



City of Arvada

City Council Agenda

FEBRUARY 13, 2023
CITY COUNCIL CHAMBERS
Regular Business

Councilmembers:

Marc Williams, Mayor
David Jones, Mayor Pro-Tem
Bob Fifer, At large
John Marriott, District 3
Randy Moorman, District 1
Lauren Simpson, District 2
Lisa Smith, At large

Staff Members Usually Present:

Lorie Gillis, City Manager
Linda Haley, Deputy City Manager
Don Wick, Deputy City Manager
Rachel Morris, City Attorney
Jacqueline Rhoades, Director of Public Works
Sharon Israel, Director of Utilities
Ryan Stachelski, Dir. of Community & Economic Development
Bryan Archer, Director of Finance
Gabriella Bommer, Director of Human Resources
Rob Smetana, Manager of City Planning & Development
Rachael Kuroiwa, Director of Communications & Engagement
Kristen Rush, City Clerk

Info: 720-898-7550

CITY COUNCIL MEETING – CITY COUNCIL CHAMBERS 6:00 PM

1. Call to Order - 6:00 PM
2. Moment of Reflection and Pledge of Allegiance - Councilmember Simpson
3. Roll Call of Councilmembers
4. Approval of Minutes - None
5. Recognitions and Communications - None
6. Presentations - None
7. Public Comment on Issues not Scheduled on Agenda - Three Minute Limit
8. New Business
 - A. Consent Agenda
 1. R23-017, A Resolution Authorizing Amendment No. 3 to the Agreement by and between the City of Arvada and PCL Construction, Inc. Establishing Contractor's Guaranteed Maximum Price III of the "Construction Management/General Contractor Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant," in an Amount Not to Exceed \$3,518,653.00
 2. R23-018, A Resolution Authorizing Amendment No. 2 to the Agreement Between the City

of Arvada and Moltz Construction, Inc., Awarding Contractor Phase II and Establishing Contractor's Guaranteed Maximum Price for Phase II of the "The Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements" in an Amount not to Exceed \$838,985.00

3. R23-019, A Resolution Authorizing a License Agreement by and between the City of Arvada and the Church Ditch Water Authority pertaining to Construction and Maintenance of Improvements along W. 80th Avenue
4. R23-020, A Resolution Authorizing An Agreement Between The City Of Arvada And Frontier Environmental Services, LLC For Goods And Services Relating To Boring Conduit And Fiber Pulling In An Amount Not To Exceed \$500,000.00

B. Resolutions

1. R23-021, A Resolution Revising and Adopting Bylaws for the Arvada Human Services Advisory Committee

C. Ordinances (First Reading) - None

9. Other

10. Public Hearings - 6:15 PM

11. Workshops

- A. 2023-3305 Community Survey
- B. 2023-3287 Lake Arbor Golf Course Master Planning and Course Improvements

12. Public Comment - Five Minute Limit

13. Reports from City Council

- A. Council Committee Reports

14. Reports from City Manager

- A. Review of Future Workshops and Presentations

15. Reports from City Attorney

16. Adjournment



REPORT TO CITY COUNCIL

AGENDA ITEM
8.A.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: Consent Agenda

Report in Brief

1. R23-017, A Resolution Authorizing Amendment No. 3 to the Agreement by and between the City of Arvada and PCL Construction, Inc. Establishing Contractor's Guaranteed Maximum Price III of the "Construction Management/General Contractor Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant," in an Amount Not to Exceed \$3,518,653.00
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Suggested Motion: Moved by: _____ I move that the Consent Item(s),
Number(s) _____
be
(Removed from the Consent Agenda and Heard Upon Item _____) (Referred to a Workshop) (Postponed
Indefinitely).

YES _____ NO _____ ABSENT _____

That All/Remaining Consent Items be (Approved) (Rejected).

YES _____ NO _____ ABSENT _____

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Enclosure, exhibits & attachments required to support the report



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.1.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: R23-017, A Resolution Authorizing Amendment No. 3 to the Agreement by and between the City of Arvada and PCL Construction, Inc. Establishing Contractor's Guaranteed Maximum Price III of the "Construction Management/General Contractor Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant," in an Amount Not to Exceed \$3,518,653.00

Report in Brief

Arvada's Ralston Water Treatment Plant (RWTP) requires significant reinvestment to provide sufficient capacity to maintain treatment of seasonal water quality changes and provide resilience in total treatment capacity. Specifically, the filter media and associated equipment are beyond their useful life, and need to be replaced. Additionally, the solids handling system is undersized.

The Arvada team recommends that the City Council approve R23-017, A Resolution Authorizing an Amendment No. 3 to the Agreement by and between the City of Arvada and PCL Construction, Inc. Establishing Contractor's Guaranteed Maximum Price III of the "Construction Management/General Contractor Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant," in an Amount Not to Exceed \$3,518,653.00.

Financial Impact

The work included in GMP 3, not to exceed \$3,518,653.00, is being funded by the following CIP projects:

RWTP Solids Handling: 97590 has a total budgeted amount of \$8,007,865.00. GMP 3 includes \$2,943,376.00 of the total budgeted amount.

RWTP Filter Improvements: 97591 has a total budgeted amount of \$13,397,419.00. GMP 3 includes \$575,538.12 of the total budgeted amount.

The Arvada team will capitalize each project above independently, although they are included in the same CM/GC.

Background

The RWTP was assessed in the 2019 Water Treatment Master Plan. The 2019 Master Plan identified the filter and solids handling systems at the RWTP as two of the priority projects. Additionally, the Arvada team has identified the filter system as being significantly past industry standard life and the solids handling as being critically undersized. The Arvada team expends considerable effort and money maintaining and operating the RWTP filter and solids handling systems to provide for needed potable water capacity from the RWTP. Under anticipated seasonal water quality conditions, the Arvada team is challenged to maintain the designated Level of Service for treatment. Should water quality be degraded due to unusual conditions such as flood or fire, the Arvada team could not maintain the necessary treatment Level of Service.

The Arvada team has been implementing the design and construction of filter and solids improvements since 2021. The implementation has included Carollo Engineers supporting the study and design of the solids handling improvements (R21-032 and R22-104), Jacobs for the design of the filter improvements under the On-Call agreement (R21-089), and PCL as the

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CMGC.

PCL Construction was selected for CMGC Pre-Construction Phase Services not to exceed \$130,000 through a competitive bid process (RFP-22-Ralston Filter and Solids Handling Improvements). Since the award of the pre-construction phase services, two contract amendments have been approved: GMP 1 (R22-055) and GMP 2 (R22-104). This GMP 3 will provide for the remainder of anticipated construction needed for both projects.

Discussion

PCL has almost completed pre-construction phase services as discussed above. As a part of their pre-construction phase services, PCL has provided the Arvada team with Guaranteed Maximum Price Packages 1 and 2 (GMP 1 and 2). GMP 1 is based on the 30% design of the filter improvements as provided by Jacobs and the preliminary design drawings from Carollo. GMP 1 includes, and is not limited to, the purchase and installation of long lead items such as filter media, underdrains, valves, gates, actuators, pumps, coatings for the RWTP filters, work to repair three filters, and concrete for a solids drying pad. Due to the level of design (10% - 30%), and escalation due to the geopolitical climate, PCL has included contingencies for construction, design, escalation, and unforeseen conditions or repairs. GMP 2 is based on the 60% design of the Filter Improvements provided by Jacobs, and the 60% design of the Solids Handling Improvements provided by Carollo. GMP 3 is based on 100% design of the Filter Improvements provided by Jacobs, and the 90% design of the Solids Handling Improvements provided by Carollo.

GMP 1 also includes the emergency repair of the filter influent flume completed in July, purchase/rental of emergency isolation for the filter influent flume, and test holing activities to support detailed design of the solids handling improvements.

GMP 2 includes construction of six filters, the purchase of all remaining items and equipment required for construction, and general conditions.

GMP 3 will include work in the oldest three filters and all work associated with the solids drying beds. This GMP 3 was not included in GMP 2 to give time to the Arvada Team to identify additional funding for the project, and to allow PCL time to identify value engineering options.

GMP 4 will include a reconciliation of costs not included in GMPs 1, 2, and 3.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

NA

Strategic Alignment

The recommended action aligns with the following Strategic Result within the Infrastructure Priority Area of the City Council Strategic Plan:

SR3 - By December 2023, update water, sewer, stormwater master plans and develop an implementation plan to address all findings.

Alternative Courses of Action

NA

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Recommendation for Action

The Arvada team recommends that City Council approve R23-017, A Resolution Authorizing an Amendment No. 3 to the Agreement by and between the City of Arvada and PCL Construction, Inc. Establishing Contractor's Guaranteed Maximum Price III of the "Construction Management/General Contractor Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant," in an Amount Not to Exceed \$3,518,653.00.

Suggested Motion:

I move that R23-017, A Resolution Authorizing an Amendment No. 3 to the Agreement by and between the City of Arvada and PCL Construction, Inc. Establishing Contractor's Guaranteed Maximum Price III of the "Construction Management/General Contractor Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant," in an Amount Not to Exceed \$3,518,653.00, be (approved) (rejected).

Prepared by:

Bethany Yaffe, Civil Engineer

Reviewed by:

Approved by:

Mary Stahl, Senior Civil Engineer	1/25/2023
Jenny Wolfschlag, City Engineer	1/25/2023
Jacqueline Rhoades, Public Works Director	1/26/2023
Bryan Archer, Director of Finance	1/31/2023
Tammy Hedlund, Legal Specialist	1/31/2023
Kelsy Sargent, Assistant City Attorney	1/31/2023
Rachel Morris, City Attorney	2/2/2023
Don Wick, Deputy City Manager	2/2/2023
Lorie Gillis, City Manager	2/2/2023

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R23-017

A RESOLUTION AUTHORIZING AN AMENDMENT NO. 3
TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND PCL CONSTRUCTION,
INC. ESTABLISHING CONTRACTOR’S GUARANTEED MAXIMUM PRICE III OF THE
“CONSTRUCTION MANAGEMENT/GENERAL CONTRACTOR AGREEMENT FOR
PRECONSTRUCTION SERVICES FOR THE REHABILITATION AND MODIFICATION
OF THE FILTER AND SOLIDS HANDLING SYSTEMS AT THE RALSTON WATER
TREATMENT PLANT,” IN AN AMOUNT NOT TO EXCEED \$3,518,653.00

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The Mayor or Mayor Pro Tem is authorized to sign and the City Clerk to attest, in form approved by the City Attorney, an Amendment No. 3, which is in substantially the same form as that attached hereto, by and between the City of Arvada and PCL Construction, Inc. for establishing Contractor’s Guaranteed Maximum Price III of the “Construction Management/General Contractor Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant,” in an amount not to exceed \$3,518,653.00.

Section 2. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 13th day of February, 2023.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

AMENDMENT NO. 3
TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND PCL
CONSTRUCTION, INC. ESTABLISHING CONTRACTOR'S GUARANTEED
MAXIMUM PRICE III OF THE "CONSTRUCTION MANAGEMENT/GENERAL
CONTRACTOR AGREEMENT FOR PRECONSTRUCTION SERVICES FOR THE
REHABILITATION AND MODIFICATION OF THE FILTER AND SOLIDS
HANDLING SYSTEMS AT THE RALSTON WATER TREATMENT PLANT," IN AN
AMOUNT NOT TO EXCEED \$3,518,653.00

1. PARTIES.

- 1.1 The parties to this Amendment No.3 are the City of Arvada, a Colorado home rule municipal corporation, whose mailing address is 8101 Ralston Road, Arvada, CO 80002 ("**Arvada**" or "**Owner**") and PCL Construction, Inc. whose place of business is located at 2000 S. Colorado Blvd., Suite 2-500, Denver, Colorado 80222 ("**Contractor**"), collectively referred to as the "**Parties.**"

2. RECITALS AND PURPOSE.

- 2.1 On or about May 24, 2022, Arvada and Contractor entered into the Construction Management/General Contractor ("**CM/GC**") Agreement for Preconstruction Services for the Rehabilitation and Modification of the Filter and Solids Handling Systems at the Ralston Water Treatment Plant, in an Amount Not to Exceed \$130,000.00 ("**Original Agreement**") wherein Contractor will provide preconstruction phase ("**Phase I**") Construction Management ("**CM**") services, including but not limited to cost estimating, constructability reviews, value engineering, development of a Guaranteed Maximum Price ("**GMP**"), and risk management.
- 2.2 On or about August 17, 2022, Arvada and Contractor executed Amendment No. 1 for the purpose of establishing GMP No. 1 in an amount not to exceed \$8,703,990.00 in order to secure purchases and procurement/fabrication for long-lead time equipment for the filter improvements and solids handling projects and related emergency repairs ("**Amendment No. 1**"). The Cost of Amendment No. 1 was in addition to the cost of Phase I of the Original Agreement.
- 2.3 On or about January 26, 2023, Arvada and Contractor executed Amendment No. 2 for the purpose of awarding Contractor the Construction Phase ("**Phase II**") of the Original Agreement and establishing GMP No. 2 in an amount to exceed \$4,381,518.00 ("**Amendment No. 2**"). The Cost of Amendment No. 2 was in addition to the cost of Amendment No. 1 and Phase I of the Original Agreement.
- 2.4 For the convenience of the Parties, (due to the voluminous nature of the Original Agreement and Amendment No.1), the Original Agreement, Amendment No. 1, and Amendment No. 2 are not attached hereto but are incorporated herein by reference.
- 2.5 This Amendment No. 3 establishes Guaranteed Maximum Price No. 3 for

Phase II, in an amount not to exceed **\$3,518,653.00** (“**GMP No. 3**”). The Cost of GMP No. 3 is in addition to the cost of Phase I of the Original Agreement and Amendments No. 1 and No. 2, for a total contract amount of **\$16,734,123.00** for the project.

3. GUARANTEED MAXIMUM PRICE.

- 3.1 The Contractor’s Guaranteed Maximum Price for the Work, including the estimated Cost of the Work and General Conditions Costs as defined in Article 8, and the Contractor’s Fee as defined in Article 7 is **\$3,518,653.00**.
- 3.2 This Price is for the performance of the Work in accordance with the Construction Contract Documents and the Exhibits listed below.

4. CONTRACT DOCUMENTS AND EXHIBITS. The Contract Documents shall consist of the Original Agreement, Amendment No. 1, Amendment No. 2, and this Amendment No. 3 together with the following, which shall be incorporated herein:

Exhibit A: Contractor’s GMP No. 3 Submission;

Exhibit B: Filter Improvements 100% design submittal dated October 2022, completed by Jacobs Engineers;

Exhibit C: Solids Handling 60% design submittal dated October 2022, completed by Carollo Engineers;

Exhibit D: Drying Pad 100% drawings submittal dated October 2022, completed by Carollo Engineers.

In the event any matter, term, provision, or condition that is the subject of this Amendment No. 3 requires clarification or is in dispute, or is the subject of a difference of opinion, the purpose and intent of the agreement shall be first ascertained by reference to the Contract Documents in their entirety. In the event of any dispute or differences between the respective documents that constitute the Contract Documents, then Contractor shall secure the written instructions from Arvada before proceeding with the performance of the services affected by such conflicts, omissions, or discrepancies. In no event may any contradictory term or provision contained in Exhibit A supersede the provisions of the Original Agreement. Any such contradictory term or provision shall be null and void.

5. CONTRACT TIME.

- 5.1 The Guaranteed Date of Substantial Completion established by this Amendment No. 3 is March 29, 2024.

(Signatures on next page)

CITY OF ARVADA, COLORADO

Marc Williams, Mayor
8101 Ralston Road
Arvada, CO 80002

ATTEST/WITNESS:

City Clerk

APPROVED AS TO FORM:

For Rachel A. Morris, City Attorney

By: _____

PCL Construction, Inc.

Richard Hewitt, District Manager
2000 S. Colorado Blvd, Suite 2-500
Denver, CO 80222
rhewitt@pcl.com

Exhibit A

AMENDMENT NO. 3

**TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND PCL
CONSTRUCTION, INC. ESTABLISHING CONTRACTOR'S GUARANTEED MAXIMUM
PRICE III OF THE "CONSTRUCTION MANAGEMENT/GENERAL CONTRACTOR
AGREEMENT FOR PRECONSTRUCTION SERVICES FOR THE REHABILITATION AND
MODIFICATION OF THE FILTER AND SOLIDS HANDLING SYSTEMS AT THE RALSTON
WATER TREATMENT PLANT," IN AN AMOUNT NOT TO EXCEED \$3,518,653.00**



CONSTRUCTION

GMP 3

FILTER AND SOLIDS HANDLING IMPROVEMENTS CMGC

CITY OF ARVADA

December 30, 2022



Blunn Reservoir

Exhibit A

Table of Contents

CLARIFICATIONS/ASSUMPTIONS	TAB 1
PRICE SUMMARY WORKSHEET	TAB 2
DETAILED ESTIMATE	TAB 3
• GMP 3 Estimate	
VE LOG	TAB 4
SCHEDULE	TAB 5
QUOTES	TAB 6

Technical Clarifications and Assumptions**1. General**

- GMP 3 is based upon:
 - Solids Handling 60% design submittal dated October 2022, completed by Carollo Engineers.
 - Filter Improvements 100% design submittal dated October 2022, completed by Jacobs Engineers.
- GMP 3 excludes AIS, BABA and all DBE/SBE requirements including all state or federal funding sources.
- GMP 3 excludes Davis-Bacon wages.
- GMP 3 assumes sand and filter media to be removed is nonhazardous.
- GMP 3 does not include cost for remediation of hazardous waste materials or archeological mitigation.
 - Owner remains responsible as the generator for all pre-existing hazardous materials found on site, will sign applicable waste manifests and except for Contractor's own negligence, will be responsible for any pre-existing hazardous materials.
- The Contractor shall be responsible for only those hazardous materials and/or chemicals as on site by contractor forces; and shall not be responsible for any existing hazardous conditions not known or foreseen prior to the start of construction.
- If the Contractor encounters a Differing Site Condition, Contractor will be entitled to an adjustment to the Contract Price and/or Contract Time(s) to the extent contractor's cost and/or time of performance have been adversely impacted by the Differing Site Condition.
- GMP 3 excludes any costs associated building permits.
- GMP 3 excludes any utility permit or services fees.
- GMP 3 does not include any costs for utility relocations and concrete encasements not shown on the drawings and/or described within 60% design submittal.
- GMP 3 excludes any/all costs associated with the usage of construction and potable water. PCL to provide the Owner with estimated water usage (gallons per month) prior to mobilization.
- GMP 3 excludes any/all costs associated with the usage of temporary power consumption. PCL to provide the Owner with estimated power demand prior to mobilization.
- GMP 3 excludes public outreach firm services.
- GMP 3 excludes all dewatering with the exception of nuisance water.
- GMP 3 assumes NTP 2/6/23
- GMP 2 assumes a total 18 month construction schedule.
- GMP 3 assumes a phased approach to the work with coordination for filter shutdowns with Owner depending on seasonal demands.
- GMP 3 assumes six filters can be taken offline at a time in the winter months and early spring months (late October to late March)
- GMP 3 excludes owner contingency.
- Taxes are excluded.
- GMP 3 excludes costs associated with inspections and special inspections.
- GMP 3 excludes all costs associated with protecting migratory birds or endangered species.
- GMP 3 assumes a standard 40 hour workweek, 5 days a week 7am-5pm.
- GMP 3 includes the following scope of work:
 - Filters Modification (1-3 Filters Only, 4-12 Filters Included in GMP 2)
 - Modifications to filter gallery piping- Filters 1-3
 - Coating of filter boxes – Filters 1-3
 - Coating of influent flume – Filters 1-3
 - Modifications to filter underdrains – Filters 1-3

- Removal and installation of new media – Filters 1-3
 - Electrical Work related to Filters 1-3
 - 16" Backwash Piping Replacement
- Solids Improvements
 - Work activities for lagoons 2&4
 - Diversion structures for lagoons 1&3 only.
 - Yard piping modifications
 - Pretreatment BLDG Pump & Piping Modifications
- GMP 3 represents an evaluation of probable cost based on early stage design documents. Contractor reserves the right to reprice the work covered by price model as design progresses and additional/changed scopes are identified. Any changes in estimated costs will be reconciled in subsequent GMP price models (and associated contract revisions) in coordination with Owner and Engineer.
- Contractor's Contingency. OWNER and CONTRACTOR shall agree upon the amount of CONTRACTOR'S contingency to be included within each GMP, as follows:
 - The CONTRACTOR's contingency amounts allowed for each GMP will be established by the CONTRACTOR and OWNER, and clearly listed in the CONTRACTOR's GMP proposal. By way of example, and not as a limitation, CONTRACTOR's contingency may be used for cost issues such as trade labor differentials, overtime, acceleration, costs in correcting defective, damaged or nonconforming Work, scope gaps, and Subcontractor defaults.
 - CONTRACTOR'S contingency amounts listed in each GMP proposal are cumulative and will be combined into a single contingency fund for CONTRACTOR's use on any portion of the Work.
 - CONTRACTOR's contingency is for the sole use of CONTRACTOR. CONTRACTOR's contingency shall not be used for changes in the Work that would require a Change Order or Amendment. CONTRACTOR may use the CONTRACTOR'S contingency for any reasonable purpose relating to the Project, excluding:
 - Legal fees or costs related to claims arising from or related to this Agreement
 - Home office overhead (OH)
 - Should CONTRACTOR's contingency be used during execution of the Work, the amount charged shall include applicable mark-ups, such as pricing for bonds, insurances, and CONTRACTOR's fee.
 - CONTRACTOR'S contingency may be used to correct defective Work, however no CONTRACTOR or Subcontractor fee shall be applied.
 - CONTRACTOR shall provide notice to OWNER of any charges against CONTRACTOR'S contingency with each Application for Payment and shall submit a contingency log showing the initial value of each contingency, any usage, and remaining value. CONTRACTOR shall submit backup documentation to OWNER showing the value and reason for each case of contingency usage. Backup documentation shall include summary of all pricing elements and applicable mark-ups.



City of Arvada Filer and Solids Improvements
GMP 3 – 100% Filters 60% Solids
December 30, 2022

- Any balance remaining in CONTRACTOR'S contingency at the Final Completion of all Work under the Agreement shall be returned to OWNER by deductive reconciliation Change Orders.
- Allowances. OWNER and CONTRACTOR shall agree upon the amount of allowances to be included in each GMP, as follows:
 - The allowance amounts for each GMP will be established by OWNER and CONTRACTOR to address risks CONTRACTOR can identify, but not adequately quantify, prior to execution of the Agreement or subsequent amendments. Allowance amounts may also be established for scopes of work that cannot be adequately defined prior to execution of the Agreement or subsequent amendments. Allowance amounts shall be clearly listed in the CONTRACTOR's GMP proposal
 - Should allowance amounts be used during execution of the Work, the amount charged shall include applicable mark-ups, such as pricing for bonds, insurances, and CONTRACTOR's fee.
 - CONTRACTOR shall submit for OWNER's approval documentation showing value and reason for each case of allowance usage. OWNER's written approval will be required prior to CONTRACTOR's usage of any allowance amounts.
 - If an individual allowance amount is exceeded during execution of the Work, additional funds may be drawn from another allowance or OWNER'S contingency with written approval of OWNER, which will not be unreasonably withheld.
 - In the event allowance amounts listed in the GMP proposal are exceeded, a change order shall be issued by OWNER for an increase in Contract Price and/or Time.
 - Any balance remaining in designated Allowances at the Final Completion of all Work under the Agreement shall be returned to OWNER by deductive reconciliation Change Order.
- GMP 3 includes the following contingencies and allowances: Design allowance is based on 60% evolution to 100% but any overruns will be the responsibility of the owner.
 - Contractor Contingency \$71,422
 - Design Allowance : \$56,422
 - Escalation Allowance \$43,986
 - Estimator Allowance \$0
 - Unforeseen Repairs Allowance \$0
 - Clay lagoon Liner Repair Allowance \$50,000
- GMP 3 will be administered as a lump sum/stipulated price contract and not a cost reimbursable contract.
- The lump sum price model provides for labor, small tools, insurances, bonds, and equipment for this project based on the following billable Rate Schedule. These rates will be used for any future change orders:





City of Arvada Filer and Solids Improvements
GMP 3 - 100% Filters 60% Solids
December 30, 2022

Craft Classification	Billable Hourly Rate (\$/HR)
Construction Manager	\$176.67
Project Manager	\$142.44
General Superintendent	\$150.07
Field Superintendent	\$136.74
Project Engineer	\$100.02
Field Engineer	\$88.42
Scheduler	\$144.40
Computer Modeler	\$105.90
HSE Coordinator	\$97.00
Foreman	\$75.05
General Foreman	\$82.30
Mason	\$63.37
Carpenter	\$63.37
Laborer	\$58.37
Pipe Layer	\$58.38
Pipe Fitter	\$63.37
Equipment Operator	\$75.05
Crane Operator	\$91.73

Small Tools Assessment / Insurance Rates / Bond Rates:

• Small Tools Assessment	\$1.00/manhour
• Project Bond Rate	1%
• Subcontract Bond Rate	1.4%
• General Liability Insurance	1%
• Builder's Risk Insurance	0.4%

Billable hourly equipment rates shall be FHWA operated rates published by Bluebook (penton) on equipmentwatch.com.

2. Civil, Demo & Earthwork

- GMP 3 assumes 12" of existing sand to be removed in Lagoon 3 & 4.
- GMP 3 Assumes 300 anchor bolts per filter to per cut down filter 1-3.
- GMP 3 assumes 12" & 24" lines can be isolated by Plant Staff to be worked on in the dry.

3. Electrical

- GMP 3 assumes electrical gear manufacturers will be selected on best value based on lead times and price.





City of Arvada Filter and Solids Improvements
GMP 3 – 100% Filters 60% Solids
December 30, 2022

4. Structural

- GMP 3 assumes influent flume can be shut down so that interior can be coated per specification and/or direction on approved product from Owner.
- GMP 3 assumes coating scope for filter boxes and flume will be defined per Jacobs and City of Arvada.
- GMP 3 includes modifications to existing I-beam at the underside of filter influent channel slab.

5. Mechanical

- GMP 3 assumes steel pipe can be reused pending inspection of interior coating and integrity of pipe. All gaskets and bolts will be new.
- GMP 3 assumes existing actuators may be used with new valves temporarily until new actuators arrive on site.
- GMP 3 assumes existing actuators may be used with new gates temporarily until new actuators arrive on site.
- GMP 3 assumes an allowable 24 hour plant shutdown window for work done in the clear well.
- GMP 3 assumes an allowable 30 hour plant shutdown window for solids yard valve installation.
- GMP 3 assumes filter influent flume can be shut down for 8-hour periods to allow installation of temporary plates to allow contractor to perform work on new gates and valves.



CONSTRUCTION



12/30/2022

PCL CONSTRUCTION, INC.

City of Arvada

Master Budget Worksheet
GMP 1 / GMP 2 / GMP 3 / GMP 4/ Total

Arvada Ralston Filter & Solids Handling Improvements

Bid Item	Description	GMP 1	GMP 2	GMP 3	GMP 4	Total Project
Filter Improvements Project						
Div.02	Existing Conditions	\$ 297,919	\$ 458,456	\$ 138,510	\$ -	\$ 894,885
Div.02.1	16" Pipe Replacement	\$ -	\$ -	\$ 287,965	\$ -	\$ 287,965
Div.03	Concrete	\$ -	\$ -	\$ -	\$ -	\$ -
Div.05	Metals	\$ -	\$ 20,000	\$ -	\$ -	\$ 20,000
Div.09	Finishes	\$ 201,152	\$ (201,152)	\$ -	\$ -	\$ -
Div.26	Electrical	\$ -	\$ 2,073,600	\$ (95,360)	\$ -	\$ 1,978,240
Div.33	Utilities	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000
Div.35	Waterway and Marine Construction	\$ -	\$ 431,185	\$ -	\$ -	\$ 431,185
Div.40	Process Interconnections	\$ -	\$ 1,032,043	\$ 50,280	\$ -	\$ 1,082,323
Div.44	Pollution and Waste Control Equipment	\$ -	\$ 2,768,583	\$ 95,242	\$ -	\$ 2,863,824
	Total Filter Improvements	\$ 499,071	\$ 6,587,715	\$ 476,637	\$ -	\$ 7,563,423
Solids Handling Project						
Div.2	Existing Conditions	\$ -	\$ 12,913	\$ 175,536	\$ 90,221	\$ 278,670
Div.3	Concrete	\$ 399,133	\$ 133,629	\$ 436,326	\$ 354,954	\$ 1,324,042
Div.5	Metals	\$ -	\$ -	\$ 90,577	\$ -	\$ 90,577
Div.6	FRP	\$ -	\$ -	\$ 13,042	\$ -	\$ 13,042
Div.7	Joint Sealants	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000
Div.9	Finishes	\$ -	\$ -	\$ -	\$ -	\$ -
Div. 26	Electrical	\$ -	\$ -	\$ -	\$ 666,762	\$ 666,762
Div. 31	Earthwork	\$ 120,670	\$ 105,676	\$ 445,140	\$ 248,204	\$ 919,690
Div. 32	Seeding	\$ -	\$ 25,000	\$ -	\$ -	\$ 25,000
Div. 33	Utilities	\$ -	\$ 52,174	\$ 483,967	\$ -	\$ 536,141
Div. 35	Waterway and Marine Construction	\$ -	\$ -	\$ -	\$ -	\$ -
Div. 40	Process Interconnections	\$ -	\$ -	\$ 570,712	\$ 125,190	\$ 695,902
Div. 44	Pollution and Waste Control Equipment	\$ -	\$ -	\$ 181,960	\$ -	\$ 181,960
	Total Solids Handling	\$ 519,803	\$ 334,393	\$ 2,397,260	\$ 1,485,330	\$ 4,736,786
Contingency & Allowance						
CONT1	Construction Contingency	\$ 200,000	\$ 66,555	\$ 71,422	\$ 36,140	\$ 374,116
CONT2	Design Contingency	\$ 250,000	\$ 16,555	\$ 56,422	\$ 36,140	\$ 359,116
CONT3	Escalation Allowance	\$ 500,000	\$ (192,912)	\$ 43,986	\$ 24,831	\$ 375,905
CONT4	Estimator Allowance	\$ -	\$ 135,000	\$ -	\$ -	\$ 135,000
CONT5	Unforeseen Conditions/Repair Allowance	\$ 150,000	\$ (50,000)	\$ -	\$ -	\$ 100,000
CONT6	Clay Lagoon Liner Repair Allowance	\$ -	\$ -	\$ 50,000	\$ -	\$ 50,000
CONT7	Coatings Allowance	\$ -	\$ 270,000	\$ -	\$ -	\$ 270,000
CONT8	Long Lead Items GMP 1 Allowance	\$ 5,405,516	\$ (5,405,516)	\$ -	\$ -	\$ -
	Total Contingency & Allowance	\$ 6,505,516	\$ (5,160,318)	\$ 221,830	\$ 97,111	\$ 1,664,138
General Requirements						
GR	General Requirements	\$ 244,803	\$ 430,471	\$ 40,062	\$ 6,944	\$ 722,280
	Total General Requirements	\$ 244,803	\$ 430,471	\$ 40,062	\$ 6,944	\$ 722,280
	Total Direct Price	\$ 7,769,193	\$ 2,192,260	\$ 3,135,789	\$ 1,589,385	\$ 14,686,627
General Expense						
B	Bond	\$ 18,474	\$ 195,295	\$ 50,833	\$ 28,389	\$ 292,990
I	Insurance	\$ 25,282	\$ 157,915	\$ 49,261	\$ 24,946	\$ 257,404
PS	Project Staff	\$ 709,516	\$ 1,048,191	\$ 10,556	\$ -	\$ 1,768,262
F	FEE - 9%	\$ 181,526	\$ 787,858	\$ 272,215	\$ 139,104	\$ 1,380,702
	Total General Expense	\$ 934,798	\$ 2,189,258	\$ 382,864	\$ 192,438	\$ 3,699,358
		GMP 1	GMP 2	GMP 3	GMP 4	Total Project
	Total Price	\$ 8,703,991	\$ 4,381,518	\$ 3,518,653	\$ 1,781,823	\$ 18,385,986



Solids GMP 3

PCL CONSTRUCTION, INC.

12/30/2022

City of Arvada

Arvada Ralston Filter & Solids Handling Improvements

<u>Bid Item</u>	<u>Description</u>	<u>GMP 3</u>
	Solids Handling Project	
Div.2	Existing Conditions	\$ 175,536
Div.3	Concrete	\$ 436,326
Div.5	Metals	\$ 90,577
Div.6	FRP	\$ 13,042
Div.7	Joint Sealants	\$ -
Div.9	Finishes	\$ -
Div. 26	Electrical	\$ -
Div. 31	Earthwork	\$ 445,140
Div. 32	Seeding	\$ -
Div. 33	Utilities	\$ 483,967
Div. 35	Waterway and Marine Construction	\$ -
Div. 40	Process Interconnections	\$ 570,712
Div. 44	Pollution and Waste Control Equipment	\$ 181,960
	Solids Handling	\$ 2,397,260
	Contingency & Allowance	
CONT1-S	Construction Contingency - Solids	\$ 59,576
CONT2-S	Design Contingency - Solids	\$ 47,064
CONT3-S	Escalation Allowance - Solids	\$ 36,691
CONT4-S	Estimator Allowance - Solids	\$ -
CONT5-S	Unforeseen Conditions/Repair Allowance -Solids	\$ -
CONT6-S	Clay Lagoon Liner Repair Allowance - Solids	\$ 50,000
CONT7-S	Coatings Allowance - Solids	\$ -
CONT8-S	Long Lead Items GMP 1 Allowance - Solids	\$ -
	Solids Contingency & Allowance	\$ 193,332
	General Requirements	
GR-S	General Requirements- Solids	\$ 33,417.71
	Solids General Requirements	\$ 33,418
	Solids Direct Cost	\$ 2,624,009
	General Expense	
B-S	Bond- Solids	\$ 42,402
I-S	Insurance- Solids	\$ 41,091
PS-S	Project Staff- Solids	\$ 8,805
F-S	FEE - 9%	\$ 227,068
	Solids General Expense	\$ 319,366
	GMP Pricing	\$ 2,943,376
	Total Solids Pricing	



Filters GMP 3

PCL CONSTRUCTION, INC.

