute a waiver by such Party of its rights hereunder.

8.08 Governmental Immunity. The Parties agree that the Town is relying on, and does not waive or intend to waive by any provision of the Agreement, the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, §§ 24-10-101 et seq., 10 C.R.S., as from time to time amended, or otherwise available to the Town, its officers, or its employees.

8.09 Applicable Law and Venue. This Agreement shall be construed according to the laws of the State of Colorado. Venue for any claim, proceeding or action arising out of this Agreement shall be in Weld County, State of Colorado.

8.10 Mediation. In the event of any dispute arising under this Agreement, except in the case of injunctive relief as set forth in Paragraph 8.11, the Parties shall submit the matter to mediation prior to commencing legal action and shall equally share the cost of the mediation.

8.11 Right to Injunction. The Parties hereto acknowledge that the services to be rendered by the Contractor under this Agreement and the rights and privileges granted to the Town under the Agreement are of a special, unique, unusual and extraordinary character which gives them a peculiar value, the loss of which may not be reasonably or adequately compensated by damages in any action at law, and the breach by the Contractor of any of the provisions of this Agreement may cause the Town irreparable injury and damage. The Contractor agrees that the Town, in addition to other relief at law, shall be entitled to injunctive and other equitable relief in the event of, or to prevent, a breach of any provision of this Agreement by the Contractor.

8.12 Costs and Attorney's Fees. If any judicial proceedings may hereafter be brought to enforce any of the provisions of this Agreement, the Town, if the prevailing party, shall be entitled to recover the costs of such proceedings, including reasonable attorney's fees and reasonable expert witness fees.

8.13 Entire Agreement. The provisions of this Agreement represent the entire and integrated agreement between the Town and the Contractor and supersede all prior negotiations, representations and agreements, whether written or oral.

8.14 Public Official Personal Liability. Nothing herein shall be construed as creating any personal liability on the part of any elected official, officer, employee or agent of the Town.

8.15 No Presumption. Each Party acknowledges that it has carefully read and reviewed the terms of this Agreement. Each Party acknowledges that the entry into and execution of this Agreement is of its own free and voluntary act and deed, without compulsion. Each Party acknowledges that it has obtained, or has had the opportunity to obtain, the advice of legal counsel of its own choosing in connection with the negotiation and execution of this Agreement and with respect to all matters set forth herein. The Parties agree that this Agreement reflects the joint drafting efforts of all Parties and in the event of any dispute, disagreement or controversy arising from this agreement, the Parties shall be considered joint authors and no provision shall be interpreted against any Party because of authorship.

8.16 Headings. The headings in this Agreement are inserted only for the purpose of convenient reference and in no way define, limit or prescribe the scope or intent of this Agreement or any part thereof.

[Remainder of page intentionally left blank.]

IN WITNESS WHEREOF, the parties have executed this Agreement on the date first written above.

TOWN OF JOHNSTOWN, COLORADO

ATTEST:

By: _____
Diana Seele, Town Clerk

By: Matthew S. LeCerf
Matthew S. LeCerf, Town Manager

J.C. York

By: _____
Name: JC York
Title: Owner.

STATE OF COLORADO)) ss
COUNTY OF _____)

SUBSCRIBED AND SWORN to before me this _____ day of _____, 20____, by
_____ as the _____ of _____.

WITNESS my hand and official seal.

My commission expires: _____

Notary Public

**REQUIRED PROVISIONS FOR CONTRACT FOR SERVICES
PROHIBITING EMPLOYMENT OF ILLEGAL ALIENS**

Contractor shall not:

1. Knowingly employ or contract with an illegal alien to perform work under this public contract for services; or
2. Enter into a contract with a subcontractor that fails to certify to the Contractor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this public contract for services.

Contractor has confirmed the employment eligibility of all employees who are newly hired for employment to perform work under the public contract for services through participation in either the e-verify program or the Department of Labor and Employment program.

Contractor is prohibited from using either the e-verify program or the Department of Labor and Employment program procedures to undertake pre-employment screening of job applicants while the public contract for services is being performed.

If Contractor obtains actual knowledge that a subcontractor performing work under the public contract for services knowingly employs or contracts with an illegal alien, the Contractor shall be required to:

1. Notify the subcontractor and the contracting state agency or political subdivision within three days that the Contractor has actual knowledge that the subcontractor is employing or contracting with an illegal alien; and
2. Terminate the subcontract with the subcontractor if within three days of receiving the notice required pursuant to subparagraph 1 of this subparagraph the subcontractor does not stop employing or contracting with the illegal alien; except that the Contractor shall not terminate the contract with the subcontractor if during such three days that subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with an illegal alien.

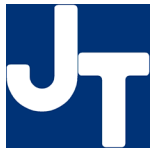
Contractor shall comply with any reasonable request by the Department made in the course of an investigation that the Department of Labor and Employment is undertaking pursuant to the authority established in subsection (5) of Section 8-17.5-102 of the Colorado Revised Statutes.

IF CONTRACTOR VIOLATES ANY OF THE AFOREMENTIONED REQUIREMENTS, THE TOWN MAY TERMINATE THE CONTRACT FOR BREACH OF CONTRACT. IF THIS CONTRACT IS SO TERMINATED, CONTRACTOR SHALL BE LIABLE FOR ACTUAL AND CONSEQUENTIAL DAMAGES TO THE TOWN OF JOHNSTOWN.

**EXHIBIT A
SERVICES**

Design a new outlet structure for the Town of Johnstown Reservoir along the east wall of the Dam. Along with design. Hire Geo technical firm for analysis of conditions and soils, Hydrology report. Site survey to update Topo. Prepare Construction drawing, Bid documents, prepare construction cost estimate. Follow all state procedure for dam repairs. As well as other items as listed in scope of services and fee summary

This work is to be done for a cost not to exceed \$66,150.00



April 13, 2021

Item #13.

Mr. John Batka, P.E.
Dam Safety Engineer
State of Colorado
Division of Water Resources
810 9th Street, Suite 200
Greeley, CO 80631

RE: JOHNSTOWN DAM, DAMID: 040132 Water Division 1, Water District 4
Information for Construction of Buttress on Upstream Side of Existing Outlet
Pipe/Structure and Modification Request to Existing Storage Restriction

Dear Mr. Batka,

J&T Consulting, Inc. is pleased to confirm that the construction of the buttress slope for the intermediate repair of the Johnstown Dam is complete. We also reviewed the amount of seepage water in the outlet pipe before and after the construction and the water volume was much smaller after the construction of the buttress slope.