12/30/2022

City of Arvada

Arvada Ralston Filter & Solids Handling Improvements

<u>Bid Item</u>	<u>Description</u>	<u>GMP 3</u>
	Filter Improvements Project	
Div.02	Existing Conditions	\$ 138,509.95
Div.02.1	16" Pipe Replacement	\$ 287,964.80
Div.03	Concrete	\$ -
Div.05	Metals	\$ -
Div.09	Finishes	\$ -
Div.26	Electrical	\$ (95,360.00)
Div.33	Utilities	\$ -
Div.35	Waterway and Marine Construction	\$ -
Div.40	Process Interconnections	\$ 50,280.39
Div.44	Pollution and Waste Control Equipment	\$ 95,241.82
	Filter Improvements	\$ 476,636.96
	Contingency & Allowance	
CONT1-F	Construction Contingency- Filters	\$ 11,845.31
CONT2-F	Design Contingency - Filters	\$ 9,357.55
CONT3-F	Escalation Allowance- Filters	\$ 7,295.16
CONT4-F	Estimator Allowance - Filters	\$ -
CONT5-F	Unforeseen Conditions/Repair Allowance -	\$ -
CONT6-F	Clay Lagoon Liner Repair Allowance - Filters	\$ 0.00
CONT7-F	Coatings Allowance - Filters	\$ -
CONT8-F	Long Lead Items GMP 1 Allowance - Filters	\$ -
	Filter Contingency & Allowance	\$ 28,498.02
	General Requirements	
GR-F	General Requirements- Filters	\$ 6,644.30
	Filter General Requirements	\$ 6,644.30
	Filter Direct Cost	\$ 511,779.28
	General Expense	
B-F	Bond- Filters	\$ 8,430.60
I-F	Insurance- Filters	\$ 8,430.60
PS-F	Project Staff- Filters	\$ 1,750.71
F-F	FEE - 9%	\$ 45,146.93
	Filter General Expense	\$ 63,758.84
		GMP 3
	GMP Pricing	\$ 575,538.12
	Total Filter Pricing	



General Estimate Summary & Item Analysis Sheet



CONSTRUCTION

BE Number GMP 3 ARVADA

Opportunity No

Owner File No

Project New Blank Estimate

Location [ProjectLocation]

Summary Page 1 of 2

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General Estimate Summary

Justin McRae

Sheet Name	Description	Quantity UOM	Labor			Equipment			Services/ Tools / Supplies		Material		Subcontract		Total PRICE		
			Hours	Rate	Total	Hours	Unit	Total	Unit	Total	Unit	Total	Unit	Total	Unit	Total	
DIRECT PRICES																	
GMP 3 Filters Handling Project			1 LS														
Div. 02	Division 02—Existing Conditions-Filters	1 LS	1,322	64.79	85,619	42	---	1,145	---	3,500	---	---	---	48,246	---	138,510	
Div. 02.1	16" Pipe Replacement-Filters	1 LS	1,553	66.25	102,855	361	---	32,718	---	71,618	---	51,192	---	29,582	---	287,965	
Div. 03	Division 03—Concrete - Filters	1 LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Div. 26	Division 26—Electrical- Filters	1 LS	---	---	---	---	---	---	---	---	---	---	---	-95,360	---	-95,360	
Div. 40	Division 40—Process Interconnections-Filters	1 LS	648	67.50	43,703	252	---	6,577	---	---	---	---	---	---	---	50,280	
Div. 44	Division 44—Pollution and Waste Control Equipment-Filters	1 LS	1,258	68.64	86,354	98	---	11,907	---	-7,084	---	4,065	---	---	---	95,242	
GMP 3 Filters Handling Project			1 LS	4,780	---	318,531	753	---	52,347	---	68,034	---	55,257	---	-17,532	---	476,637
GMP 3 Solids Handling Project			1 LS														
Div.2	Division 02—Existing Conditions-Solids	1 LS	806	67.14	54,094	183	---	20,832	---	60,610	---	---	---	40,000	---	175,536	
Div.3	Division 03—Concrete-Solids	1 LS	2,487	69.24	172,216	1,588	---	79,508	---	78,264	---	52,338	---	54,000	---	436,326	
Div.5	Division 05—Metals-Solids	1 LS	417	66.31	27,637	40	---	4,860	---	3,760	---	54,320	---	---	---	90,577	
Div.6	Division 06- FRP Solids	1 LS	48	63.37	3,042	---	---	---	---	---	---	10,000	---	---	---	13,042	
Div.31	Division 31 - Earthwork	1 LS	1,102	69.70	76,824	1,749	---	90,570	---	186,341	---	91,405	---	---	---	445,140	
Div.33	Division 33—Utilities-Solids	1 LS	1,803	70.65	127,408	1,376	---	76,606	---	24,232	---	225,721	---	30,000	---	483,967	
Div.35	Division 35—Waterway and Marine Construction-Solids	1 LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Div.40	Division 40—Process Interconnections-Solids	1 LS	1,802	70.55	127,139	367	---	35,245	---	14,500	---	384,428	---	9,400	---	570,712	
Div.44	Division 44—Pollution and Waste Control Equipment-Solids	1 LS	148	68.41	10,125	12	---	1,458	---	750	---	169,627	---	---	---	181,960	
GMP 3 Solids Handling Project			1 LS	8,613	---	598,485	5,315	---	309,079	---	368,457	---	987,839	---	133,400	---	2,397,260
Contingency & Allowance			1 LS														
CONT1	Construction Contingency	1 LS	---	---	---	---	---	---	---	71,422	---	---	---	---	---	71,422	
CONT2	Design Allowance	1 LS	---	---	---	---	---	---	---	56,422	---	---	---	---	---	56,422	
CONT3	Escalation Allowance	1 LS	---	---	---	---	---	---	---	43,986	---	---	---	---	---	43,986	
CONT 6	Lagoon Clay Liner Repair Allowance	1 LS	---	---	---	---	---	---	---	50,000	---	---	---	---	---	50,000	

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CONSTRUCTION

BE Number GMP 3 ARVADA

Opportunity No

Owner File No

Project New Blank Estimate

Location [ProjectLocation]

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General Estimate Summary

Justin McRae

Sheet Name	Description	Quantity UOM	Labor			Equipment			Services/ Tools / Supplies		Material		Subcontract		Total PRICE	
			Hours	Rate	Total	Hours	Unit	Total	Unit	Total	Unit	Total	Unit	Total	Unit	Total
Contingency & Allowance		1 LS	---	---	---	---	---	---	---	221,830	---	---	---	---	---	221,830
General Requirements		1 LS														
GR	General Requirements	1 LS	270	63.93	17,261	90	---	6,542	---	16,259	---	---	---	---	---	40,062
General Requirements		1 LS	270	---	17,261	90	---	6,542	---	16,259	---	---	---	---	---	40,062
DIRECT PRICES			13,663	---	934,277	6,158	---	367,968	---	674,580	---	1,043,096	---	115,868	---	3,135,789
GENERAL EXPENSE PRICES																
FIXED GENERAL EXPENSE			1 LS													
GE 8	F6 BOND	100 %	---	---	---	---	---	---	508.33	50,833	---	---	---	---	508.33	50,833
GE 9	F7 INSURANCE	100 %	---	---	---	---	---	---	492.61	49,261	---	---	---	---	492.61	49,261
FIXED GENERAL EXPENSE			1 LS	---	---	---	---	---	---	100,094	---	---	---	---	---	100,094
VARIABLE GENERAL EXPENSE			1 LS													
GE 17	V7 PROJECT STAFF	100 %	---	---	---	---	---	---	105.56	10,556	---	---	---	---	105.56	10,556
VARIABLE GENERAL EXPENSE			1 LS	---	---	---	---	---	---	10,556	---	---	---	---	---	10,556
GENERAL EXPENSE PRICES			T.DC.	---	---	---	---	---	---	110,650	---	---	---	---	---	110,650
TOTAL PRICE			13,663	---	934,277	6,158	---	367,968	---	785,230	---	1,043,096	---	115,868	---	3,246,438
Fee																272,215
TOTAL BID																3,518,653

J01 STANDARD LANDSCAPE MASTER.RPT

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BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project New Blank Estimate
Location

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Item Analysis Sheet

Justin McRae

Div. 02	Division 02—Existing Conditions-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	02 41 00B Demolition																	
	02 41 01B Electric Utilities Demolition																	
	02 41 00B Demolition	1	LS															
	Demo Filters 1-12	1	LS															
	Assume non-hazardous																	
	Demo Filter 1-3	1	LS															
	Demo Filter Media 1-3	4,612	CF															
	Filters 1-3					1,260.00	SF											
	10" Gravel					1,045.80	CF											
	4" Garnet					415.80	CF											
	9" Sand					945.00	CF											
	21" Anthracite					2,205.00	CF											
	Total Media					4,611.60	CF											
	Total Media					170.80	CY											
	Underdrain					1,260.00	SF											
	Hours Per Filter					16.04	HR											
	Demo Media 1-3					170.80	CY											
	Demo Foreman	170.80	CY	3.550	0.282	48	82.30	3,960	---	---	---	---	---	---	---	---	23.18	3,960
	Laborer	170.80	CY	3.550	0.282	48	58.37	2,808	---	---	---	---	---	---	---	---	16.44	2,808
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	Kinetic Media Removal	3	EA	---	---	---	---	---	---	---	---	---	---	---	16,082.00	48,246	16,082.00	48,246
	Demo Filter Media 1-3	4,611.60	CF	47.925	0.021	96	70.34	6,768	---	---	0.108422	500	---	---	10.46	48,246	12.04	55,514
	Demo Balls & Clean Hoppers 1-3	1,260	SF															

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Div. 02	Division 02—Existing Conditions-Filters	1.00
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BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project New Blank Estimate
Location

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Item Analysis Sheet

Justin McRae

Div. 02 Division 02—Existing Conditions-Filters 1.00 LS

Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
Demo Balls & Clean Hoppers 1-3		1,260	SF			1,260	0.00											
	Demo Foreman	1,260	SF	30.000	0.033	42	SU3 82.30	3,457	---	---	---	---	---	---	---	---	2.74	3,457
	Laborer	1,260	SF	10.000	0.100	126	LG5 58.37	7,355	---	---	---	---	---	---	---	---	5.84	7,355
	Comp 185 CFM Diesel	1,260	SF	30.000	0.033	---	---	---	27.26	1,145	---	---	---	---	---	---	0.908730	1,145
	Dumpster	1	EA	---	---	---	---	---	---	---	750.00	750	---	---	---	---	750.00	750
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
Anchor Cut Down						900	0.00											
	Demo Foreman	900	EA	37.000	0.027	24	SU3 82.30	2,002	---	---	---	---	---	---	---	---	2.22	2,002
	Laborer	900	EA	12.333	0.081	73	LG5 58.37	4,259	---	---	---	---	---	---	---	---	4.73	4,259
Demo Balls & Clean Hoppers 1-3		1,260.00	SF	4.749	0.211	265	64.35	17,073	0.908730	1,145	0.992063	1,250	---	---	---	---	15.45	19,468
Demo Gate Filter 1-3		3	EA															
Demo Gates						3	0.00											
	Demo Foreman	3	EA	0.125	8.000	24	SU3 82.30	1,975	---	---	---	---	---	---	---	---	658.40	1,975
	Laborer	3	EA	0.042	24.000	72	LG5 58.37	4,203	---	---	---	---	---	---	---	---	1,400.88	4,203
Anchor Bolt Removal & Patch						3	0.00											
	Demo Foreman	3	EA	0.250	4.000	12	SU3 82.30	988	---	---	---	---	---	---	---	---	329.20	988
	Laborer	3	EA	0.083	12.000	36	LG5 58.37	2,101	---	---	---	---	---	---	---	---	700.44	2,101
Demo Gate Filter 1-3		3.00	EA	0.021	48.000	144	64.35	9,267	---	---	---	---	---	---	---	---	3,088.92	9,267
Demo Valve Filter 1-3		12	EA															
	6"					3	0.00											
	16"					3	0.00											
	20"					3	0.00											
	14"					3	0.00											
Demo Valves Large						9	0.00											
	Demo Foreman	9	EA	0.063	16.000	144	SU3 82.30	11,851	---	---	---	---	---	---	---	---	1,316.80	11,851

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Div. 02 Division 02—Existing Conditions-Filters 1.00



BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project New Blank Estimate
Location

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Item Analysis Sheet

Justin McRae

Proprietary and Confidential

Div. 02	Division 02—Existing Conditions-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Laborer	9	EA	0.021	48.000	432	LG5 58.37	25,216	---	---	---	---	---	---	---	---	2,801.76	25,216
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	Demo Valves Small						3.00 EA											
	Demo Foreman	3	EA	0.250	4.000	12	SU3 82.30	988	---	---	---	---	---	---	---	---	329.20	988
	Laborer	3	EA	0.083	12.000	36	LG5 58.37	2,101	---	---	---	---	---	---	---	---	700.44	2,101
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	Demo Valve Concrete Patching						3.00 EA											
	Demo Foreman	3	EA	0.125	8.000	24	SU3 82.30	1,975	---	---	---	---	---	---	---	---	658.40	1,975
	Laborer	3	EA	0.042	24.000	72	LG5 58.37	4,203	---	---	---	---	---	---	---	---	1,400.88	4,203
	Patching Material	3	EA	---	---	---	---	---	---	---	250.00	750	---	---	---	---	250.00	750
	Demo Valve Filter 1-3	12.00	EA	0.017	60.000	720	64.35	46,334	---	---	145.83	1,750	---	---	---	---	4,006.98	48,084
	Demo Equipment Filter 1-3	1	LS															
	Demo wash arms																	
	Demo Bubbler lever, transmitter & Piping																	
	Demo Equipment Filter 1-3						3.00 EA											
	Demo Foreman	3	EA	0.125	8.000	24	SU3 82.30	1,975	---	---	---	---	---	---	---	---	658.40	1,975
	Laborer	3	EA	0.042	24.000	72	LG5 58.37	4,203	---	---	---	---	---	---	---	---	1,400.88	4,203
	Demo Equipment Filter 1-3	1.00	LS	---	---	96	64.35	6,178	---	---	---	---	---	---	---	---	---	6,178
	Demo Filter 1-3	1.00	LS	---	---	1,322	64.79	85,619	---	1,145	---	3,500	---	---	---	48,246	---	138,510
	Demo Filters 1-12	1.00	LS	---	---	1,322	64.79	85,619	---	1,145	---	3,500	---	---	---	48,246	---	138,510
	Demo Pipe Gallery Mechanical	1	LS															
	F-R-5001 , F-R 5002, F-R 5003, F-R 5004, F-R 5005, F-R 5006																	

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Div. 02	Division 02—Existing Conditions-Filters	1.00
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BE Number GMP 3 ARVADA
Opportunity No
Owner File No
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Div. 02	Division 02—Existing Conditions-Filters	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
Demo Pipe Gallery Mechanical Access				1	LS													
	Laborer					80.00	HR		1.000		LG5							
	Hoisting/Carts/Protection/Scaffolds					6.00	MO						2,500.00					
	Temp Flange/Pipe Bracing					1.00	LS						7,500.00					
	Containment/Cleanup					1.00	LS						3,500.00					
	Roll-Dumpster & Disposal					4.00	EA						1,415.00					
Demo Pipe Gallery Mechanical Access				1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---
Demo 1& 5 Filter Backwash Supply Piping				5	EA													
	Typical Filters 4-9					5.00	EA						CHRS/Per		Total	CHRS		
	Setup/Remove/Cleanup/Patch					5.00	EA						16.00			80.00		
	DEMO 24" Backwash BTFly VLV					5.00	EA						8.00			40.00		
	DEMO 12" EFF BTFly VLV					5.00	EA						8.00			40.00		
	DEMO 16"x12" Reducing Elbow					5.00	EA						2.00			10.00		
	DEMO Sample Pump Piping					5.00	EA						2.00			10.00		
	DEMO Filter EFF Spool Element					5.00	EA						2.00			10.00		
	DEMO EFF Flow Transmitter & Piping					5.00	EA						4.00			20.00		

	Crew Total Hours					1.00	LS									210.00		
	Crew Hours Per Location					42.00	HR											
	Demo 1& 5 Filter Backwash Supply Piping																	
	Demo Foreman					5.00	EA		0.024		SU3							
	Laborer					5.00	EA		0.008		LG5							
Demo 1& 5 Filter Backwash Supply Pi				5.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---
Demo 2 - Filter 8 Surface Wash Isolation VLV				3	EA													
	Filter 8					3.00	EA						CHRS/Per		Total	CHRS		

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Div. 02	Division 02—Existing Conditions-Filters	1.00
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Div. 02	Division 02—Existing Conditions-Filters	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	DEMO 6" EFF BTFLY VLV					3.00	EA						4.00			12.00		

	Crew Total Hours					1.00	LS									12.00		
	Crew Hours Per Location					4.00	HR											
	Surface Wash Isolation VLV					3.00	EA											
	Demo Foreman					3.00	EA		0.250			SU3						
	Laborer					3.00	EA		0.083			LG5						
Demo 2 - Filter 8 Surface Wash Isolati		3.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Demo 3,4&6 - Filter 10 Backwash Supply/Filter Piping		3	EA															
	Typical Filters 10-12					3.00	EA						CHRS/Per		Total	CHRS		
	Setup/Remove/Cleanup/Patch					3.00	EA						8.00			24.00		
	DEMO Filter Effluent Flanged Spool					3.00	EA						4.00			12.00		
	Temp Remove Actuator					3.00	EA						8.00			24.00		
	DEMO Turbidity Analyzer Piping					3.00	EA						4.00			12.00		
	DEMO Sample Piping					3.00	EA						4.00			12.00		

	Crew Total Hours					1.00	LS									84.00		
	Crew Hours Per Location					28.00	HR											
	Demo 3&4 Filter 10 Backwash Piping					3.00	EA											
	Demo Foreman					3.00	EA		0.036			SU3						
	Laborer					3.00	EA		0.012			LG5						
Demo 3,4&6 - Filter 10 Backwash Sup		3.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Demo 7,8&12,15- Filter 2&3 BKWSH EFF Piping		2	EA															
	Typical Filters 2&3					2.00	EA						CHRS/Per		Total	CHRS		
	Setup/Remove/Cleanup/Patch					2.00	EA						16.00			32.00		
	DEMO 20" Backwash BTFLY VLV					1.00	EA						8.00			8.00		

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Div. 02	Division 02—Existing Conditions-Filters	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	DEMO 12" EFF BTFly VLV					2.00	EA							8.00		16.00		
	DEMO 12" Piping					2.00	EA							4.00		8.00		
	DEMO Sample Pump Piping 1- 3					1.00	EA							8.00		8.00		

	Crew Total Hours					1.00	LS									72.00		
	Crew Hours Per Location					36.00	HR											
	DEMO 7,8&12- Filter 2&3 BKWSH EFF Piping																	
	Demo Foreman					2.00	EA		0.028		SU3							
	Laborer					2.00	EA		0.009		LG5							
	Demo 7,8&12,15- Filter 2&3 BKWSH E	2.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo 9- Combined Filter EFF Sample Pump	1	EA															
						1.00												
	DEMO Filter EFF Pump & Pipe					1.00	EA						CHRS/Per		Total	CHRS		
	*****												4.00			4.00		
	Crew Total Hours					1.00	LS									4.00		
	Crew Hours Per Location					4.00	HR											
	Demo 9- Combined Filter EFF Sample Pump																	
	Demo Foreman					1.00	EA		0.250		SU3							
	Laborer					1.00	EA		0.083		LG5							
	Demo 9- Combined Filter EFF Sample	1.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo 10&11 Filter 12 Backwash Valve	1	EA															
	Typical Filters 12					1.00	EA											
	Setup/Remove/Cleanup/Patch					1.00	EA						CHRS/Per		Total	CHRS		
	DEMO 24" Flanged Pipe & Valve					1.00	EA						8.00			8.00		
	DEMO Tubing & Transmitter					1.00	EA						8.00			8.00		
	*****												4.00			4.00		

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Crew Total Hours					1.00	LS									20.00		
	Crew Hours Per Location					20.00	HR											
	Demo 10&11 Filter 12 Backwash Valve					1.00	EA											
	Demo Foreman					1.00	EA		0.050		SU3							
	Laborer					1.00	EA		0.017		LG5							
	Demo 10&11 Filter 12 Backwash Valv	1.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo 13 Filter 1,2&3 BWV & FI Gate	3	EA															
	Typical Filters 1,2,3					3.00	EA											
	Setup/Remove/Cleanup/Patch					3.00	EA						CHRS/Per		Total	CHRS		
	DEMO 16" BWV Valve Stem/Actuator					3.00	EA						16.00			48.00		
	DEM Gate & Actuator					3.00	EA						6.00			18.00		
	DEMO Concrete Support					3.00	EA						16.00			48.00		
	*****					3.00	EA						6.00			18.00		
	Crew Total Hours					1.00	LS									132.00		
	Crew Hours Per Location					44.00	HR											
	Demo 13 Filter 1,2&3 BWV & FI Gate					3.00	EA											
	Demo Foreman					3.00	EA		0.023		SU3							
	Laborer					3.00	EA		0.008		LG5							
	Sawcut					3.00	EA						750.00					
	Demo 13 Filter 1,2&3 BWV & FI Gate	3.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo 14 Filter 1 Air Vacuum Valve	1	EA															
	Typical Filters 1					1.00	EA											
	Demo Air/Vacuum Vacuum					1.00	EA						CHRS/Per		Total	CHRS		
	*****												4.00			4.00		
	Crew Total Hours					1.00	LS									4.00		
	Crew Hours Per Location					4.00	HR											

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Demo 14 Filter 1 Air Vacuum Valve					1.00	EA											
	Demo Foreman					1.00	EA		0.250			SU3						
	Laborer					1.00	EA		0.083			LG5						
	Demo 14 Filter 1 Air Vacuum Valve	1.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo 18,25,27,29 Control Panel	4	EA															
	Demo 18,25,27,29 Control Panel					4.00	EA						CHRS/Per		Total	CHRS		
	Demo 18,25,27,29 Control Panel					4.00	EA						8.00			32.00		
	*****					*****	*****	*****	*****	*****	*****	*****	*****	*****				
	Crew Total Hours					1.00	LS									32.00		
	Crew Hours Per Location					8.00	HR											
	Demo 18,25,27,29 Control Panel					4.00	EA											
	Demo Foreman					4.00	EA		0.125			SU3						
	Laborer					4.00	EA		0.042			LG5						
	Core Drill 8" Floor Pipe					1.00	EA						250.00					
	Demo 18,25,27,29 Control Panel	4.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo 26,28,30,31 Air Lines	1	EA															
	Demo 26,28,30,31 Air Lines					1.00	EA						CHRS/Per		Total	CHRS		
	Demo 26,28,30,31 Air Lines					1.00	EA						24.00			24.00		
	*****					*****	*****	*****	*****	*****	*****	*****	*****	*****				
	Crew Total Hours					1.00	LS									24.00		
	Crew Hours Per Location					24.00	HR											
	Demo 26,28,30,31 Air Lines					1.00	EA											
	Demo Foreman					1.00	EA		0.042			SU3						
	Laborer					1.00	EA		0.014			LG5						
	Demo 26,28,30,31 Air Lines	1.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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Div. 02	Division 02—Existing Conditions-Filters	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Demo Pipe Gallery Mechanical	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo Electrical MCC	1	LS															
	Demo Electrical MCC																	
	Demo Foreman					1.00	EA		0.125		SU3							
	Laborer					1.00	EA		0.042		LG5							
	Demo Electrical MCC	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	MOP Temp Isolation	25	EA															
	Demo Foreman					25.00	EA		0.125		SU3							
	Laborer					25.00	EA		0.042		LG5							
	Purchase 6 Plates					6.00	EA						1,200.00					
	Purchase 1 Large Plate					1.00	EA						2,500.00					
	Pumps and Sand Bags for Leakage					1.00	LS						5,000.00					
	MOP Temp Isolation	25.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo Field Coordinator					3.00	MO		1.000		EN2		300.00					
	02 41 00B Demolition	1.00	LS	---	---	1,322	64.79	85,619	---	1,145	---	3,500	---	---	---	48,246	---	138,510
	Division 02—Existing Conditions-Filter	1.00	LS	---	---	1,322	64.79	85,619	---	1,145	---	3,500	---	---	---	48,246	---	138,510



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Div. 02.1	16" Pipe Replacement-Filters	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Backwash Piping Replacement	1	LS															
	3 Locations																	
	Sitework / Earthwork / Shoring	1	LS															
	Demo Asphalt	720	SF															
	12'x60'					720.00	SF											
	6"					13.33	CY											
						288.00	LF											
	Demo Asphalt					720.00	SF											
	Demo Foreman	720	SF	85.000	0.012	8	SU3 82.30	697	---	---	---	---	---	---	---	---	0.968235	697
	Excavation/ Install Shoring	720	SF	42.500	0.024	17	LG5 58.37	989	---	---	---	---	---	---	---	---	1.37	989
	Bckho-Ldr Ct 320C 1.5cy	720	SF	85.000	0.012	8	OP2 75.05	636	131.84	1,117	---	---	---	---	---	---	2.43	1,752
	Hammer - 1700 lbs/ft	720	SF	85.000	0.012	8	OP2 75.05	636	19.27	163	---	---	---	---	---	---	1.11	799
	Skidsteer Ldr Cat 249D3	720	SF	85.000	0.012	8	OP2 75.05	636	63.25	536	---	---	---	---	---	---	1.63	1,172
	Sawcut (2 Times)	500	LF	---	---	---	---	---	---	---	7.00	3,500	---	---	---	---	7.00	3,500
	Dumpster	1	EA	---	---	---	---	---	---	---	750.00	750	---	---	---	---	750.00	750
	Demo Asphalt	720.00	SF	14.167	0.071	51	70.70	3,593	2.52	1,816	5.90	4,250	---	---	---	---	13.42	9,659
	Shoring	1	LS															
	Material																	
P	Trench Box	1	LS	---	---	---	---	---	---	---	---	4,801	---	---	---	---	---	4,801
P	Screw Jacks	1	LS	---	---	---	---	---	---	---	---	8,000	---	---	---	---	---	8,000
P	Beam and Plate	1	LS	---	---	---	---	---	---	---	---	12,000	---	---	---	---	---	12,000
P	Shoring Plate	1	LS	---	---	---	---	---	---	---	---	6,000	---	---	---	---	---	6,000
	Shoring	1.00	LS	---	---	---	---	---	---	---	---	30,801	---	---	---	---	---	30,801

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Div. 02.1	16" Pipe Replacement-Filters	1.00
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Div. 02.1 16" Pipe Replacement-Filters 1.00 LS

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE						
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total				
Excavation						192 CY																
	Per Location					64.00	CY															
	Total Excavation					192.00	CY															
	4 Days Per Location					72.00	HR															
	Excavation					192.00	CY															
	Demo Foreman	192 CY		2.000	0.500	96	SU3 82.30	7,901	---	---	---	---	---	---	---	---	41.15 7,901					
	Excavation/ Install Shoring	192 CY		1.000	1.000	192	LG5 58.37	11,207	---	---	---	---	---	---	---	---	58.37 11,207					
	Bckho-Ldr Ct 320C 1.5cy	192 CY		2.000	0.500	96	OP2 75.05	7,205	131.84	12,657	---	---	---	---	---	---	103.45 19,861					
	Skidsteer Ldr Cat 249D3	192 CY		2.000	0.500	96	OP2 75.05	7,205	63.25	6,072	---	---	---	---	---	---	69.15 13,277					
	Engineering	1 LS		---	---	---	---	---	---	---	---	2,500	---	---	---	---	---	2,500				
	Vac Truck	1 LS		---	---	---	---	---	---	---	---	---	---	---	---	17,726	---	17,726				
	Water Fill	6 LD		---	---	---	---	---	---	---	---	---	---	---	71.00	426	71.00	426				
	Trucking 13cy Loads					15.00	EA															
P	2 Hour Trucking	30 HR		---	---	---	---	---	---	---	120.00	3,600	---	---	---	---	120.00	3,600				
P	Tipping Fee	15 EA		---	---	---	---	---	---	---	350.00	5,250	---	---	---	---	350.00	5,250				
	Spoils Dump STS	1 LS		---	---	---	---	---	---	---	---	1,500	---	---	---	---	---	1,500				
	Utility Conflict					3.00	EA															
2	Utility Conflict	3 EA		0.125	8.000	48	LG5 58.37	2,802	---	---	---	---	---	---	---	---	933.92	2,802				
	STS	1 LS		---	---	---	---	---	---	---	---	2,036	---	---	---	---	---	2,036				
Excavation						192.00	CY	0.364	2.750	528	68.79	36,319	97.55	18,729	77.53	14,886	---	---	94.54	18,152	458.78	88,086
Backfill / Flow Fill						180 CY																
	Pipe Encasement Below in Concrete CLSM Backfill					180.00	CY															
	Backfill / Flow Fill					180.00	CY															
	Demo Foreman	3 EA		0.125	8.000	24	SU3 82.30	1,975	---	---	---	---	---	---	---	---	---	658.40	1,975			
	Backfill / Flow Fill	3 EA		0.063	16.000	48	LG5 58.37	2,802	---	---	---	---	---	---	---	---	---	933.92	2,802			

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Div. 02.1 16" Pipe Replacement-Filters 1.00



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Div. 02.1	16" Pipe Replacement-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Bckho-Ldr Ct 320C 1.5cy	3	EA	0.125	8.000	24	OP2 75.05	1,801	131.84	3,164	---	---	---	---	---	---	1,655.12	4,965
	Compaction Wheel	3	EA	0.125	8.000	---	---	---	25.00	600	---	---	---	---	---	---	200.00	600
	Skidsteer Ldr Cat 249D3	3	EA	0.125	8.000	24	OP2 75.05	1,801	63.25	1,518	---	---	---	---	---	---	1,106.44	3,319
	CLSM Backfill	180	CY	---	---	---	---	---	---	---	---	---	200.00	36,000	---	---	200.00	36,000
	Class 6 RB	150	TN	---	---	---	---	---	---	---	---	---	25.00	3,750	---	---	25.00	3,750
	Placement STS	1	LS	---	---	---	---	---	---	---	---	1,500	---	---	---	---	---	1,500
	Backfill / Flow Fill	180.00	CY	1.500	0.667	120	69.83	8,379	29.35	5,282	8.33	1,500	220.83	39,750	---	---	305.06	54,912
	Paving	432	SF															
	Paving	750	SF	---	---	---	---	---	---	---	---	---	---	---	12.00	9,000	12.00	9,000
	Paving	432.00	SF	---	---	---	---	---	---	---	---	---	---	---	20.83	9,000	20.83	9,000
	Bollards	3	EA															
	Bollards	3	EA	0.063	16.000	48	LGS 58.37	2,802	---	---	---	---	---	---	---	---	933.92	2,802
	Skidsteer Ldr Cat 249D3	3	EA	0.250	4.000	12	OP2 75.05	901	63.25	759	---	---	---	---	---	---	553.22	1,660
	Auger Attachment	3	EA	0.250	4.000	---	---	---	25.00	300	---	---	---	---	---	---	100.00	300
	Bollard	3	EA	---	---	---	---	---	---	---	---	---	250.00	750	---	---	250.00	750
	Concrete	3	CY	---	---	---	---	---	---	---	---	---	200.00	600	---	---	200.00	600
	Bollards	3.00	EA	0.050	20.000	60	61.71	3,702	353.02	1,059	---	---	450.00	1,350	---	---	2,037.14	6,111
	Sitework / Earthwork / Shoring	1.00	LS	---	---	759	68.52	51,994	---	26,886	---	51,437	---	41,100	---	27,152	---	198,569
	Pipe Modifications	1	LS															
	Core Drill 26"																	
	Supply Pipe included																	

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Div. 02.1	16" Pipe Replacement-Filters	1.00
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Div. 02.1	16" Pipe Replacement-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Material																	
	New 24" Pipe						1.00 LS						32,673.09					
	Pipefitter	3 EA		0.021	48.000	144	63.37	9,125	---	---	---	---	---	---	---	---	3,041.76	9,125
	Core Drill 26" SUB	3 EA		---	---	---	---	---	---	---	1,000.00	3,000	---	---	---	---	1,000.00	3,000
	Grout Joint	3 EA		---	---	---	---	---	---	---	---	---	250.00	750	---	---	250.00	750
	Pipe Modifications	1.00 LS		---	---	144	63.37	9,125	---	---	---	3,000	---	750	---	---	---	12,875
	Concrete	24 CY																
	Concrete Pipe Collar & Pipe Encasement																	
	Formwork	381 SF																
	Fab Forms	381 SF																
	Fab SOG Form						48.00 SF											
	Fab SOG Forms	48 SF		3.000	0.333	16	63.37	1,014	---	---	---	---	---	---	---	---	21.12	1,014
	3/4" MDO Plywood	48 SF		---	---	---	---	---	---	---	1.15	55	---	---	---	---	1.15	55
	Form Hardware	48 SF		---	---	---	---	---	---	---	0.600000	29	---	---	---	---	0.600000	29
	Dimen. Lumber (4x4-4x8)	211.20 BF		---	---	---	---	---	---	---	2.50	528	---	---	---	---	2.50	528
	Fab Wall Form (Stick Built Gang)						108.00 SF											
	Fab Wall Forms	108 SF		4.000	0.250	27	63.37	1,711	---	---	---	---	---	---	---	---	15.84	1,711
	3/4" MDO Plywood	108 SF		---	---	---	---	---	---	---	1.15	248	---	---	---	---	2.30	248
	Form Hardware	108 SF		---	---	---	---	---	---	---	0.600000	65	---	---	---	---	0.600000	65
	Scaffold Planks	--- LF		---	---	---	---	---	---	---	1.00	---	---	---	---	---	---	---
	Dimen. Lumber (4x4-4x8)	475.20 BF		---	---	---	---	---	---	---	2.50	1,188	---	---	---	---	2.50	1,188
	Encasement						225.00 SF											
	Form Ply 3/4"	247.50 SF		---	---	---	---	---	---	---	3.00	743	---	---	---	---	3.00	743
	Dimen. Lumber (2x4-2x10)	495 BF		---	---	---	---	---	---	---	2.50	1,238	---	---	---	---	2.50	1,238

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Div. 02.1	16" Pipe Replacement-Filters	1.00
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Div. 02.1	16" Pipe Replacement-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Fab Forms	381.00	SF	8.860	0.113	43	63.37	2,725	---	---	10.74	4,093	---	---	---	---	17.90	6,818
	Pipe Collar & Pipe Encase	381	SF															
	Totals Formwork					381.00	sf											
	Form Oil	381	SF	---	---	---	---	---	---	---	0.250000	95	---	---	---	---	0.250000	95
	Erect and Strip Supplies	381	SF	---	---	---	---	---	---	---	0.500000	191	---	---	---	---	0.500000	191
	Pipe Collar & Pipe Encase					381.00	SF											
	SOG (3/EA)	48	SF	1.000	1.000	48	WKS 63.37	3,042	---	---	---	---	---	---	---	---	63.37	3,042
	Walls One Sided - Pipe Penetration (3/EA)	108	SF	1.000	1.000	108	WKS 63.37	6,844	---	---	---	---	---	---	---	---	63.37	6,844
	Encasement	225	SF	4.000	0.250	56	WKS 63.37	3,565	---	---	---	---	---	---	---	---	15.84	3,565
	Pipe Collar & Pipe Encase	381.00	SF	1.795	0.557	212	63.37	13,450	---	---	0.750000	286	---	---	---	---	36.05	13,736
	Formwork	381.00	SF	1.493	0.670	255	63.37	16,175	---	---	11.49	4,379	---	---	---	---	53.95	20,554
	Concrete Materials	27.60	CY															
	TOTAL CONCRETE					24.00	Cy											
	CONC BASE BID					24.00												
	Conc.4000 Psi	24	CY	---	---	---	---	---	---	---	---	---	225.00	5,400	---	---	225.00	5,400
	Conc.4000 Psi Waste 15%	3.60	CY	---	---	---	---	---	---	---	---	---	225.00	810	---	---	225.00	810
	Short Load (9/EA)	9	EA	---	---	---	---	---	---	---	---	---	250.00	2,250	---	---	250.00	2,250
	Enviromental Fees	9	LD	---	---	---	---	---	---	---	---	---	25.00	225	---	---	25.00	225
	Fuel Surcharge	9	LD	---	---	---	---	---	---	---	---	---	25.00	225	---	---	25.00	225
	Hot Weather Concrete-Ice	---	CY	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Cold Weather Concrete-Additive	---	CY	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Conc. Placing Supplies	28	CY	---	---	---	---	---	---	---	5.00	140	---	---	---	---	5.00	140

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Div. 02.1	16" Pipe Replacement-Filters	1.00
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Div. 02.1	16" Pipe Replacement-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
Concrete Materials		27.60	CY	---	---	---	---	---	---	5.07	140	322.83	8,910	---	---	327.90	9,050
Concrete Placement		24	CY														
Pipe Collar & Pipe Encase						24.00	CY										
Sog (3/EA)	4	CY	0.125	8.000	32	WKS	63.37	2,028	---	---	---	---	---	---	---	506.96	2,028
Walls (3/EA)	5	CY	0.125	8.000	40	WKS	63.37	2,535	---	---	---	---	---	---	---	506.96	2,535
Pipe Encasement (3/EA)	15	CY	0.500	2.000	30	WKS	63.37	1,901	---	---	---	---	---	---	---	126.74	1,901
Concrete Placement		24.00	CY	0.235	4.250	102	63.37	6,464	---	---	---	---	---	---	---	269.32	6,464
Concrete Pumping		1	CY														
Line Pump	36	HR	---	---	---	---	---	---	---	184.00	6,624	---	---	---	---	184.00	6,624
Line Pump Charge per Cy	24	CY	---	---	---	---	---	---	---	2.00	48	---	---	---	---	2.00	48
Concrete Pumping		1.00	CY	---	---	---	---	---	---	6,672.00	6,672	---	---	---	---	6,672.00	6,672
Joint Prep		165	SF														
Vertical CJ Retardant Labor	90	SF	10.000	0.100	9	WKS	63.37	570	---	---	---	---	---	---	---	6.34	570
Horizontal CJ Retardant Labor	75	SF	5.000	0.200	15	WKS	63.37	951	---	---	---	---	---	---	---	12.67	951
Joint Prep (Waterblast)	165	SF	10.000	0.100	17	WKS	63.37	1,046	---	---	---	---	---	---	---	6.34	1,046
Waterblast Equip. & STS	1	LS	---	---	---	---	---	---	---	---	1,500	---	---	---	---	---	1,500
Joint Prep		165.00	SF	4.074	0.245	41	63.37	2,566	---	---	9.09	1,500	---	---	---	24.65	4,066
Waterstop		1	LS														
Hydro Waterstop	72	LF	---	---	---	---	---	---	---	---	---	6.00	432	---	---	6.00	432
Install Hydro Waterstop	72	LF	4.000	0.250	18	WKS	63.37	1,141	---	---	---	---	---	---	---	15.84	1,141

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Div. 02.1	16" Pipe Replacement-Filters	1.00
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Div. 02.1 16" Pipe Replacement-Filters 1.00 LS

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Waterstop	1.00	LS	---	---	18	63.37	1,141	---	---	---	---	---	432	---	---	---	1,573
	Rebar Sub: Supply & Install	1.35	TN															
	Rule of Thumb 300 Lbs per CY					2,700.00	Lbs											
	Concrete Rebar= \$1800 per TN					2,430.00	USD											
	Purchase Rebar	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	2,430	---	2,430
	Install Rebar	3	EA	0.031	32.000	96	63.37	6,084	---	---	---	---	---	---	---	---	2,027.84	6,084
	Rebar Sub: Supply & Install	1.35	TN	0.014	71.111	96	63.37	6,084	---	---	---	---	---	---	1,800.00	2,430	6,306.31	8,514
	Install Formsavers/Drill Dowel	---	EA															
	Drill & Dowel Rebar					180.00												
	Drill in Dowels up to 12 " Depth	180	EA	2.000	0.500	90	63.37	5,703	---	---	---	---	---	---	---	---	31.69	5,703
	STS Dowels incl's Epoxy, Drills, Bits Etc.	180	EA	---	---	---	---	---	---	---	18.00	3,240	---	---	---	---	18.00	3,240
	Install Formsavers/Drill Dowel	---	EA	---	---	90	63.37	5,703	---	---	---	3,240	---	---	---	---	---	8,943
	Equipment / Access	1	LS															
	Forklift, RT 10,000# Reach	3	EA	0.063	16.000	48	75.05	3,602	121.50	5,832	---	---	---	---	---	---	3,144.80	9,434
	Access Ladders	1	LS	---	---	---	---	---	---	---	---	1,250	---	---	---	---	---	1,250
	Equipment / Access	1.00	LS	---	---	48	75.05	3,602	---	5,832	---	1,250	---	---	---	---	---	10,684
	Concrete	24.00	CY	0.037	27.073	650	64.23	41,735	243.00	5,832	715.87	17,181	389.25	9,342	101.25	2,430	3,188.34	76,520
	Backwash Piping Replacement	1.00	LS	---	---	1,553	66.25	102,855	---	32,718	---	71,618	---	51,192	---	29,582	---	287,965

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Div. 02.1 16" Pipe Replacement-Filters

1.00



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Div. 02.1	16" Pipe Replacement-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	16" Pipe Replacement-Filters	1.00	LS	---	---	1,553	66.25	102,855	---	32,718	---	71,618	---	51,192	---	29,582	---	287,965

Div. 02.1	16" Pipe Replacement-Filters	1.00
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Div. 03	Division 03—Concrete - Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	03 01 32B Repair of Vertical and Overhead Concrete Surfaces																	
	03 01 32.01G Guide to Vertical and Overhead Concrete Surface Repair Systems																	
	03 01 33B Repair of Horizontal Concrete Surfaces																	
	03 01 33.01G Guide to Horizontal Concrete Surface Repair Systems																	
	03 39 00B Concrete Curing																	
	03 63 00B Concrete Doweling																	
	03 64 23B Epoxy Resin Injection Grouting																	
	03 64 23.01G Guide to Crack Epoxy Resin Selection																	
	03 64 24B Polyurethane Injection Grouting																	
	03 64 24.01G Guide to Polyurethane Resin Selection																	
	Minor Concrete Included in Activities																	
Division 03—Concrete - Filters		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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Div. 26	Division 26—Electrical- Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	26 05 02B Basic Electrical Requirements																	
	26 05 04B Basic Electrical Materials and Methods																	
	26 05 05B Conductors																	
	26 05 26B Grounding and Bonding for Electrical Systems																	
	26 05 33B Raceway and Boxes																	
	26 05 70B Electrical Systems Analysis																	
	26 08 00B Commissioning of Electrical Systems																	
	26 09 13B Power Measurement and Control																	
	26 14 13B Switchboards																	
	26 20 00B Low-Voltage AC Induction Motors																	
	26 24 16B Panelboards																	
	Sup 1/Panelboard Schedules																	
	26 24 19B Low-Voltage Motor Control																	
	26 27 26B Wiring Devices																	
	26 29 23B Low-Voltage Adjustable Frequency Drive System																	
	26 43 00B Surge Protective Devices																	
	Filters GMP 2	1	LS															
	Filters GMP 2 Electrical	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	-2,073,600	---	-2,073,600
	Division 26?Electrical Fitlers					1.00	LS									1,444,939.00		
	Electrical VE					1.00	LS									-25,000.00		
	Electrical GE					1.00	LS									86,293.00		
	Electrical VGE					1.00	LS									475,085.00		
	Temp Power					1.00	LS									12,283.00		
	Electrical Material Escalation					1.00	LS									45,000.00		
	Suggested Estiamting Contingency Elec																	
	Filters GMP 2	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	-2,073,600	---	-2,073,600
	GMP 3 Reconcile	1	LS															
	GMP 3 Reconcile																	

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Div. 26	Division 26—Electrical- Filters	1.00
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Div. 26 **Division 26—Electrical- Filters** **1.00 LS**

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Filters	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	1,444,939	---	1,444,939
	Electrical GE	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	86,293	---	86,293
	Electrical VGE	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	475,085	---	475,085
	Temp Power	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	12,283	---	12,283
	Generator Quick	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	98,534	---	98,534
	Electrical Material Escalation	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	45,000	---	45,000
	Suggested Est Contingency Elec	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	35,000	---	35,000
	Deducts																	
	MCC-3 Solids Pumps Nema 12	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	-10,397	---	-10,397
	Change Backwash MCC-3 Nema 12	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	12,515	---	12,515
	Rosemont radar units	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	-16,745	---	-16,745
	Delete Gen Quick Connection Cabinet	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	-98,534	---	-98,534
	Delete Disconnects at MTR Valves/Gates	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	-105,733	---	-105,733
	GMP 3 Reconcile	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	1,978,240	---	1,978,240
	Division 26—Electrical- Filters	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	-95,360	---	-95,360



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Div. 40	Division 40—Process Interconnections-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	40 05 15B Piping Support Systems																	
	40 27 00B Process Piping-General																	
	40 27 00.03B Carbon Steel Pipe and Fitting (General Svc) (Data Sheet)																	
	40 27 00.07B Galvanized Steel Pipe and Malleable Iron Fittings (Data Sheet)																	
	40 27 00.10B Polyvinyl Chloride (PVC) Pipe and Fittings (Data Sheet)																	
	40 27 01B Process Piping Specialties																	
	40 27 02B Process Valves and Operators																	
	40 80 01B Process Piping Leakage Testing																	
	40 90 00B Instrumentation and Control for Process Systems																	
	40 91 00B Instrumentation and Control Components																	
	40 91 01B I&C Component Index																	
	40 91 02.01B Analytical Measurement Components																	
	40 95 80B Fiber Optic Communication System																	
	40 99 90B Package Control Systems																	
	Purchase Pipe Materials (Exposed)	1	LS															
	Permanent Pipe Materials	1	LS															
	Purchase Filters 1-3 Material						1.00	LS										
	Purchase Filters 4-6 Material						1.00	LS										
	Purchase Filters 7-9 Material						1.00	LS										
	Purchase Filters 10-12 Material						1.00	LS										
	Purchase Misc. Material						1.00	LS										
	Total												137,172.00					
	Purchase Pipe Filter Materials (Exposed)																	
	Purchase Valves Filters Materials (Exposed)																	
	Permanent Pipe Materials	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Temporary Pipe Materials	1	LS															
	STS - Installation (Exposed)						1.00	LS					2,500.00					

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Div. 40	Division 40—Process Interconnections-Filters	1.00
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	STS - Rigging/Scaffolding (Exposed)					1.00	LS						10,000.00					
	STS - Testing (Exposed)					1.00	LS						3,000.00					
	STS - Temp Waste Materials					1.00	LS						3,500.00					
	STS - Temp Spools					1.00	LS						3,500.00					
	Rigging Setup/teardown					4.00	EA											
	Pipe Foreman					4.00	EA		0.125		SU3							
	Pipefitter					4.00	EA		0.031		WK8							
	STS - Filter Drain Supplies					1.00	LS						3,500.00					
	PIPE SUPPORTS GROUTING																	
	Non-Shrink Grout @ 0.3 CF/EA SUPP																	
	Pipe Supports Q-ty:					12.00	EA											
	Non-Shrink Grout					3.60	CF						M3340.000					
	All-Thread, Nuts, Washers included in pipe purchase																	
	Pipe Supports Uni-Strut																	
	Epoxy @ 0.5 Tube/EA SUPP																	
	Uni-Strut Drill & Epoxy					7.00	EA											
	Epoxy Bonding Agent (Hilti-RE 500)					4.00	EA						80.00					
	STS - Uni-Strut Install					1.00	LS						1,000.00					
	All-Thread, Nuts, Washers included in pipe purchase																	
Temporary Pipe Materials		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Purchase Pipe Materials (Exposed)		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Install Piping (Exposed)		1	LS															
Direct Manhours		1	LS															
	4-Man Crew																	
	Filter 1-3					249.00	mhr											
	Filter 4-6					171.00	mhr											
	Filter 7-9					168.00	mhr											

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Div. 40	Division 40—Process Interconnections-Filters	1.00
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Div. 40	Division 40—Process Interconnections-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Filter 10-12					270.00	mhr											
	Misc.					60.00	mhr											

	Total Manhours					918.00	mhr											
	Pipe Foreman					229.50	HR		1.000			SU3						
	Pipefitter					918.00	HR		1.000			WK8						
	Filter 1-3 Decuct Pipe Foreman	62.25	HR	1.000	1.000	62	SU3	82.30	---	---	---	---	---	---	---	---	82.30	5,123
	Filter 1-3 Deduct	249	HR	1.000	1.000	249	WK8	63.37	---	---	---	---	---	---	---	---	63.37	15,779
	Temp Spool Install/Removal					12.00	EA											
	Pipe Foreman					12.00	EA		0.125			SU3						
	Pipefitter					12.00	EA		0.042			WK8						
	Direct Manhours	1.00	LS	---	---	311	67.16	20,902	---	---	---	---	---	---	---	---	---	20,902
	Adjustments	1	LS															
	Filter 1-3					125.00	mhr					Overhead	Access/Egress		Tight	Space		
	Filter 4-6					86.00	mhr					Overhead	Access/Egress		Tight	Space		
	Filter 7-9					84.00	mhr					Overhead	Access/Egress		Tight	Space		
	Filter 10-12					135.00	mhr					Overhead	Access/Egress		Tight	Space		
	Misc.					30.00	mhr					Overhead	Access/Egress		Tight	Space		

	Total Manhours					460.00	mhr											
	Pipe Foreman					115.00	HR		1.000			SU3						
	Pipefitter					460.00	HR		1.000			WK8						
	Filter 1-3 Decuct Pipe Foreman	31.25	HR	1.000	1.000	31	SU3	82.30	---	---	---	---	---	---	---	---	82.30	2,572
	Filter 1-3 Deduct	125	HR	1.000	1.000	125	WK8	63.37	---	---	---	---	---	---	---	---	63.37	7,921

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Div. 40	Division 40—Process Interconnections-Filters	1.00
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Div. 40	Division 40—Process Interconnections-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Adjustments	1.00	LS	---	---	156	67.16	10,493	---	---	---	---	---	---	---	---	---	10,493
	Pipe Testing	1	LS															
	Half day test					13.00	EA											
	Pipefitter					13.00	EA		0.250		WK8							
	Comp 185 CFM Diesel					13.00	EA		0.250							Comp 185 CFM Di		
	Pipe Testing	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Equipment	1	LS															
	Confined Space Equipment	1	LS															
	(Direct MH + Adjustment) / 4																	
	Filter 1-3					72.00	hr											
	Filter 10-12					80.00	hr											

	Total Hours					152.00	hr											
	Blower Vent., 15,000 cfm					6.00	MO		1.000								Blower Vent., 15	
	Confined Space Watch					152.00	HR		1.000		LG5							
	Confined Space Watch	72	HR	1.000	1.000	72	LS	58.37	---	---	---	---	---	---	---	---	58.37	4,203
	Confined Space Equipment	1.00	LS	---	---	72		58.37	---	---	---	---	---	---	---	---	---	4,203
	Scissor Lift - 26' Electric	1	LS															
	(Direct MH + Adjustment) / 4																	

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Div. 40	Division 40—Process Interconnections-Filters	1.00
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Div. 40	Division 40—Process Interconnections-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Filter 1-3					72.00	hr											
	Filter 4-6					52.00	hr											
	Filter 7-9					52.00	hr											
	Filter 10-12					80.00	hr											
	Misc.					20.00	hr											

	Total Hours					276.00	hr											
	Scissor Lift - 26' Electric					276.00	HR		1.000								Scissor Lift -	
2	Scissor Lift - 26' Electric 1-3 Deduct	72	HR	1.000	1.000	---	---	---	3.92	564	---	---	---	---	---	---	7.83	564
	Scissor Lift - 26' Electric	1.00	LS	---	---	---	---	---	---	564	---	---	---	---	---	---	---	564
	Forklift, 5500# LGP WH	1	LS															
	(Direct MH + Adjustment)/4																	
	Filter 1-3					72.00	hr											
	Filter 4-6					52.00	hr											
	Filter 7-9					52.00	hr											
	Filter 10-12					80.00	hr											
	Misc.					20.00	hr											

	Total Hours					276.00	hr											
	Forklift, 5500# LGP WH					276.00	HR		1.000		OP2						Forklift, 5500#	
	Forklift, 5500# LGP WH 1-3 Deduct	72	HR	1.000	1.000	72 ^{OP2}	75.05	5,404	22.76	1,639	---	---	---	---	---	---	97.81	7,043
	Forklift, 5500# LGP WH	1.00	LS	---	---	72	75.05	5,404	---	1,639	---	---	---	---	---	---	---	7,043

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Div. 40	Division 40—Process Interconnections-Filters	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Forklift, RT 10,000# Reach	1	LS															
	((Direct MH + Adjustment)/4)/2																	
	Filter 1-3					36.00	hr											
	Filter 4-6					26.00	hr											
	Filter 7-9					26.00	hr											
	Filter 10-12					40.00	hr											
	Misc.					10.00	hr											

	Total Hours					138.00	hr											
	Forklift, RT 10,000# Reach					138.00	HR		1.000		OP2						Forklift, RT 10	
	Forklift, RT 10,000# Reach 1-3 Deduct	36	HR	1.000	1.000	36	OP2 75.05	2,702	121.50	4,374	---	---	---	---	---	---	196.55	7,076
	Forklift, RT 10,000# Reach	1.00	LS	---	---	36	75.05	2,702	---	4,374	---	---	---	---	---	---	---	7,076
	Equipment	1.00	LS	---	---	180	68.38	12,308	---	6,577	---	---	---	---	---	---	---	18,885
	Install Piping (Exposed)	1.00	LS	---	---	648	67.50	43,703	---	6,577	---	---	---	---	---	---	---	50,280
	Piping Subs	1	LS															
	Pipe Disinfection	1	LS															
	12" Filter Effluent					75.00	lf											
						12.00	EA											
	Pipe Disinfection SUB					1.00	LS								25,000.00			
	Disinfection Support					12.00	EA											
	Disinfection Support					48.00	HR		1.000		WK8							

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Div. 40	Division 40—Process Interconnections-Filters	1.00
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Comp 185 CFM Diesel Trc Water-TA 2000 Gal -O STS - Pipe Disinfection Misc					48.00 48.00 1.00	HR HR LS		1.000 1.000			OP2		2,500.00			Comp 185 CFM Di Trc Water-TA 20	
Pipe Disinfection		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pipe Welding		1	LS															
	12" STL Butt Weld						ea											0.00
	Exposed Pipe Weld Sub					1.00	LS								10,000.00			
	Decide on the scale of potential standby time for the welder																	
	Welding Sub Standby Time					0.00	HR								150.00			
	Decide on the assistance PCL is going to dedicate to welding sub																	
	Assist Pipe Welder																	
	Yard Pipe Crew					0.00	HR		1.000			mx8						
Pipe Welding		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Piping Subs		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Mechanical Field Coordinator					3.00	MO		1.000			EN2		300.00				
Division 40—Process Interconnections		1.00	LS	---	---	648	67.50	43,703	---	6,577	---	---	---	---	---	---	---	50,280

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Div. 40	Division 40—Process Interconnections-Filters	1.00
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Div. 44 Division 44—Pollution and Waste Control Equipment-Filters 1.00 LS

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	44 42 56.03B Vertical Turbine Pumps																	
	44 42 56.17B Sampling Pumps																	
	44 43 30B Filter Media																	
	44 43 34B Filter Underdrain System																	
	44 42 56.17B Sampling Pumps	1	LS															
	44 42 56.17B Sampling Pumps	1	LS	---	---	---	---	---	---	---	---	-25,000	---	---	---	---	---	-25,000
	44 42 56.17B Sampling Pumps	1	LS	---	---	---	---	---	---	---	---	---	---	4,065	---	---	---	4,065
	Foreman					1.00	EA		0.250		SU3							
	Sampling Pumps					1.00	EA		0.083		WK8							
	STS					1.00	LS						500.00					
	44 42 56.17B Sampling Pumps	1.00	LS	---	---	---	---	---	---	---	---	-25,000	---	4,065	---	---	---	-20,935
	44 43 30B Filter Media 1-12	1	LS															
	Supply Media					634.00	CY											
	Supply Media					1,268.00	TN											
	44 43 30B Filter Media 1-12					1.00	LS						494,216.00					
	Tent and Heater for Media	1	LS															
	Early Delivery & Storage																	
	Tent					1.00	LS						1,250.00					
	Heater					3.00	MO						750.00					
	Fuel					250.00	GAL						5.00					
	Tent Setup/Removal/Maintenance					1.00	EA		0.021		WK8							
	Tent and Heater for Media	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Fitler Media 1-3	3	EA															

Div. 44 Division 44—Pollution and Waste Control Equipment-Filters 1.00

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Filter Meida					1,260.00	SF											
	28" Anthracite					2,935.80	CF											
	10" Sand					1,045.80	CF											
	Total Media					3,981.60	CF											
	Total Media					147.00	CY											
	Crew Time Per Filter					32.67	HR											
	44 43 30B Filter Media 1-3					147.00	CY											
	Foreman	147	CY	1.500	0.667	98	SU3 82.30	8,065	---	---	---	---	---	---	---	---	54.87	8,065
	Filter Media	147	CY	0.500	2.000	294	WK8 63.37	18,631	---	---	---	---	---	---	---	---	126.74	18,631
	Hopper Inductor	98	HR	---	---	---	---	---	---	---	142.00	13,916	---	---	---	---	142.00	13,916
	Hoses	1	EA	---	---	---	---	---	---	---	1,500.00	1,500	---	---	---	---	1,500.00	1,500
	Forklift, RT 10,000# Reach	147	CY	1.500	0.667	98	OP2 75.05	7,355	121.50	11,907	---	---	---	---	---	---	131.03	19,262
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	Fitler Media 1-3	3.00	EA	0.006	163.333	490	69.49	34,051	3,969.01	11,907	5,305.33	15,916	---	---	---	---	20,624.70	61,874
	Fitler Media 4-12	9	EA															
	Filter Meida					4,158.00	SF											
	28" Anthracite					9,688.14	CF											
	10" Sand					3,451.14	CF											
	Total Media					13,139.28	CF											
	Total Media					487.00	CY											
	Crew Time Per Filter					36.44	HR											
	Fitler Media 4-12					487.00	CY											
	Foreman					487.00	CY		1.500		SU3							
	Filter Media					487.00	CY		0.500		WK8							
	Hopper Inductor					0.00	HR						142.00					
	Hoses					1.00	EA						1,500.00					
	Forklift, RT 10,000# Reach					487.00	CY		1.500		OP2						Forklift, RT 10	
	STS					1.00	LS						500.00					

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Div. 44 **Division 44—Pollution and Waste Control Equipment-Filters** **1.00**

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Filter Media 4-12	9.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	44 43 30B Filter Media 1-12	1.00	LS	---	---	490	69.49	34,051	---	11,907	---	15,916	---	---	---	---	---	61,874
	44 43 31 Filter Agitators	1	LS															
	Filter Wash Arms	48	EA															
	4 Arms per filter					48.00	EA						2,000.00		96,000.00			
	Filter Wash Arms	1.00	LS										233,100.00		116,550.00			
	Foreman	3	EA	0.063	16.000	48	SU3 82.30	3,950	---	---	---	---	---	---	---	---	1,316.80	3,950
	Filter Wash Arms	3	EA	0.021	48.000	144	WK8 63.37	9,125	---	---	---	---	---	---	---	---	3,041.76	9,125
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	Filter Wash Arms	48.00	EA	0.250	4.000	192	68.10	13,076	---	---	10.42	500	---	---	---	---	282.83	13,576
	Agitator Nozzles	1	LS															
	Agitator Nozzles					1.00	LS						116,550.00					
	Foreman	3	EA	0.125	8.000	24	SU3 82.30	1,975	---	---	---	---	---	---	---	---	658.40	1,975
	Agitator Nozzles	3	EA	0.042	24.000	72	WK8 63.37	4,563	---	---	---	---	---	---	---	---	1,520.88	4,563
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	Agitator Nozzles	1.00	LS	---	---	96	68.10	6,538	---	---	---	500	---	---	---	---	---	7,038
	44 43 31 Filter Agitators	1.00	LS	---	---	288	68.10	19,614	---	---	---	1,000	---	---	---	---	---	20,614
	44 43 34B Filter Underdrain System	1	LS															

Div. 44	Division 44—Pollution and Waste Control Equipment-Filters	1.00
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Div. 44	Division 44—Pollution and Waste Control Equipment-Filters	1.00 LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Underdrain Supply 1-9					1.00	LS						1,150,000.00					
	Underdrain Supply 10-12					1.00	LS						390,000.00					
	Unload / Store / Prep	12	EA															
	Unload , Organize parts, store, transport																	
	Unload / Store / Prep					12.00	EA		0.083		WK8							
	Forklift, RT 10,000# Reach					12.00	EA		0.500		OP2						Forklift, RT 10	
	Unload / Store / Prep	12.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Underdrain Install 1-3	3	EA															
	44 43 34B Filter Underdrain System																	
	Foreman	3	EA	0.025	40.000	120	SU3 82.30	9,876	---	---	---	---	---	---	---	---	3,292.00	9,876
	Underdrain Install	3	EA	0.008	120.000	360	WK8 63.37	22,813	---	---	---	---	---	---	---	---	7,604.40	22,813
	STS	1	LS	---	---	---	---	---	---	---	---	1,000	---	---	---	---	---	1,000
	Underdrain Install 1-3	3.00	EA	0.006	160.000	480	68.10	32,689	---	---	333.33	1,000	---	---	---	---	11,229.73	33,689
	Underdrain Install 4-6	3	EA															
	44 43 34B Filter Underdrain System																	
	Foreman					3.00	EA		0.025		SU3							
	Underdrain Install					3.00	EA		0.008		WK8		1,000.00					
	STS					1.00	LS											
	Underdrain Install 4-6	3.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Underdrain Install 7-9	3	EA															
	44 43 34B Filter Underdrain System																	
	Foreman					3.00	EA		0.025		SU3							
	Underdrain Install					3.00	EA		0.008		WK8		1,000.00					
	STS					1.00	LS											

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Div. 44	Division 44—Pollution and Waste Control Equipment-Filters	1.00
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Div. 44 Division 44—Pollution and Waste Control Equipment-Filters 1.00 LS

Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
Underdrain Install 7-9		3.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Underdrain Install 10-12		3	EA														
44 43 34B Filter Underdrain System																	
Foreman						3.00	EA		0.025		SU3						
Underdrain Install						3.00	EA		0.008		WK8						
STS						1.00	LS						1,000.00				
Grout						1.00	LS						3,500.00				
STS Core 3" (126/ea)						1.00	LS						3,000.00				
Underdrain Install						126.00	EA		1.000		WK8						
Underdrain Install 10-12		3.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---
44 43 34B Filter Underdrain Syste		1.00	LS	---	---	480	68.10	32,689	---	---	---	1,000	---	---	---	---	33,689
Pump Rehab		1	LS														
Pump Rehab						1.00	LS								37,275.00		
Foreman						2.00	EA		0.063		SU3						
Underdrain Install						2.00	EA		0.021		WK8						
Pump Rehab		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Equipment Field Coordinator						2.00	MO		1.000		EN2		300.00				
Division 44—Pollution and Waste Cont		1.00	LS	---	---	1,258	68.64	86,354	---	11,907	---	-7,084	---	4,065	---	---	95,242



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Proprietary and Confidential

Div.2	Division 02—Existing Conditions-Solids	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
02 41 00B Demolition		1 LS																
Demo Existing 12" BWR Pipe		120 LF																
4 Locations behind diversion box																		
DC01 Note 1						120.00	LF											
Demo Existing 12" BWR Pipe		120.00 LF																
Demo Foreman	120 LF	3.750	0.267	32	SU3	82.30	2,634	---	---	---	---	---	---	---	---	---	21.95	2,634
Laborer	120 LF	1.250	0.800	96	LG5	58.37	5,604	---	---	---	---	---	---	---	---	---	46.70	5,604
Bckho 329EL 2.5CY -O	120 LF	3.750	0.267	32	OP2	75.05	2,402	174.34	5,579	---	---	---	---	---	---	---	66.51	7,981
Dumpster	1 EA	---	---	---	---	---	---	---	---	750.00	750	---	---	---	---	---	750.00	750
Demo Existing 12" BWR Pipe		120.00 LF	0.750	1.333	160	66.49	10,639	46.49	5,579	6.25	750	---	---	---	---	---	141.40	16,968
Demo Burried Electrical Conduit		705 LF																
DC01 Note 2																		
Demo Burried Electrical Conduit		705.00 LF																
Demo Foreman	705 LF	45.000	0.022	16	SU3	82.30	1,289	---	---	---	---	---	---	---	---	---	1.83	1,289
Laborer	705 LF	15.000	0.067	47	LG5	58.37	2,743	---	---	---	---	---	---	---	---	---	3.89	2,743
Bckho 329EL 2.5CY -O	705 LF	45.000	0.022	16	OP2	75.05	1,176	174.34	2,731	---	---	---	---	---	---	---	5.54	3,907
Dumpster	1 EA	---	---	---	---	---	---	---	---	750.00	750	---	---	---	---	---	750.00	750
Demo Burried Electrical Conduit		705.00 LF	9.000	0.111	78	66.49	5,209	3.87	2,731	1.06	750	---	---	---	---	---	12.33	8,690
Demo 24" BWW Valve & Tee		3 EA																
DC02 Note 1&2																		
Demo 24" BWW Valve & Tee						3.00	EA											
Demo Foreman						3.00	EA		0.125		SU3							
Laborer						3.00	EA		0.042		LG5							
Bckho 329EL 2.5CY -O						3.00	EA		0.125		OP2						EX Cat 329	
Dumpster						1.00	EA						750.00					

Div.2	Division 02—Existing Conditions-Solids	1.00
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Div.2	Division 02—Existing Conditions-Solids	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Demo 24" BWW Valve & Tee	3.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Demo 12" Plug Valve	1	EA															
	Demo 12" Plug Valve					1.00	EA											
	Demo Foreman	1	EA	0.125	8.000	8	SU3 82.30	658	---	---	---	---	---	---	---	---	658.40	658
	Laborer	1	EA	0.042	24.000	24	LG5 58.37	1,401	---	---	---	---	---	---	---	---	1,400.88	1,401
	Bckho 329EL 2.5CY -O	1	EA	0.125	8.000	8	OP2 75.05	600	174.34	1,395	---	---	---	---	---	---	1,995.15	1,995
	Demo 12" Plug Valve	1.00	EA	0.025	40.000	40	66.49	2,660	1,394.75	1,395	---	---	---	---	---	---	4,054.43	4,054
	Demo 24" Filter Backwash Waste Line	240	LF															
	Assume Exoped																	
	Demo 24" Filter Backwash Waste Line					240.00	LF											
	Demo Foreman	240	LF	15.000	0.067	16	SU3 82.30	1,317	---	---	---	---	---	---	---	---	5.49	1,317
	Laborer	240	LF	5.000	0.200	48	LG5 58.37	2,802	---	---	---	---	---	---	---	---	11.67	2,802
	Bckho 329EL 2.5CY -O	240	LF	15.000	0.067	16	OP2 75.05	1,201	174.34	2,790	---	---	---	---	---	---	16.63	3,990
	Cut Pipe	1	LS	---	---	---	---	---	---	---	---	1,500	---	---	---	---	---	1,500
	Dumpster	2	EA	---	---	---	---	---	---	---	750.00	1,500	---	---	---	---	750.00	1,500
	Demo 24" Filter Backwash Waste Line	240.00	LF	3.000	0.333	80	66.49	5,319	11.62	2,790	12.50	3,000	---	---	---	---	46.29	11,109
	Demo 8" Solids Blowdown Line	240	LF															
	Assume exposed																	
	Demo 8" Solids Blowdown Line					240.00	LF											
	Demo 8" Solids Blowdown Line					240.00	LF											
	Demo Foreman	240	LF	30.000	0.033	8	SU3 82.30	658	---	---	---	---	---	---	---	---	2.74	658
	Laborer	240	LF	10.000	0.100	24	LG5 58.37	1,401	---	---	---	---	---	---	---	---	5.84	1,401
	Bckho 329EL 2.5CY -O	240	LF	30.000	0.033	8	OP2 75.05	600	174.34	1,395	---	---	---	---	---	---	8.31	1,995
	Dumpster	4	EA	---	---	---	---	---	---	---	750.00	3,000	---	---	---	---	750.00	3,000
	Demo 8" Solids Blowdown Line	240.00	LF	6.000	0.167	40	66.49	2,660	5.81	1,395	12.50	3,000	---	---	---	---	29.39	7,054

Div.2	Division 02—Existing Conditions-Solids	1.00
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Div.2	Division 02—Existing Conditions-Solids	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Demo Basin Exposed Drain 6" Lines	1,440	LF															
	Lagoon 3 & 4																	
	Exposed on sand bed PVC or HDPE ?																	
	Demo Basin 6" Lines					1,440.00	LF											
	Demo Foreman	1,440	LF	45.000	0.022	32	SU3 82.30	2,634	---	---	---	---	---	---	---	---	1.83	2,634
	Laborer	1,440	LF	15.000	0.067	96	LG5 58.37	5,604	---	---	---	---	---	---	---	---	3.89	5,604
	Skidsteer Ldr Cat 246C	1,440	LF	45.000	0.022	32	OP2 75.05	2,402	63.25	2,024	---	---	---	---	---	---	3.07	4,426
	Dumpster	4	EA	---	---	---	---	---	---	---	750.00	3,000	---	---	---	---	750.00	3,000
	Demo Basin Exposed Drain 6" Lines	1,440.00	LF	9.000	0.111	160	66.49	10,639	1.41	2,024	2.08	3,000	---	---	---	---	10.88	15,663
	Demo Sand Layer 3 Clay Lined	533.50	CY															
	Assume 1' of sand removal																	
	240x60- 2 Each					533.50												
	Assume 1' Sand					533.50	CY											
	Demo Foreman	533.50	CY	22.350	0.045	24	SU3 82.30	1,965	---	---	---	---	---	---	---	---	3.68	1,965
	Laborer	533.50	CY	22.350	0.045	24	LG5 58.37	1,393	---	---	---	---	---	---	---	---	2.61	1,393
	Cat 416F2 Skiploader-0	533.50	CY	22.350	0.045	24	OP2 75.05	1,791	83.70	1,998	---	---	---	---	---	---	7.10	3,789
	Cat, 938G Loader	533.50	CY	22.350	0.045	24	OP2 75.05	1,791	95.79	2,287	---	---	---	---	---	---	7.64	4,078
	Trac JD450G 70hp -O	533.50	CY	22.350	0.045	24	OP2 75.05	1,791	26.56	634	---	---	---	---	---	---	4.55	2,425
	30% Swell Factor for hauling					693.55	EA											
	Trucking 13cy Loads					69.00	EA											
P	Hour Trucking	138	HR	---	---	---	---	---	---	---	120.00	16,560	---	---	---	---	120.00	16,560
P	Tipping Fee	69	EA	---	---	---	---	---	---	---	450.00	31,050	---	---	---	---	450.00	31,050
	Demo Sand Layer 3 Clay Lined	533.50	CY	4.470	0.224	119	73.16	8,732	9.22	4,918	89.24	47,610	---	---	---	---	114.83	61,261
	Demo Sand Layer 4 Clay Lined	533.50	CY															
	Assume 1' of sand removal																	
	240x60- 2 Each					533.50												

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Div.2	Division 02—Existing Conditions-Solids	1.00
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Div.2	Division 02—Existing Conditions-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Assume 1' Sand					533.50	CY											
	Demo Foreman					533.50	CY		22.350		SU3							
	Laborer					533.50	CY		22.350		LG5							
	Cat 416F2 Skiploader-0					533.50	CY		22.350		OP2						Cat 416F2 Skip	
	Cat, 938G Loader					533.50	CY		22.350		OP2						Ldr Cat938	
	Trac JD450G 70hp -0					533.50	CY		22.350		OP2						Dozer JD450	
	30% Swell Factor for hauling					693.55												
	Trucking 13cy Loads					53.00	EA						120.00					
	Hour Trucking					106.00	HR						450.00					
	Tipping Fee					53.00	EA											
Demo Sand Layer 4 Clay Lined		533.50	CY	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Demo Concrete Diversion Structures		130	CY															
	Demo Concrete Diversion Structures					32.40	CY											
	4 Structures					130.00	CY											
	Demo Structure 1 & 3	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	40,000	---	40,000
	Demo Structure 2 & 4					1.00	LS								40,000	00.00		
Demo Concrete Diversion Structures		130.00	CY	---	---	---	---	---	---	---	---	---	---	---	307.69	40,000	307.69	40,000
Pretreatment BLDG Demo		1	LS															
	Pretreatment BLDG Demo					1.00	EA											
	Demo Foreman	1	EA	0.031	32.000	32	SU3 82.30	2,634	---	---	---	---	---	---	---	---	2,633.60	2,634
	Laborer	1	EA	0.010	96.000	96	LG5 58.37	5,604	---	---	---	---	---	---	---	---	5,603.52	5,604
	Gantry	1	LS	---	---	---	---	---	---	---	---	2,500	---	---	---	---	---	2,500
Pretreatment BLDG Demo		1.00	LS	---	---	128	64.35	8,237	---	---	---	2,500	---	---	---	---	---	10,737
02 41 00B Demolition		1.00	LS	---	---	806	67.14	54,094	---	20,832	---	60,610	---	---	---	40,000	---	175,536

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Div.2	Division 02—Existing Conditions-Solids	1.00
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Div.2	Division 02—Existing Conditions-Solids	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
Division 02—Existing Conditions-Solid	1.00 LS			---	---	806	67.14	54,094	---	20,832	---	60,610	---	---	---	40,000	---	175,536



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Div.3	Division 03—Concrete-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
CONCRETE - Diversion Structures 1 & 3		153	CY														
Sub Grade Prep		3,064	SF														
Quantities						3,064.00											
3	Foundation Prep	3,064	SF	200.000	0.005	46 WKS	63.37	2,912	---	---	---	---	---	---	---	0.950550	2,912
	Bckho-Ldr Ct 420C 1.0cy	3,064	SF	200.000	0.005	15 OP2	75.05	1,150	72.69	1,114	---	---	---	---	---	0.738685	2,263
	Trench Compactor 24"-33"	3,064	SF	200.000	0.005	---	---	---	27.44	420	---	---	---	---	---	0.137209	420
	Cold Weather Slab Protection	3,064	SF	---	---	---	---	---	---	---	2.00	6,128	---	---	---	2.00	6,128
Sub Grade Prep		3,064.00	SF	50.000	0.020	61	66.29	4,062	0.500644	1,534	2.00	6,128	---	---	---	3.83	11,724
Concrete Formwork		3,950	SF														
Fab Formwork		1,183	SF														
Fab SOG & Ftg Forms		144	SF														
Rental SOG Forms						144.00											
4	1. Diversion Structure (4/ea)	144	SFM	---	---	---	---	---	---	---	3.50	2,016	---	---	---	14.00	2,016
	Form Hardware	144	SF	---	---	---	---	---	---	---	0.600000	86	---	---	---	0.600000	86
	Dimen. Lumber (2x4-2x10)	316.80	BF	---	---	---	---	---	---	---	2.50	792	---	---	---	2.50	792
Fab SOG & Ftg Forms		144.00	SF	---	---	---	---	---	---	---	20.10	2,894	---	---	---	20.10	2,894
Fab Wall Forms		1,039	SF														
Rental Wall Forms						1,039.00											
4	1. Diversion Structure (4/ea)	1,039	SFM	---	---	---	---	---	---	---	3.50	14,546	---	---	---	14.00	14,546
	Mob in/Mob Out Rental Forms	4	LDS	---	---	---	---	---	---	---	2,000.00	8,000	---	---	---	2,000.00	8,000
	Load/Unload Rental Forms	32	HR	1.000	1.000	32 WKS	63.37	2,028	---	---	---	---	---	---	---	63.37	2,028

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Div.3	Division 03—Concrete-Solids	1.00
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Div.3	Division 03—Concrete-Solids	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Assemble/ Disassemble Form Sys	1,039	SF	8.000	0.125	130	63.37	8,230	---	---	---	---	---	---	---	---	7.92	8,230
	Form Hardware	1,039	SF	---	---	---	---	---	---	---	0.600000	623	---	---	---	---	0.600000	623
	Scaffold Planks	240	LF	---	---	---	---	---	---	---	5.00	1,200	---	---	---	---	5.00	1,200
	Fab Wall Forms	1,039.00	SF	6.419	0.156	162	63.37	10,258	---	---	23.45	24,369	---	---	---	---	33.33	34,627
	Fab Formwork	1,183.00	SF	7.308	0.137	162	63.37	10,258	---	---	23.05	27,264	---	---	---	---	31.72	37,522
	Erect and Strip Formwork	3,950	SF															
	Totals Formwork					3,950.00	SF											
	Form Oil	3,950	SF	---	---	---	---	---	---	---	0.030000	119	---	---	---	---	0.030000	119
	Erect and Strip Supplies	3,950	SF	---	---	---	---	---	---	---	0.250000	988	---	---	---	---	0.250000	988
	1. Diversion Structure (4/ea)	3,950	SF															
	1. Diversion Structure (4/ea)					3,950.00	SF											
	SOG & Ftgs (8/ea)	288	SF	2.000	0.500	144	63.37	9,125	---	---	---	---	---	---	---	---	31.69	9,125
	Slopped Slab (8/ea) Against Existing 3 Sides	84	SF	1.500	0.667	56	63.37	3,549	---	---	---	---	---	---	---	---	42.25	3,549
	Walls 2' (4/ea) Stem	216	SF	3.000	0.333	72	63.37	4,563	---	---	---	---	---	---	---	---	21.12	4,563
	Walls 13' (4/ea) Box	2,808	SF	6.000	0.167	468	63.37	29,657	---	---	---	---	---	---	---	---	10.56	29,657
	Walls Slopped 13' to 0' (8/ea)	308	SF	4.000	0.250	77	63.37	4,879	---	---	---	---	---	---	---	---	15.84	4,879
	Blockouts	178	SF	1.500	0.667	119	63.37	7,520	---	---	---	---	---	---	---	---	42.25	7,520
	Stairs	68	SF	1.000	1.000	68	63.37	4,309	---	---	---	---	---	---	---	---	63.37	4,309
	1. Diversion Structure (4/ea)	3,950.00	SF	3.936	0.254	1,004	63.37	63,602	---	---	---	---	---	---	---	---	16.10	63,602
	Loose Formwork	462	SF															
	Edge Materials					68.00												
	Form Ply 3/4"	74.80	SF	---	---	---	---	---	---	---	3.00	224	---	---	---	---	3.00	224
	Dimen. Lumber (2x4-2x10)	149.60	BF	---	---	---	---	---	---	---	2.50	374	---	---	---	---	2.50	374

Div.3	Division 03—Concrete-Solids	1.00
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
Wall Sitck Built Materials						216.00												
	Form Ply 3/4"	237.60 SF		---	---	---	---	---	---	---	3.00	713	---	---	---	---	3.00	713
	Dimen. Lumber (2x4-2x10)	475.20 BF		---	---	---	---	---	---	---	2.50	1,188	---	---	---	---	2.50	1,188
Handrail Lumber 4 Bf per lf						240.00 lf												
	Dimen. Lumber (2x4-2x10)	960 BF		---	---	---	---	---	---	---	2.50	2,400	---	---	---	---	2.50	2,400
	Handrails	240 LF		5.000	0.200	48 ^{WKS}	63.37	3,042	---	---	---	---	---	---	---	---	12.67	3,042
Blockouts						178.00 SF												
	Form Ply 3/4"	195.80 SF		---	---	---	---	---	---	---	3.00	587	---	---	---	---	3.00	587
	Dimen. Lumber (2x4-2x10)	391.60 BF		---	---	---	---	---	---	---	2.50	979	---	---	---	---	2.50	979
Loose Formwork		462.00 SF		9.625	0.104	48	63.37	3,042	---	---	13.99	6,466	---	---	---	---	20.58	9,507
Erect and Strip Formwork		3,950.00 SF		3.756	0.266	1,052	63.37	66,644	---	---	1.92	7,572	---	---	---	---	18.79	74,216
Concrete Formwork		3,950.00 SF		3.255	0.307	1,214	63.37	76,902	---	---	8.82	34,835	---	---	---	---	28.29	111,738
03300 Cast In Place Concrete		153 CY																
Concrete Materials		160.65 CY																
TOTAL CONCRETE						153.00 Cy												
CONC BASE BID						153.00												
	Conc.4000 Psi	153 CY		---	---	---	---	---	---	---	---	---	250.00	38,250	---	---	250.00	38,250
	Conc.4000 Psi Waste 5%	7.65 CY		---	---	---	---	---	---	---	---	---	250.00	1,913	---	---	250.00	1,913
	Short Load	10 EA		---	---	---	---	---	---	---	---	---	350.00	3,500	---	---	350.00	3,500
	Enviromental Fees	19 LD		---	---	---	---	---	---	---	---	---	35.00	665	---	---	35.00	665
	Fuel Surcharge	19 LD		---	---	---	---	---	---	---	---	---	35.00	665	---	---	35.00	665
	Hot Weather Concrete-Ice	--- CY		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Cold Weather Concrete	76.50 CY		---	---	---	---	---	---	---	---	---	75.00	5,738	---	---	75.00	5,738