We have provided attached construction photos with materials testing results for the construction of the buttress slope.

Below is the previous plan for construction and monitoring that we have also provided dates when items were completed and the monitoring of the outlet pipe seepage will continue as proposed.

Construction and Monitoring Plan

1. Video inspection of the existing 15" diameter vitrified clay pipe (VCP) that enters the existing downstream outlet box from the west, video inspection of the existing 6"-8" diameter toe drain that enters the existing downstream outlet box from the south, and video inspection of the existing 24" diameter reinforced concrete pipe (RCP) that exits the existing downstream outlet box to the north. This will give us a visual condition assessment of the existing pipelines. – Completed on February 18, 2021
2. Use earthen fill for the buttress construction that has the following gradation characteristics:

Earthen Fill Gradation	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
2 in	100
#200	Greater than 30

3. Placement of earthen fill by using loader/dozer to place/push material down existing slope until material is 2 feet above the current water surface. Once 2 feet above current water surface utilize small sheep's foot vibratory compactor to compact buttress. The material should be compacted to 95% standard proctor at moisture content of +1% over to -2% under the optimum moisture content as determined by the proctor on the earthen fill. – Completed on April 12, 2021



RE: JOHNSTOWN DAM, DAMID: 040132 Water Division 1, Water District 4
Information for Construction of Buttress on Upstream Side of Existing Outlet
Pipe/Structure and Modification Request to Existing Storage Restriction

4/13/21

-2-

4. Placement of riprap by using loader/dozer and/or trackhoe to place/push material down the earthen fill slope to armor the buttress to protect from wave erosion. – Completed on April 12, 2021
5. The schedule for the buttress construction will be late February or early March when temperatures warrant construction (i.e. greater than 32 degrees during earthfill placement). The video inspection would occur prior to construction of the buttress. – Completed on April 12, 2021
6. Monitoring of outlet pipe – The Town of Johnstown checks the outlet pipe daily to see if water is flowing from the outlet pipe. This monitoring will continue after construction of the buttress. If there becomes an issue where more water begins to flow from the outlet pipe (pipe flowing at a depth of 6 inches or more) the Town of Johnstown would decrease the amount of water flowing into the reservoir and utilize their existing pump station to draw down the water level in the reservoir. If more drawdown is required than the flows being pumped through the existing pump station a dewatering pump could be utilized to pump into the downstream outlet box to discharge through the existing 24" diameter concrete pipe bringing the level of the reservoir down by no more than 1 foot per day. – Monitoring will continue at the same frequency.

Request for Modification of Existing Storage Restriction

The Town of Johnstown would like to request an increase of the water level to 1-ft below the normal full level or G.H. 5 on the staff gauge once the buttress is constructed and once higher potable water demands start which is usually around April 15th. – Now that construction is completed the Town would like to store water to 1-ft below the normal full level or G.H. 5 on the staff gauge.

Thank you for your consideration of the information provided for the construction of the buttress slope and the request for modification of the existing storage restriction. Please feel free to contact me with any questions or if you need additional information.

Sincerely,



J.C. York, P.E.

J&T Consulting, Inc.

Cc: Marco Carani, Public Works Director

Attachments:

Buttress Construction Photos

Materials Testing Information



Town of Johnstown

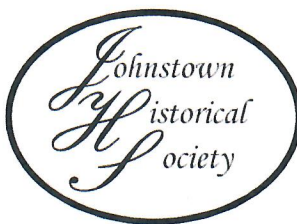
INFORMATIONAL ITEMS ONLY

These items are for Town Council information. Any of these items can be discussed if a Councilmember desires.

The Community That Cares

www.TownofJohnstown.com

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141



March 1, 2021

Matt LeCerf
Town Manager
Town of Johnstown
450 S. Parish Avenue
Johnstown, Colorado 80534

Subject: Museum Director, Initial Progress Report

Dear Matt,

Despite the unprecedented challenges nation-wide on so many levels that would define the year 2020, JHS actually had a great year overall.

We owe that to the Town of Johnstown, new members, and other generous volunteers and donors who reached out to give us a hand up from a bleak outlook after Covid-19 hit hard last spring.

The JHS Board's objective for the museum director's role was to have that person manage the day-to-day operation of the museum by performing the most critical functions of their organization and to work with the Board to grow the museum's presence in the community. The first year would be mostly an investment of time updating and improving on existing policy and procedures, working on rebuilding the Society/Museum website, creating fresh displays, and enacting a plan to increase our volunteer and member retention.

To that end, I remain confident that we are on the right path moving forward. I'm working with the new board on this year's continued transition.

This letter report provides the details of our progress and an outline of this year's goals in the sections that follow.

Respectfully submitted,

Billie DeLancey
Museum Director
Historic Parish House and Museum

1. Purpose

This report serves two purposes. First, the museum director is responsible for providing progress reports to the Town of Johnstown. This initial report highlights Billie DeLancey's activities as the museum Director (MD) from August 2020 through February 2021, along with JHS plans for events and fundraisers this year. Secondly, these reports will serve as a tool for the Board and MD to measure progress over time to ensure we stay on track with our goals.

We're off to a great start!

2. August – December 2020

How We Invested the Town's Funding

In addition to the Town creating a paid position for a museum director to manage the Parish House and Museum, JHS also received grant money to offset lost income last year because of Covid-19 and the forced cancellation of our annual in-person events and fundraisers. The total amount of \$33,552.26 in grant funding to JHS in 2020 basically falls into three categories:

Museum Director and Social Media Coordinator Pay

The Town created a new position for a part-time MD in August and provided an allowance for JHS to hire Karla Humphrey as an independent contractor to carry out the critical function of managing our social media platforms – Facebook and Google Suite. The combined amounts for paid help in 2020 totaled \$10,242.60.

Parish House Building and Grounds

The Town's commitment to paying the Colorado State Historical Fund's (SHF) grant match requirements of 25 percent of each award to JHS has been instrumental in helping to return the Parish House and grounds to its original state of grandeur in the early 1900s. Our current grant is for the engineering design for the replacement of the property's failing retaining walls. The match was \$6,000.00. Typically, the Town has paid the match as the final payment to our architect, but for this grant, the Town paid the match as the first of the three payments to Sheuber + Darden Architects from their first invoice submitted in December. JHS will pay out the remaining SHF grant proceeds to the architect as the remaining deliverables are met. This engineering design/construction documents project will be completed this summer.

Additionally, the Town paid for tree trimming services coordinated by the MD and performed by The Tree Guys of Milliken. For safety reasons, and because the current SHF grant is a "paper" grant with the anticipation of a new grant application submission later this year or in 2022 for the actual retaining walls reconstruction, it will be a few years before the trees can be removed as part of that project. The tree trimming also enhanced the exterior aesthetics of the property as well as brought it into compliance with Town regulations on street tree overhang clearances. This project totaled \$3,600.00.

The MD also managed the first part of a three-year window improvement project by Heritage Window Restoration in Commerce City, a historic building contractor. The remaining three of five original porch screens to the Parish House had been in storage for years. In lieu of storm windows, and because the screens were original to the house exterior, the three existing screens were restored by Heritage Window Restoration, and two more were manufactured to match them for a total of five porch screens. This portion of the project totaled \$5,995.00.

Together, these improvements to the Parish House property under the Town's 2020 budget totaled \$15,595.00.

Last November, mold was discovered in the east basement room at the Parish House. The MD worked with the Town Manager and ServiceMaster of Fort Collins/Loveland to coordinate the remediation. ServiceMaster removed the affected drywall under negative air pressure and used bleach to clean the wall and floor surfaces. This portion of the project totaled \$443.73, which was not included in the 2020 budget, but paid by the Town under a separate invoice.

Given that the wall and wood trim beneath the windows in the room have visible signs of past repair from water damage, and that it has reappeared, the Town Manager and MD agreed to wait until spring 2021 to replace the drywall in the room. The MD will continue to monitor for moisture once the sprinkler system is turned on and the spring rains begin. The Town maintenance crew will complete the drywall installation once we determine the source of the water intrusion, correct it, and ensure that the condition and integrity of the basement wall has not been affected.

Equipment, Supplies, and Digitization Services

Lastly, the Town budgeted an additional \$7,714.66 to be used for equipment, supplies, and digitization services. The MD researched the costs and purchased new office and computer equipment, an upgraded web version of JHS's museum software, archival and office supplies, and sent off our obsolete VHS and audio cassette tapes to be converted to .MP4 format. Having this extra funding available gave JHS the resources to help the MD fulfill her responsibilities at the Parish House.

Reorganize First to Support our Growing Community's Needs

Having a MD to manage the Parish House has changed the dynamics of JHS and the museum operations. It adds value to JHS's and the Town's vision for the downtown area and facilitates the changes needed to ensure sustainable growth for JHS and the Parish House. The MD is also an active participant of the recently created JDDA group and serves as a liaison to the JHS Board in this capacity.

Other initial work performed by the MD during 2020 included supporting the Society's most immediate needs and administrative tasks, assisting with fundraising and events, and working with the Board on internal organizational improvements, starting with the JHS Annual Meeting and Board member elections.

New and Expanded JHS Board of Directors

As a 501(c)(3) non-profit cultural organization, JHS holds an annual meeting each November for the purpose of electing/re-electing the next year's board members to fill vacancies and to present recommended changes to the Society's bylaws. Information is passed along with plans for the upcoming year, and we generally take this opportunity to recognize the hard work and generosity of our volunteers, members, and donors.

When Billie DeLancey started her position as MD in August 2020, she was actively serving as the JHS Board Secretary. Because of the potential conflict of interest this relationship presented, Billie became the Acting Secretary and continued to fulfill her responsibilities until a new Secretary could be elected. As Acting Secretary, Billie supported the Board in the effort to seek out and vet new board members.

The Board aims for diversity in its directors and reached out to five candidates; four of whom accepted an offer to interview with the Board. Interviews were held on October 7, 2020 at the Parish House with candidates Becky Lassen, Jamie Desrosier, and Cathy and Clair Hull. The Board agreed that all four candidates were qualified, and their names were placed on the ballot.

As the November 17th meeting date approached, the Board considered the recent surge in Covid-19 infections and the associated risks of having an in-person, indoor gathering, and that the Town had recently closed its buildings to the public for these safety reasons. The Board opted to cancel the Annual Meeting five days before the event and had the current JHS membership vote by absentee ballot. The completed ballots were returned via email, mail, or in-person to the MD as Acting Secretary, who tallied and documented the results. The new Board consists of the following members. The green shading represents the incoming directors:

2021 JHS Board of Directors	
President	Beverly Kirkpatrick
Vice President	Ardis Briggs-Tomlinson
Treasurer	Becky Lassen
Secretary	Cathy Hull
Director	Chad Young (formerly Treasurer)
Director	Jamie Desrosier
Director	Clair Hull

Considerable thought was put into this new Board. We improved upon our method of selecting Board members with proactive vetting and an interview process. We spelled out the increased time commitment for Board members and added a requirement that all members complete an online non-profit board member training course provided by the Colorado Secretary of State's office. Also, by increasing the number of directors from five to seven, along with having the MD and the social media coordinator involved in managing the two legs of our organization – the Parish House and Museum and our online presence, JHS will benefit from more talent and skills plugged into committee assignments. With the MD and social media coordinator also attending Board meetings – this brings the number to nine for discussion and planning.

3. Moving Forward – 2021 and Beyond

2021 Town Budget

The Town budgeted \$44,496.20 for JHS in 2021, which includes the MD's wages and an allowance for our Social Media Coordinator. The total for these expenses is \$25,991.20. Additionally, the Town provided \$4,500.00 for JHS toward website development and the second phase of the Parish House windows project in the amount of \$14,005.00.

Website

As part of JHS's re-organization efforts the MD and social media coordinator are working together on a new website. JHS will retain the ability to update and make changes through a user-friendly interface with the software. We are in the process of transferring our domain name to a new JHS account, and we will meet with a website designer/hosting service this month.

Parish House Storm Windows

The MD will continue to manage the ongoing Parish House windows project by Heritage Window Restoration. The Town budgeted \$40,000.00 for the overall project. The porch screens portion of the project was completed in December 2020, as stated above. This year, the budgeted \$14,005.00 will be applied toward the second phase of the project – energy-efficient storm windows, with the remaining

\$20,000.00 to finish the storm windows installation in 2022. This upgrade to the Parish House exterior will serve to reduce energy consumption and annual heating costs, in addition to protecting the interior windows.