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Conc. Placing Supplies	153	CY	---	---	---	---	---	---	---	40.00	6,120	---	---	---	---	40.00	6,120
	Concrete Materials	160.65	CY	---	---	---	---	---	---	---	38.10	6,120	315.78	50,730	---	---	353.87	56,850
	Concrete Placement	153	CY															
	Total Concrete CY					153.00												
	1. Diversion Structure (2/ea)	153	CY															
	1. Diversion Structure (2/ea)					153.00	CY											
	SOG & Ftgs (8/ea)	36.50	CY	1.250	0.800	29	WKS 63.37	1,850	---	---	---	---	---	---	---	---	50.70	1,850
	Slopped Slab (8/ea) Against Existing 3 Sides	45	CY	1.000	1.000	45	WKS 63.37	2,852	---	---	---	---	---	---	---	---	63.37	2,852
	Slopped Slab Screedrail	1	LS	---	---	---	---	---	---	---	---	3,000	---	---	---	---	---	3,000
	Walls 2' (4/ea) Stem	4	CY	0.250	4.000	16	WKS 63.37	1,014	---	---	---	---	---	---	---	---	253.48	1,014
	Walls 13' (4/ea) Box	52	CY	1.250	0.800	42	WKS 63.37	2,636	---	---	---	---	---	---	---	---	50.70	2,636
	Walls Slopped 13' to 0' (8/ea)	11.50	CY	1.250	0.800	9	WKS 63.37	583	---	---	---	---	---	---	---	---	50.70	583
	Stairs	3	CY	1.250	0.800	2	WKS 63.37	152	---	---	---	---	---	---	---	---	50.70	152
	1. Diversion Structure (2/ea)	153.00	CY	1.067	0.937	143	63.37	9,087	---	---	19.61	3,000	---	---	---	---	79.00	12,087
	Pumping	153	CY															
	Tailgate					0.00	CY											
	Crane & Bucket					0.00	CY											
	Concrete Pump					153.00	CY											
	36 M 120' Boom (Hourly Charge)	128	HR	---	---	---	---	---	---	---	195.00	24,960	---	---	---	---	195.00	24,960
	36 M 120' Boom (CY Charge)	153	CY	---	---	---	---	---	---	---	4.25	650	---	---	---	---	4.25	650
	Pumping	153.00	CY	---	---	---	---	---	---	---	167.39	25,610	---	---	---	---	167.39	25,610
	Concrete Placement	153.00	CY	1.067	0.937	143	63.37	9,087	---	---	187.00	28,610	---	---	---	---	246.39	37,698
	03300 Cast In Place Concrete	153.00	CY	1.067	0.937	143	63.37	9,087	---	---	227.00	34,730	331.57	50,730	---	---	617.96	94,548

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
03251 Concrete Joints		153	CY														
Concrete Joint Qty																	
Joint Prep-Waterblast		368	SF														
Vertical CJ Retardant Labor		--- SF	60.000	0.017	---	WKS 63.37	---	---	---	---	---	---	---	---	---	---	---
Horizontal CJ Retardant Labor		368 SF	10.000	0.100	37	WKS 63.37	2,332	---	---	---	---	---	---	---	---	6.34	2,332
Joint Prep (Waterblast)		368 SF	10.000	0.100	37	WKS 63.37	2,332	---	---	---	---	---	---	---	---	6.34	2,332
Waterblast Equip. & STS		1 LS	---	---	---	---	---	---	---	---	1,500	---	---	---	---	---	1,500
Vertical CJ + 10% Retardant Purchase		--- SF	---	---	---	---	---	---	---	0.600000	---	---	---	---	---	---	---
Horizontal CJ + 10% Retardant Purchase		404.80 SF	---	---	---	---	---	---	---	0.300000	121	---	---	---	---	0.300000	121
Joint Prep-Waterblast		368.00 SF	5.000	0.200	74	63.37	4,664	---	---	4.41	1,621	---	---	---	---	17.08	6,285
Waterstop Qty		162	LF														
Waterstop Qty						162.00											
Waterstop PVC		162 LF	---	---	---	---	---	---	---	---	---	9.00	1,458	---	---	9.00	1,458
Hydro Waterstop		--- LF	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Install Waterstops		162 LF	5.000	0.200	32	WKS 63.37	2,053	---	---	---	---	---	---	---	---	12.67	2,053
Install Hydro Waterstop		--- LF	5.000	0.200	---	WKS 63.37	---	---	---	---	---	---	---	---	---	---	---
Waterstop Qty		162.00 LF	5.000	0.200	32	63.37	2,053	---	---	---	---	9.00	1,458	---	---	21.67	3,511
03251 Concrete Joints		153.00 CY	1.443	0.693	106	63.37	6,717	---	---	10.60	1,621	9.53	1,458	---	---	64.03	9,797
Conc Finishing		3,744	SF														
Quantities						3,744.00 SF											
Point and Patch Finish		2,496 SF	40.000	0.025	62	WKS 63.37	3,954	---	---	---	---	---	---	---	---	1.58	3,954
Grout Finish		1,248 SF	15.000	0.067	83	WKS 63.37	5,272	---	---	---	---	---	---	---	---	4.22	5,272
Finishing Supplies P&P		2,496 SF	---	---	---	---	---	---	---	0.030000	75	---	---	---	---	0.030000	75
Finish Supplies Smooth Form		1,248 SF	---	---	---	---	---	---	---	0.100000	125	---	---	---	---	0.100000	125

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Wet Finish Supplies	---	SF	---	---	---	---	---	---	---	0.050000	---	---	---	---	---	---	---
	Conc Finishing	3,744.00	SF	25.714	0.039	146	63.37	9,227	---	---	0.053333	200	---	---	---	---	2.52	9,426
	Curing	153	CY															
	Curing	7,495	SF															
	Quantities					7,495.00	SF											
	Curing Labor	7,495	SF	200.000	0.005	37	63.37	2,375	---	---	---	---	---	---	---	---	0.316850	2,375
	Water Curing Supplies	7,495	SF	---	---	---	---	---	---	---	0.100000	750	---	---	---	---	0.100000	750
	Curing	7,495.00	SF	200.000	0.005	37	63.37	2,375	---	---	0.100000	750	---	---	---	---	0.416850	3,124
	Curing	153.00	CY	4.083	0.245	37	63.37	2,375	---	---	4.90	750	---	---	---	---	20.42	3,124
	03200 Conc Reinforcement	17.98	TN															
	Rebar Sub: Supply & Install	17.98	TN															
	Rule of Thumb 235 Lbs per CY					35,955.00	Lbs											
	Purchase Form Savers																	
	Mech. Coupler #5	---	EA	---	---	---	---	---	---	---	---	---	26.70	---	---	---	---	---
	Rebar Subcontractor																	
	Concrete Rebar= \$3000 per TN					53,932.50	USD											
	03200 Concrete Rebar Sub	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	54,000	---	54,000
	Rebar Sub: Supply & Install	17.98	TN	---	---	---	---	---	---	---	---	---	---	---	3,003.75	54,000	3,003.75	54,000
	Install Formsavers/Drill Dowel	---	EA															
	Install Formsavers																	
	Install No 5- 8 Form Savers	---	EA	4.000	0.250	---	63.37	---	---	---	---	---	---	---	---	---	---	---

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Drill & Dowel Rebar																	
	Drill in Dowels up to 12 " Depth	---	EA	3.000	0.333	---	WKS 63.37	---	---	---	---	---	---	---	---	---	---	---
	STS Dowels incl's Epoxy, Drills, Bits Etc.	---	EA	---	---	---	---	---	---	---	9.00	---	---	---	---	---	---	---
	Install Formsavers/Drill Dowel	---	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03200 Conc Reinforcement	17.98	TN	---	---	---	---	---	---	---	---	---	---	---	3,003.75	54,000	3,003.75	54,000
	Concrete Equipment	1	LS															
	Concrete Foreman	1	MO	1.000	1.000	173	SU3 82.30	14,265	---	---	---	---	---	---	---	---	14,265.32	14,265
	Concrete Field Coordinator	0.50	MO	1.000	1.000	87	EN2 88.42	7,663	---	---	---	---	300.00	150	---	---	15,626.00	7,813
	Crane Ruff Ter 90 Ton	1	MO	1.000	1.000	173	OP4 91.73	15,900	126.10	21,815	---	---	---	---	---	---	37,714.37	37,714
	Forklift, RT 10,000# Reach	2	MO	1.000	1.000	347	OP2 75.05	26,017	121.50	42,039	---	---	---	---	---	---	34,028.19	68,056
	Comp 185 CFM Diesel	2	MO	1.000	1.000	---	---	---	27.26	9,433	---	---	---	---	---	---	4,716.31	9,433
	Scaffod	2	MO	1.000	1.000	---	---	---	8.67	3,000	---	---	---	---	---	---	1,500.00	3,000
	Gen Fldlites 5-10 KW	2	MO	1.000	1.000	---	---	---	4.88	1,688	---	---	---	---	---	---	843.85	1,688
	Concrete Equipment	1.00	LS	---	---	780	81.85	63,845	---	77,974	---	---	---	150	---	---	---	141,969
	CONCRETE - Diversion Structures	153.00	CY	0.062	16.257	2,487	69.24	172,216	519.66	79,508	511.53	78,264	342.08	52,338	352.94	54,000	2,851.80	436,326
	Division 03—Concrete-Solids	1.00	LS	---	---	2,487	69.24	172,216	---	79,508	---	78,264	---	52,338	---	54,000	---	436,326



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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	05 50 00B Metal Fabrications	1	LS															
	05 05 19B Post-Installed Anchors																	
	05500 Misc Metals	1	LS															
	Supply Misc Metals	1	LS															
	Diversion Structures																	
	Grating					480.00	SF						50.00		24,000.00			
	Grating Angle					184.00	LF						20.00		3,680.00			
	Grating Supports Beams					64.00	LF						50.00		3,200.00			
	Alum. Stairs (3 Risers)					3.00	EA						1,500.00		4,500.00			
	Handrail Stairs					40.00	LF						65.00		2,600.00			
	Handrail Exterior of Structure					208.00	LF						65.00		13,520.00			

	Diversion Structures					51,500.00												
	Materials																	
	05500 Supply Misc Metals	1	LS	---	---	---	---	---	---	---	---	---	---	51,500	---	---	---	51,500
	Supply Anchor Bolts	188	EA	---	---	---	---	---	---	---	---	---	15.00	2,820	---	---	15.00	2,820
	STS Drill and Epoxy	188	EA	---	---	---	---	---	---	---	20.00	3,760	---	---	---	---	20.00	3,760
	Non-Shrink Grout	---	CF	---	---	---	---	---	---	---	---	---	25.00	---	---	---	---	---
	Epoxy Grout	---	CF	---	---	---	---	---	---	---	---	---	250.00	---	---	---	---	---
	Concrete Class 4 - 3000 psi	---	CY	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Supply Misc Metals	1.00	LS	---	---	---	---	---	---	---	---	3,760	---	54,320	---	---	---	58,080
	Install Misc Metals	1	LS															
	Grating	480	SF	5.000	0.200	96	WKS 63.37	6,084	---	---	---	---	---	---	---	---	12.67	6,084
	Grating Angle	184	LF	5.000	0.200	37	WKS 63.37	2,332	---	---	---	---	---	---	---	---	12.67	2,332

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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Grating Supports Beams	8	EA	0.250	4.000	32	WKS 63.37	2,028	---	---	---	---	---	---	---	---	253.48	2,028
	Alum. Stairs (3 Risers)	3	EA	0.063	16.000	48	WKS 63.37	3,042	---	---	---	---	---	---	---	---	1,013.92	3,042
	Handrail	248	LF	2.000	0.500	124	WKS 63.37	7,858	---	---	---	---	---	---	---	---	31.69	7,858
	Forklift, RT 10,000# Reach	40	HR	1.000	1.000	40	OP2 75.05	3,002	121.50	4,860	---	---	---	---	---	---	196.55	7,862
	Metals Foreman	40	HR	1.000	1.000	40	SU3 82.30	3,292	---	---	---	---	---	---	---	---	82.30	3,292
	Install Misc Metals	1.00	LS	---	---	417	66.31	27,637	---	4,860	---	---	---	---	---	---	---	32,497
	05500 Misc Metals	1.00	LS	---	---	417	66.31	27,637	---	4,860	---	3,760	---	54,320	---	---	---	90,577
	05 50 00B Metal Fabrications	1.00	LS	---	---	417	66.31	27,637	---	4,860	---	3,760	---	54,320	---	---	---	90,577
	Division 05—Metals-Solids	1.00	LS	---	---	417	66.31	27,637	---	4,860	---	3,760	---	54,320	---	---	---	90,577



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Location

Item Analysis Sheet

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Div.6	Division 06- FRP Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
06 08 17 FRP		1	LS															
	Solids Lagoon Level Gauges					4.00	EA						2,500.00		10,000.00			
06 08 17 FRP		1	LS	---	---	---	---	---	---	---	---	---	---	10,000	---	---	---	10,000
	Level Gauges	4	EA	0.083	12.000	48	63.37	3,042	---	---	---	---	---	---	---	---	760.44	3,042
06 08 17 FRP		1.00	LS	---	---	48	63.37	3,042	---	---	---	---	---	10,000	---	---	---	13,042
Division 06- FRP Solids		1.00	LS	---	---	48	63.37	3,042	---	---	---	---	---	10,000	---	---	---	13,042



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Div.31	Division 31 - Earthwork	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Earthwork	1	LS															
	Diversion Structure Shoring	1	LS															
	Shoring Per Month per Unit					1.00	MO									21,222.10		
	2 Units Per Month					2.00	EA									42,444.20		

	Engineering					1.00	EA									2,800.00		
	Delivery & Pickup					2.00	EA						3,750.00			7,500.00		
	4 Months Rental 2 Units					4.00	MO						42,444.20			169,776.80		

	Total					1.00	LS									180,076.80		
	Shoring Box for Concrete Lined Beds	1	LS	---	---	---	---	---	---	---	---	180,076	---	---	---	---	---	180,076
	Diversion Structure Shoring	1.00	LS	---	---	---	---	---	---	---	---	180,076	---	---	---	---	---	180,076
	Diversion Structures Earthwork	1	LS															
	Excavate Structure for demolition in Div. 2																	
	Prep for new structure																	
	Excavation Each					179.00	CY											
	Total Ex					716.00	CY											
	Clay Lined Beds Repair	1	LS															
	Patch Clay Lined Pond					750.00	SF						15.00			11,250.00		
	Patch Clay Lined Pond					1.00	LS						11,250.00					
	Clay Lined Beds Repair	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Nuisance Dewatering For Excavations	1	LS															

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Div.31	Division 31 - Earthwork	1.00
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Div.31	Division 31 - Earthwork	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Pump 8" Trash)Hyd/Diesel) -O	6	MO	1.000	1.000	---	---	---	12.79	13,276	---	---	---	---	---	---	2,212.62	13,276
	Fuel	150	GAL	---	---	---	---	---	---	---	5.00	750	---	---	---	---	5.00	750
	Piping	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	Laborer	40	HR	1.000	1.000	40	58.37	2,335	---	---	---	---	---	---	---	---	58.37	2,335
	Nuisance Dewatering For Excavations	1.00	LS	---	---	40	58.37	2,335	---	13,276	---	1,250	---	---	---	---	---	16,861
	Excavate Structures	716	CY															
	4 Structures																	
	2 Day per Structure																	
	Install Slide Rail During Excavation																	
	Excavate Structures	716.00	CY															
	0.5 Demo Foreman	716	CY	11.250	0.089	32	82.30	2,619	---	---	---	---	---	---	---	---	3.66	2,619
	0.5 Laborer	716	CY	5.625	0.178	64	58.37	3,715	---	---	---	---	---	---	---	---	5.19	3,715
	0.5 Bckho 349EL-3.0 cy-O	716	CY	11.250	0.089	32	75.05	2,388	192.26	6,118	---	---	---	---	---	---	11.88	8,506
	0.5 Skidsteer Ldr Cat 246C	716	CY	11.250	0.089	32	75.05	2,388	63.25	2,013	---	---	---	---	---	---	6.15	4,401
	0.5 Cat, 938G Loader	716	CY	11.250	0.089	32	75.05	2,388	95.79	3,048	---	---	---	---	---	---	7.59	5,437
	Export																	
	Trucking 13cy Loads																	
	0.5 Hour Trucking	34	HR	---	---	---	---	---	---	---	120.00	2,040	---	---	---	---	60.00	2,040
	0.5 Tipping Fee	17	EA	---	---	---	---	---	---	---	350.00	2,975	---	---	---	---	175.00	2,975
	Excavate Structures	716.00	CY	3.750	0.267	191	70.70	13,499	15.61	11,179	7.00	5,015	---	---	---	---	41.47	29,693
	Subgrade Prep	1,824	SF															
	36" Rockbase																	
	0.5 Rock	405	TN	---	---	---	---	---	---	---	---	---	30.00	6,075	---	---	15.00	6,075
	Subgrade Prep	1,824.00	SF															
	0.5 Foreman	1,824	SF	28.500	0.035	32	82.30	2,634	---	---	---	---	---	---	---	---	1.44	2,634
	Div.31	Division 31 - Earthwork	1.00															



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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
0.5	Laborer	1,824	SF	14.250	0.070	64	LG5 58.37	3,736	---	---	---	---	---	---	---	---	2.05	3,736
0.5	Bckho 349EL-3.0 cy-O	1,824	SF	28.500	0.035	32	OP2 75.05	2,402	192.26	6,152	---	---	---	---	---	---	4.69	8,554
0.5	Skidsteer Ldr Cat 246C	1,824	SF	28.500	0.035	32	OP2 75.05	2,402	63.25	2,024	---	---	---	---	---	---	2.43	4,426
0.5	Trench Compactor 24"-33"	1,824	SF	28.500	0.035	---	---	---	27.44	878	---	---	---	---	---	---	0.481434	878
0.5	Trc Water-TA 2000 Gal -O	1,824	SF	28.500	0.035	32	OP2 75.05	2,402	33.37	1,068	---	---	---	---	---	---	1.90	3,469
Subgrade Prep		1,824.00	SF	9.500	0.105	192	70.70	13,574	5.55	10,122	---	---	3.33	6,075	---	---	16.32	29,771
Backfill Structures		412	CY															
Remove Sliderail																		
Backfill Structures		412.00	CY															
0.5	Demo Foreman	412	CY	6.400	0.156	32	SU3 82.30	2,649	---	---	---	---	---	---	---	---	6.43	2,649
0.5	Laborer	412	CY	3.200	0.313	64	LG5 58.37	3,758	---	---	---	---	---	---	---	---	9.12	3,758
0.5	Bckho 349EL-3.0 cy-O	412	CY	6.400	0.156	32	OP2 75.05	2,416	192.26	6,188	---	---	---	---	---	---	20.88	8,604
0.5	Cat, 938G Loader	412	CY	6.400	0.156	32	OP2 75.05	2,416	95.79	3,083	---	---	---	---	---	---	13.35	5,499
0.5	Trench Compactor 24"-33"	412	CY	6.400	0.156	---	---	---	27.44	883	---	---	---	---	---	---	2.14	883
0.5	Trc Water-TA 2000 Gal -O	412	CY	6.400	0.156	32	OP2 75.05	2,416	33.37	1,074	---	---	---	---	---	---	8.47	3,490
Backfill Structures		412.00	CY	2.133	0.469	193	70.70	13,654	27.25	11,229	---	---	---	---	---	---	60.39	24,883
Diversion Structures Earthwork		1.00	LS	---	---	616	69.90	43,061	---	45,806	---	6,265	---	6,075	---	---	---	101,208
Earthwork		1.00	LS	---	---	616	69.90	43,061	---	45,806	---	186,341	---	6,075	---	---	---	281,284
Lagoon Sand		3,200	CY															
Drain Rock 6"																		
Lagoon 1 & 2							533.00	CY				24.30						
Lagoon 3 & 4							533.00	CY										
Tons Drain Rock							2,132.00	TN				30.00			63,960.00			
SAND 12"																		

Div.31	Division 31 - Earthwork	1.00
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Lagoon 1 & 2					1,067	.00 CY											
	Lagoon 3 & 4					1,067	.00 CY											
	Tons Sand					4,268	.00 TN						25.00		106,700	.00		
P	0.5 Lagoon Drain Rock Supply	2,132	TN	---	---	---	---	---	---	---	---	---	30.00	31,980	---	---	15.00	31,980
P	0.5 Lagoon Sand Supply	4,268	TN	---	---	---	---	---	---	---	---	---	25.00	53,350	---	---	12.50	53,350
	Stockpile & Tram Sand					3,200	.00 CY											
	0.5 Cat, 938G Loader	3,200	CY	40.000	0.025	40	OP2 75.05	3,002	95.79	3,832	---	---	---	---	---	---	2.14	6,834
	Lagoon 1 & 2 Drain Rock Infill	533	CY															
	Lagoon 1 & 2 Drain Rock Infill					533	.00 CY											
	0.5 Foreman	533	CY	22.000	0.045	12	SU3 82.30	997	---	---	---	---	---	---	---	---	1.87	997
	0.5 Laborer	533	CY	7.333	0.136	36	LG5 58.37	2,121	---	---	---	---	---	---	---	---	3.98	2,121
	0.5 Cat, 938G Loader	533	CY	22.000	0.045	12	OP2 75.05	909	95.79	1,160	---	---	---	---	---	---	3.88	2,069
	0.5 Cat 416F2 Skiploader-0	533	CY	22.000	0.045	12	OP2 75.05	909	83.70	1,014	---	---	---	---	---	---	3.61	1,923
	0.5 Telebelt 130'	533	CY	22.000	0.045	---	---	---	425.00	5,148	---	---	---	---	---	---	9.66	5,148
	0.5 Telebelt 130'	533	CY	22.000	0.045	---	---	---	4.25	51	---	---	---	---	---	---	0.096591	51
	0.5 Trc Water-TA 2000 Gal -O	533	CY	22.000	0.045	12	OP2 75.05	909	33.37	404	---	---	---	---	---	---	2.46	1,313
	Lagoon 1 & 2 Drain Rock Infill	533.00	CY	6.286	0.159	85	68.94	5,846	14.59	7,778	---	---	---	---	---	---	25.56	13,624
	Lagoon 3&4 Drain Rock Infill	533	CY															
	Lagoon 3&4 Drain Rock Infill					533	.00 CY											
	0.5 Foreman	533	CY	22.000	0.045	12	SU3 82.30	997	---	---	---	---	---	---	---	---	1.87	997
	0.5 Laborer	533	CY	7.333	0.136	36	LG5 58.37	2,121	---	---	---	---	---	---	---	---	3.98	2,121
	0.5 Cat, 938G Loader	533	CY	22.000	0.045	12	OP2 75.05	909	95.79	1,160	---	---	---	---	---	---	3.88	2,069
	0.5 Cat 416F2 Skiploader-0	533	CY	22.000	0.045	12	OP2 75.05	909	83.70	1,014	---	---	---	---	---	---	3.61	1,923
	0.5 Telebelt 130'	533	CY	22.000	0.045	---	---	---	425.00	5,148	---	---	---	---	---	---	9.66	5,148
	0.5 Telebelt 130'	533	CY	22.000	0.045	---	---	---	4.25	51	---	---	---	---	---	---	0.096591	51
	0.5 Trc Water-TA 2000 Gal -O	533	CY	22.000	0.045	12	OP2 75.05	909	33.37	404	---	---	---	---	---	---	2.46	1,313

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Div.31	Division 31 - Earthwork	1.00
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Lagoon 3&4 Drain Rock Infill	533.00	CY	6.286	0.159	85	68.94	5,846	14.59	7,778	---	---	---	---	---	---	25.56	13,624
	Lagoon 1 & 2 Sand Infill	1,067	CY															
	Lagoon 1 & 2 Sand Infill					1,067	.00	CY										
0.5	Foreman	1,067	CY	27.000	0.037	20	SU3 82.30	1,626	---	---	---	---	---	---	---	---	1.52	1,626
0.5	Laborer	1,067	CY	9.000	0.111	59	LG5 58.37	3,460	---	---	---	---	---	---	---	---	3.24	3,460
0.5	Cat, 938G Loader	1,067	CY	27.000	0.037	20	OP2 75.05	1,483	95.79	1,893	---	---	---	---	---	---	3.16	3,376
0.5	Cat 416F2 Skiploader-0	1,067	CY	27.000	0.037	20	OP2 75.05	1,483	83.70	1,654	---	---	---	---	---	---	2.94	3,137
0.5	Telebelt 130'	1,067	CY	27.000	0.037	---	---	---	425.00	8,398	---	---	---	---	---	---	7.87	8,398
0.5	Telebelt 130'	1,067	CY	27.000	0.037	---	---	---	4.25	84	---	---	---	---	---	---	0.078704	84
0.5	Trc Water-TA 2000 Gal -O	1,067	CY	27.000	0.037	20	OP2 75.05	1,483	33.37	659	---	---	---	---	---	---	2.01	2,142
	Lagoon 1 & 2 Sand Infill	1,067.00	CY	7.714	0.130	138	68.94	9,535	11.89	12,688	---	---	---	---	---	---	20.83	22,223
	Lagoon 3 & 4 Sand Infill	1,067	CY															
	Lagoon 3 & 4 Sand Infill					1,067	.00	CY										
0.5	Foreman	1,067	CY	27.000	0.037	20	SU3 82.30	1,626	---	---	---	---	---	---	---	---	1.52	1,626
0.5	Laborer	1,067	CY	9.000	0.111	59	LG5 58.37	3,460	---	---	---	---	---	---	---	---	3.24	3,460
0.5	Cat, 938G Loader	1,067	CY	27.000	0.037	20	OP2 75.05	1,483	95.79	1,893	---	---	---	---	---	---	3.16	3,376
0.5	Cat 416F2 Skiploader-0	1,067	CY	27.000	0.037	20	OP2 75.05	1,483	83.70	1,654	---	---	---	---	---	---	2.94	3,137
0.5	Telebelt 130'	1,067	CY	27.000	0.037	---	---	---	425.00	8,398	---	---	---	---	---	---	7.87	8,398
0.5	Telebelt 130'	1,067	CY	27.000	0.037	---	---	---	4.25	84	---	---	---	---	---	---	0.078704	84
0.5	Trc Water-TA 2000 Gal -O	1,067	CY	27.000	0.037	20	OP2 75.05	1,483	33.37	659	---	---	---	---	---	---	2.01	2,142
	Lagoon 3 & 4 Sand Infill	1,067.00	CY	7.714	0.130	138	68.94	9,535	11.89	12,688	---	---	---	---	---	---	20.83	22,223
	Lagoon Sand	3,200.00	CY	6.581	0.152	486	69.44	33,763	13.99	44,763	---	---	26.67	85,330	---	---	51.21	163,856

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Div.31	Division 31 - Earthwork	1.00
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Div.31	Division 31 - Earthwork	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
Division 31 - Earthwork		1.00	LS	---	---	1,102	69.70	76,824	---	90,570	---	186,341	---	91,405	---	---	---	445,140

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Div.33	Division 33—Utilities-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
Buried Pipe		220	LF														
Yard Pipe Materials		1	LS														
	Purchase DIP					1.00	LS					98,837.00					
	Purchase Exposed Valves					1.00	LS					15,264.00					
	Purchase Exposed NBG					1.00	LS					19,217.00					
	Purchase Exposed Misc					1.00	LS					21,798.00					

Total																	
Purchase Yard Pipe Materials		1	LS	---	---	---	---	---	---	---	---	245,614	---	---	---	---	245,614
Pipe Rigging STS		1	LS	---	---	---	---	---	---	---	2,500	---	---	---	---	---	2,500
Pipe Installation STS		1	LS	---	---	---	---	---	---	---	1,500	---	---	---	---	---	1,500
3/4" Class II ABC		30	TN	---	---	---	---	---	---	---	---	27.00	810	---	---	27.00	810
Lean Conc Fill CLSM		59	CY	---	---	---	---	---	---	---	---	200.00	11,800	---	---	200.00	11,800
3/8" Pea Gravel (1.80 TN/CY)		41	TN	---	---	---	---	---	---	---	---	20.00	820	---	---	20.00	820
"Squeegee"		210	TN	---	---	---	---	---	---	---	---	27.00	5,670	---	---	27.00	5,670
Testing STS		1	LS	---	---	---	---	---	---	---	2,500	---	---	---	---	---	2,500
Trench Protection		1	LS	---	---	---	---	---	---	---	12,500	---	---	---	---	---	12,500
Yard Pipe Materials		1.00	LS	---	---	---	---	---	---	---	19,000	---	264,714	---	---	---	283,714
Nuisance Dewatering For Excavations		1	LS														
Pump 8" Trash)Hyd/Diesel) -O		3	MO	1.000	1.000	---	---	---	12.79	6,638	---	---	---	---	---	2,212.62	6,638
Fuel		150	GAL	---	---	---	---	---	---	---	5.00	750	---	---	---	5.00	750
Piping		1	LS	---	---	---	---	---	---	---	500	---	---	---	---	---	500

Div.33	Division 33—Utilities-Solids	1.00
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BE Number GMP 3 ARVADA
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Laborer	40	HR	1.000	1.000	40	58.37	2,335	---	---	---	---	---	---	---	---	58.37	2,335
	Nuisance Dewatering For Excavations	1.00	LS	---	---	40	58.37	2,335	---	6,638	---	1,250	---	---	---	---	---	10,223
	Pipe Subs	1	LS															
	Cathodic Protection	1	LS															
	Information unknown Only details are provided, no plans or specifications																	
	Cathodic Material and Install	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	30,000	---	30,000
	Test Stations	---	EA															
2	Yard Pipe Crew (LF+1PL+3LG3)	---	EA	0.125	8.000	---	58.38	---	---	---	---	---	---	---	---	---	---	---
	Bckho-Ldr Ct 420C 1.0cy	---	EA	0.125	8.000	---	75.05	---	---	---	---	---	---	---	---	---	---	---
	Test Stations	---	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Deep Anodes	---	EA															
2	Yard Pipe Crew (LF+1PL+3LG3)	---	EA	0.250	4.000	---	58.38	---	---	---	---	---	---	---	---	---	---	---
	Bckho-Ldr Ct 420C 1.0cy	---	EA	0.250	4.000	---	75.05	---	---	---	---	---	---	---	---	---	---	---
	Deep Anodes	---	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Cathodic Protection	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	30,000	---	30,000
	Pipe Subs	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	30,000	---	30,000
	Production Pipe Subtotal	220	LF															
	Pothole Crew	14	EA															
	Deep Potholes	4	EA															
2	Yard Pipe Crew (LF+1PL+3LG3)	4	EA	0.125	8.000	64	58.38	3,736	---	---	---	---	---	---	---	---	934.04	3,736

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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Bckho-Ldr Ct 420C 1.0cy	4	EA	0.125	8.000	32	OP2 75.05	2,402	72.69	2,326	---	---	---	---	---	---	1,181.90	4,728
	Deep Potholes	4.00	EA	0.042	24.000	96	63.94	6,138	581.50	2,326	---	---	---	---	---	---	2,115.94	8,464
	Shallow Potholes	10	EA															
	2 Yard Pipe Crew (LF+1PL+3LG3)	10	EA	0.250	4.000	80	WK1 58.38	4,670	---	---	---	---	---	---	---	---	467.02	4,670
	Bckho-Ldr Ct 420C 1.0cy	10	EA	0.250	4.000	40	OP2 75.05	3,002	72.69	2,907	---	---	---	---	---	---	590.95	5,909
	Shallow Potholes	10.00	EA	0.083	12.000	120	63.94	7,672	290.75	2,907	---	---	---	---	---	---	1,057.97	10,580
	Pothole Crew	14.00	EA	0.065	15.429	216	63.94	13,810	373.82	5,233	---	---	---	---	---	---	1,360.25	19,043
	Unload & Handle	1	LS															
	Unload & Handle	40	HR	1.000	1.000	40	WK1 58.38	2,335	---	---	---	---	---	---	---	---	58.38	2,335
	Forklift, RT 10,000# Reach	40	HR	1.000	1.000	40	OP2 75.05	3,002	121.50	4,860	---	---	---	---	---	---	196.55	7,862
	Unload & Handle	1.00	LS	---	---	80	66.71	5,337	---	4,860	---	---	---	---	---	---	---	10,197
	24" Backwash Waste (BWV)	160	LF															
	Tap existing to Lagoons 3 & 4, 2 locations																	
	24" CM Lined/Prime Coated DIP																	
	Bell/Spigot																	
	Bury depth: 5800.65																	
	6' Trench Width, 9.35' Deep																	
	Trench Box: 6'x12'x10'																	
	6" Pea Gravel Bedding, Pipe Zone+12" "Squeegee" Backfill																	
	Dig / Lay / Bury	160	LF															
	Dig / Lay / Bury																	
	2 Yard Pipe Crew (LF+1PL+3LG3)	160	LF	2.240	0.446	143	WK1 58.38	8,340	---	---	---	---	---	---	---	---	52.12	8,340
	Bckho 329EL 2.5CY -O	160	LF	2.240	0.446	71	OP2 75.05	5,361	174.34	12,453	---	---	---	---	---	---	111.34	17,814
	Cat, 938G Loader	160	LF	2.240	0.446	71	OP2 75.05	5,361	95.79	6,842	---	---	---	---	---	---	76.27	12,203
	Trench Compactor 24"-33"-O	160	LF	2.240	0.446	---	---	---	27.44	1,960	---	---	---	---	---	---	12.25	1,960
	Trc Water-TA 2000 Gal -O	160	LF	2.240	0.446	71	OP2 75.05	5,361	33.37	2,383	---	---	---	---	---	---	48.40	7,744

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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Dig / Lay / Bury	160.00	LF	0.448	2.232	357	68.38	24,422	147.74	23,639	---	---	---	---	---	---	300.38	48,061
	Risers	2 EA																
2	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.250	4.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Bckho 329EL 2.5CY -O	2 EA		0.250	4.000	8	OP2 75.05	600	174.34	1,395	---	---	---	---	---	---	997.58	1,995
	Cat, 938G Loader	2 EA		0.250	4.000	8	OP2 75.05	600	95.79	766	---	---	---	---	---	---	683.36	1,367
	Trench Compactor 24"-33"-O	2 EA		0.250	4.000	---	---	---	27.44	220	---	---	---	---	---	---	109.77	220
	Trc Water-TA 2000 Gal -O	2 EA		0.250	4.000	8	OP2 75.05	600	33.37	267	---	---	---	---	---	---	433.67	867
	Risers	2.00	EA	0.050	20.000	40	68.38	2,735	1,323.78	2,648	---	---	---	---	---	---	2,691.40	5,383
	Valve Adjustments	2 EA																
2	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.250	4.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Bckho-Ldr Ct 420C 1.0cy	2 EA		0.250	4.000	8	OP2 75.05	600	72.69	581	---	---	---	---	---	---	590.95	1,182
	Conc 3000 PSI	1 CY		---	---	---	---	---	---	---	---	---	200.00	200	---	---	200.00	200
	Valve Adjustments	2.00	EA	0.083	12.000	24	63.94	1,534	290.75	581	---	---	100.00	200	---	---	1,157.97	2,316
	Tie in to Existing	2 EA																
	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.125	8.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Bckho-Ldr Ct 420C 1.0cy	2 EA		0.125	8.000	16	OP2 75.05	1,201	72.69	1,163	---	---	---	---	---	---	1,181.90	2,364
	Tie in to Existing	2.00	EA	0.063	16.000	32	66.71	2,135	581.50	1,163	---	---	---	---	---	---	1,648.92	3,298
	Test	2 EA																
	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.125	8.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Comp 185 CFM Diesel	2 EA		0.125	8.000	---	---	---	27.26	436	---	---	---	---	---	---	218.10	436
	Test	2.00	EA	0.125	8.000	16	58.38	934	218.10	436	---	---	---	---	---	---	685.12	1,370
	24" Backwash Waste (BWW)	160.00	LF	0.341	2.932	469	67.70	31,760	177.92	28,467	---	---	1.25	200	---	---	377.67	60,428
	12" Backwash Recycle (BWR)	30 LF																
	Tap existing to Outlet Box 1 & 2, 2 locations																	
	12" CM Lined/Prime Coated DIP																	
	Bell/Spigot																	

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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Bury depth: 5801.69 5' Trench Width, 8.3' Deep Trench Box: 6'x12'x10' 6" Pea Gravel Bedding, Pipe Zone+12" "Squeegee" Backfill																	
	Dig / Lay / Bury	30 LF																
	Dig / Lay / Bury																	
2	Yard Pipe Crew (LF+1PL+3LG3)	30 LF		1.900	0.526	32	WK1 58.38	1,844	---	---	---	---	---	---	---	---	61.45	1,844
	Bckho 329EL 2.5CY -O	30 LF		1.900	0.526	16	OP2 75.05	1,185	174.34	2,753	---	---	---	---	---	---	131.26	3,938
	Cat, 938G Loader	30 LF		1.900	0.526	16	OP2 75.05	1,185	95.79	1,512	---	---	---	---	---	---	89.92	2,697
	Trench Compactor 24"-33"-O	30 LF		1.900	0.526	---	---	---	27.44	433	---	---	---	---	---	---	14.44	433
	Trc Water-TA 2000 Gal -O	30 LF		1.900	0.526	16	OP2 75.05	1,185	33.37	527	---	---	---	---	---	---	57.06	1,712
	Dig / Lay / Bury	30.00 LF		0.380	2.632	79	68.38	5,399	174.18	5,225	---	---	---	---	---	---	354.13	10,624
	Tie in to Existing	2 EA																
	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.125	8.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Bckho-Ldr Ct 420C 1.0cy	2 EA		0.125	8.000	16	OP2 75.05	1,201	72.69	1,163	---	---	---	---	---	---	1,181.90	2,364
	Tie in to Existing	2.00 EA		0.063	16.000	32	66.71	2,135	581.50	1,163	---	---	---	---	---	---	1,648.92	3,298
	Test	2 EA																
	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.125	8.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Comp 185 CFM Diesel	2 EA		0.125	8.000	---	---	---	27.26	436	---	---	---	---	---	---	218.10	436
	Test	2.00 EA		0.125	8.000	16	58.38	934	218.10	436	---	---	---	---	---	---	685.12	1,370
	12" Backwash Recycle (BWR)	30.00 LF		0.236	4.232	127	66.70	8,467	227.49	6,825	---	---	---	---	---	---	509.73	15,292
	8" Backwash Recycle (BWR)	30 LF																
	Tap existing to Outlet Box 3 & 4, 2 locations 8" CM Lined/Prime Coated DIP Bell/Spigot Bury depth: 5801.18 5' Trench Width, 8.83' Deep Trench Box: 6'x12'x10'																	