Work Plan and Long-term Goals

This year will be a defining one for JHS and the Parish House and Museum. Our new leadership team is reviewing existing missions and vision statements, logos, bylaws, policies, procedures, and job descriptions. It is determining how to best grow into a bigger coat of responsibility in a sustainable manner to meet our community's needs. We have a working 2021 project timeline in place with tentative dates and an order for accomplishing this year's goals.

We also have a start on a 10-year plan with the following anniversaries as major events on the horizon for JHS and the Town of Johnstown to consider:

- July 6, 2024: 100th anniversary of the Johnstown Meteorite fall.
- July 4, 2026: National 250th (Sestercentennial) celebration of the USA.
- June 29, 2028: 100th anniversary of the Johnstown tornado.

For the first half of 2021, the MD will continue to work with the Board on reorganization efforts. She will also develop a volunteer program with the Membership/Volunteer Committee, taking advantage of these remaining few months before we reopen while the pandemic subsides as more and more people become vaccinated.

Reopening the Museum

We are currently working on a phased plan for reopening the museum starting in April with limited capacity to view the displays and our video tour of the Parish House in the Visitor's Center. An online tour request form will allow guests to sign up and schedule an appointment. We plan to reopen the Parish House on Wednesdays by this summer, with two additional open days by fall – one on the weekend to accommodate guests who work weekdays. When we reopen, we will be ready to roll with new plans, fundraisers, and events.

For the second half of 2021 (provided that Covid-19 restrictions allow it), JHS is planning to hold its *Stitches in Time Quilt & Craft Fair* and other events and fundraisers with the focus on replenishing our financial cushion. Other sources of revenue include membership dues, book sales, and donations. The MD will participate in these committee-managed activities, although most of her work this year will be focused on museum collections as the museum's curator.

Museum Collections

The MD is responsible for managing the JHS collections. This year will see a significant change in the process of how collection objects are handled and catalogued. The MD will engage in museum collections care and preservation training in June. JHS has a backlog of donated objects that will be accessioned into our collections database, which will be perfect for hands-on training for new volunteers on the importance of handling and caring for historical artifacts. Other Collections projects this year include:

Museum Software

The MD and the social media coordinator have been working with our museum collections software company – PastPerfect – on upgrading to the web version of the software to better align with our needs. This conversion is already underway and, when completed this spring, will allow us to integrate many of our separate functions, such as contact management, tracking volunteer work hours and assignments, and managing our memberships and donations.

Historic Photograph Collection

With our new museum software, flatbed scanner, and archival storage boxes and materials for a photograph and historic document collection, the MD will lead the effort to scan and catalogue our collection of historic photos and properly preserve and archive them.

Oral History Collection

The MD catalogued the inventory of VHS and audio cassette tapes and sent them out for digitization last year. A total of 140 oral histories were sent. Two of the four boxes have been returned so far, along with the accompanying digitized files. The Collections Committee will begin to review these narratives and select and edit them for various uses in new historical outreach projects as well as having them available on the JHS YouTube channel.

Johnstown Breeze Newspaper Collection Digitization – Joint Project

The MD will work with The Johnstown Breeze to research options for having the Breeze's collection of newspapers digitized from their original physical state. It is a near-complete collection dating back about 114 years, with the oldest papers reaching a critical state of deterioration. The Breeze newspaper is perhaps the oldest and best resource of local history and every-day happenings since the early 1900s, and JHS is on board to help with preserving this extensive collection of Johnstown's history.

"A Tribute to Johnstown" by Rebecca S. Healy, 1977

This little paperback book has been a great resource of Johnstown history over the years, and we are bringing it back with a fresh look. It was researched and compiled for the country's 1976 bi-centennial celebration. JHS will sell the updated versions as a revenue stream.

Museum Displays and Offsite Exhibits

The MD is working with the Collections Committee to create a display at the museum about Johnstown's fires and firefighters. Additional exhibits are being planned for bringing history to meet people where they are – at the YMCA, the library, and other public locations around town that will expand our footprint in the community.

4. Our Continued Commitment

In conclusion, JHS and the MD are committed to bringing the Parish House and Museum and our programs to the next level of museum professionalism. Together, we thank Matt LeCerf and the Johnstown Town Council for your generosity in helping us to make this leap of faith to better serve Johnstown and the region.



Town of Johnstown

Building Permit Statistics

July, 2021

Single Family Residential

Issued ytd 106

Commercial

*New Building Issued ytd 11

Other Residential (basements/alterations/additions)

Issued ytd 86

Other Commercial * (tenant finish/alterations/additions)

Issued ytd 14

Fees collected at permit issuance	Residential YTD	Commercial YTD
Construction Valuation	(\$34,457,591)	(\$32,785,326)
Building permit fees	\$292,647	\$209,254
F&F or <u>F&F Credit</u>	\$0	\$0
Paving	\$0	\$0
Water Upgrade	\$250	\$0
Water & Sewer Reimbursement	\$3,262	\$0
Raw Water Development Fee	\$870,895	\$186,658
Water Meter	\$52,450	\$6,401
Water Tap	\$682,322	\$204,981
Sewer Tap	\$559,680	\$78,130
Regional Sewer Development fee	\$446,500	
Sewer Inspection Fee	\$10,600	\$1,000
Park	\$53,000	\$0
Use Tax	\$559,594	\$471,473
Larimer Use Tax	\$65,874	\$90,378
Open Space Impact Fee	\$126,564	\$0
Library Impact Fee	\$121,688	\$0
Public Facilities Impact Fee	\$168,434	\$235,777
Police Facilities Impact Fee	\$77,698	\$82,894
Transportation Facilities Impact Fee	\$294,362	\$805,627
Traffic Signal	\$558	\$0
School District Fee	(\$58,266)	N/A
TOTAL FEES (YTD)	\$4,386,378	\$2,372,573

The Community That Cares

www.TownofJohnstown.com

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141

Building permits issued for individual dwelling units - 1991 to (date)

Single family, duplex, 4-plex						
Year	Issued	Month avg		Year	Issued	Month avg
*1961 - 90	165	0.0		2016	132	11.00
1991	2	0.17		2017	140	11.67
1992	5	0.42		2018	126	10.50
1993	7	0.75		2019	87	7.25
1994	47	3.92		2020	108	9.75
1995	106	8.83		2021	106	15.14
1996	145	12.00				
1997	143	11.92				
1998	175	14.58				
1999	145	12.08		TOTAL	5212	
2000	134	11.92				
2001	152	12.67				
2002	262	21.92				
2003	284	24.17				
2004	331	27.67				
2005	375	31.33				
2006	180	15.75				
2007	160	133.42				
2008	97	8.00				
2009	89	7.42				
2010	124	10.33				
2011	184	15.34				
2012	310	25.84				
2013	378	31.50				
2014	272	22.67				
2015	162	13.50				

The Community That Cares

www.TownofJohnstown.com

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO | F: 970.587.0141



August 23, 2021

Mr. Marco Carani
Town of Johnstown
PO Box 609
Johnstown, CO 80534

Subject: Sanitary Survey of Town of Johnstown
Public Water System Identification No. CO0162418
Weld County

Dear Mr. Carani:

A sanitary survey was performed on July 30, 2021 by the Field Services Section of the Colorado Department of Public Health & Environment's Water Quality Control Division (the department) at the Town of Johnstown (the supplier) in accordance with the *Colorado Primary Drinking Water Regulations, 5 CCR 1002-11* (Regulation 11), Sections 11.38(1)(b) and 11.38(2). This letter serves to provide the supplier with written notification of the sanitary survey findings, including any identified significant deficiencies and violations of Regulation 11. The assistance provided was very helpful and is greatly appreciated. Table 1 identifies the parties present during the sanitary survey.

Table 1: Parties Present

Name	Organization
Marco Carani, Saul Herrera, Ellen, Hilbig, Michael Murphy, Maurice Pribble and Wayne Ramey	Town of Johnstown
Kit Armstrong, Ellen Henrichs and Paul Kosik	Colorado Department of Public Health & Environment

Table 2 summarizes the number of findings and the required written response and resolution dates.

Table 2: Sanitary Survey Findings

Severity Category	Number Identified	Written Response Due (within 45 days of letter date)	Resolution Due (within 120 days of letter, or department-approved alternate date)	Public Notice Required (Violations of Regulations 11)
Significant Deficiencies	0	No response required	Not applicable	Not required
Violations	0	No response required	Not applicable	Not required
Observations - Recommendations	8	No response required	Not applicable	Not applicable

A list of the findings for each category in Table 2 can be found in the following sections:

Section I: Significant Deficiencies

According to Regulation 11, Section 11.3(72), a significant deficiency means:

any situation, practice, or condition in a public water system with respect to design, operation, maintenance, or administration, that the state determines may result in or have the potential to result in production of finished drinking water that poses an unacceptable risk to health and welfare of the public served by the water system.

No significant deficiencies were identified.



Section II: Violations

No violations were identified.

Section III: Observations/Recommendations

The department recommends the supplier follow up and consider the following observations-recommendations. Please direct questions regarding any of the items below to the department inspector.

1. T901 - Treatment: Johnstown SWTP01 (SDWIS ID: 001)

Cross-Connection: Uncontrolled cross-connection that may allow contamination to enter drinking water.

In accordance with Section 11.39(3)(b) of Regulation 11, suppliers of water are prohibited from installing or permitting any uncontrolled cross-connections within a supplier's treatment waterworks. Unprotected cross-connections present potential sanitary hazards and health risks that meet the definition of a significant deficiency as defined in Section 11.3(72) of Regulation 11 and must be corrected. At the time of the sanitary survey, the department inspector identified an improperly controlled cross-connection where a testable double check valve was used to control the filter surface washers connected to the potable water system which is considered an uncontrolled cross-connection (Attachment #1). Per the department's Backflow Prevention and Cross-Connection Control Policy (DW#-007), filter surface washes connected to the potable water system must be protected with an air gap, pressure-resistant vacuum breaker, spill-resistant vacuum breaker or reduced pressure zone (RPZ) backflow prevention assembly. The department recommends the supplier refer to Section 4.3.1.8 of the Colorado Design Criteria for Potable Water Systems which states surface or subsurface wash systems for filters must have a properly installed RPZ backflow preventer on the finished water system. The department may allow for a pressure vacuum breaker or spill-resistant vacuum breaker on the finished water line provided the vacuum breaker on the finished water feed line is immediately located above the overflow height of the filters.

In accordance with Section 11.39 of Regulation 11, the supplier must control or remove this cross-connection to prevent the potential backflow of the identified contaminant from entering the water supply system. In order to correct this deficiency, the supplier must install an appropriate backflow prevention assembly at the location which prevents backflow into the treatment waterworks or remove the identified cross-connection within 120 days of this letter or according to a department-approved alternative schedule. The supplier is expected to submit a photograph of the installed backflow prevention assembly to the department inspector that clearly demonstrates an appropriately installed backflow prevention assembly along with a narrative description of the work that was done. If a backflow assembly is installed, a copy of the test report from a certified cross-connection control technician should also be provided to the department inspector.

After the sanitary survey and before this letter was issued, the supplier provided a response and pictures demonstrating that the double check valve has been replaced with an RPZ backflow prevention assembly (Attachment #1). In addition, the supplier also provided a backflow assembly test report demonstrating the RPZ assembly was tested properly and passed. As such, the deficiency has been resolved and no further response is needed from the supplier at this time.

2. D410 - Distribution: Distribution System (SDWIS ID: DS001)

Valve Inspection and Exercising Program: Valve inspection and exercising program implementation.

At the time of the sanitary survey, the supplier's valve exercising program was discussed. The department inspector noted the supplier did not perform valve inspection or exercising for most of the distribution system. The department recommends developing a program in accordance with *American Water Works Association Standard G200-04 Distribution System Operation and Maintenance*, which states:

"This program shall include at least the following elements: a) A goal for the number of transmission valves to be exercised annually based on the percentage of the total valves in the system. b) A goal for the number of distribution valves to be exercised annually. c) Measures to verify that the goals are met and written procedures for action if the goals are not attained. d) Critical valves in the distribution system shall be

identified for exercising on a regular basis. Potential quality and isolation concerns shall be recognized. The program shall track the annual results and set goals to reduce the percent of inoperable valves."

Inspecting and exercising valves should include completely closing, opening and re-closing until the valve seats properly. Leaking or damaged valves should be scheduled for repair. Valves potentially incapable of properly opening or closing completely should be considered for replacement. A record of valve maintenance and operation, including the number and direction of turns to closure, should be kept. A written standard operating procedure (SOP) for the valve inspection and exercising program should be developed and incorporated into the supplier's operations and maintenance (O&M) plan.