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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	6" Pea Gravel Bedding, Pipe Zone+12" "Squeegee" Backfill																	
	Dig / Lay / Bury	30 LF																
	Dig / Lay / Bury																	
2	Yard Pipe Crew (LF+1PL+3LG3)	30 LF		1.600	0.625	38	WK1 58.38	2,189	---	---	---	---	---	---	---	---	72.97	2,189
	Bckho 329EL 2.5CY -O	30 LF		1.600	0.625	19	OP2 75.05	1,407	174.34	3,269	---	---	---	---	---	---	155.87	4,676
	Cat, 938G Loader	30 LF		1.600	0.625	19	OP2 75.05	1,407	95.79	1,796	---	---	---	---	---	---	106.78	3,203
	Trench Compactor 24"-33"-O	30 LF		1.600	0.625	---	---	---	27.44	515	---	---	---	---	---	---	17.15	515
	Trc Water-TA 2000 Gal -O	30 LF		1.600	0.625	19	OP2 75.05	1,407	33.37	626	---	---	---	---	---	---	67.76	2,033
	Dig / Lay / Bury	30.00 LF		0.320	3.125	94	68.38	6,411	206.84	6,205	---	---	---	---	---	---	420.53	12,616
	Tie in to Existing	2 EA																
	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.125	8.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Bckho-Ldr Ct 420C 1.0cy	2 EA		0.125	8.000	16	OP2 75.05	1,201	72.69	1,163	---	---	---	---	---	---	1,181.90	2,364
	Tie in to Existing	2.00 EA		0.063	16.000	32	66.71	2,135	581.50	1,163	---	---	---	---	---	---	1,648.92	3,298
	Test	2 EA																
	Yard Pipe Crew (LF+1PL+3LG3)	2 EA		0.125	8.000	16	WK1 58.38	934	---	---	---	---	---	---	---	---	467.02	934
	Comp 185 CFM Diesel	2 EA		0.125	8.000	---	---	---	27.26	436	---	---	---	---	---	---	218.10	436
	Test	2.00 EA		0.125	8.000	16	58.38	934	218.10	436	---	---	---	---	---	---	685.12	1,370
	8" Backwash Recycle (BWR)	30.00 LF		0.212	4.725	142	66.88	9,480	260.15	7,804	---	---	---	---	---	---	576.13	17,284
	24" BFV Tie-In	1 EA																
	24" BFV (V500 - CI)																	
	Mechanical Joints																	
	24" BFV Bury depth: 5800.65																	
	Trench Box: 12'x12'x12'																	
	10' SQ. Pad, 12" ABC, CLSM Valve O.D.+12"																	
	Excavate	166 CY																
	12'x12'x10' Open Cut Hole																	
	Shored 3 Sides w/ Ramp toards SW																	

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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
2	Yard Pipe Crew (LF+1PL+3LG3)	166	CY	12.000	0.083	28	WK1 58.38	1,615	---	---	---	---	---	---	---	---	9.73	1,615
	Bckho 329EL 2.5CY -O	166	CY	12.000	0.083	14	OP2 75.05	1,038	174.34	2,412	---	---	---	---	---	---	20.78	3,450
	Cat, 938G Loader	166	CY	12.000	0.083	14	OP2 75.05	1,038	95.79	1,325	---	---	---	---	---	---	14.24	2,363
	Trc Water-TA 2000 Gal -O	166	CY	12.000	0.083	14	OP2 75.05	1,038	33.37	462	---	---	---	---	---	---	9.03	1,500
	Excavate	166.00	CY	2.400	0.417	69	68.38	4,730	25.29	4,198	---	---	---	---	---	---	53.78	8,928
	Cut Existing Pipe	2	EA															
	2 Pipelayer	2	EA	2.000	0.500	2	WK1 58.38	117	---	---	---	---	---	---	---	---	58.38	117
	STS - Pipe Cut	1	LS	---	---	---	---	---	---	---	---	250	---	---	---	---	---	250
	Cut Existing Pipe	2.00	EA	1.000	1.000	2	58.38	117	---	---	125.00	250	---	---	---	---	183.38	367
	Concrete Base	100	SF															
	- Subgrade Prep (12")					100	0.00	SF										
	3/4" Class II ABC	8	TN	---	---	---	---	---	---	---	---	---	27.00	216	---	---	27.00	216
	Subgrade Prep	100	SF	25.000	0.040	4	WK1 58.38	234	---	---	---	---	---	---	---	---	2.34	234
	Trc Water-TA 2000 Gal -O	100	SF	25.000	0.040	4	OP2 75.05	300	33.37	133	---	---	---	---	---	---	4.34	434
	- Concrete Base Formwork					34	0.00	SF										
	Purchase Formwork																	
	Form Ply 3/4"	34	SF	---	---	---	---	---	---	---	3.00	102	---	---	---	---	3.00	102
	Dimen. Lumber (2x4-2x10)	74.80	BF	---	---	---	---	---	---	---	2.50	187	---	---	---	---	2.50	187
	Install Formwork																	
	Install Formwork	34	SF	1.600	0.625	21	WK1 58.38	1,241	---	---	---	---	---	---	---	---	36.49	1,241
	- Concrete Base Placement																	
	Purchase Concrete																	
	Conc.2500 Psi Conc	4	CY	---	---	---	---	---	---	---	---	---	200.00	800	---	---	200.00	800

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Div.33	Division 33—Utilities-Solids	1.00
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BE Number GMP 3 ARVADA

Opportunity No

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Item Analysis Sheet

Proprietary and Confidential

Div.33	Division 33—Utilities-Solids	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Conc.2500 Psi Conc Waste 5%	0.20	CY	---	---	---	---	---	---	---	---	---	200.00	40	---	---	200.00	40
	Super Plasticizer	4	CY	---	---	---	---	---	---	---	---	---	7.00	28	---	---	7.00	28
	Short Load Fee	1	LDS	---	---	---	---	---	---	---	---	---	200.00	200	---	---	200.00	200
	Enviromental Fee	1	LDS	---	---	---	---	---	---	---	---	---	35.00	35	---	---	35.00	35
	Energy Surcharge	1	LDS	---	---	---	---	---	---	---	---	---	35.00	35	---	---	35.00	35
	Cold Weather Conc.	4	CY	---	---	---	---	---	---	---	---	---	75.00	300	---	---	75.00	300
	Place Concrete																	
	Concrete Base	4	CY	0.650	1.538	6 WK1	58.38	359	---	---	---	---	---	---	---	---	89.81	359
P	Line Pump	4	HR	---	---	---	---	---	---	---	184.00	736	---	---	---	---	184.00	736
P	Line Pump Charge per Cy	4	CY	---	---	---	---	---	---	---	2.00	8	---	---	---	---	2.00	8
	Concrete Base	100.00	SF	2.825	0.354	35	60.26	2,133	1.33	133	10.33	1,033	16.54	1,654	---	---	49.54	4,954
	Place Valve	1	EA															
	Valve and Pipe Material included in Pipe Purchase																	
	- Install Valve																	
	Install Valve	1	EA	0.250	4.000	4 WK1	58.38	234	---	---	---	---	---	---	---	---	233.51	234
	Install Solid Sleeve and Pipe	5	LF	1.250	0.800	4 WK1	58.38	234	---	---	---	---	---	---	---	---	46.70	234
	Forklift, RT 10,000# Reach	1	EA	0.250	4.000	4 OP2	75.05	300	121.50	486	---	---	---	---	---	---	786.20	786
	-CLSM Backfill to 12" Over Valve																	
	Purchase CLSM																	
	Lean Conc Fill CLSM	12	CY	---	---	---	---	---	---	---	---	---	200.00	2,400	---	---	200.00	2,400
	Lean Conc Fill CLSM/ 5% Waste	0.60	CY	---	---	---	---	---	---	---	---	---	200.00	120	---	---	200.00	120
	Install CLSM																	
	Pour CLSM	12	CY	3.000	0.333	4 WK1	58.38	234	---	---	---	---	---	---	---	---	19.46	234
	Line Pump	12	HR	3.000	0.333	4 OP2	75.05	300	121.50	486	---	---	184.00	2,208	---	---	249.52	2,994
	Line Pump Charge per Cy	12	CY	3.000	0.333	4 OP2	75.05	300	---	---	2.00	24	---	---	---	---	27.02	324

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Div.33	Division 33—Utilities-Solids	1.00
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Item Analysis Sheet

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Div.33	Division 33—Utilities-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Place Valve	1.00	EA	0.042	24.000	24	66.71	1,601	972.00	972	24.00	24	4,728.00	4,728	---	---	7,325.13	7,325
	Backfill	99	CY															
2	Yard Pipe Crew (LF+1PL+3LG3)	99	CY	6.200	0.161	32	WK1 58.38	1,864	---	---	---	---	---	---	---	---	18.83	1,864
	Bckho 329EL 2.5CY -O	99	CY	6.200	0.161	16	OP2 75.05	1,198	174.34	2,784	---	---	---	---	---	---	40.22	3,982
	Cat, 938G Loader	99	CY	6.200	0.161	16	OP2 75.05	1,198	95.79	1,530	---	---	---	---	---	---	27.55	2,728
	Trc Water-TA 2000 Gal -O	99	CY	6.200	0.161	16	OP2 75.05	1,198	33.37	533	---	---	---	---	---	---	17.49	1,731
	Trench Compactor 24"-33"	99	CY	6.200	0.161	16	OP2 75.05	1,198	27.44	438	---	---	---	---	---	---	16.53	1,637
	Backfill	99.00	CY	1.033	0.968	96	69.49	6,658	53.38	5,284	---	---	---	---	---	---	120.63	11,942
	Valve Adjustments	1	EA															
2	Yard Pipe Crew (LF+1PL+3LG3)	1	EA	0.250	4.000	8	WK1 58.38	467	---	---	---	---	---	---	---	---	467.02	467
	Bckho-Ldr Ct 420C 1.0cy	1	EA	0.250	4.000	4	OP2 75.05	300	72.69	291	---	---	---	---	---	---	590.95	591
	Conc 3000 PSI	0.50	CY	---	---	---	---	---	---	---	---	---	200.00	100	---	---	200.00	100
	Valve Adjustments	1.00	EA	0.083	12.000	12	63.94	767	290.75	291	---	---	100.00	100	---	---	1,157.97	1,158
	24" BFV Tie-In	1.00	EA	0.004	238.377	238	67.15	16,006	10,879.12	10,879	1,307.00	1,307	6,482.00	6,482	---	---	34,674.24	34,674
	12" PV Tie-In	1	EA															
	12" Plug Valve (V405 - CI)																	
	Mechanical Joints																	
	12" PV Bury depth: 10'																	
	Trench Box: 12'x12'x12'																	
	Excavate	166	CY															
	12'x12'x10' Open Cut Hole																	
	Shored 3 Sides w/ Ramp toards S																	
2	Yard Pipe Crew (LF+1PL+3LG3)	166	CY	25.000	0.040	13	WK1 58.38	775	---	---	---	---	---	---	---	---	4.67	775
	Bckho 329EL 2.5CY -O	166	CY	25.000	0.040	7	OP2 75.05	498	174.34	1,158	---	---	---	---	---	---	9.98	1,656
	Cat, 938G Loader	166	CY	25.000	0.040	7	OP2 75.05	498	95.79	636	---	---	---	---	---	---	6.83	1,134

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Div.33	Division 33—Utilities-Solids	1.00
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Trc Water-TA 2000 Gal -O	166	CY	25.000	0.040	7	OP2 75.05	498	33.37	222	---	---	---	---	---	---	4.34	720
	Excavate	166.00	CY	5.000	0.200	33	68.38	2,270	12.14	2,015	---	---	---	---	---	---	25.82	4,286
	Cut Existing Pipe	2	EA															
	2 Pipelayer	2	EA	2.000	0.500	2	WK1 58.38	117	---	---	---	---	---	---	---	---	58.38	117
	STS - Pipe Cutting	1	LS	---	---	---	---	---	---	---	---	250	---	---	---	---	---	250
	Cut Existing Pipe	2.00	EA	1.000	1.000	2	58.38	117	---	---	125.00	250	---	---	---	---	183.38	367
	Install Valve	1	EA															
	Valve and Pipe Material included in Pipe Purchase																	
	- Install Valve																	
	Install Valve	1	EA	0.250	4.000	4	WK1 58.38	234	---	---	---	---	---	---	---	---	233.51	234
	Install Solid Sleeve and Pipe	5	LF	1.250	0.800	4	WK1 58.38	234	---	---	---	---	---	---	---	---	46.70	234
	Forklift, RT 10,000# Reach	1	EA	0.250	4.000	4	OP2 75.05	300	121.50	486	---	---	---	---	---	---	786.20	786
	-CLSM Backfill to 12" Over Valve																	
	Purchase CLSM																	
	Lean Conc Fill CLSM	12	CY	---	---	---	---	---	---	---	---	---	200.00	2,400	---	---	200.00	2,400
	Lean Conc Fill CLSM/ 5% Waste	0.60	CY	---	---	---	---	---	---	---	---	---	200.00	120	---	---	200.00	120
	Install CLSM																	
	Pour CLSM	12	CY	3.000	0.333	4	WK1 58.38	234	---	---	---	---	---	---	---	---	19.46	234
	Line Pump	12	HR	3.000	0.333	4	OP2 75.05	300	121.50	486	---	---	184.00	2,208	---	---	249.52	2,994
	Line Pump Charge per Cy	12	CY	3.000	0.333	4	OP2 75.05	300	---	---	2.00	24	---	---	---	---	27.02	324
	Install Valve	1.00	EA	0.042	24.000	24	66.71	1,601	972.00	972	24.00	24	4,728.00	4,728	---	---	7,325.13	7,325
	Backfill	99	CY															

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
2	Yard Pipe Crew (LF+1PL+3LG3)	99	CY	12.500	0.080	16	WK1 58.38	925	---	---	---	---	---	---	---	---	9.34	925
	Bckho 329EL 2.5CY -O	99	CY	12.500	0.080	8	OP2 75.05	594	174.34	1,381	---	---	---	---	---	---	19.95	1,975
	Cat, 938G Loader	99	CY	12.500	0.080	8	OP2 75.05	594	95.79	759	---	---	---	---	---	---	13.67	1,353
	Trc Water-TA 2000 Gal -O	99	CY	12.500	0.080	8	OP2 75.05	594	33.37	264	---	---	---	---	---	---	8.67	859
	Trench Compactor 24"-33"	99	CY	12.500	0.080	8	OP2 75.05	594	27.44	217	---	---	---	---	---	---	8.20	812
	Backfill	99.00	CY	2.083	0.480	48	69.49	3,302	26.48	2,621	---	---	---	---	---	---	59.83	5,923
	Valve Adjustments	1	EA															
2	Yard Pipe Crew (LF+1PL+3LG3)	1	EA	0.250	4.000	8	WK1 58.38	467	---	---	---	---	---	---	---	---	467.02	467
	Bckho-Ldr Ct 420C 1.0cy	1	EA	0.250	4.000	4	OP2 75.05	300	72.69	291	---	---	---	---	---	---	590.95	591
	Conc 3000 PSI	0.50	CY	---	---	---	---	---	---	---	---	---	200.00	100	---	---	200.00	100
	Valve Adjustments	1.00	EA	0.083	12.000	12	63.94	767	290.75	291	---	---	100.00	100	---	---	1,157.97	1,158
	12" PV Tie-In	1.00	EA	0.008	118.720	119	67.87	8,058	5,899.09	5,899	274.00	274	4,828.00	4,828	---	---	19,058.74	19,059
	Thrust Blocks	6	EA															
	Purchase Thrust Block Material	6	EA															
	Purchase Thrust Block Forms																	
	Form Ply 3/4"	22	SF	---	---	---	---	---	---	---	3.00	66	---	---	---	---	3.00	66
	Dimen. Lumber (2x4-2x10)	48.40	BF	---	---	---	---	---	---	---	2.50	121	---	---	---	---	2.50	121
	Purchase Concrete																	
	Conc.2500 Psi Conc	3	CY	---	---	---	---	---	---	---	---	---	200.00	600	---	---	200.00	600
	Conc.2500 Psi Conc Waste 5%	0.15	CY	---	---	---	---	---	---	---	---	---	200.00	30	---	---	200.00	30
	Super Plasticizer	3	CY	---	---	---	---	---	---	---	---	---	7.00	21	---	---	7.00	21
	Short Load Fee	1	LDS	---	---	---	---	---	---	---	---	---	200.00	200	---	---	200.00	200
	Enviromental Fee	1	LDS	---	---	---	---	---	---	---	---	---	35.00	35	---	---	35.00	35
	Energy Surcharge	1	LDS	---	---	---	---	---	---	---	---	---	35.00	35	---	---	35.00	35

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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Cold Weather Conc.	3	CY	---	---	---	---	---	---	---	---	---	50.00	150	---	---	50.00	150
	Purchase Thrust Block Material	6.00	EA	---	---	---	---	---	---	---	31.17	187	178.50	1,071	---	---	209.67	1,258
	Thrust Block Install	6	EA															
	Install Formwork	22	SF	1.600	0.625	14	WK1 58.38	803	---	---	---	---	---	---	---	---	36.49	803
	Place Concrete																	
	Concrete Base	3	CY	0.250	4.000	12	WK1 58.38	701	---	---	---	---	---	---	---	---	233.51	701
P	Line Pump	12	HR	---	---	---	---	---	---	---	184.00	2,208	---	---	---	---	184.00	2,208
P	Line Pump Charge per Cy	3	CY	---	---	---	---	---	---	---	2.00	6	---	---	---	---	2.00	6
	Thrust Block Install	6.00	EA	0.233	4.292	26	58.38	1,503	---	---	369.00	2,214	---	---	---	---	619.54	3,717
	Thrust Blocks	6.00	EA	0.233	4.292	26	58.38	1,503	---	---	400.17	2,401	178.50	1,071	---	---	829.20	4,975
	Production Pipe Subtotal	220.00	LF	0.155	6.439	1,417	66.65	94,421	318.04	69,968	18.10	3,982	57.19	12,581	---	---	822.51	180,952
	Buried Pipe	220.00	LF	0.151	6.621	1,457	66.42	96,756	348.21	76,606	110.15	24,232	1,260.43	277,295	136.36	30,000	2,294.95	504,889
	Mechanical Field Coordinator	2	MO	1.000	1.000	347	EN2 88.42	30,652	---	---	---	---	300.00	600	---	---	15,626.00	31,252
P	GMP 2 adjust	1	LS	---	---	---	---	---	---	---	---	---	---	-52,174	---	---	---	-52,174
	Division 33—Utilities-Solids	1.00	LS	---	---	1,803	70.65	127,408	---	76,606	---	24,232	---	225,721	---	30,000	---	483,967

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Div.33	Division 33—Utilities-Solids	1.00
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Div.35	Division 35—Waterway and Marine Construction-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
Division 35—Waterway and Marine Co		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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Div.35	Division 35—Waterway and Marine Construction-Solids	1.00
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Div.40 **Division 40—Process Interconnections-Solids** **1.00 LS**

Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Purchase Pipe Materials (Exposed)	1	LS															
	Permanent Pipe Materials	1	LS															
	Lagoon Outlet Boxes					1.00	LS						53,820.00					
	Solids Pump #1					1.00	LS						48,026.00					
	Solids Pump #2					1.00	LS						51,143.00					
	Underdrain System					1.00	LS						55,848.00					
	Precast Wheel Stopper					1.00	LS						49,020.00					
	Total																	
	Purchase Pipe Materials (Exposed)	1	LS	---	---	---	---	---	---	---	---	---	---	241,718	---	---	---	241,718
	Precast Wheel Stops	1	LS	---	---	---	---	---	---	---	---	---	---	49,020	---	---	---	49,020
	- Mechanical Unload and Store																	
	Pipefitter	40	MHR	1.000	1.000	40	WK8 63.37	2,535	---	---	---	---	---	---	---	---	63.37	2,535
	Forklift, RT 10,000# Reach	40	MHR	1.000	1.000	40	OP2 75.05	3,002	121.50	4,860	---	---	---	---	---	---	196.55	7,862
	- Precast Wheel Stopper Unload and Store																	
	Pipefitter	6	LDS	0.333	3.000	18	WK8 63.37	1,141	---	---	---	---	---	---	---	---	190.11	1,141
	Forklift, RT 10,000# Reach	6	LDS	0.333	3.000	18	OP2 75.05	1,351	121.50	2,187	---	---	---	---	---	---	589.65	3,538
	Permanent Pipe Materials	1.00	LS	---	---	116	69.21	8,028	---	7,047	---	---	---	290,738	---	---	---	305,813
	Temporary Pipe Materials	1	LS															
P	STS - Installation (Exposed)	1	LS	---	---	---	---	---	---	---	---	2,000	---	---	---	---	---	2,000
P	STS - Rigging (Exposed)	1	LS	---	---	---	---	---	---	---	---	5,000	---	---	---	---	---	5,000
P	STS - Testing (Exposed)	1	LS	---	---	---	---	---	---	---	---	1,000	---	---	---	---	---	1,000
P	STS - Baker Scaffold	1	LS	---	---	---	---	---	---	---	---	1,000	---	---	---	---	---	1,000
	Baker Scaffold - 2 EA - Home Depot Plug																	
P	STS - Davit Arm Crane	1	LS	---	---	---	---	---	---	---	---	5,000	---	---	---	---	---	5,000

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Div.40 **Division 40—Process Interconnections-Solids** **1.00**



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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Pipe Supports - Wall Bracket Epoxy @ 0.5 Tube/EA SUPP Wall Bracket Drill & Epoxy					40.00	EA											
	Epoxy Bonding Agent (Hilti-RE 500)	20	EA	---	---	---	---	---	---	---	---	---	80.00	1,600	---	---	80.00	1,600
	STS - Uni-Strut Install	1	LS	---	---	---	---	---	---	---	---	---	---	1,000	---	---	---	1,000
	All-Thread, Nuts, Washers included in pipe purchase																	
	Temporary Pipe Materials	1.00	LS	---	---	---	---	---	---	---	---	14,000	---	2,600	---	---	---	16,600
	Purchase Pipe Materials (Exposed)	1.00	LS	---	---	116	69.21	8,028	---	7,047	---	14,000	---	293,338	---	---	---	322,413
	Install Piping (Exposed)	1	LS															
	Direct Manhours	1	LS															
	4-Man Crew																	
	- Outlet Boxes					192.00	mhr											
	- Solids Pump #1					183.00	mhr											
	- Solids Pump #2					192.00	mhr											
	Total Manhours					192.00	mhr											
	Pipe Foreman	48	HR	1.000	1.000	48	SU3 82.30	3,950	---	---	---	---	---	---	---	---	82.30	3,950
	Pipefitter	192	HR	1.000	1.000	192	WK8 63.37	12,167	---	---	---	---	---	---	---	---	63.37	12,167
	Underdrain System	4,100	LF															
	4-Man Crew																	
	Exposed 3" Slotted/4" HDPE, sitting 6" above FF on sand, 4 Lagoons																	
	- Underdrain System					356.00	mhr											
	- Underdrain System					124.00	mhr						Elevation (6" off FF)					

Div.40	Division 40—Process Interconnections-Solids	1.00
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Div.40	Division 40—Process Interconnections-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total

	Total Manhours					480.00	mhr											
	Per Chart																	
0.5	Pipe Foreman	120	HR	1.000	1.000	60	SU3 82.30	4,938	---	---	---	---	---	---	---	---	41.15	4,938
0.5	Pipefitter	480	HR	1.000	1.000	240	WK8 63.37	15,209	---	---	---	---	---	---	---	---	31.69	15,209
	Per LF																	
	Pipe Foreman					4,100.00	LF		10.000		WK8							
Underdrain System		4,100.00	LF	13.667	0.073	300	67.16	20,147	---	---	---	---	---	---	---	---	4.91	20,147
Direct Manhours		1.00	LS	---	---	540	67.16	36,264	---	---	---	---	---	---	---	---	---	36,264
Install Precast Concrete Stoppers		1	LS															
	Lagoon 1					285.00	EA											
	Lagoon 2					285.00	EA											
	Lagoon 3					285.00	EA											
	Lagoon 4					285.00	EA											

	Total					1,140.00	EA											
0.5	Pipe Foreman	285	EA	4.000	0.250	36	SU3 82.30	2,932	---	---	---	---	---	---	---	---	10.29	2,932
0.5	Pipefitter	1,140	EA	4.000	0.250	143	WK8 63.37	9,030	---	---	---	---	---	---	---	---	7.92	9,030
Install Precast Concrete Stoppers		1.00	LS	---	---	178	67.16	11,962	---	---	---	---	---	---	---	---	---	11,962
Adjustments		1	LS															
	- Outlet Boxes					64.00	mhr											
	- Solids Pump #1					41.00	mhr		Access		Egress		Tight Spaces					
	- Solids Pump #2					64.00	mhr		Access		Egress		Tight Spaces					
	- Underdrain System					160.00	mhr		1 Week per									

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Div.40	Division 40—Process Interconnections-Solids	1.00
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Div.40	Division 40—Process Interconnections-Solids	1.00 LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	----- Total Manhours					329.00	mhr											
0.5	Pipe Foreman	82.25	HR	1.000	1.000	41	SU3 82.30	3,385	---	---	---	---	---	---	---	---	41.15	3,385
0.5	Pipefitter	329	HR	1.000	1.000	165	WK8 63.37	10,424	---	---	---	---	---	---	---	---	31.69	10,424
	Adjustments	1.00	LS	---	---	206	67.16	13,809	---	---	---	---	---	---	---	---	---	13,809
	Pipe Testing	1	LS															
	Test Pipe Crew	10	EA	0.125	8.000	80	WK8 63.37	5,070	---	---	---	---	---	---	---	---	506.96	5,070
	Comp 185 CFM Diesel	1	EA	0.125	8.000	---	---	---	27.26	218	---	---	---	---	---	---	218.10	218
	Pipe Testing	1.00	LS	---	---	80	63.37	5,070	---	218	---	---	---	---	---	---	---	5,288
	Equipment	1	LS															
	Skidsteer Ldr Cat 246C	1	LS															
	(Direct MH+Adjustments) / 4																	
	- Outlet Boxes					64.00	mhr											
	- Underdrain System					160.00	mhr											
	- Precast Concrete Stoppers					71.00	mhr											
	----- Total Hours					295.00	hr											
0.5	Skidsteer Ldr Cat 246C	295	HR	1.000	1.000	148	OP2 75.05	11,070	63.25	9,330	---	---	---	---	---	---	69.15	20,400
	Skidsteer Ldr Cat 246C	1.00	LS	---	---	148	75.05	11,070	---	9,330	---	---	---	---	---	---	---	20,400
	Forklift, RT 10,000# Reach	1	LS															
	((Direct MH+Adjustments) / 4) / 2																	

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Div.40	Division 40—Process Interconnections-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	- Outlet Boxes					32.00	mhr											
	- Solids Pump #1					28.00	mhr											
	- Solids Pump #2					64.00	mhr											
	- Underdrain System					80.00	mhr											
	- Precast Concrete Stoppers					71.00	mhr											
	Total Hours					275.00	hr											
0.5	Forklift, RT 10,000# Reach	275	HR	1.000	1.000	138	OP2 75.05	10,319	121.50	16,706	---	---	---	---	---	---	98.28	27,026
	Forklift, RT 10,000# Reach	1.00	LS	---	---	138	75.05	10,319	---	16,706	---	---	---	---	---	---	---	27,026
	Equipment	1.00	LS	---	---	285	75.05	21,389	---	26,036	---	---	---	---	---	---	---	47,426
	Install Piping (Exposed)	1.00	LS	---	---	1,289	68.67	88,494	---	26,254	---	---	---	---	---	---	---	114,749
	Piping Subs	1	LS															
	Heat Tracing	1	LS															
	Radar Levels @ Outlet Boxes					4.00	EA											
	Heat Tracing Sub	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	5,000	---	5,000
	Heat Tracing	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	5,000	---	5,000
	Pipe Welding	1	LS															
	24" STL Butt Weld					8.00	ea								250.00		2,000.00	
	Exposed Pipe Weld Sub	1	LS	---	---	---	---	---	---	---	---	---	---	---	---	2,000	---	2,000
	Welding Sub Standby Time	16	HR	---	---	---	---	---	---	---	---	---	---	---	150.00	2,400	150.00	2,400

Div.40	Division 40—Process Interconnections-Solids	1.00
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Div.40	Division 40—Process Interconnections-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Assist Pipe Welder																	
	Yard Pipe Crew	16	HR	1.000	1.000	16	63.37	1,014	---	---	---	---	---	---	---	---	63.37	1,014
	Pipe Welding	1.00	LS	---	---	16	63.37	1,014	---	---	---	---	---	---	---	4,400	---	5,414
	Piping Subs	1.00	LS	---	---	16	63.37	1,014	---	---	---	---	---	---	---	9,400	---	10,414
	40 05 59.20 Fabricated SS Slide Gates	1	LS															
	Lagoon Outlet Boxes																	
	3'x3' Slide Gate					4.00	EA									0.00		
	5'x5' Slide Gate					4.00	EA									0.00		

	Slide Gates					0.00												
	40 05 59.20 Fabricated SS Slide Gates	1	LS	---	---	---	---	---	---	---	---	---	---	90,790	---	---	---	90,790
	0.5 Foreman	8	EA	0.083	12.000	48	82.30	3,950	---	---	---	---	---	---	---	---	493.80	3,950
	0.5 Gate Install	8	EA	0.028	36.000	144	63.37	9,125	---	---	---	---	---	---	---	---	1,140.66	9,125
	0.5 Forklift, RT 10,000# Reach	8	EA	0.250	4.000	16	75.05	1,201	121.50	1,944	---	---	---	---	---	---	393.10	3,145
	STS	1	LS	---	---	---	---	---	---	---	---	500	---	---	---	---	---	500
	40 05 59.20 Fabricated SS Slide Ga	1.00	LS	---	---	208	68.64	14,276	---	1,944	---	500	---	90,790	---	---	---	107,510
	0.5 Mechanical Field Coordinator	2	MO	1.000	1.000	173	88.42	15,326	---	---	---	---	300.00	300	---	---	7,813.00	15,626
	Division 40—Process Interconnections	1.00	LS	---	---	1,802	70.55	127,139	---	35,245	---	14,500	---	384,428	---	9,400	---	570,712

Div.40	Division 40—Process Interconnections-Solids	1.00
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Div.44	Division 44—Pollution and Waste Control Equipment-Solids	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
43 23 13.35	Horizontal Centrifugal Pumps	1	LS															
	Fairbanks																	
	Flowserve																	
	ITT-Flygt																	
	30P1000 & 30P2000					2.00	EA								169,627.00			
P 43 23 13.35	Horizontal Centrifugal Pumps	1	LS	---	---	---	---	---	---	---	---	---	---	169,627	---	---	---	169,627
	Unload & handle																	
	Unload & handle	2	EA	0.250	4.000	8	WK8 63.37	507	---	---	---	---	---	---	---	---	253.48	507
	Forklift, RT 10,000# Reach	2	EA	0.500	2.000	4	OP2 75.05	300	121.50	486	---	---	---	---	---	---	393.10	786
	Centrifugal Pump Install	2	EA															
	Foreman	2	EA	0.063	16.000	32	SU3 82.30	2,634	---	---	---	---	---	---	---	---	1,316.80	2,634
	Centrifugal Pump Install	2	EA	0.021	48.000	96	WK8 63.37	6,084	---	---	---	---	---	---	---	---	3,041.76	6,084
	Forklift, RT 10,000# Reach	2	EA	0.250	4.000	8	OP2 75.05	600	121.50	972	---	---	---	---	---	---	786.20	1,572
	Hoisting	1	EA	---	---	---	---	---	---	---	750.00	750	---	---	---	---	750.00	750
	Centrifugal Pump Install	2.00	EA	0.015	68.000	136	68.51	9,318	486.00	972	375.00	750	---	---	---	---	5,519.76	11,040
43 23 13.35	Horizontal Centrifugal	1.00	LS	---	---	148	68.41	10,125	---	1,458	---	750	---	169,627	---	---	---	181,960
	Division 44—Pollution and Waste Cont	1.00	LS	---	---	148	68.41	10,125	---	1,458	---	750	---	169,627	---	---	---	181,960

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Div.44 Division 44—Pollution and Waste Control Equipment-Solids 1.00



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CONT1	Construction Contingency	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Construction Contingency	3,246,438	TC	---	---	---	---	---	---	---	0.022000	71,422	---	---	---	---	0.022000	71,422
Construction Contingency				1.00	LS	---	---	---	---	---	---	71,422	---	---	---	---	---	71,422



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CONT2	Design Allowance	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Design Contingency	3,246,438	TC	---	---	---	---	---	---	---	0.022000	71,422	---	---	---	---	0.022000	71,422
	100% Design Adjust	1	LS	---	---	---	---	---	---	---	---	-15,000	---	---	---	---	---	-15,000
Design Allowance		1.00	LS	---	---	---	---	---	---	---	---	56,422	---	---	---	---	---	56,422



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CONT3	Escalation Allownance	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Escalation Sub	115,868	SC	---	---	---	---	---	---	---	0.050000	5,793	---	---	---	---	0.050000	5,793
	Escalation MAT	1,043,096	MC	---	---	---	---	---	---	---	0.050000	52,155	---	---	---	---	0.050000	52,155
	GMP 3 Adjust	1	LS	---	---	---	---	---	---	---	---	-13,962	---	---	---	---	---	-13,962
							3,518,653.00							17,691.00				
							3,518,653.00											
							0.00											
Escalation Allownance		1.00	LS	---	---	---	---	---	---	---	---	43,986	---	---	---	---	---	43,986



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CONT 6	Lagoon Clay Liner Repair Allowance	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Lagoon Clay Liner Repair Allowance	1	LS	---	---	---	---	---	---	---	---	50,000	---	---	---	---	---	50,000
	Lagoon Clay Liner Repair Allowance	1.00	LS	---	---	---	---	---	---	---	---	50,000	---	---	---	---	---	50,000



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GR	General Requirements	1.00	LS
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
01 41 26	Permits	1	LS															
	01 41 26 Permits					1.00	LS						5,000.00					
01 41 26	Permits	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
01 50 00	Temp Facilities & Controls	1	LS															
MOB / DEMOB	Equipment	1	LS															
Freight In		1	LS															
	Load at Yard					50.00	HR		1.000		WK5							
	Load Permits					1.00	EA						500.00					
	Form Material/Panels					2.00	EA						500.00					
	Misc. Loads					0.00	EA						500.00					
	Unload at Job Site					50.00	HR		1.000		WK5							
	ENTER PRICES From Equipment Freight Report																	
	Equipment Freight -IN					1.00	LS						15,000.00					
Freight In		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Freight Out		1	LS															
	Load at Site					50.00	HR		1.000		WK5							
	Load Permits					1.00	EA						500.00					
	Form Material/Panels					2.00	EA						500.00					
	Plants					0.00	EA						0.00					
	Light Equipment					0.00	EA						250.00					
	Misc. Loads					0.00	EA						500.00					
	Unload at Yard					50.00	HR		1.000		WK5							
	ENTER PRICES From Equipment Freight Report																	
	Equipment Freight -OUT					1.00	LS						15,000.00					

GR	General Requirements	1.00
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GR	General Requirements	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Freight Out	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	MOB / DEMOB Equipment	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Set-Up Fuel Storage	1	LS															
	Tanks						LS						2,000.00					
	Hardware						LS						1,000.00					
	Berms & Liner																	
	Set-Up Fuel Storage	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Install Power	1	EA															
	Power Main Connection						LS						7,500.00					
	Water Main Connection						LS						2,500.00					
	Install Power	1.00	EA	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Dismantle Buildings	1	LS															
	Dismantle Office-Labor					75.00	HR		1.000		WK5							
	Dismantle Buildings	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Dismantle Facilities	1	LS															
	Dismantle Facilities-Lab					50.00	HR		1.000		WK5							
	Dismantle Facilities	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Dismantle Utilities	1	LS															
	Dismantle Utilities-Labor					50.00	HR		1.000		WK5							
	Dismantle Utilities	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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GR	General Requirements	1.00
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BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project New Blank Estimate
Location

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Item Analysis Sheet

Justin McRae

GR	General Requirements	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
Cleanup & Restore Site		1	LS														
	Cleanup & Restore Site						LS					5,000.00					
Cleanup & Restore Site		1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Snow Removal & Sanding		1	LS														
	Snow Removal																
0.5	Laborer	360	HR	1.000	1.000	180	LG5 58.37	10,507	---	---	---	---	---	---	---	29.19	10,507
0.5	Bckho-Ldr Ct 420C 1.0cy	180	HR	1.000	1.000	90	OP2 75.05	6,755	72.69	6,542	---	---	---	---	---	73.87	13,296
Snow Removal & Sanding		1.00	LS	---	---	270	63.93	17,261	---	6,542	---	---	---	---	---	---	23,803
Oper Office Bldg		1	LS														
PCL / Engineer Office		16	MO														
	PCL Trailer Office 12'x60'					16.00	MO		1.000								900.00
	Engineer Trailer Office 12'x44'					16.00	MO		1.000								800.00
	Mobs/Demob					1.00	EA					38,290.00					
	Temp Fencing					1.00	LS					7,500.00					
	Furniture PCL					1.00	LS					5,000.00					
	Furniture Engineer					1.00	LS					5,000.00					
	Office Equipment PCL					16.00	MO					550.00					
	Office Equipment Engineer					16.00	MO					550.00					
	T1 Connection and Virtual Private Network																
	Internet Installation						LS					1,500.00					
	Computer Software						LS					500.00					
	Office Supplies PCL					16.00	MO					350.00					
	Office Supplies Engineer					16.00	MO					350.00					
	Post & Courier					16.00	MO					200.00					
	Audit Fees					0.00	EA					0.00					
	Construction Signs					1.00	LS					5,600.00					
	Sewage Billing					16.00	MO					500.00					
PCL / Engineer Office		16.00	MO	---	---	---	---	---	---	---	---	---	---	---	---	---	---

U01 STANDARD-LANDSCAPE-MASTER.RPT

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GR	General Requirements	1.00
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BE Number GMP 3 ARVADA
 Opportunity No
 Owner File No
 Project New Blank Estimate
 Location

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Justin McRae

GR	General Requirements	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Oper Office Bldg	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	01 50 00 Temp Facilities & Control	1.00	LS	---	---	270	63.93	17,261	---	6,542	---	---	---	---	---	---	---	23,803
	First Aid & Safety STS	1	LS															
	Medical/Drug Testing					30.00	EA						75.00					
	*** Estimate for local requirements																	
	Training & Orientation					30.00	EA						35.00					
	*** Estimate for local requirements																	
	F.A. & Safety Supplies	13,663	MH	---	---	---	---	---	---	---	0.120000	1,640	---	---	---	---	0.120000	1,640
	*** Allow 0.120 per Total Man Hours																	
	Fire Protection	13,663	MH	---	---	---	---	---	---	---	0.070000	956	---	---	---	---	0.070000	956
	*** Allow 0.07 per Total Man Hours																	
	Water Coolers					4.00	EA						50.00					
	Drinking Water & Ice					16.00	MO						500.00					
	Air Monitors					16.00	MO		1.000								AIR MONITORS	
	Rescue Tripod w/yo yo					16.00	MO		1.000								RESCUE TRIPOD W	
	Yo Yo Winch					16.00	MO		1.000								YO YO WINCH	
	First Aid & Safety STS	1.00	LS	---	---	---	---	---	---	---	---	2,596	---	---	---	---	---	2,596
	SMALL Tools-Expendables	1	LS															
	SMALL Tools-Expendables	13,663	MH	---	---	---	---	---	---	---	1.00	13,663	---	---	---	---	1.00	13,663
	SMALL Tools-Expendables	1.00	LS	---	---	---	---	---	---	---	---	13,663	---	---	---	---	---	13,663
	Warranty Work	1	LS															

U01 STANDARD-LANDSCAPE-MASTER.RPT

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GR	General Requirements	1.00
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BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project **New Blank Estimate**
Location

Item Analysis Sheet

Justin McRae

GR	General Requirements	1.00	LS
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	Warranty Work					1.00	LS						30,000.00					
	Warranty Work	1.00	LS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	General Requirements	1.00	LS	---	---	270	63.93	17,261	---	6,542	---	16,259	---	---	---	---	---	40,062

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U01 STANDARD-LANDSCAPE-MASTER.RPT C:\Users\JWMcRae\AppData\Local\BEST\LocalFiles\dd18a6d1-9e76-471c-b1bf-961af687dd2b\	GR	General Requirements	1.00
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BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project **New Blank Estimate**
Location

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Proprietary and Confidential

GE 8	F6 BOND	100.00	%
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No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
US CONTRACT BOND Class B		100	%														
	US CONTRACT BOND Class B	3,518,653	TB	---	---	---	---	---	---	0.010000	35,187	---	---	---	---	0.010000	35,187
US CONTRACT BOND Class B		100.00	%	---	---	---	---	---	---	351.87	35,187	---	---	---	---	351.87	35,187
SDI		100	%														
	SDI - Subcontractor	115,868	SC	---	---	---	---	---	---	0.013500	1,564	---	---	---	---	0.013500	1,564
	SDI - Equipment	1,043,096	MC	---	---	---	---	---	---	0.013500	14,082	---	---	---	---	0.013500	14,082
SDI		100.00	%	---	---	---	---	---	---	156.46	15,646	---	---	---	---	156.46	15,646
F6 BOND		100.00	%	---	---	---	---	---	---	508.33	50,833	---	---	---	---	508.33	50,833



BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project **New Blank Estimate**
Location

Item Analysis Sheet

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GE 9	F7 INSURANCE	100.00	%
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor			Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit	Total
	=====																	
	Delete Insurance not applicable.																	
	Place * beside appropriate Insurance Required.																	
	=====																	
	General Liability	100 %																
	Gen Liab-USA 8.50/M	3,518,653	TB	---	---	---	---	---	---	---	0.010000	35,187	---	---	---	---	0.010000	35,187
	General Liability	100.00 %		---	---	---	---	---	---	---	351.87	35,187	---	---	---	---	351.87	35,187
	Builders Risk Insurance	100 %																
	Builders Risk	3,518,653	TB	---	---	---	---	---	---	---	0.004000	14,075	---	---	---	---	0.004000	14,075
	Builders Risk Insurance	100.00 %		---	---	---	---	---	---	---	140.75	14,075	---	---	---	---	140.75	14,075
	F7 INSURANCE	100.00 %		---	---	---	---	---	---	---	492.61	49,261	---	---	---	---	492.61	49,261



BE Number GMP 3 ARVADA
Opportunity No
Owner File No
Project **New Blank Estimate**
Location

Item Analysis Sheet

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Justin McRae

GE 17	V7 PROJECT STAFF	100.00	%
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Proprietary and Confidential

No.	Description	Quantity	UOM	Units Per Hours	ManHrs Per Unit	Labor		Equipment		Services/ Tools/Supplies		Perm. Material		SubContract		Total PRICE	
						Hours	\$ / hr	Total	\$ / hr	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	\$/ItemUnit	Total	Unit
Management		100 %															
	SeniorPm / Const Mgr.					2.75 MO		1.000		ST4	1,300.00						
	Project Manager					6.00 MO		1.000		ST1	1,300.00						
	General Supt.					6.00 MO		1.000		ST3	300.00					Trc Pickup	4x4
	Field Superintendent					16.00 MO		1.000		SU2	300.00					Trc Pickup	4x4
	Startup Manager					2.00 MO		1.000		ST1	300.00					Trc Pickup	4x4
	Site Truck - Foreman Use					16.00 MO		1.000								Trc Pickup	4x4
	Safety						TC					0.01					
	Safety Supervisor					6.00 MO		1.000		OF6	300.00						
	Admin					12.00 MO		1.000		OF1	150.00						
Management		100.00 %		---	---	---	---	---	---	---	---	---	---	---	---	---	---
Engineering & Survey		100 %															
	Proj Eng.					16.00 MO		1.000		EN1	300.00						
Engineering & Survey		100.00 %		---	---	---	---	---	---	---	---	---	---	---	---	---	---
Management Assessment		100 %															
	Estimate Central Engineering Time Required for Project																
	CED Mgmnt Assessment	3,518,653 TB		---	---	---	---	---	---	0.003000	10,556	---	---	---	---	0.003000	10,556
Management Assessment		100.00 %		---	---	---	---	---	---	105.56	10,556	---	---	---	---	105.56	10,556
V7 PROJECT STAFF		100.00 %		---	---	---	---	---	---	105.56	10,556	---	---	---	---	105.56	10,556



SUBMITTAL REVIEW FORM (ATTACH TO EACH SUBMITTAL)		
CONTRACTOR: PCL Construction		OWNER: City of Arvada
EOR: Jacobs, Carollo, HDR		
SUBMITTAL REVISION:	☐ 1st ☐ 2nd ☐ 3rd ☐ Other:	
DATE: 11/7/2022	DUE: 11/28/2022	SUBMITTAL PACKAGE: 01 32 00 - 001
PROJECT NO.: 21WA52, 21WA50, 20WA54		SUBMITTAL NUMBER(S): 01
PROJECT NAME: Ralston Filter and Solids Handling Improvements		NO. OF PAGES: 8
SPECIFICATION SECTION AND SUBMITTAL DESCRIPTION: Construction Progress Documentation – Preliminary Schedule		PRIORITY: C
REVIEW ACTION: ☐ CODE 1: No Exceptions Taken – Approved - Work may proceed. ☐ CODE 1A: Approved as Noted – Work may proceed. Resubmittal not required. ☐ CODE 2: Partial Approval, Resubmit as Noted – Work may proceed subject to incorporation of changes indicated; resubmit for record. No payments shall be made until record is complete. ☐ CODE 3: Revise and Resubmit – Work may not proceed. ☐ CODE 4: For Record Only. Not subject to review by Engineer or Owner. By: _____ Date: _____ ENGINEER		
Engineer's review and acceptance of this submittal are expressly limited as provided in the Contract documents and are only to determine conformance with information given in the Contract documents and compatibility with the design concept for the completed project as functioning whole as indicated in the Contract documents. Contractor is, and Engineer is NOT, responsible for all matters relating to fabrication, shipping, handling, storage, assembly, installation, construction, (including all safety aspects of performing the Work), and for coordinating the Work. Engineer's review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all subtrades.		



INSTRUCTIONS TO REVIEWER: Include submittal page number reference for each comment.

TECHNICAL REVIEW COMMENTS:



TECHNICAL REVIEW COMMENTS (CONTD.):



CONTRACTOR'S SUBMITTAL FORM (ATTACH TO EACH SUBMITTAL)		
CONTRACTOR: PCL Construction	OWNER: City of Arvada	EOR: Jacobs, Carollo, HDR
SUBMITTAL REVISION:	☐ 1st ☐ 2nd ☐ 3rd ☐ Other:	
DATE: 11/7/2022	SUBMITTAL PACKAGE: 01 32 00 - 001	
PROJECT NO.: 21WA52, 21WA50, 20WA54	SUBMITTAL NUMBER(S): 01	
PROJECT NAME: Ralston Filter and Solids Handling Improvements		NO. OF PAGES: 8
SPECIFICATION SECTION AND SUBMITTAL DESCRIPTION: Construction Progress Documentation – Preliminary Schedule		
SUBMITTED AS: ☐ Per Documents ☒ With Deviation (Submittal Deviation form attached) ☐ Proposed Substitution (Submittal Deviation form attached) ☐ Other:		
CONTRACTOR hereby certifies that (i) CONTRACTOR has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies. Reviewed By  By: <u>11/07/2022 7:44:27 AM</u> CONTRACTOR (Authorized Representative)		



SUBMITTAL DEVIATION FORM	
DATE: 11/7/2022	SUBMITTAL NUMBER: 01
PROJECT NO.: 21WA52, 21WA50, 20WA54	PROJECT NAME: Ralston Filter and Solids Handling Improvements
The following deviation is submitted in compliance with Section 01 33 00. DESCRIPTION OF PROPOSED DEVIATION: Specification section 01 31 13 section 1.05.A.3 – As discussed in previous schedule workshop and as detailed in GMP 01, schedule assumes six filters may be taken offline at one time during low flow seasons. Specification section 01 11 00 section 1.02.B – Please see schedule narrative for updated milestone dates The above proposed deviation will result in the following benefits to the Owner: MONETARY: _____ SCHEDULE: _____	
The undersigned will pay for changes to the design, including engineering design, detailing, and construction costs caused by the requested deviation.	
CONTRACTOR: PCL Reviewed By  By: _____ 11/07/2022 7:44:40 AM CONTRACTOR (Authorized Representative)	
DESIGN CONSULTANT RECOMMENDATION: ☐ Acceptable ☐ Not Acceptable _____ ENGINEER	
OWNER EVALUATION: ☐ Acceptable ☐ Not Acceptable _____ OWNER Comments: _____	
THIS FORM IS NOT APPROVED UNTIL SIGNED BY OWNER	



November 04, 2022

Re:

City of Arvada Filters, Solids Handling, and Clarifier Rehabilitation Project
Baseline Schedule – File: 5403253-2022-10

The schedule presented is the full baseline schedule. The schedule contains the use of WBS elements.

1. General Approach & Assumptions

- The schedule makes use of the WBS structure to define the work areas found in the Contract documents.
- The project design for the solids handling scope is still underway and full scope could change as design progresses. PCL has made assumptions based on the current and anticipated design. Some revisions could be required, and durations changed once full construction documents are issued.
- Activities are held on a working day calendar in order to easily track the paths of the project without float jumps due to changing calendars.
- The project holds an assumed allotment of 10 working days for inclement weather. Refer to the schedule and activity GR1120. If additional weather is incurred it will be requested on a case by case basis.
- Submittals have been included into the schedule and a 15-working day review time has been provided to accommodate the contractual review.
- The basis for the activity durations and sequencing has been derived from a combination of historical data and averages of time required for each task. We have taken into consideration the average crew size required in order to achieve optimal performance per item of work.
- The schedule assumes that two filter trains can be taken offline at one time from the window of November to the first week of April.
- This schedule shows a completion date of Filters 10-12 at the end of March 2023 and a completion date of Filters 4-6 the first week of April 2023. Per the demand data provided by Owner and Jacobs, this will result in a net production of 14 MGD with an anticipated maximum demand of 15 MGD for the month of March. PCL will present Owner with alternative options to allow start up of Filters 10-12 in February at the baseline schedule workshop.

PCL Construction, Inc.

2000 Colorado Blvd Ste 2-500

Denver, CO 80222

P: 303-365-6500 www.pcl.com



CONSTRUCTION

▶ TOGETHER WE BUILD SUCCESS

2. Abbreviations & Conventions

We have used the following abbreviations and conventions in the activity descriptions:

1. Forming, placing reinforcing, and placing concrete are typically carried as one activity and abbreviated as F/R/I/P.
2. Other abbreviations that appear are:
 - a. P&S Prepare & Submit
 - b. R&A Review & Approval
 - c. P&D Procure & Delivery

3. Longest Path

The longest path of the project is currently through the procurement and installation of electrical gear. Due to market conditions, the lead times of the equipment will not be finalized until PCL issues release letter. The procurement timeframes in the baseline schedule considers a moderately conservative timeframe for electrical gear and will be updated upon release. PCL and Weifield Group will work with plant operations for electrical MOPs to investigate and plumb electrical conduit ahead of the gear to shorten installation timeframes.

4. Project Completion Milestones

Milestone 1: Substantial Completion April 19th, 2024

Milestone 2: Six filters complete April 4th, 2023

Milestone 3: Nine filters complete July 5th, 2023

Milestone 4: Twelve filters complete January 22nd, 2023

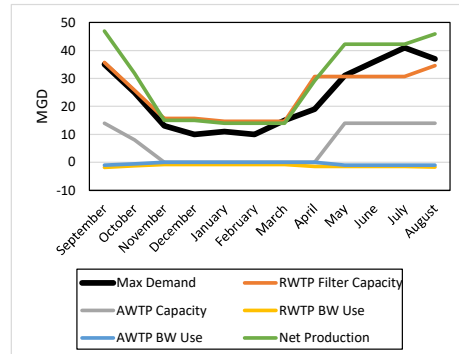
Milestone 5: Solids staging pad complete February 14, 2023

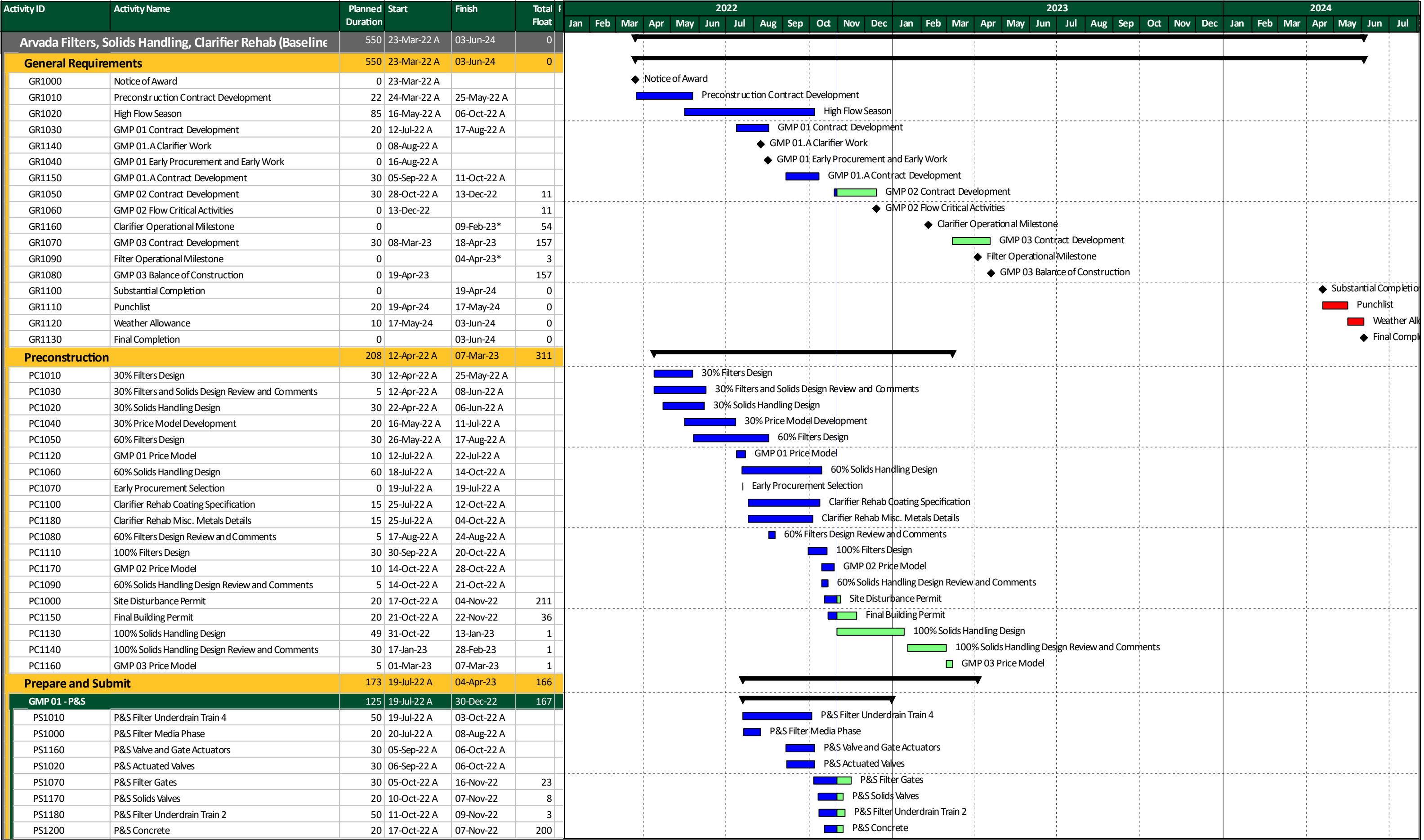
Milestone 6: Solids pretreatment piping complete March 15, 2023

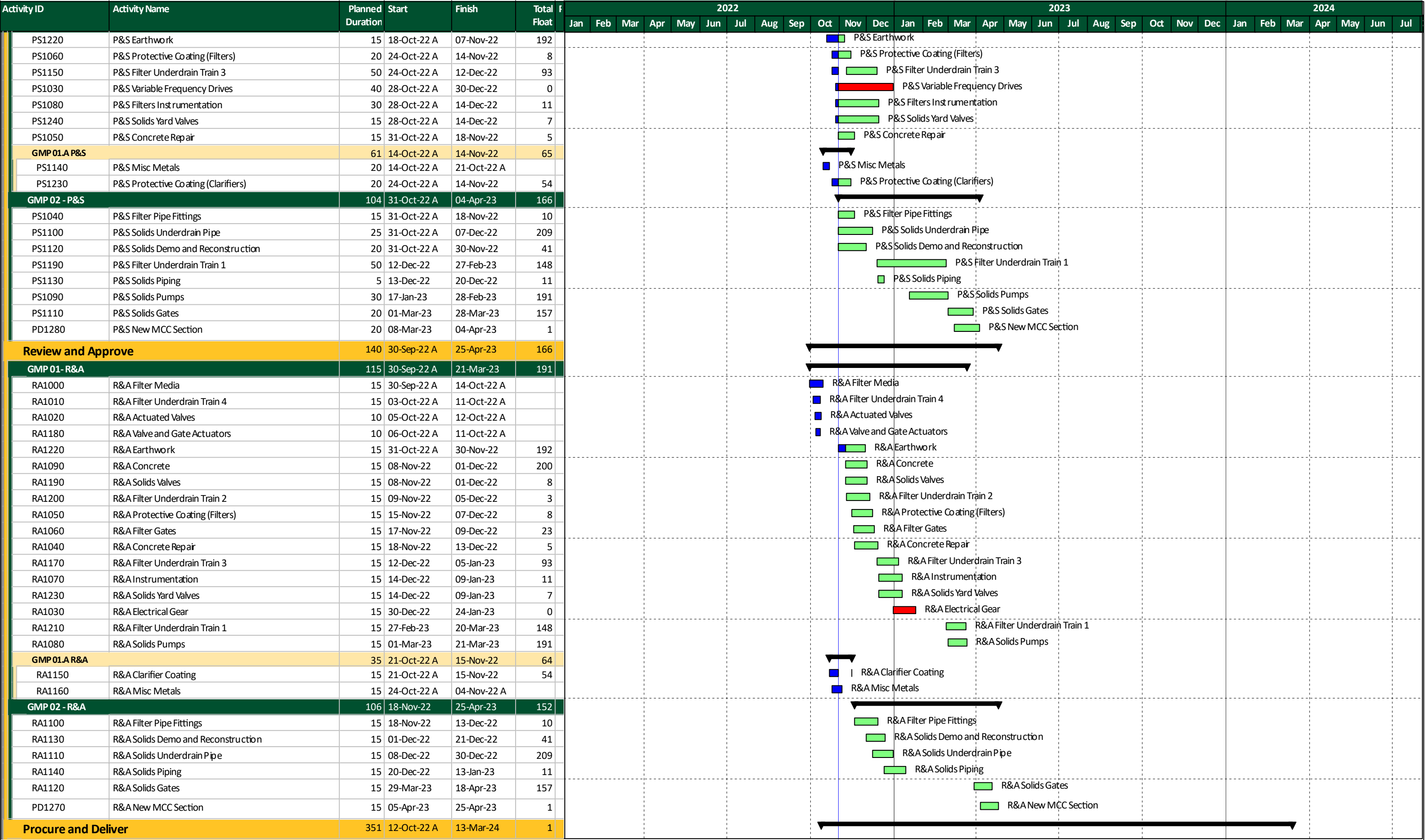
Milestone 7: Lagoons 1&3 complete July 10, 2023

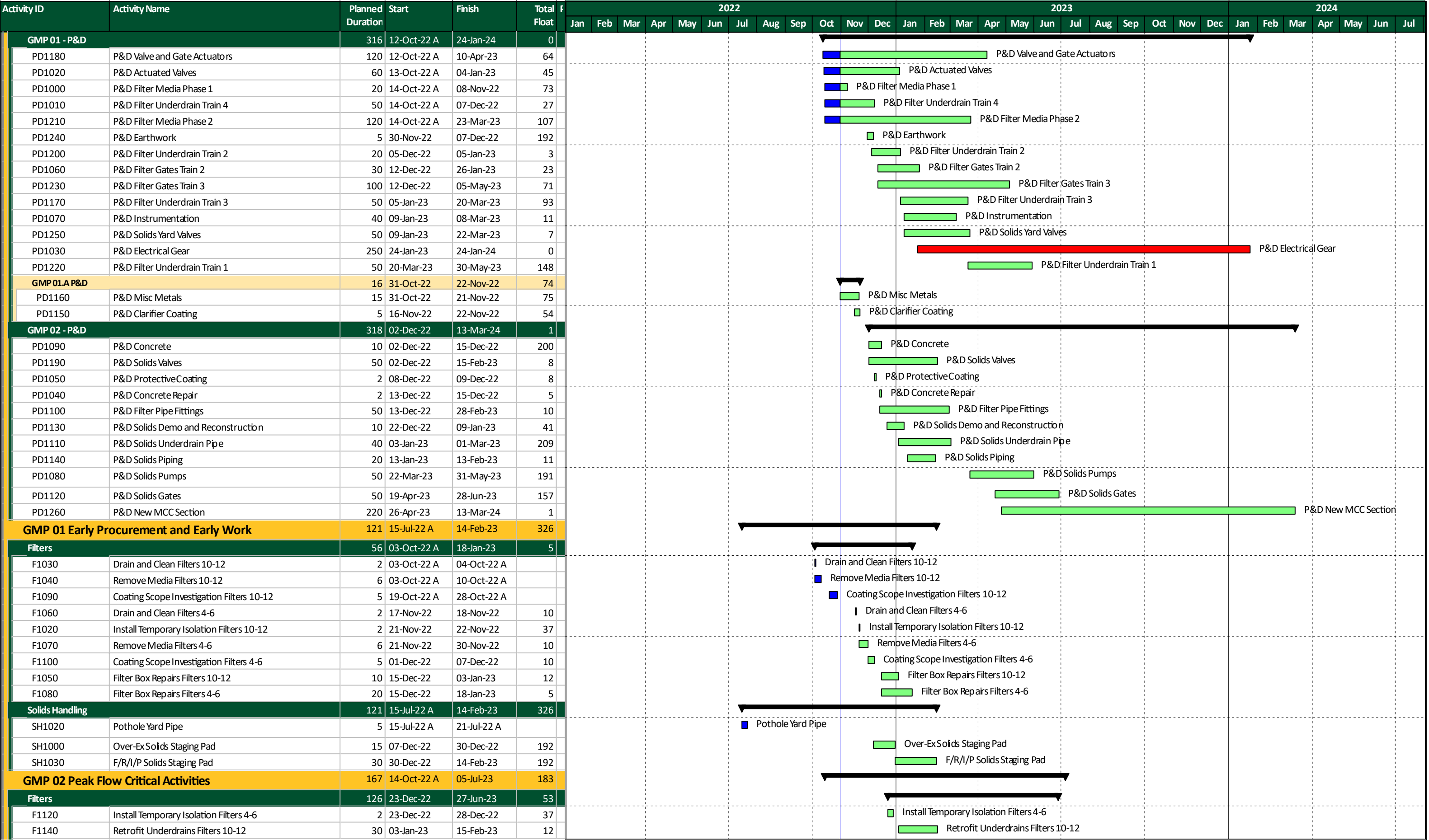
Milestone 8: Lagoons 2&4 October 12, 2023

	MGD						Filters 1-3				Filters 4-6				Filters 7-9				Filters 10-12				Largest Filter OOS Production (MGD)
	Max Demand	RWTP Filter Capacity	AWTP Capacity	RWTP BW Use	AWTP BW Use	Net Productio n	Number	Loading Rate (gpm/sf)	Area (sf)	Production (MGD)	Number	Loading Rate (gpm/sf)	Area (sf)	Production (MGD)	Number	Loading Rate (gpm/sf)	Area (sf)	Production (MGD)	Number	Loading Rate (gpm/sf)	Area (sf)	Production (MGD)	
September	35	36	14	-1.8	-1.0	47	3	5	420	9.072	3	5	462	9.9792	3	5	462	9.9792	3	5	462	9.9792	-3.3264
October	25	26	8	-1.3	-0.6	32	3	5	420	9.072	3	5	462	9.9792	3	5	462	9.9792	3	5	462	9.9792	-3.3264
November	13	16	0	-0.8	0.0	15	3	5	420	9.072	0	5	462	0	3	5	462	9.9792	0	5	462	0	-3.3264
December	10	16	0	-0.8	0.0	15	3	5	420	9.072	0	5	462	0	3	5	462	9.9792	0	5	462	0	-3.3264
January	11	15	0	-0.7	0.0	14	3	5	420	9.072	0	5	462	0	3	5	462	9.9792	0	6.5	462	0	-4.32432
February	10	15	0	-0.7	0.0	14	3	5	420	9.072	0	6.5	462	0	3	5	462	9.9792	0	6.5	462	0	-4.32432
March	15	15	0	-0.7	0.0	14	3	5	420	9.072	0	6.5	462	0	3	5	462	9.9792	0	6.5	462	0	-4.32432
April	19	31	0	-1.5	0.0	29	3	5	420	9.072	3	6.5	462	12.97296	0	5	462	0	3	6.5	462	12.97296	-4.32432
May	31	31	14	-1.5	-1.0	42	3	5	420	9.072	3	6.5	462	12.97296	0	5	462	0	3	6.5	462	12.97296	-4.32432
June	36	31	14	-1.5	-1.0	42	3	5	420	9.072	3	6.5	462	12.97296	0	6.5	462	0	3	6.5	462	12.97296	-4.32432
July	41	31	14	-1.5	-1.0	42	3	5	420	9.072	3	6.5	462	12.97296	0	6.5	462	0	3	6.5	462	12.97296	-4.32432
August	37	35	14	-1.7	-1.0	46	0	5	420	0	3	6.5	462	12.97296	3	6.5	462	12.97296	3	6.5	462	12.97296	-4.32432
Completion		46	14	-2.3	-1.0	57	3	6.5	420	11.7936	3	6.5	462	12.97296	3	6.5	462	12.97296	3	6.5	462	12.97296	-4.32432









Activity ID	Activity Name	Planned Duration	Start	Finish	Total Float	2022												2023												2024						
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
B1510	Install Instrumentation Filters 1-3	5	09-Aug-23	16-Aug-23	134																															
B1450	Demo Existing BWW Line Filters 1-3	5	16-Aug-23	23-Aug-23	134																															
B1460	Install New BWW Pipe Filters 1-3	6	23-Aug-23	31-Aug-23	134																															
B1470	Backfill BWW Line Filters 1-3	3	31-Aug-23	06-Sep-23	134																															
B1490	Exterior Flume Repairs Filters 1-3	10	06-Sep-23	20-Sep-23	134																															
B1480	Patch Asphalt and Clean - Flume Exterior 1-3	10	20-Sep-23	04-Oct-23	134																															
B1410	Retrofit Underdrains Filters 1-3	15	12-Oct-23	02-Nov-23	53																															
B1430	Install Gates and Actuators Filters 1-3	13	02-Nov-23	22-Nov-23	85																															
B1500	Install New Media Filters 1-3	10	02-Nov-23	17-Nov-23	53																															
B1520	Install Valves and Actuators Filters 1-3	15	17-Nov-23	12-Dec-23	53																															
B1530	Install Gates Filters 1-3	5	12-Dec-23	19-Dec-23	53																															
B1580	Recoat Exposed Pipe	10	12-Dec-23	28-Dec-23	78																															
B1540	Interior Flume Repairs Filters 1-3	15	19-Dec-23	12-Jan-24	53																															
B1550	Phased Install New Electrical Gear	21	24-Jan-24	23-Feb-24	0																															
B1560	Phased Demo Existing Electrical Gear	21	31-Jan-24	01-Mar-24	35																															
B1570	PLC Controls/Programming	30	23-Feb-24	05-Apr-24	0																															
Solids Handling		304	10-Jan-23	27-Mar-24	41																															
SH1080	Demo Existing Pipe	7	10-Jan-23	19-Jan-23	41																															
SH1090	Remove Solids Lagoons 1&3	10	14-Feb-23	01-Mar-23	192																															
SH1150	Excavate Outlet Structures Lagoons 1&3	10	14-Feb-23	01-Mar-23	192																															
SH1170	Install Underdrains Lagoons 1&3	20	02-Mar-23	29-Mar-23	209																															
SH1070	Install 8" Interconnecting Piping	10	10-Mar-23	24-Mar-23	225																															
SH1240	Install Tie-In Lagoon 3 &4	8	10-Mar-23	22-Mar-23	7																															
SH1190	Install New Sand Lagoons 1&3	14	30-Mar-23	18-Apr-23	209																															
SH1110	Demo Outlet Structures Lagoons 1&3	10	19-Apr-23	02-May-23	157																															
SH1130	F/R/I/P Outlet Structure Lagoons 1&3	40	03-May-23	28-Jun-23	157																															
SH1210	Install Gates Lagoons 1&3	2	29-Jun-23	30-Jun-23	157																															
SH1100	Remove Solids Lagoons 2&4	10	11-Jul-23	24-Jul-23	157																															
SH1160	Excavate Outlet Structures Lagoons 2&4	10	11-Jul-23	24-Jul-23	157																															
SH1120	Demo Outlet Structures Lagoons 2&4	10	25-Jul-23	07-Aug-23	157																															
SH1180	Install Underdrains Lagoons 2&4	20	25-Jul-23	21-Aug-23	175																															
SH1140	F/R/I/P Outlet Structure Lagoons 2&4	40	08-Aug-23	03-Oct-23	157																															
SH1200	Install New Sand Lagoons 2&4	14	22-Aug-23	11-Sep-23	175																															
SH1220	Install Gates Lagoons 2&4	2	04-Oct-23	05-Oct-23	157																															
A1000	Install New MCC Section	10	14-Mar-24	27-Mar-24	1																															
Startup and Comissioning		286	01-Mar-23	19-Apr-24	30																															
SH1230	Final Startup and Comissioning - Lagoons	10	01-Mar-23	15-Mar-23	276																															
SH1250	Fill and Test Lagoons 1&3	5	03-Jul-23	10-Jul-23	157																															
B1950	Fill and Test Lagoons 2&4	5	06-Oct-23	12-Oct-23	157																															
F1000	Fill and Test Filters 1-3	5	12-Jan-24	22-Jan-24	53																															
SH1050	Startup and Comissioning - Solids Pumps	5	28-Mar-24	03-Apr-24	1																															
F1010	Final Startup and Comissioning - Electrical Gear	10	05-Apr-24	19-Apr-24	0																															

December 29, 2022

WGC# ICO14370-V4

PCL
2000 S. Colorado Blvd., Suite 500
Denver
Phone: 720-682-9371

Attn: Jessie Gloor

Reference: City of Arvada – Ralston WTP – Filter and Solids Handling Improvements – GMP – 2

Weifield Group Contracting, Inc. is pleased to provide our probable cost lump sum proposal on the referenced project.

PRICING (ELECTRICAL, INSTRUMENTATION, & CONTROL):

Filter Improvements	\$1,444,939.00
Solids Handling	\$517,129.00
Fixed General Expenses	\$86,293.00
Variable General Expenses	\$475,085.00
Temporary Power	\$12,283.00
Generator Quick Connect Switchboard	\$98,534.00
Suggested material escalation	\$45,000.00
Suggested estimating contingency	\$35,000.00

Weifield / Timber Line Scope Reductions

- Eliminate the addition for a new MCC-3 section at Solids Pumps and Replace with individual Mitsubishi VFD's Nema 12, which will be fed from the existing MCC-3 with the addition of new breaker buckets **<\$10,397.00>**
- Change Backwash 250HP VFD's Nema 12 manufacture to Mitsubishi **\$12,515.00**
- Use Rosemount radar units over the filters (No display) in lieu of EH Ultrasonics with controllers **<\$16,745.00>**
- Deletion for the Generator Quick Connection Cabinet **<\$98,534.00>**
- Deletion for the disconnect switches at motorized valves and gates **<\$105,733.00>**

CLARIFICATIONS:

1. In this proposal the term “provide” shall mean to furnish and install, complete and ready for intended use.
2. In this proposal the acronym “FBO” shall mean Furnished by Others.
3. In this proposal the acronym “PBO” shall mean Provided by Others.
4. Our proposal is based on the contract documents listed below:
 - a. Filter Specifications dated: October 2022
 - b. Filter Drawings dated: October 2022
 - c. Solids Specifications dated: October 2022
 - d. Solids Drawings dated: October 2022
5. Our proposal is based on a mutually agreeable lump sum contract to be determined.
6. Our proposal is based on a mutually agreeable schedule within 30 days of the Notice to Proceed.
7. Our proposal is based on a 40-hour work week and anticipates a construction duration of 16 months.
8. Our proposal remains valid for 60 days.
9. Others shall not hold Weifield Group Contracting, Inc. liable for errors, omissions, inadequacies of materials, or equipment specified or supplied by others.
10. We have not included provisions for differing site conditions.
11. We have not included temporary environmental controls, de-watering, surveying, utility locates, potholing, or traffic control.
12. We will provide cleanup of our own identifiable debris to onsite waste and recycle containers furnished by the General Contractor.
13. Our proposal is based on all electrical materials being stored on site. We anticipate up to 1 Conex storage containers for the duration of the project and to utilize sharing of office trailer with PCL.
14. We have offered an allowance for Temporary trailer construction power as an add.
15. Temporary construction power will utilize existing power sources
 - a. Task lighting and extension cord are provided by individual trades.
16. We have included Safe-Off only for all demolition.
17. Start-up and Commissioning of Filter Train is figure to be 5 working days per each.

INCLUSIONS:

1. Permit Fees
2. Sales Taxes (Non-Permanent material & equipment)
3. One Year Warranty
4. All safety equipment and tools for our scope
5. Mobilization of electrical equipment and supplies
6. All submittals, drawings, factory tests, field inspections, field testing, and operator/maintenance training for equipment furnished by WGC
7. Electrical and I&C Connections to Process Equipment
 - a. As indicated on drawings
8. Instrumentation and Controls
 - a. As indicated on drawings
 - b. Timber Line BOM
8. Selective Demolition of Electrical Systems
 - a. Render safe for mechanical equipment for removal and disposal by others
 1. Valves
 2. Inline instruments
 3. Sample Pumps
 4. Bubbler Panels
9. Heat Tracing
 - a. As indicated on drawings

EXCLUSIONS:

1. Bond premium (Can be added at \$34,063.00)
2. Sales Tax (Permanente materials)
3. Delays and/or extension of the project schedule
4. Builders Risk Insurance
5. Utility company development fees for permanent and temporary service and consumption charges
6. Handling or disposing of hazardous materials
7. Cut, patch, and replacement of concrete, asphalt, landscaping, and any other existing to remain surfaces
8. Excavation, backfill, export spoils, dewatering, concrete, and rebar
 - a. Trenching – 510'
 - b. Excavation cu/yds – 175
 - c. Export of spoils cu/yds – 99
 - d. Backfill cu/yds – 78
 - e. Concrete cu/yds – 80
 - f. Rebar
 - i. Horizontal – 3,513'
 - ii. Hoops – 255 at 1,953'
9. All concrete including housekeeping pads, protective bollards, etc.
 - a. MCC's – 2
 - b. Transformers – 2
 - c. VFD's – 2
10. Demolition of Concrete and Conduits embedded in Concrete
11. Painting
12. Cathodic Protection
13. Furnish and installation for Backwash Pumps 41-PMP-0101 and 41-PMP-0201, Insulated NDE Bearings and Shaft Grounding devices (Reference drawing F-E-1001 sheet Keyed Note 3)
14. Installation of any equipment or instruments into inline process piping (mag flow meters, flow tubes, etc.)
15. Furnish and Installation of Spool Pieces and Flanges for instruments
16. All taps or associated equipment (valves, pressure reducers, solenoids, etc.) needed in process piping including tubing for analytical instruments
17. Seismic Engineering and Calculation (Reference 01 88 15 Anchorage & Bracing and 01 81 50 Design Criteria)
18. Furnishing and Installation of all motors (Reference 26 20 00 Low-Voltage AC Induction Motors and 26 05 06 Voltage Motors up to 500 Horsepower)
19. Removal of existing owner items for new electrical installation requirements
20. Furnishing and Installation of Stilling Wells and blind flanges – 4 (Reference drawing 00TN01 detail NL900)
21. Grouting of equipment stands
 - a. Jacobs reference details 4091-163, 4091-382 and 4091-394G
 - b. Carollo reference drawing 00TE3 details EM202 and EM210

Sincerely,

WEIFIELD GROUP CONTRACTING*Robb Herder*

Estimator
720.230.6374



ELECTRICAL CONTRACTING

Curtis Miller

VP of Industrial
Cell: 303.669.3702

P.O. Box 710
Frederick, CO 80530

Date	Quote #
12/16/2022	1307

Name / Address
PCL CONSTRUCTION 711 W. GREENTREE DRIVE SUITE 201 TEMPE, AZ 85284

Rep	Project
JK	

Description	Qty	Total
Pump Model 33159 with 1/2 HP AC motor , 1/60/115/230 volts, 1750 RPM	2	4,065.00T
Mechanical seal p/n 3202424000	1	0.00T
Stator p/n 3403501120	1	0.00T
Standard Warranty		
Sales Tax		0.00
Freigh is included		Total
Phone #		\$4,065.00

303-833-9998



Pioneer Equipment, Inc
3738 E. Miami Ave.
Phoenix, AZ 85040
Tel: 602-437-4312 Fax: 602-437-0174

SALES QUOTE

Page: 1 / 2
Sales Quote Number: 2221474
Sales Quote Date: 12/20/2022
Quote Valid To Date: 1/19/2023

To: Justin McRae
P.C.L. CONSTRUCTORS, INC.
1711 W. GREENTREE DR., STE 201
TEMPE, AZ 85284

Quoted By: ERIC LOCK

We are pleased to quote on the following equipment:

Qty.	Item No.	Description	Unit Price	Total Price
		City in Colorado 60% Budget Quote ONLY SECTION 43_23_13.35 HORIZONTAL NON-CLOG CENTRIFUGAL PUMPS		
1		Lot of 2 Flowserve 3MF11A FR3A Pumps with baseplates and 1.5hp motors. Notes/Comments/Exceptions: - Pump curve is per attached ONLY. - Installation NOT included. - Piping, reducers and valves are NOT included. - Mechanical seal flush piping/accessories NOT included. - Gauges, sensors & instrumentation NOT included. - Controls, VFD's, starters & panels NOT included. - Field tests are NOT included. - On-site representation is included but limited to 4 one day visits. - Shipping & Handling to street site is INCLUDED. - Any applicable taxes would be EXTRA. - Lubricants/oils (if required) are NOT included. - Standard domestic packaging ONLY. - Manufacturer's standard paint & prep ONLY. - Not responsible for any liquidated damages. - Not responsible for any consequential damages. - Manufacturer's standard warranty would apply. - Customer will be responsible for any cancellation charges billed to Pioneer Equipment by the manufacturer.		