3. M820 - Management:

Emergency Response Plan: Supplier emergency response plan.

At the time of the sanitary survey, the supplier had a written emergency response plan. The department recommends the supplier update its plan for distribution pressure drops below 20 pounds per square inch gauge (psig). The plan should be able to guide the supplier in the event of a naturally occurring or a human-caused failure or condition that might compromise the distribution of safe drinking water. Per Section 8.2.1 of Chapter 8 (Distribution Systems) of the Design Criteria, pressures in the distribution system must be at least 20 psig. Line breaks and pressures below 20 psig can lead to potential backflow situations in the distribution system. The department's environmental release and incident report line (1-877-518-5608) must be notified whenever the distribution system loses substantial water pressure. Guidance on responding to pressure loss and main break incidents may be found at the department's website: <https://cdphe.colorado.gov/report-concern-emergency>. For more information on responding to pressure loss and main break incidents, please contact Bryan Pilson of the department's Acute Response Team at 303-692-3318 or via email at bryan.pilson@state.co.us.

4. M651 - Management:

Customer Metering: Customer meters and accurate accounting of water used.

The supplier does not calculate water losses in the distribution system. The department recommends the supplier calculate water losses regularly in the distribution system based on metered water usage and/or estimation of the average, daily consumption of residents and visitors. Typical average daily consumption of year-round single-family dwellings without irrigation may range between 75 to 100 gallons per person. Based on this rate with an accurate count of residents and visitors or using more accurate figures developed with historical data and/or influent flow data to the sanitary sewer, an estimated consumption of water may be determined for a selected basis of time. Using this calculation with the amount of water purchased allows the supplier to calculate water losses on a yearly, quarterly or monthly basis which the supplier can use to assess the overall physical condition of the distribution system and help determine if there are line breaks or excessive leaks in the distribution system. If average monthly water losses are over 15 percent, the department recommends the supplier check calibration of meters to verify system losses are accurate and consider distribution piping replacement in combination with leak detection program to reduce water loss and provide improved protection of the finished water.

5. M622 - Management:

As-built Records: Current as-built records of water system facilities.

At the time of the sanitary survey, the supplier was beginning to move from hard copies of as-built drawings of the distribution system to an electronic system. The department recommends the supplier continue to transfer all as-built drawings of its system to its new electronic system. The supplier's electronic system should be a specialized geographic information system (GIS) program that includes a complete and detailed GIS map with inventory and specifications of the distribution system mains such as pipe size, date of installation, pipe material, etc. as well as valves, hydrants and all associated appurtenances. In addition, the department recommends the supplier also accurately determine the locations and construction details of sewer mains to ensure proper separation of potable water mains and sewer lines and to help keep sewer lines intact in the event the supplier is doing excavation work to replace or repair any potable water mains. Furthermore, the supplier should consider using planning and scheduling software compatible with the GIS data to help plan, coordinate and electronically document the supplier's O&M activities for the entire distribution system such as

valve exercising and inspection, hydrant flushing, etc. Planning and scheduling software allows the supplier to be more proactive, efficient, thorough and timely with its O&M activities.

6. M620 - Management:

Operations and Maintenance Plan: Operations and Maintenance Plan.

In accordance with industry practices and standards such as American Water Works Association *Standard G100-05 Water Treatment Plant Operation and Management*, the supplier should have a documented O&M plan. During the sanitary survey, the department inspector noted the supplier had a partially complete written O&M plan. The department recommends the supplier prepare an O&M plan to be maintained on-site. The O&M plan should include, but should not be limited to, a detailed drawing or schematic of the water system, equipment capacity, equipment operational procedures, equipment manuals, SOPs for water treatment and distribution, maintenance schedule and records, O&M records, important contacts and phone numbers, etc. In particular, the supplier should develop, implement and include distribution maintenance SOPs such as valve inspection and exercising, line repairs/replacements, disinfection and flushing. The O&M plan, along with the emergency response plan, should also address procedures for dealing with pipeline breaks and loss of water system pressure. These plans should include written procedures to repair leaks in the distribution system, and flushing and disinfection of affected portions of the distribution system when it is shut down for leak repairs. The department recommends that the O&M plan be prepared and reviewed concurrently with the emergency response plan in order to maintain consistency between the two.

7. F332 - Management:

Alternative Tank Inspection Schedule: Supplier is using an alternative tank inspection schedule.

At the time of the sanitary survey, the department reviewed the supplier's finished water storage tank inspection plan and observed that the supplier had an alternative schedule for periodic inspections of its storage tank which was done every two years. Periodic and comprehensive storage tank inspections must be performed quarterly and every five years, respectively, per Regulation 11, Section 11.28(2)(a)(iii). As discussed in the storage tank inspection violation (F318) noted earlier in the letter, full periodic inspections for tanks on an alternative inspection schedule are still expected by the department to be performed at least once a year. During the sanitary survey, the department noted that the supplier still intends to maintain an alternative tank inspection schedule for its storage tank that is to be performed on a yearly basis. At the time of the sanitary survey, the supplier's tank inspection plan intended that periodic inspections for the elevated storage tank (Storage Tank) are performed yearly due to safety concerns and cost. Please note that the justification for this alternative schedule must be included in the supplier's tank inspection plan which is subject to department review and revision.

8. R514 - Monitoring, Recordkeeping and Data Verification:

Sample Sites Not Representative: Sample site location not representative.

Regulation 11.16(4) the Revised Total Coliform Rule requires the supplier to develop a written sampling plan that identifies routine total coliform sample sites that are representative of water throughout the distribution system and Regulation 11.16(6) requires the supplier to collect samples according to the written sampling plan. At the time of the sanitary survey, the department inspector observed that the supplier's total coliform sampling had been performed by the Weld County Health Department according to the supplier's written total coliform sampling plan. However, the supplier's plan did not include upstream and downstream sites in the event of a positive coliform test result. In addition, the supplier's sampling plan did not include alternate routine sample sites in the event a regular routine sample site is temporarily unavailable. The department recommends the supplier include additional alternate sample sites along with upstream and downstream sites. Although the use and rotation of additional sample sites representative of the distribution system is encouraged, the supplier is required to include all coliform sample sites/locations in its total coliform rule sampling plan. When adding new coliform sample sites, the supplier must update sample locations in the monitoring plan and submit a copy of the updated plan to the department. The monitoring plan templates are available at <https://cdphe.colorado.gov/monitoringplans>. For more information and guidance on selecting upstream and downstream sites, please contact Drinking Water Compliance Specialist Jamie Duvall at 303-692-3376 or jamie.duvall@state.co.us.