Lead Time: 39 Weeks + transit
F.O.B.: Factory
Terms: NET 20 DAYS
Sales: Gary Denkler

Prices quoted are subject to adjustment to price in effect at time of shipment.
Orders which require financing are subject to the approval of our credit department.
Delivery date given on this order is contingent upon promised shipment from our suppliers and upon government restrictions or other factors beyond our control.
All applicable taxes to apply.



Pioneer Equipment, Inc
3738 E. Miami Ave.
Phoenix, AZ 85040
Tel: 602-437-4312 Fax: 602-437-0174

SALES QUOTE

Page: 2 / 2

Sales Quote Number: 2221474

Sales Quote Date: 12/20/2022

Quote Valid To Date: 1/19/2023

To: Justin McRae
P.C.I. CONSTRUCTORS, INC.
1711 W. GREENTREE DR., STE 201
TEMPE, AZ 85284

Quoted By: ERIC LOCK

We are pleased to quote on the following equipment:

Qty.	Item No.	Description	Unit Price	Total Price
		- See attached for details. 60% BUDGET quote only.		

Lead Time: 39 Weeks + transit
F.O.B.: Factory
Terms: NET 20 DAYS
Sales: Gary Denkler

Prices quoted are subject to adjustment to price in effect at time of shipment.
Orders which require financing are subject to the approval of our credit department.
Delivery date given on this order is contingent upon promised shipment from our
suppliers and upon government restrictions or other factors beyond our control.
All applicable taxes to apply.



Contact: Eric Lock
Address: Pioneer Equipment Inc
3738 E. Miami Ave.
Phoenix, AZ 85040
Phone: 602-437-4312

Proposal Summary

Customer: Pioneer Equipment Inc
Cust / Proj Ref: PCL
FLS # / Reference: 4328930637 /
Date: Dec 20, 2022

Primary Selection Summary - Centrifugal

Item No.	Qty	Capacity	Head	Pump	Driver power rating	Material	Avg Unit Price (USD)		Lead Time (weeks)
				Stages	Speed		Pump	Motor	
30P1000/30P2000	2	200.0 USgpm	13.00 ft	3MF11A FR3A	1.50 hp / 1.12 kW	CI		Included	39
				1	900 rpm				

Proposal Total: Pumps: 169,627 USD
Motor: Included
Grand Total: 169,627 USD

Comments: 60% Budget Quote ONLY



MF
***Solids-Handling
Pumps***



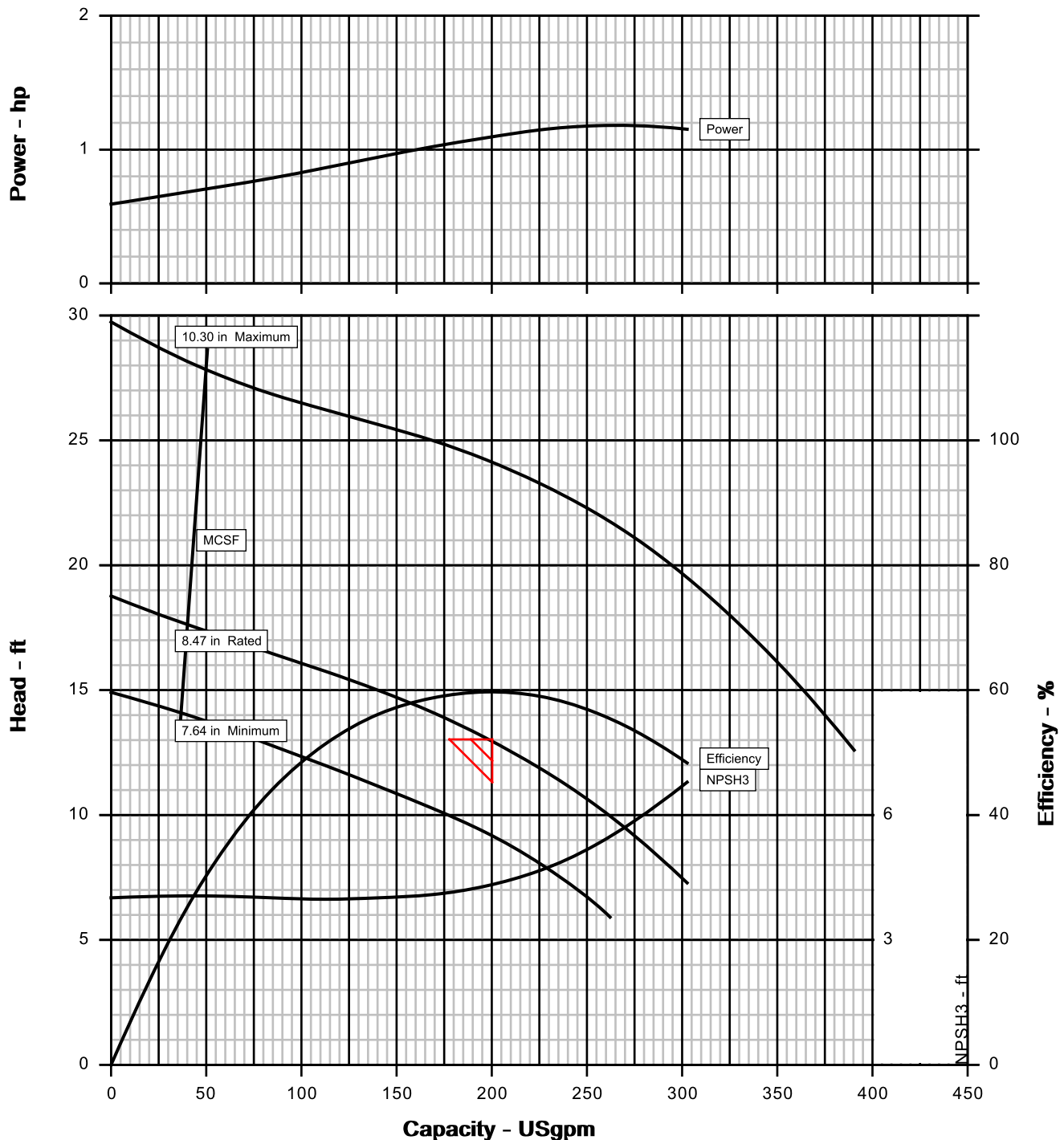


Pump size & type / Stages : 3MF11A FR3A / 1
Based on curve no. : 89116149
Impeller diameter : 8.47 in

Customer : Pioneer Equipment Inc
Item number : 30P1000/30P2000
Service : WTP Sedimentation Basin Solids
Flowserve reference : 4328930637
Date : December 20, 2022

Capacity : 200.0 USgpm
Head : 13.00 ft
Density / Specific gravity : - / 1.000
Pump speed : 880 rpm
Ns / Nss (per eye) : 1,438 / 4,260 (US)
Test tolerance : ANSI/HI 14.6 Grade 1U

CURVES ARE APPROXIMATE, PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS; CAPACITY, HEAD, AND EFFICIENCY.

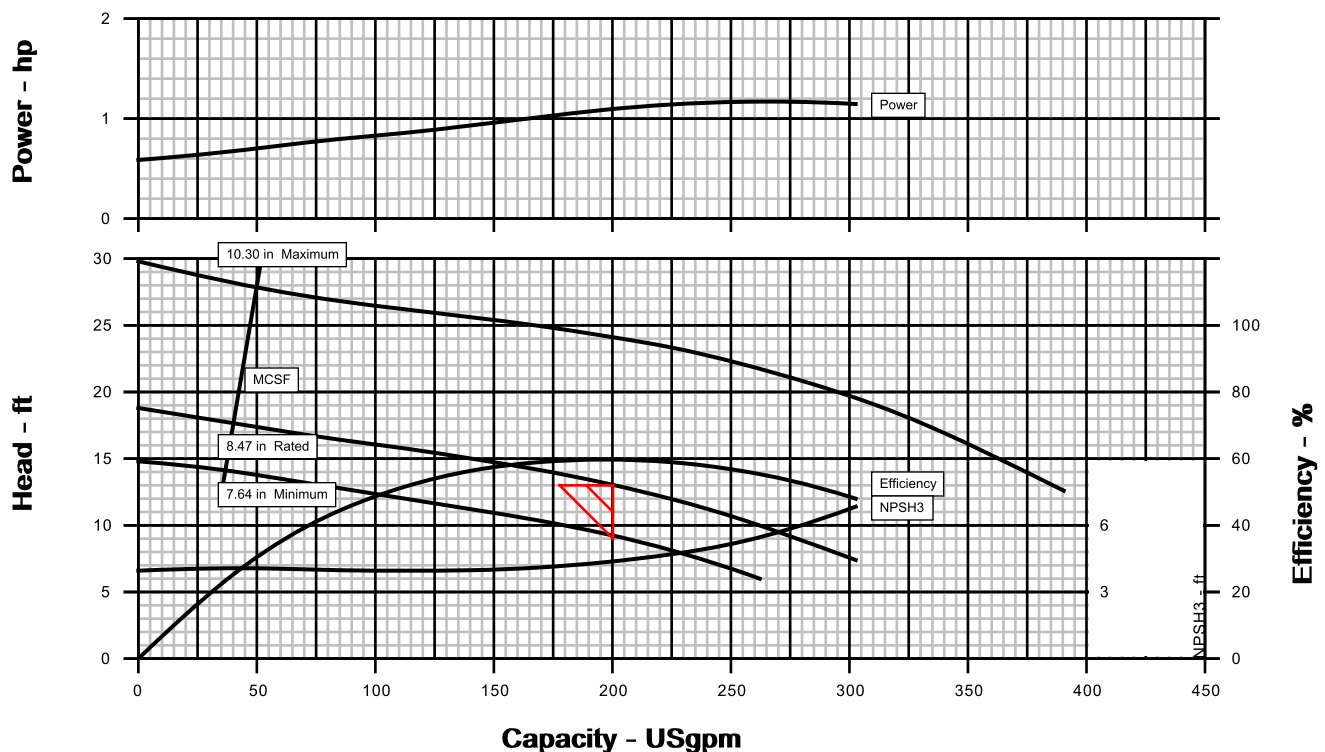


Customer	: Pioneer Equipment Inc	Pump / Stages	: 3MF11A FR3A / 1
Customer reference	: PCL	Based on curve no.	: 89116149
Item number	: 30P1000/30P2000	Flowserve reference	: 4328930637
Service	: WTP Sedimentation Basin Solids	Date	: December 20, 2022

Operating Conditions	Materials / Specification
Capacity (rated/normal) : 200.0 USgpm / -	Material column code : CI
Water capacity (CQ=1.00) : -	Pump specification : -
Total developed head : 13.00 ft	Other Requirements Hydraulic selection : No specification Construction : No specification Test tolerance : ANSI/HI 14.6 Grade 1U Driver Sizing : Max Power(MCSF to EOC) not using SF
Water head (CH=1.00) : -	
NPSHa/NPSHa less margin : 18.0 ft / -	
Maximum suction pressure : 0.0 psig	
Liquid	
Liquid type : Sewage	
Liquid description : 0-3% Solids	
Temperature : 85 °F	
Density / Specific gravity : - / 1.000	
Solid Size - Actual / Limit : - / 2.00 in	
Viscosity / Vapor pressure : 1.00 cP / -	

Performance			
Hydraulic power : 0.66 hp	Impeller diameter		
Pump speed : 880 rpm	Rated	: 8.47 in	
Pump overall efficiency (CE=1.00) : 60.0 %	Maximum	: 10.30 in	
NPSH required (NPSH3) : 4.3 ft	Minimum	: 7.64 in	
Rated brake power : 1.09 hp	Ns / Nss (per eye)	: 1,438 / 4,260 (US)	
	Minimum continuous flow	: 40.9 USgpm	
Maximum brake power : 1.19 hp	Maximum head at rated diameter	: 18.77 ft	
Driver power rating : 1.50 hp / 1.12 kW	Flow at BEP	: 198.4 USgpm	
Casing working pressure : 8.1 psig	Flow as % of BEP	: 100.8 %	
(based on shut off @ cut dia/rated SG)	Efficiency at normal flow	: -	
Maximum allowable : 75.0 psig	Impeller diameter ratio (rated/max)	: 82.2 %	
Hydrostatic test pressure : 100.0 psig	Head rise to shut off	: 44.4 %	
Estimated rated seal chamber pressure : -	Total head ratio (rated / max) / (max / rated)	: 53.9 % / 185.6 %	

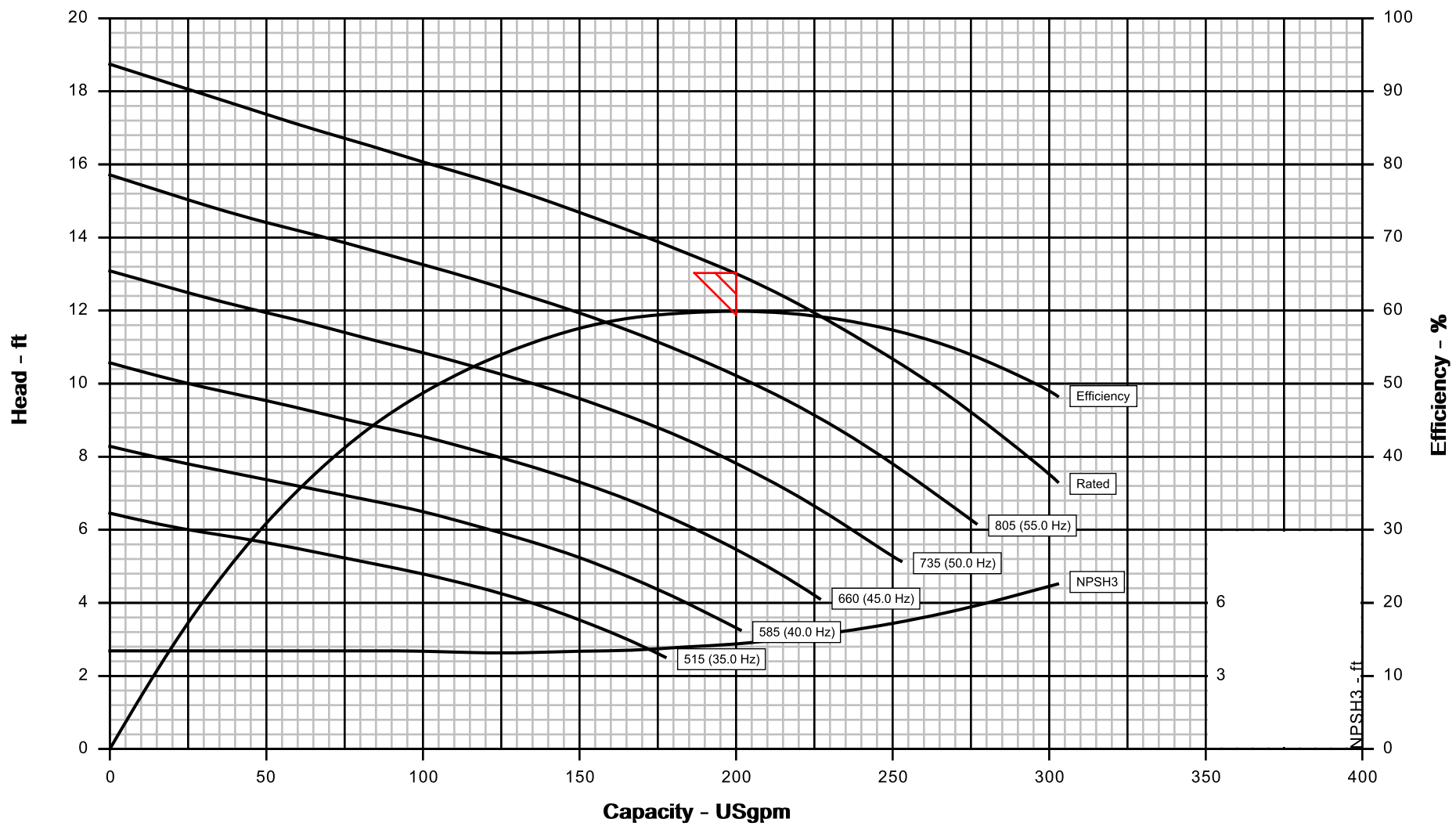
CURVES ARE APPROXIMATE, PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS; CAPACITY, HEAD, AND EFFICIENCY.



Customer	: Pioneer Equipment Inc		Capacity	: 200.0 USgpm
Item number	: 30P1000/30P2000		Head	: 13.00 ft
Service	: WTP Sedimentation Basin Solids		Density / Specific gravity	: - / 1.000
Flowserve reference	: 4328930637		Pump speed	: 880 rpm
Pump size & type / Stages	: 3MF11A FR3A	/ 1	Ns / Nss (per eye)	: 1,438 / 4,260 (US)
Based on curve no.	: 89116149			
Impeller diameter	: 8.47 in		Date	: December 20, 2022



CURVES ARE APPROXIMATE, PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS: CAPACITY, HEAD, AND EFFICIENCY.

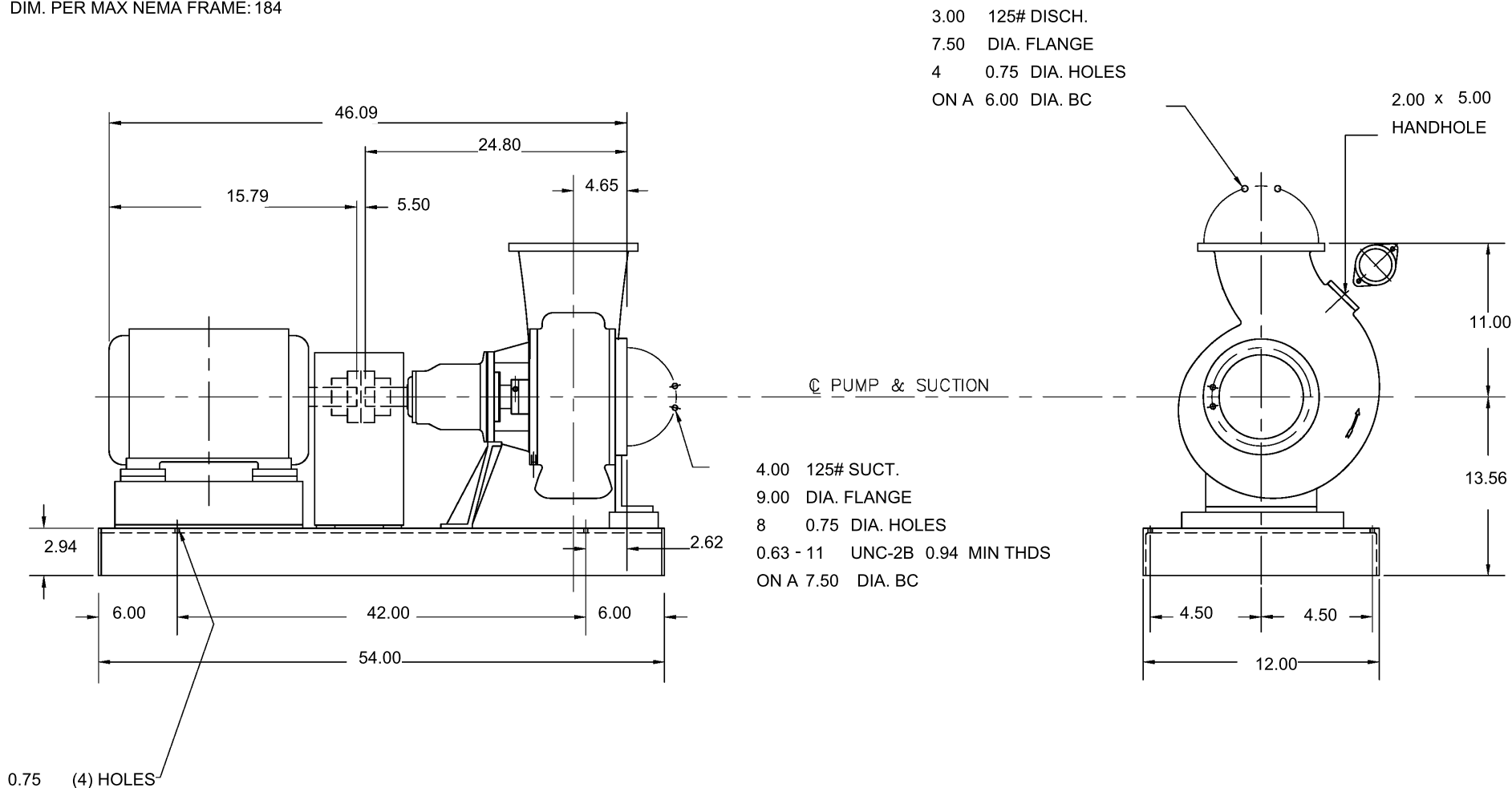


Customer	: Pioneer Equipment Inc	Pump / Stages	: 3MF11A FR3A / 1
Customer reference	: PCL	Based on curve no.	: 89116149
Item number	: 30P1000/30P2000	Flowserve reference	: 4328930637
Service	: WTP Sedimentation Basin Solids	Date	: December 20, 2022

Construction					Driver Information	
Nozzles	Size	Rating	Face	Position	Manufacturer	: Baldor ECP
Suction	4.00 in	125#	FF	End	Power	: 1.50 hp / 1.12 kW
Discharge	3.00 in	125#	FF	Side	Service factor (requested / actual)	: 1.15 / 1.15
Casing mounting				: Foot	Synchronous speed	: 900 rpm
Casing split				: Radial	Orientation / Mounting	: Horizontal / Foot
Impeller type				: Enclosed	Driver type	: -
Bearing type (radial)				: Angular Contact	Frame-size / material	: 184T / -
Bearing number (radial)				: Refer	Enclosure	: TEFC
Bearing type (thrust)				: Angular Contact	Hazardous area class	: -
Bearing number (thrust)				: Refer	Explosion 'T' rating	: -
Bearing lubrication				: Grease	Volts / Phase / Hz	: 460 / 3 / 60 Hz
Rotation (view from coupling)				: CW per Hyd. Institute	Amps-full load/locked rotor	: - / -
Materials					Motor starting	: Direct on line (DOL)
Casing				: Cast Iron	Insulation	: -
Impeller				: Cast Iron	Temperature rise	: -
Case wear ring				: 400 Series Hard SS	Bearings	: -
Impeller wear ring				: CA15 SS	Lubrication	: -
Inducer				: N/A	Motor mounted by	: Flowserve
Shaft				: Gr. 1045 Carbon Steel	Sound Pressure (dBA @ 1.0 m)	
Sleeve				: 316L SS	Driver, expected	: -
Baseplate, Coupling and Guard					Pump & driver, estimated	: -
Baseplate type				: Channel	Seal Information	
Baseplate material				: Steel	Arrangement	: Double Mechanical
Coupling manufacturer				: Falk	Size	: As Required
Coupling size				: As Required	Manufacturer / Type	: Flowserve / Cartridge
Coupling / Shaft guard				: Plastic	Material code (Man'f/API)	: - / -
Weights (Approx.)					Internal neck bushing	: -
Bareshaft pump (net)				: 285.0 lb	Gland	
Baseplate (net)				: 187.0 lb	Gland material	: -
Driver (net)				: 110.0 lb	Flush	: -
Shipping gross weight/volume				: Refer / Refer	Vent	: -
Testing					Drain	: -
Hydrostatic test				: Non witnessed	Auxiliary seal device	: -
Performance test				: Non witnessed	Piping	
NPSH test				: None	Seal flush plan	: -
Paint and Package					Seal flush construction	: -
Pump paint				: Epoxy	Seal flush material	: -
Base grout surface prep				: N/A	Aux seal flush plan	: -
Shipment type				: Domestic	Aux seal flush construction	: -
					Aux seal flush material	: -
Notes						
Impeller Eye Area: 12.2 sq.in.						
-						
-						
-						
-						
-						

REFERENCE ONLY (NOT TO SCALE)

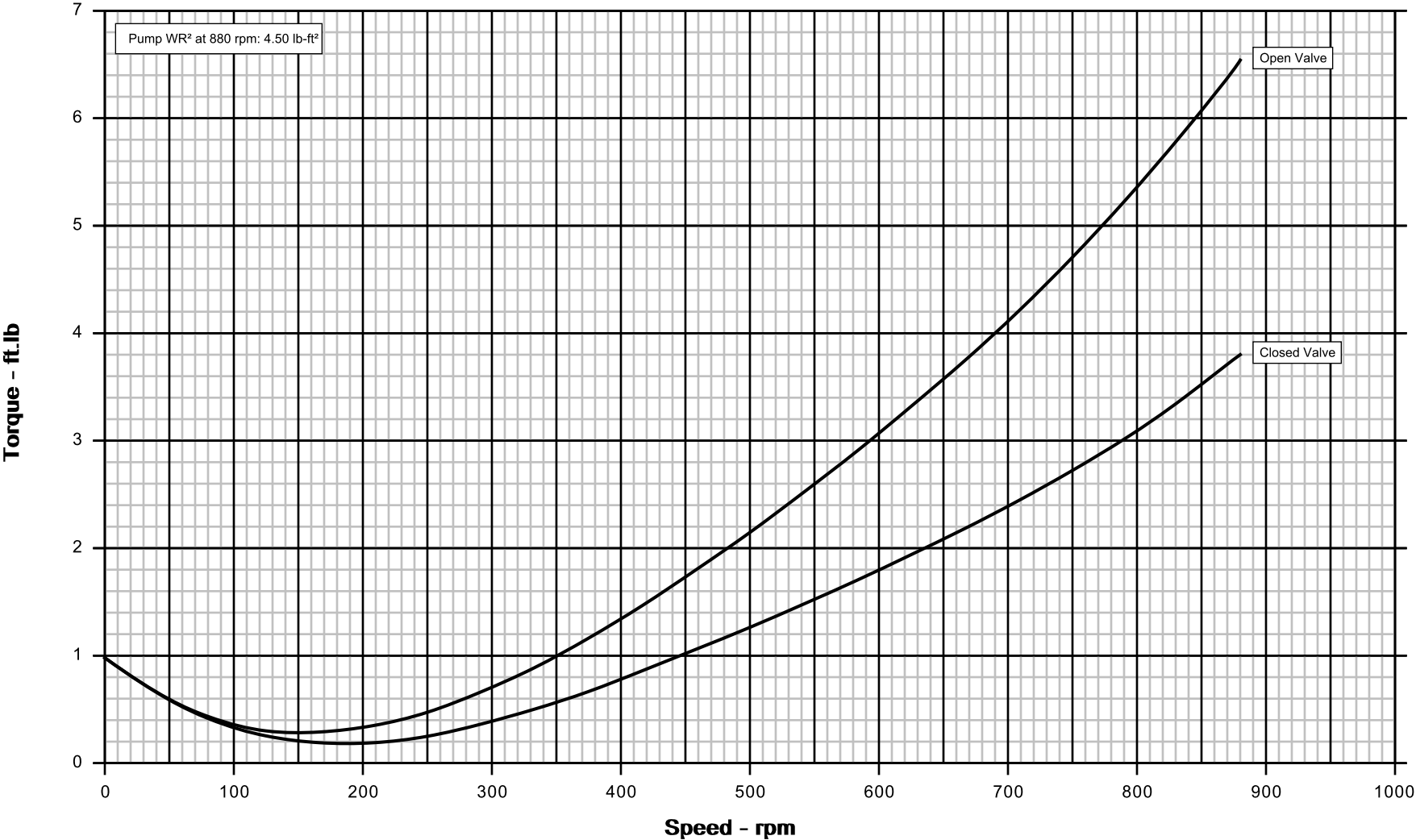
DIM. PER MAX NEMA FRAME: 184



Customer	: Pioneer Equipment Inc	Pump size & type	: 3MF11A FR3A	Drawing number	: -
Item number	: 30P1000/30P2000	Pump speed / Stages	: 880 rpm / 1	Date	: December 20, 2022
Service	: WTP Sedimentation Basin Solids	Flow / Head	: 200.0 USgpm / 13.00 ft	Certified by / Date	: -
Customer PO #	: -	Driver power / Frame	: 1.50 hp / 1.12 kW / 184T	Seal type	: Cartridge
Flowserve reference	: 4328930637	Volts / Phase / Hz	: 460 / 3 / 60 Hz	Seal flush plan	: -

Customer	: Pioneer Equipment Inc		Capacity	: 200.0 USgpm
Item number	: 30P1000/30P2000		Head	: 13.00 ft
Service	: WTP Sedimentation Basin Solids		Density / Specific gravity	: - / 1.000
Flowserve reference	: 4328930637		Pump speed	: 880 rpm
Pump size & type / Stages	: 3MF11A FR3A / 1		Ns / Nss (per eye)	: 1,438 / 4,260 (US)
Based on curve no.	: 89116149		Pump WR ² at 880 rpm	: 4.50 lb-ft ²
Impeller diameter	: 8.47 in		Date	: December 20, 2022

CURVES ARE APPROXIMATE, PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS; CAPACITY, HEAD, AND EFFICIENCY.





Contact: Eric Lock

Address: Pioneer Equipment Inc
3738 E. Miami Ave.
Phoenix, AZ 85040

Phone: 602-437-4312

Scope of Supply

Customer: Pioneer Equipment Inc
Cust / Proj Ref: PCL
Item number: 30P1000/30P2000
Service: WTP Sedimentation Basin Solids

Pump / Stages: 3MF11A FR3A / 1
Based on curve no.: 89116149
FLS # / Reference: 4328930637 /
Date: Dec 20, 2022

Qty	Description		
2	3MF11A FR3A FPD - CI MF Solids Handling ----- SCOPE OF SUPPLY ----- "MF" Horizontal Pump No Horizontal Suction Head Discharge Nozzle- UP Viewed from Suction Bearing Frame Orientation/Speed Acceptable ----- MATERIAL MODIFICATIONS ----- Cast Iron ASTM 278 CI 30 Casing Cast Iron ASTM 278 CI 30 Impeller 11-14% Chr Stl A-487/CA-15 325-375 BHN W.R. 11-14% Chr Stl A-743/CA-40 400-450 BHN W.R. ASTM A108 Gr 1045 Shaft 316L Stainless Steel Shaft Sleeve No Lantern Ring ----- MECHANICAL MODIFICATIONS ----- Standard Balance Grease Lubrication Casing Drain 1/2" NPT (Plugged) Casing Vent 1/2" NPT (Plugged) Suction Gauge Connection 1/2" NPT (Plugged) Discharge Gauge Connection 1/2" NPT (Plugged) Lifting Lugs "Horizontal" Sleeve Type Stainless Steel Anchor Bolts ----- MECHANICAL SEALS & PACKING ----- Mechanical Seal Cartridge Seal Double Cartridge Flowserve ISC2 Double FLS Silicon/Silicon 316SS Viton (5Z4Z/5Z4T) Solids Exclusion Bushing (Reduced Flush Applications) ----- SEALING FLUSH SYSTEMS ----- Customer Supplied Seal Flush Seal Flush Plan 54 - Customer Supplied Mount Motor at Factory		

Feature quantities match pump quantity unless otherwise noted.

Proposal is valid for 30 days.

Customer: Pioneer Equipment Inc
 Cust / Proj Ref: PCL
 Item number: 30P1000/30P2000
 Service: WTP Sedimentation Basin Solids

Pump / Stages: 3MF11A FR3A / 1
 Based on curve no.: 89116149
 FLS # / Reference: 4328930637 /
 Date: Dec 20, 2022

Qty	Description		
	----- COUPLINGS -----		
	Falk "T" Type Spacer		
	----- GUARDS -----		
	Std. OSHA Non-Metallic (Safety Orange) Guard		
	Aluminum Mesh Stuffing Box Guard		
	----- BASEPLATE -----		
	Channel Baseplate		
	Flowserve Supplied Standard Shims		
	----- HYDROSTATIC TESTING -----		
	Hydrotest, Non-Witnessed (with Certificate)		
	----- PERFORMANCE TESTING -----		
	Performance Test, Non-Witnessed		
	Constant Speed Application		
	Factory Motor and Drive		
	Performance Test With Packed Gland		
	Noise Level Test		
1	On site representation		
	Vibration Test Supplied		
	----- ENGINEERING ANALYSIS -----		
1	Torsional Analysis		
1	Foundation Analysis		
1	Baseplate Analysis		
1	Anchor Bolt Analysis		
1	Lifting Lug Analysis		
1	Seismic Calculations		
1	Bearing Life Calculation		
1	Shaft Deflection and Stress Analysis		
1	Horz. Structural and Rotor Frequency		
	----- PAINTING & SURFACE PREPARATIONS -----		
	Flowserve Choice Epoxy		
	SSPC-SP-10 or 6 Surface Prep		
	----- COMMERCIAL OPTIONS -----		
	1 Year Extended Warranty		
	24 Mo. Installation or 30 Mo. Delivery		
	----- DOCUMENTATION -----		
	Submittal Package Required		
	For Information Only		
	Electronic Document Submittal (Flowserve STD Format)		
	Flowserve Detailed Doc. Package		
	+ General Arrangement Drawing, Certified		
	+ IOM		
	+ Bill of Materials		
	+ Scope of Supply		

Feature quantities match pump quantity unless otherwise noted.

Proposal is valid for 30 days.

Customer: Pioneer Equipment Inc

Cust / Proj Ref: PCL

Item number: 30P1000/30P2000

Service: WTP Sedimentation Basin Solids

Pump / Stages: 3MF11A FR3A / 1

Based on curve no.: 89116149

FLS # / Reference: 4328930637 /

Date: Dec 20, 2022

Qty	Description		
	+ Typical Performance Curve (Affinity) + Cross Sectional Drawing + Pump Material List + Spare Parts Furnished + Coating Information + Accessory Information + Pump Performance Test Procedure + Pump Nameplate Drawing + Motor Data Pack + Seal information ----- PACKAGING ----- Domestic Packaging ----- INCO & FREIGHT TERMS ----- FCA Factory ----- SPARE PARTS ----- Spare Pump Bearings Spare motor bearings Spare mechanical seal		
2	Driver ----- MOTORS ----- Driver by Flowserve Horizontal TEFC Corro Duty Motor 1.50 hp 900 RPM 184T Motor		

Customer Comments

Feature quantities match pump quantity unless otherwise noted.
Proposal is valid for 30 days.

Pump Supplier To The World

Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered, and special purpose pumps and systems.

Pumping Solutions

Flowserve is providing pumping solutions that permit customers to continuously improve productivity, profitability and pumping system reliability.

Market-Focused Customer Support

Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the inquiry.



Dynamic Technologies

Flowserve is without peer in the development and application of pump technology, including:

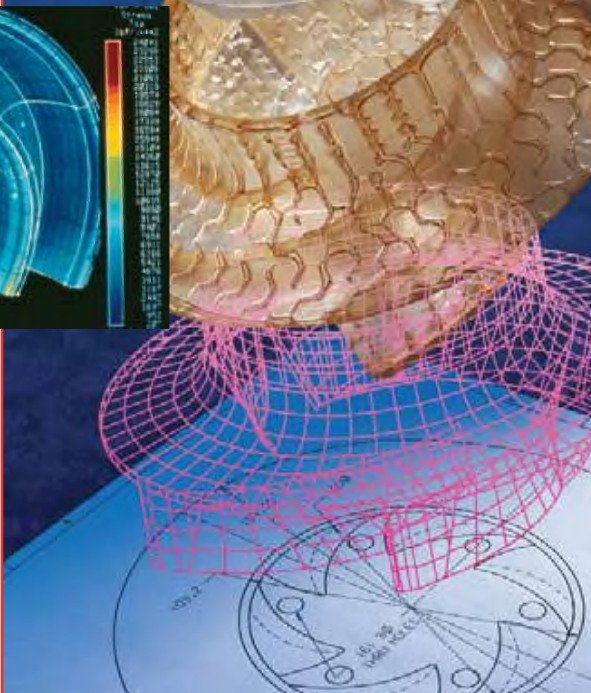
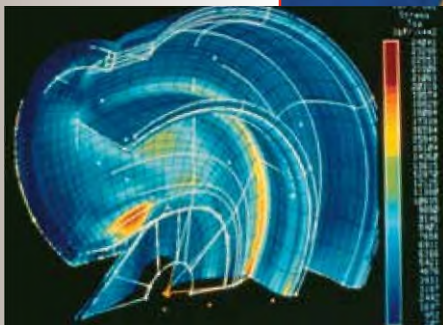
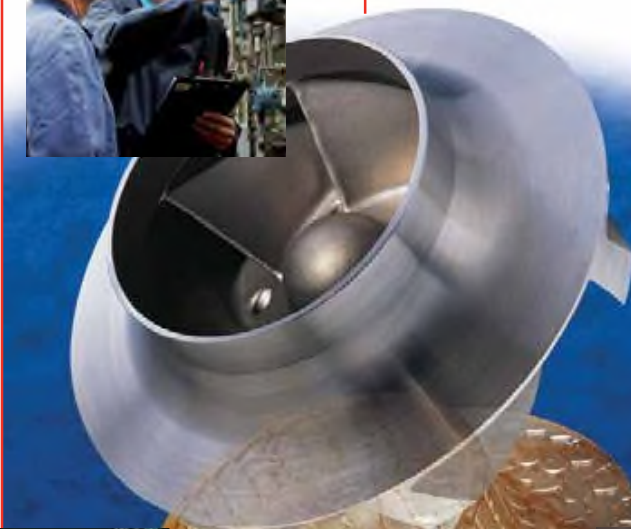
- Hydraulic engineering
- Mechanical design
- Materials science
- Intelligent pumping
- Manufacturing technology

Broad Product Lines

Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps, to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:

- Single-stage process
- Between bearing single-stage
- Between bearing multistage
- Vertical
- Submersible motor
- Positive displacement
- Nuclear
- Specialty



MF
Solids-Handling
Pumps

Rugged and Efficient Design

The Flowserve MF is an end-suction, side-discharge, mixed-flow, non-clog pump. It is specifically engineered for reliability, low cost and long life in demanding sewage handling services or where solids in suspension are of particular concern. The rugged MF is designed, manufactured and tested in conformance with the Standards of the Hydraulic Institute.