Section IV: Field Verification/Sampling

While performing the sanitary survey, the department inspector performed water quality sampling for free chlorine and turbidity. Table 3 indicates the results of the water quality sampling performed on-site.

Table 3: Sampling Results

Parameter	Sample Location	Value	Units	Notes
Turbidity	Johnstown SWTP01 - (Combined Filter Effluent)	0.08	NTU	The department measured turbidity using a Hach 2100Q. Mr. Michael Maring's turbidity reading at this location was 0.058 NTU. The WTP's online turbidimeter (Hach TU5300) was reading 0.044 NTU at this location.
Disinfectant Residual - Free Chlorine	Johnstown SWTP01 - (Entry Point)	1.86	mg/L	The department measured free chlorine using a Hach Pocket Colorimeter II. The online analyzer (Hach Cl17) for free chlorine was reading 1.91 mg/L at this location.
Disinfectant Residual - Free Chlorine	North Elevated Tank Booster Chlorinator - (Entry Point)	0.92	mg/L	The department measured free chlorine using a Hach Pocket Colorimeter II. Mr. Pribble's free chlorine reading at this location was 0.91 mg/L. The online analyzer (Hach Cl10) for free chlorine was reading 1.06 mg/L at this location.
Disinfectant Residual - Free Chlorine	Loaf 'N Jug Gas Station at 67 Gateway Circle - (Bathroom Sink - Distribution System)	0.99	mg/L	The department measured free chlorine using a Hach Pocket Colorimeter II.

Reminders

- Regulation 11, Section 11.4(1)(b) (Prior Approval Required) requires the department's approval prior to commencement of construction of any improvements, treatment process modifications or the addition of new water sources.
- Most regulations, guidance documents and forms are available on the department's website at <https://wqcdcompliance.com>.
- Regulation 11, Section 11.5 requires all suppliers of water to develop and implement a monitoring plan. The department's monitoring plan template is available at <https://cdphe.colorado.gov/monitoringplans>. For assistance developing or updating your monitoring plan, coaching assistance can be requested via the Local Assistance Unit website at <https://cdphe.colorado.gov/dwtrain>. The supplier is required to submit a copy of the updated plan via the department's online portal at <https://wqcdcompliance.com/login>. For portal support, please contact Kaleb Winisko at kaleb.winisko@state.co.us or 303-691-7803. The plan will then be reviewed by the Drinking Water Compliance Assurance Section. For questions regarding the monitoring plan requirements please contact the Compliance Assurance Section at 303-692-3556.
- In November 2018, the Water and Wastewater Facility Operators Certification Board updated and revised the criteria for facility classification in Regulation No. 100. These revisions are important because treatment and distribution/collection system classification establishes the minimum certification level for the operator in responsible charge. This may affect your facility's operator certification requirements. For existing facilities, the new criteria were applied March 1, 2021. More information is available at <https://cdphe.colorado.gov/wq-facility-classification>.

Attached is a form that the supplier may use to document the required written response to this letter. While using this form is optional, it will fulfill the requirement to provide a written response if completed and submitted to the department by the written response due date listed above. Please submit written response to

the drinking water portal at <https://wqcdcompliance.com/login> under the category "Sanitary Survey Inspection."

We would appreciate any feedback that you provide so that we can improve. Please take a few moments to complete [this survey](#).

If you have any questions, please contact me at 303-692-3327 or paul.kosik@state.co.us. Thank you for your time and cooperation.

Sincerely,

**Paul
Kosik**

Digitally signed by
Paul Kosik
Date: 2021.08.23
15:37:10 -06'00'

Paul Kosik, P.E.
Senior Field Engineer
Field Services Section
Water Quality Control Division
Colorado Department of Public Health & Environment

Encl: Sanitary Survey Response Form

cc: Weld County Health Department
Drinking Water File, PWSID No. CO0162418
R Wayne Ramey, ORC
Clayton Moores, P.E., CDPHE-FSS, Unit Manager
Kit Armstrong, CDPHE-FSS, Staff Field Engineer
Ellen Henrichs, P.E., CDPHE-FSS, Staff Field Engineer
Jorge Delgado, P.E., CDPHE-DWCAS, Unit Manager
Jamie Duvall, CDPHE-DWCAS, Compliance Specialist

Attachments



Attachment: 1

Severity: Significant Deficiency No. 1

Facility ID: Johnstown SWTP01 (SDWIS ID: 001)

Category: Treatment - Cross-Connection

Attachment Comments: Top Picture - At the time of the sanitary survey, the house water used for providing water for surface washing of the filters was protected only by a double check valve (circled red) which is not considered an appropriate level of cross-connection control protection. Bottom Picture - After the sanitary survey, the supplier provided a response demonstrating the double check valve was replaced appropriately with an RPZ assembly to properly protect the potable water line supplying the surface wash to the filters.

Weld County School District RE-5J
Cash in Lieu Statement
Prepared: 03/11/2021



Beginning Cash Balance, July 1, 2018		-
Johnstown Cash in Lieu for 2018-19	22,250.00	
Johnstown Cash in Lieu for 2019-20	12,000.00	
		34,250.00
Milliken Cash in Lieu for 2018-19	112,842.00	
Milliken Cash in Lieu for 2019-20	83,046.00	
		195,888.00
Cash in Lieu Interest for 2018-19	179.51	
Cash in Lieu Interest for 2019-20	292.51	
		472.02
Miscellaneous Cash in Lieu for 2018-19	12,750.00	
Miscellaneous Cash in Lieu for 2019-20	7,000.00	
		19,750.00
Ending Cash Balance, June 30, 2020		250,360.02

JONES MEMORIAL LIBRARY CASH FLOW REPORT - JULY 2021			Y-T-D	2021 BUDGET		Notes
						Item #16.
BEGINNING CHECKING BALANCE		\$ 245,553.07	\$ -	\$ 20,000.00	To Date	
INFLOWS	Donations/Grants	\$ 250.00	\$ 250.00	\$ 3,500.00		
	Interest	\$ 12.32	\$ 1,619.44	\$ 60,000.00		
	Misc Income	\$ 70.49	\$ 941.32	\$ 7,500.00		
	<i>Investments</i>	\$ -	\$ -	\$ -		
	Town of Johnstown	\$ 94,804.75	\$ 784,425.99	\$ 1,138,005.00		
	High Plains Library District	\$ 75,710.66	\$ 550,267.28	\$ 550,267.00		
	Transfer from Reserve Account	\$ -	\$ 122.95	\$ -		
INFLOWS TOTAL		\$ 170,848.22	\$ 1,337,626.98	\$ -		
TOTAL AVAILABLE FUNDS		\$ 416,401.29		\$ 1,779,272.00		
OUTFLOWS	Advertising	\$ 1,508.00	\$ 11,534.00	\$ 22,000.00		
	Audio/CD -9	\$ 324.41	\$ 3,396.47	\$ 12,000.00	91	
	Books - 183	\$ 2,490.68	\$ 19,291.60	\$ 50,000.00	1467	Milliken - \$5000 HPLD grant
	Collection Fees/Bad Debts	\$ -	\$ -	\$ 2,000.00		
	Computer Expenses	\$ -	\$ 1,897.93	\$ 5,000.00		
	Equipment & Furniture	\$ 394.20	\$ 13,158.70	\$ 45,000.00		Milliken - \$6746.20
	Insurance, Bldg. Contents	\$ -	\$ -	\$ 5,000.00		
	<i>Investments</i>	\$ -	\$ 725,000.00	\$ 684,772.00		
	Legal Fees/Consulting Fees	\$ -	\$ 148.00	\$ 10,000.00		
	Maintenance	\$ 3,358.91	\$ 19,054.47	\$ 60,000.00		
	Memberships/Licenses	\$ 60.94	\$ 256.57	\$ 2,500.00		
	Outreach/PCC	\$ 59.92	\$ 7,094.91	\$ 10,000.00		
	Professional Enrichment	\$ 36.62	\$ 197.93	\$ 5,000.00		*Bessie Minor grant
	*Programming/Gifts \$587.96	\$ 1,786.40	\$ 9,100.98	\$ 15,000.00		\$1,065
	Salaries/Bonuses	\$ 78,685.83	\$ 152,417.02	\$ 450,000.00		
	Subscriptions, Periodicals	\$ 649.60	\$ 1,376.78	\$ 5,000.00		
	Supplies, Janitorial	\$ -	\$ 441.25	\$ 3,000.00		
	Supplies, Library	\$ 80.31	\$ 2,949.22	\$ 12,000.00		Milliken - \$141.23
	Telephone	\$ 535.80	\$ 3,570.95	\$ 8,000.00		
	Utilities	\$ 2,543.72	\$ 16,788.75	\$ 40,000.00		
	Video/DVD - 16	\$ 366.59	\$ 1,960.37	\$ 10,000.00	101	Milliken - \$14.25
	Worker's Comp.	\$ -	\$ -	\$ 3,000.00		**Interior Refresh
	**Capital Improvement	\$ 8,397.92	\$ 52,418.92	\$ 320,000.00		\$23,436.00
	Transfers	\$ -	\$ -	\$ -		**Landscaping
OUTFLOWS TOTAL		\$ 101,279.85	\$ 1,042,054.82	\$ 1,779,272.00		\$13,397.92
ENDING CHECKING BALANCE		\$ 315,121.44				**Mechanical Upgrades
						\$15,585.00

						Notes
BEGINNING PETTY CASH BALANCE	\$	1,607.84				Item #16.
	\$	-				
ENDING PETTY CASH BALANCE	\$	1,607.84				
BEGINNING RESERVE ACCOUNT BALANCE	\$	-	Y-T-D			
	Interest	\$	acct. closed			
ENDING RESERVE ACCOUNT BALANCE	\$	-				
	COLORADO TRUST INVESTMENT		Y-T-D			
BEGINNING BALANCE	\$	4,782,075.09				
	Income	\$	\$	1,578.82		
	Contribution	\$				
ENDING BALANCE	\$	4,782,207.72				

The regular meeting of the Glenn A. Jones, M.D. Memorial Library Board was called to order at 7:05 pm. Chad Young, Debi Sauer, Corina Strickland, Jenna Hall, Sheryl Ballard and Director Kristi Plumb were in attendance. Pat Hardesty, representing Elemental Landscaping, joined us for a brief update on the Outdoor Classroom before the formal meeting commenced.

The June 2021 minutes were approved. The financial report for June was reviewed and approved as follows:

June beginning balance	\$ 139,332.21	Petty Cash beginning balance	\$ 1,607.84
Inflow	119,118.19		-0-
Outflow	12,897.33		-0-
Transfers	-0-		-0-
Ending balance	\$ 245,553.07		\$ 1,607.84
CO Trust: \$ 4,782,075.09			

Director's Report:

Building: Pat Hardesty, representing Elemental Landscaping, apologized for lack of communication and completion and wants to move forward. If stage pergola and ramp are not done by Labor Day, daily deductions from bill will be taken. Kristi will talk w/Dave Plumb regarding fair deductions. Lawn Barber trimmed bushes near the employee parking lot. After much haggling by Kristi, the Town adjusted sprinklers to run only at night and cleaned up the NW trees and added mulch. Newell Brothers Tree Service will remove and grind the stumps of the dead trees bordering the south side of the parking lot.

Milliken: We will be sponsoring a Backyard BBQ team for Beef-n-Bean Days! Memorandum of Understanding has been to the Milliken Town Administrator and Town Attorney and will be resubmitted to HPLD for one last look by their attorney-Town of Milliken has on their agenda for July 28th-Kristi has been diligent in moving this process along!

New Hire: Ashley Ecton will start August 17th and will be working all Saturdays and one evening.

2022 Budget: pre-planning thoughts include; upgrading doors, if/how to split out Milliken, landscaping, additional staff to maintain building and property. Kristi will poll staff for their budget wishes.

Outreach: COVID-19 vaccination clinics in both locations on August 26th hosted by Weld County Department of Public Health & Environment.

SRP: 1,187 participants compared to 600 last year! Programs were added to accommodate the numbers and local sponsors insured prizes for all.

Review and updating of Policies and Procedures begins...pages 1-9 Mission and Vision statements

Programming: In building Story Time begins again on August 16th.

Meeting adjourned at 9 pm. Next meeting will be August 17, 2021.

June stats: Johnstown –door count: 5892	circulation: 9744
Milliken – door count: 773	circulation: 769

Respectfully submitted, Sheryl Ballard, secretary