Performance Benefits

- Flexibility
 - Configurations
 - Motor mounts
 - Nozzle orientation
- Reliability
 - Robust construction
 - Special materials
- Efficiency
 - Broad hydraulic range
 - Reduced power consumption
- Easy maintenance

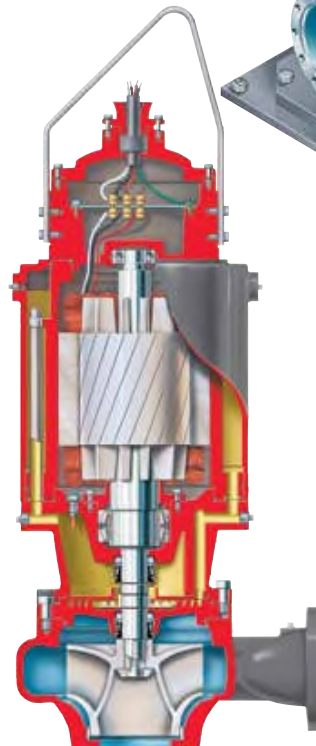
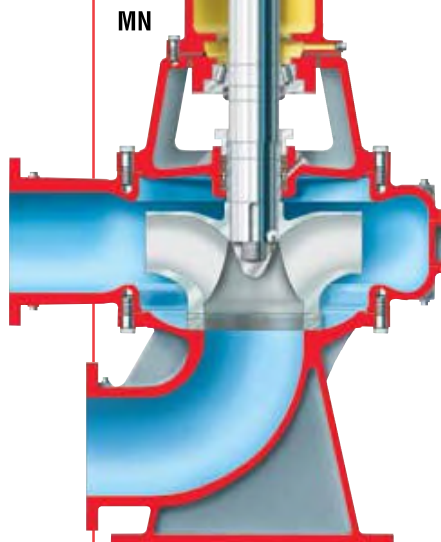
Typical Applications

- Sewage
- Storm water
- Industrial wastes

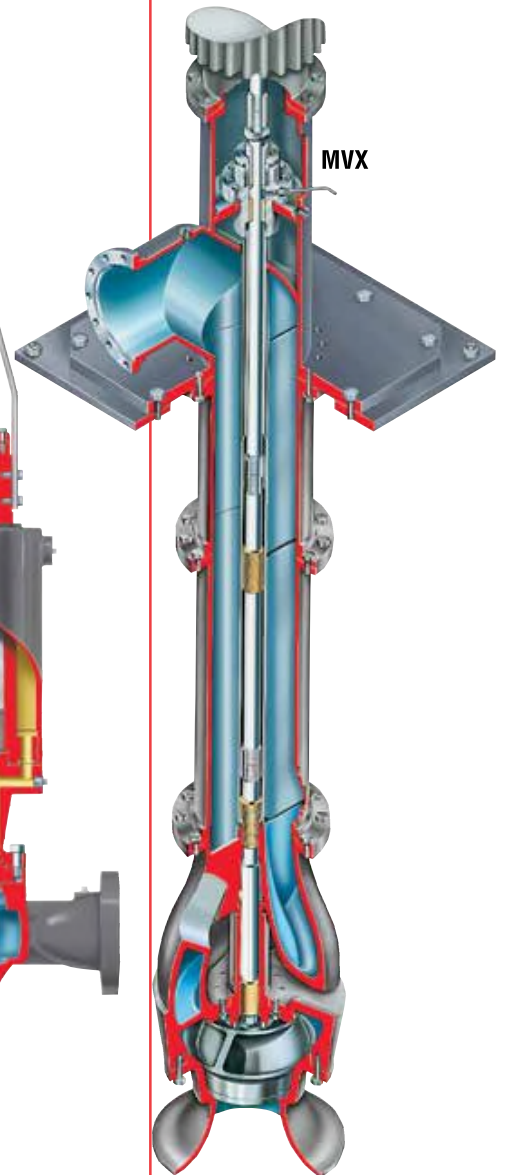
Complementary Pump Designs

Depending upon application requirements, Flowserve can also provide these pump designs:

- Dry-pit, solids-handling
- Vertical, wet-pit
- Submersible non-clog



MSX



MVX

**MF
Solids-Handling
Pumps**

Renowned for reliability, the rugged Flowserve MF solids-handling pump offers extraordinary flexibility and cost efficiency. Versatile performers, medium-capacity MF pumps can be found throughout the collection-treatment-effluent municipal cycle and in industrial waste services.

Operating Parameters

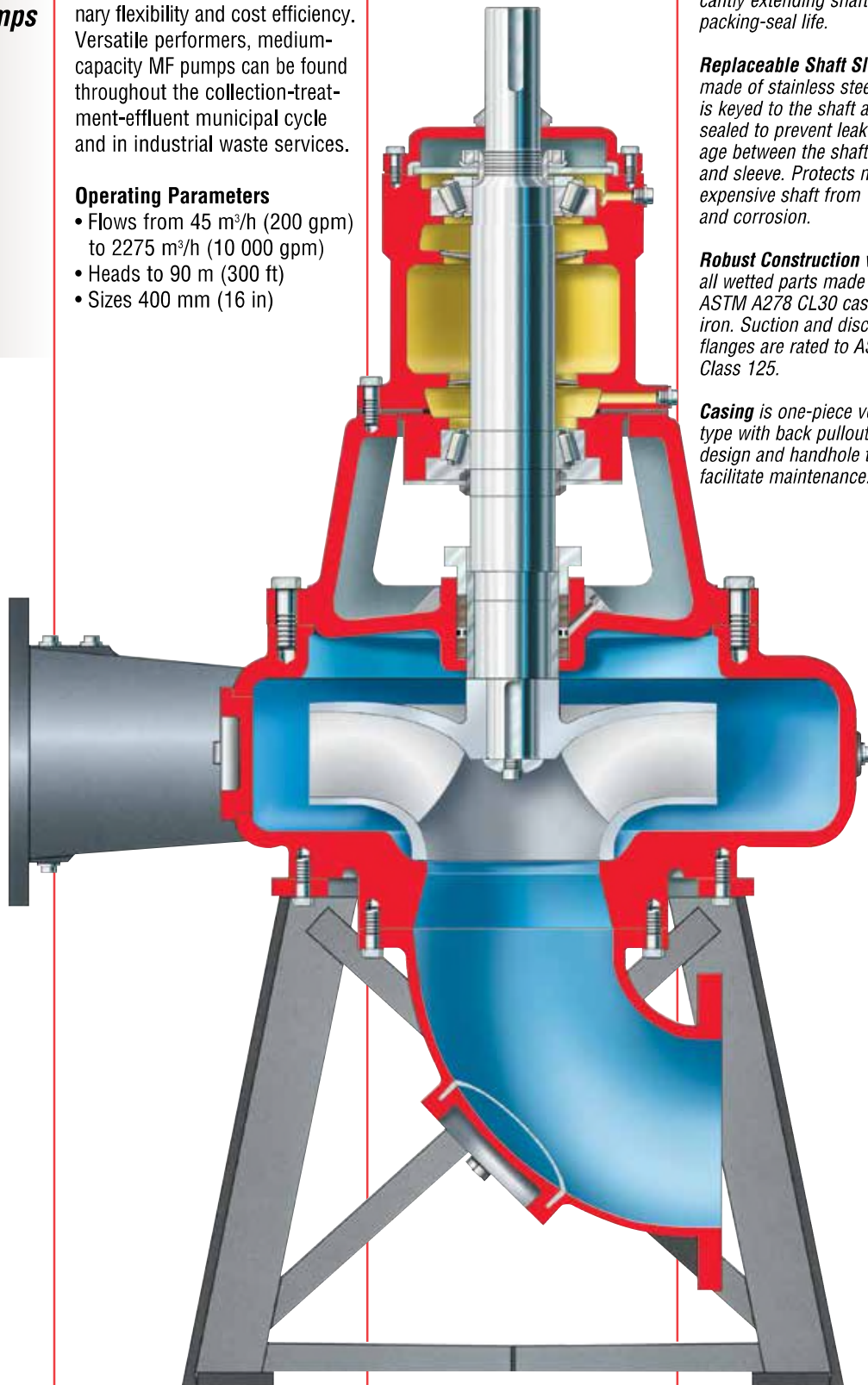
- Flows from 45 m³/h (200 gpm) to 2275 m³/h (10 000 gpm)
- Heads to 90 m (300 ft)
- Sizes 400 mm (16 in)

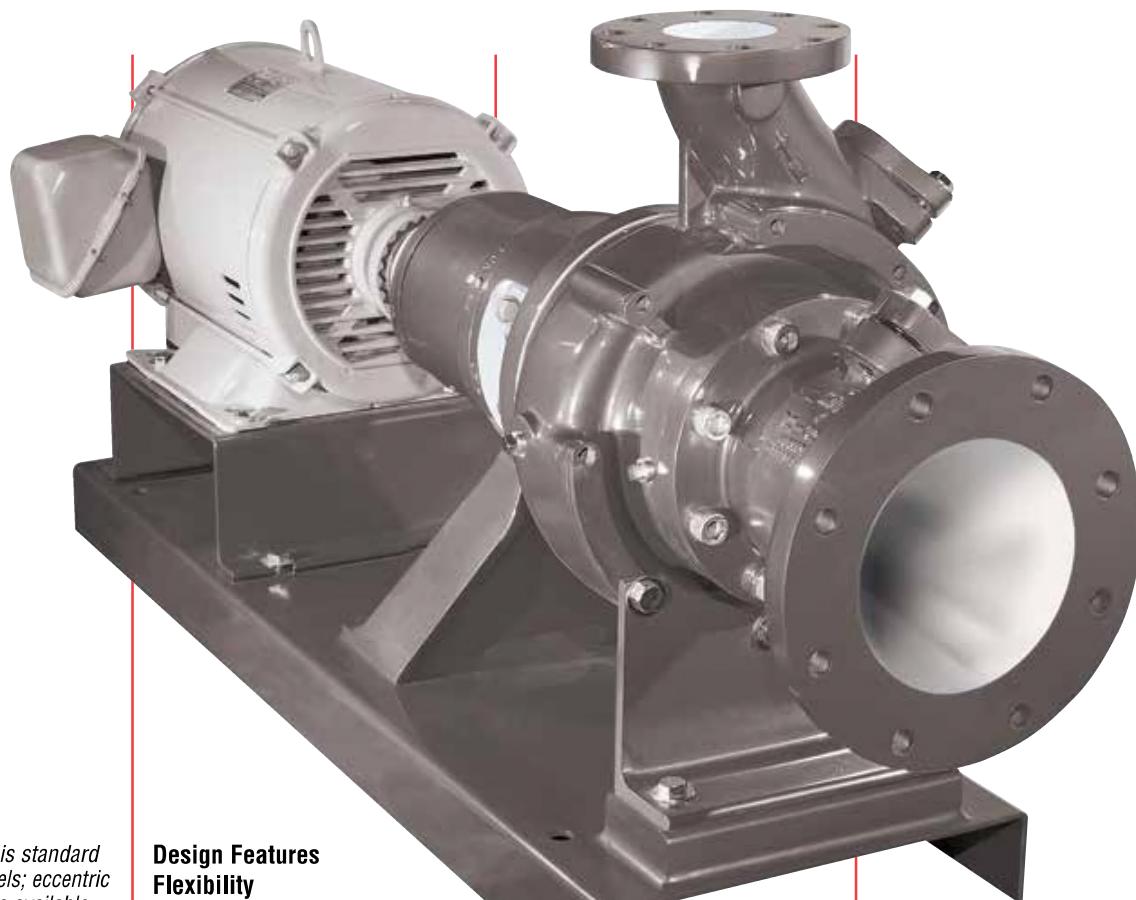
Carbon Steel Shaft with oversized dimensions is robust and rigid, significantly extending shaft and packing-seal life.

Replaceable Shaft Sleeve, made of stainless steel, is keyed to the shaft and sealed to prevent leakage between the shaft and sleeve. Protects more expensive shaft from wear and corrosion.

Robust Construction with all wetted parts made of ASTM A278 CL30 cast iron. Suction and discharge flanges are rated to ASME Class 125.

Casing is one-piece volute type with back pullout design and handhole to facilitate maintenance.





Suction Elbow is standard on vertical models; eccentric suction nozzle is available on horizontal models. Handhole access for inspection and cleaning is standard. Chrome steel wear rings are available.

Non-clog Impeller is key locked to the shaft to prevent loosening by torque from forward or reverse rotation. Chrome steel wear rings are available.

Stuffing Box readily accommodates packing or mechanical seals per customer preference.

Ball or Tapered Roller Bearings (grease lubricated) firmly support the shaft, virtually eliminate axial and radial thrust loads, and are designed for a minimum of 40 000 hours B_{10} life.

Bearing Housing With Integral Jacking Bolts permits axial adjustment of optional wear rings via a shim pack between the bearing housing and back head.

Design Features

- Flexibility
- Horizontal and vertical models
- Variety of mounting arrangements
- Variety of nozzle positions to suit most piping arrangements without special or costly modifications
- Direct or independent motor mounting

Reliability

- Minimal shaft deflection with oversized shaft and reduced overhang, virtually eliminating shaft failure and increasing packing or seal life
- Conservative bearing design arranged to eliminate all radial and axial play
- Hardened chrome steel shaft sleeve standard
- Supports to minimize vibration assure rigidity

Efficiency

- Maximum solids-handling capabilities
- Wide range of efficient operation and reduced power consumption



Ease of Maintenance

- Easy access to seal chamber through large openings in the bearing housing support
- Removable gland for easy packing adjustment or replacement
- Stuffing box arranged for either grease or water seal
- Wide variety of mechanical seal options

- Back pullout of entire rotating assembly without disturbing the casing or suction and discharge piping
- Readily accessible lubrication points in bearing housing

Technical Data and Options

Available Options

- Chrome steel wear rings of varying hardness
- 316 SS or hardened shaft sleeves
- Single, double, cartridge or split mechanical seals
- Bronze, nickel, cast iron or stainless steel castings
- Paint systems
- Baseplates
- Testing
 - Performance
 - Hydrostatic
 - Variable speed
- Coupling type
- Coupling guard

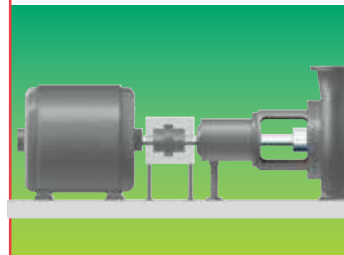
Configurations

MFV



Vertical With Motor Mounted on Separate Floor

MF



Horizontal End-Suction

MFC

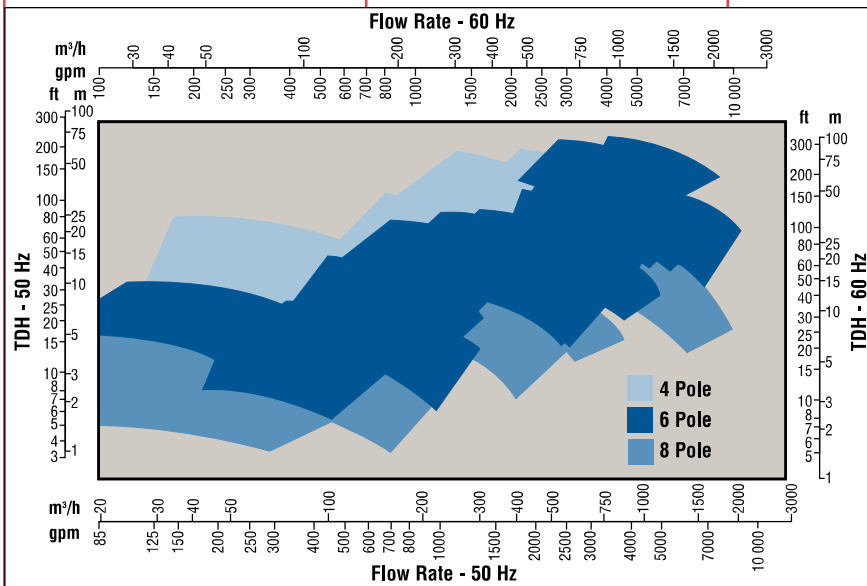


Vertical With Direct Connected Motor

Materials of Construction

Port	Standard Fitted	Optional Material
Casing	Cast Iron	1½% Ni Cast Iron Ductile Iron
Impeller	Cast Iron	1½% Ni Cast Iron Bronze 11–14% Cr Stl.
Impeller Wearing Ring	None	11–14% Cr Stl. 250–300 BHN
Casing Wearing Ring	None	15–18% Cr Stl. 300–350 BHN
Gland	Bronze	—
Shaft	Carbon Steel	Low Alloy Steel
Shaft Sleeve	11–14% Cr Stl. 325–400 BHN	450–500 BHN
Line Bearing	Ball or Tapered Roller	—
Thrust Bearing	Ball or Tapered Roller	—
Stuffing Box Head	Cast Iron	1½% Ni Cast Iron Ductile Iron
Suction Head or Elbow	Cast Iron	1½% Ni Cast Iron Ductile Iron
Seal Cage	PTFE	Bronze
Packing	Non-Asbestos	Mechanical Seals
Adjusting Shims	Plastic	—
Grease Fittings	Alemite	—
Coupling	All Metal Flexible	Refer to Factory
Horizontal Baseplates	Fabricated Steel	—
Vertical Motor Pedestal	Fabricated Steel	—

MF Range Chart



Global Engineered Services and Support

Total Cost Reduction

Asset Management

Product Life Cycle

Performance Re-rates

Site Diagnostics

Repair Services

Energy Management

Spare Parts

Maintenance Contracts

Materials Upgrades

Turnkey Services

Field Repairs

Installation

Project Supervision

Commissioning

Equipment Upgrades

Condition Monitoring

Systems Analysis

Field Machining

Service Dedication

Flowserve Engineered Services is focused on providing customers with uncompromising service and support, where and when needed. Dedicated to delivering the highest quality support, Engineered Services integrates its extensive pump and materials engineering knowledge with creative service solutions. Engineered Services fully understands the business challenges facing customers and is prepared to manage solutions to succeed as a team.

A worldwide network of service and repair centers staffed by highly skilled engineers and technicians is available around the clock, seven days a week to respond to customer queries, evaluate and troubleshoot problems, and provide reliable solutions.

Strength of Experience, Commitment to Excellence

Flowserve has long served industries requiring superior equipment performance and service life.

- Oil and gas production
- Hydrocarbon processing
- Chemical processing
- Water resources
- Power generation
- Nuclear
- Mining and mineral processing
- Pulp and paper
- General industry

Engineered Services is dedicated to maximizing equipment performance and providing reliability-centered maintenance programs for pumps and related equipment, regardless of manufacturer. Using the FlowStar™ asset management software, Engineered Services tracks performance and supports improvement programs using a service life cycle cost business approach. The results are improved reliability and increased profitability.

Your Business Partner

Flowserve partners with customers to respond to the dynamic business conditions that affect them. Flowserve will work with customers to drive efficiency, maximize throughput and control process quality. Whether user needs involve on-site technical assistance or broader project planning with full turnkey responsibility, Flowserve Engineered Services will deliver professional, reliable results.





Warranty

1. **WARRANTY:** Subject to the limitations in Section 2 herein, Seller warrants that the Equipment shall be free from defects in material, workmanship, and title. If it appears within twelve (12) months from the initial Equipment startup or until eighteen (18) months after shipment, whichever occurs first, that the Equipment or any part thereof does not conform to this warranty, and Buyer so notifies Seller within a reasonable time after discovery, Seller shall thereupon promptly correct such nonconformity by repair or replacement EXW Seller's factory or service center. Seller's sole obligation and Buyer's sole remedy under this warranty is repair or replacement at Seller's election. Seller's warranty obligation for Services shall be the earlier of either ninety (90) days from the date of initial startup or six (6) months after completion of the Service work. Seller shall not be responsible for any on-site costs, including removal and reinstallation of any warranted Equipment. Buyer agrees to provide Seller reasonable and clear access to its Equipment which may include removal of materials or structures not supplied by Seller as well as supplying any equipment, materials or structures which are necessary to provide reasonable access to the Equipment being repaired or replaced. All Equipment repaired or replaced will be re-warranted only for the remainder of the original warranty period. **THE EXPRESS WARRANTY SET FORTH HEREIN IS THE EXCLUSIVE WARRANTY OF SELLER, AND NO OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE, SHALL APPLY.** Seller is not responsible for repairs or alterations made by others without mutual written agreement between Seller and Buyer. Seller does not warrant the Equipment or any repair/replacement part against the effects of erosion, corrosion, or normal wear and tear due to operation or the environment. The warranty and remedies set forth herein are conditioned upon proper storage, installation, use and maintenance of the Equipment in all material respects, and in accordance with Seller's written recommendations. Replacement parts or repairs furnished under this warranty shall be subject to the warranty provisions herein for the remaining original warranty period.
2. **LIMITATION OF LIABILITY / EXCLUSION OF CONSEQUENTIAL LOSS:** The remedies set forth herein are exclusive, and the total liability of the Seller with respect to this Order, or any breach thereof, whether based on contract, warranty, tort (including negligence), indemnity, strict liability or otherwise, shall not exceed the Order price of the specific Equipment or Service which gives rise to the claim.

In all cases where Buyer claims damages allegedly arising out of defective or nonconforming Equipment or Services, Buyer's exclusive remedies and Seller's sole liability shall be those specifically provided for under Section 1 "Warranty".

IN NO EVENT, WHETHER ARISING BEFORE OR AFTER COMPLETION OF ITS OBLIGATIONS UNDER THE CONTRACT, SHALL SELLER BE LIABLE FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES OF ANY KIND (INCLUDING BUT NOT LIMITED TO LOSS OF USE, REVENUE OR PROFITS, INVENTORY OR USE CHARGES, COST OF CAPITAL, OR CLAIMS OF CUSTOMERS) INCURRED BY THE BUYER OR ANY THIRD PARTY.

3. **GENERAL PROVISIONS:** (a) No Action, regardless of form, arising out of transactions under the Order, may be brought by the Buyer more than one (1) year after the cause of action has accrued. (b) Any modification to these Terms must be set forth in a written instrument signed by a duly authorized representative of Seller. (c) In the event Buyer has reason to believe the Equipment could be subject to a claim for damages or personal injury, Buyer shall immediately provide Seller with written notice of such claim, and shall provide Seller reasonable opportunity to inspect said Equipment and/or investigate the basis for such potential claim. (d) **UNLESS OTHERWISE SPECIFICALLY PROVIDED IN SELLER'S QUOTATION, EQUIPMENT AND SERVICES HEREUNDER ARE NOT INTENDED FOR USE IN ANY NUCLEAR OR NUCLEAR RELATED APPLICATIONS. IF SELLER'S QUOTATION EXPRESSLY STATE THAT THE EQUIPMENT AND SERVICES ARE INTENDED FOR NUCLEAR OR NUCLEAR RELATED APPLICATIONS, SELLER'S ADDENDUM (P-62) FOR NUCLEAR LIABILITY PROTECTION IS HEREBY INCORPORATED.** Buyer (i) accepts the Equipment and Services in accordance with the restriction set forth in the immediately preceding sentences, (ii) agrees to communicate such restriction in writing to any and all subsequent purchasers or users, and (iii) agrees to defend, indemnify and hold harmless Seller from any and all claims, losses, liability, suits, judgments and damages, including incidental and consequential damages, arising from the use of the Equipment or Services in any nuclear or nuclear related applications, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

**Flowserve... Supporting Our Customers
With The World's Leading
Pump Brands**



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5215 North O'Connor Blvd.
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Irving, Texas 75039-5421 USA



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B1644CGN-Victoria-San Fernando
Buenos Aires, Argentina
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Telefax: +54 11 4714 1610

Europe, Middle East, Africa

Flowserve Corporation
Parallelweg 13
4878 AH Etten-Leur
The Netherlands
Telephone: +31 76 502 8100

Your local Flowserve representative:

**PIONEER
EQUIPMENT INC.**

1-800-523-9998
Sales@pioneerequip.com

Asia Pacific

Flowserve Pte. Ltd.
10 Tuas Loop
Singapore 637345
Telephone: +65 6771 0600
Telefax: +65 6862 2329

Red Flint Sand & Gravel, LLC

1 American Blvd.
PO Box 688
Eau Claire, WI 54702
Phone: (715) 855-7600
Fax: (715) 855-7608



DATE: July 8, 2022
TO: Jessie Gloor
Pcl Construction
FROM: Kaylie Berlin
SUBJECT: Granular Filter Materials
QUOTE: QTE220706E12-02REV1

Phone: 720-682-9371
Email: jgloor@pcl.com

**BUDGETARY
ARVADA, CO**

Listed below is our quotation for the Red Flint products you requested, quoted Ex Works Eau Claire, WI. Sales tax, if applicable, has not been included in the quoted price. Our product pricing will remain valid for 30 days, however, Red Flint reserves the right to re-quote the media as conditions change and update the purchase order pricing accordingly. Our terms are net 30 days, with 1.5% interest charged per month on all account balances over 30 days. Red Flint imposes a surcharge of 2% on the transaction of Visa, MasterCard, Discover, and American Express credit cards, which is not greater than our cost of acceptance. We do not surcharge debit cards.

Red Flint granular filter materials have been used in municipal and industrial filtration applications since 1917. Red Flint filtration media is produced to meet exacting size and uniformity specifications and meets or exceeds the AWWA B100-16 Standard (Granular Filter Materials) and is NSF/ANSI Standard 61 (Drinking Water System Components – Health Effects) certified for quality and purity.

ITEM CODE	ITEM DESCRIPTION	QUANTITY
AB00000	Sand Blend	1250 tons
Lagoon 1 Material Subtotal:		\$ 69,000.00
AB00000	Sand Blend	1250 tons
Lagoon 2 Material Subtotal:		\$ 69,000.00
AB00000	Sand Blend	1250 tons
Lagoon 3 Material Subtotal:		\$ 69,000.00
AB00000	Sand Blend	1250 tons
Lagoon 4 Material Subtotal:		\$ 69,000.00
TOTAL USD:		\$ 276,000.00

Additional Notes:

1. The requested products will be scheduled for production upon receipt of a Purchase Order. We will notify you of the anticipated delivery date or delivery date range upon receipt of the Purchase Order. Red Flint can better accommodate your delivery schedule the earlier we receive the Purchase Order.
2. Independent Laboratory Testing is not included in the quoted price.
3. Bulk Density of Sand & Gravel = 100 lb/cubic foot.

4. Red Flint shall not be liable for any delay or failure in delivering any of the products if such delay or failure shall be due to one or more of the following causes: fire, strike, lockout, dispute with workmen, pandemic, flood, lightning, accident, delay in transportation, shortage of fuel, inability to obtain material within quoted prices, war, embargo, demand or requirement of the United States or any governmental or war activity, or any other cause whatsoever beyond the reasonable control of Red Flint. In addition, Red Flint shall not be liable for any delays or failure attributable to failure of any materials supplier or freight carrier to perform any of its obligations in a timely manner. In the event of any such delay, Red Flint's obligations related to such products shall be excused for the period of such delay and the time for the performance shall be extended by a period equivalent to such delay.

5. Material quoted based on the below specification:

Sieve Size	Percent by Weight Passing Sieve
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	5-30
#100	1-10
#200	0

Please advise if we can be of further assistance by calling Red Flint at (715) 855-7600 or you can email me at kaylie.berlin@redflint.com. Purchase orders can be sent to sales@redflint.com. Thank you for considering Red Flint Sand and Gravel.



AWI BUDGETARY PRICING

Owner..... City of Arvada, CO
Facility Name Ralston Water Treatment Plant
Consulting Engineer Jacobs
DateJune 23, 2022

Scope of Work

AWI ProductPanel Underdrains
Material of Construction 304L stainless steel (304 stainless steel fasteners)
Number of Filters..... See Budget Pricing Table for Quantities
Number of Cells per Filter Two (2)
Filter Cell Width 21 feet
Filter Cell Length 11 feet
Air Feed for Air Scour from N/A

Includes:

- Phoenix Filter Panel Underdrain Systems
- Cleaning of stainless steel using power wire brushing
- All necessary fasteners
- Anchors with adhesive
- Gaskets and sealants
- Installation and maintenance manuals
- Freight FOB jobsite
- Customary field service (10 days / 2 trips per cell)

Budgetary Pricing

AWI Scope of Work.....See the Budget Pricing Table that Follows

AWI BUDGETARY PRICING PHILOSOPHY

When preparing budgetary pricing for a project, the goal of AWI is to provide a price that conservatively reflects a reasonably accurate view of the scope of work for that project. By “conservative” we mean that in our view budgetary pricing should be higher by a small percentage than a bid day price at some reasonable point in the future allowing for minor changes in scope of supply.

AWI does not feel that comparison of budgetary pricing for capital equipment is a valid means to anticipate price competitiveness on bid day. When attempting to price-compete based upon budget pricing, the temptation is much too great to leave out or dramatically underestimate key components of a project such as freight and service. AWI includes full freight FOB jobsite and more than adequate field service by our exceptional Installation Supervisors in our budgetary pricing. In addition, comparison of budgetary pricing overlooks the substantial advantage AWI has when comparing the cost of equipment installation. We would welcome the opportunity to review installation of AWI Phoenix™ Underdrains Systems in greater detail.

In general, AWI welcomes the opportunity to provide budgetary pricing for our Products. We prefer to offer our underdrain systems on a standalone basis; however, when customer circumstances dictate, AWI does have the capability to furnish a broader package of filter equipment including such items as filter media, troughs, air scour blowers, etc.

In preparing budgetary pricing, the biggest variable that AWI confronts is the cost of stainless steel which has varied significantly over the years. AWI uses an index published by Global Stainless Steel, Inc. called “North American Surcharges” to monitor stainless steel costs. Fortunately, though the cost of stainless steel is a significant part of the overall cost of producing AWI Underdrain Systems, it is not the only cost. As a result, the cost of AWI Underdrain Systems is substantially less volatile than the cost of stainless steel.

Budget Pricing Table

At the time this budgetary pricing is being prepared, there is significant unknown – the quantity of filters for which underdrain systems will be being purchased.

Filter quantities have a significant impact upon the budgetary pricing provided by AWI based upon the following factors:

- Engineering costs are essentially the same for a single filter or multiple filters.
- Larger filter quantities facilitate more efficient raw material purchasing.

- Manufacturing set-up costs are essentially the same for a single filter or multiple filters.
- AWI can generally fit multiple filters on a single truck during shipping so shipping costs per filter will go up for small quantities.
- Field service costs can be spread more efficiently over multiple filters.

AWI is presenting budgetary pricing options multiple filter selections to provide perspective for decision making:

Budgetary Pricing	
Number of Filters	Budget
Filters 1 - 9	\$1,150,000
Filters 10 - 12	\$390,000



Red Flint Sand & Gravel, LLC

1 American Blvd.

PO Box 688

Eau Claire, WI 54702

Phone: (715) 855-7600

Fax: (715) 855-7608



DATE: June 28, 2022
TO: Jessie Gloor
 Pcl Construction
FROM: Kaylie Berlin
SUBJECT: Granular Filter Materials
QUOTE: QTE220516E12-01REV1

Phone: 480-582-2573
 Email: jgloor@pcl.com

ARVADA, CO

Listed below is our quotation for the Red Flint products you requested, quoted with delivery to Arvada, CO. Our product pricing will remain valid for 30 days; however, freight rate at time of shipping will apply. Our terms are net 30 days, with 1.5% interest charged per month on all account balances over 30 days. Red Flint imposes a surcharge of 2% on the transaction of Visa, MasterCard, Discover, and American Express credit cards, which is not greater than our cost of acceptance. We do not surcharge debit cards.

Red Flint granular filter materials have been used in municipal and industrial filtration applications since 1917. Red Flint filtration media is produced to meet exacting size and uniformity specifications and meets or exceeds the AWWA B100-16 Standard (Granular Filter Materials) and is NSF/ANSI Standard 61 (Drinking Water System Components – Health Effects) certified for quality and purity.

ITEM CODE	ITEM DESCRIPTION	QUANTITY
AC25022	Anthracite 1.00-1.10mm, UC<1.4	156 (45 cuft) super sacks
AB36010	Filter Sand 0.55-0.65mm, UC<1.4	65 (40 cuft) super sacks
PA13099	Pallets- Anthracite	156 pallets
PA11099	Industrial Pallets	65 pallets
Phase 1 Material Subtotal:		\$ 131,277.25
SV15099	Independent Laboratory Testing	1 lot *see note 2
Phase 1 Independent Laboratory Testing Subtotal:		\$ 1,365.00
TA12099	Estimated Shipping & Handling	6 flatbeds
TA13099	Estimated Shipping & Handling	8 flatbeds
Phase 1 Freight Subtotal:		\$ 83,200.00
AC25022	Anthracite 1.00-1.10mm, UC<1.4	156 (45 cuft) super sacks
AB36010	Filter Sand 0.55-0.65mm, UC<1.4	65 (40 cuft) super sacks
PA13099	Pallets- Anthracite	156 pallets
PA11099	Industrial Pallets	65 pallets
Phase 2 Material Subtotal:		\$ 187,138.25
SV15099	Independent Laboratory Testing	1 lot *see note 2
Phase 2 Independent Laboratory Testing Subtotal:		\$ 1,365.00
TA12099	Estimated Shipping & Handling	6 flatbeds
TA13099	Estimated Shipping & Handling	8 flatbeds
Phase 2 Freight Subtotal:		\$ 89,870.00
Total:		\$ 494,215.50

Additional Notes:

1. The requested products will be scheduled for production upon receipt of a Purchase Order. We will notify you of the anticipated delivery date or delivery date range upon receipt of the Purchase Order. Red Flint can better accommodate your delivery schedule the earlier we receive the Purchase Order.
2. Independent Laboratory Testing per Phase is included in the quoted price:

Test	Filter Sand	Anthracite
Gradations (ES, UC included)	1	1
Specific Gravity	1	1
Acid Solubility	1	1
Mohs' Hardness	---	1
Ash Content	---	1

- a. Please allow 3-4 weeks for testing results
 - b. No post shipment sampling or testing is included in the price
- 3. Shipping & Handling price is based on current rates and fuel surcharge. Actual rates and surcharge at the time of shipping will apply.** Delivery will be made via flatbed trucks; a forklift is needed to remove the pallets from the trucks. After the first hour of truck unloading, there is an \$85/hour demurrage charge for any further unloading time.
4. We advise all of our customers to account for the volatility of the shipping market in their project contingency plans. We will pass on increases, should they occur on this project, when we invoice. If reductions were to occur, we will also pass on those savings at invoice.
5. Bulk Density of Sand & Gravel = 100 lb/cubic foot.
6. Bulk Density of Anthracite = 50 lb/cubic foot.
7. Prior to accepting a purchase order, Red Flint will provide updated and current freight rates. The freight rates at time of shipping will apply; rates will be updated after purchase order no less than every 30 days for the duration of the project as freight rates change
- 8. Anthracite coal pricing and availability is extremely volatile, and pricing and availability are quoted based on current availability. This quotation is an estimate based on current pricing and availability and is not guaranteed. Actual anthracite price may change prior to shipment, and Red Flint will advise the customer of any anticipated price or lead time increases prior to shipment. Red Flint will immediately re-quote as conditions change and the purchase order pricing will be adjusted accordingly.**
9. Purchaser to verify quantities prior to placing an order
10. Quantity based on 12 filters: 3 filters with 440 sqft each and 9 filters 462 sqft each
11. An additional 1.5" filter sand and 3" anthracite included for skimming allowance.
12. Red Flint guarantees the media will meet the specifications before it leaves our facility and once it arrives onsite. Any post-shipment sampling and testing shall be performed by a technician familiar with sampling and testing water filtration media. Red Flint shall approve the laboratory selected for post-shipment testing. Post-shipment sampling and testing is not included in our proposal
13. All post-shipment sampling shall be performed prior to installation and handling of the media. If the sampling and testing is done after the media is installed, it shall be for the Owner/Engineer's records and not used as a basis for approval or rejection.

14. Red Flint shall not be liable for any delay or failure in delivering any of the products if such delay or failure shall be due to one or more of the following causes: fire, strike, lockout, dispute with workmen, pandemic, flood, lightning, accident, delay in transportation, shortage of fuel, inability to obtain material within quoted prices, war, embargo, demand or requirement of the United States or any governmental or war activity, or any other cause whatsoever beyond the reasonable control of Red Flint. In addition, Red Flint shall not be liable for any delays or failure attributable to failure of any materials supplier or freight carrier to perform any of its obligations in a timely manner. In the event of any such delay, Red Flint's obligations related to such products shall be excused for the period of such delay and the time for the performance shall be extended by a period equivalent to such delay.

Media Characteristics:

Filter Sand

- a. Specific Gravity: > 2.6
- b. Acid Solubility: < 5%
- c. Silica Content: > 85%

Anthracite

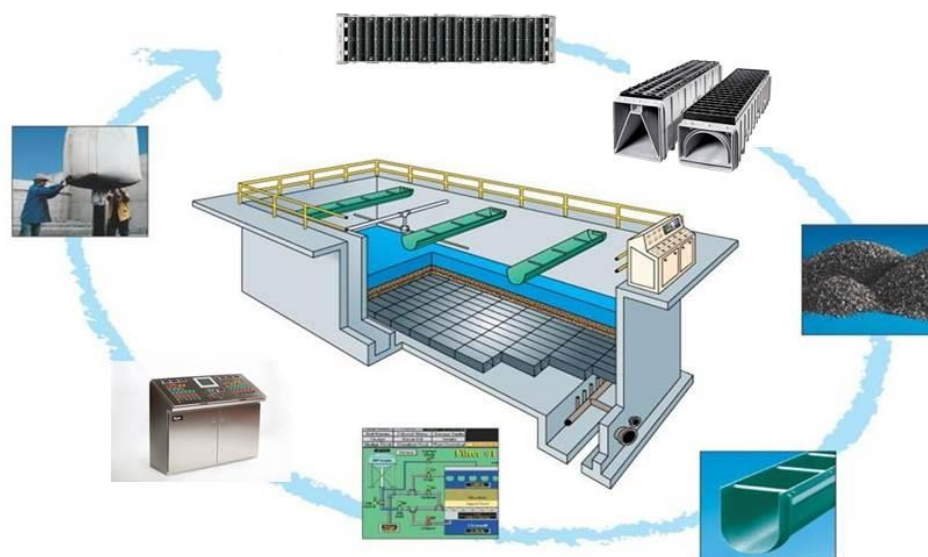
- a. Specific Gravity: > 1.55
- b. Acid Solubility: < 2%
- c. Mohs Hardness: > 2.7 (exception to the specification)
- d. Ash Content: < 15%

Please advise if we can be of further assistance by calling Red Flint at (715) 855-7600 or you can email me at kaylie.berlin@redflint.com. Purchase orders can be sent to sales@redflint.com. Thank you for considering Red Flint Sand and Gravel.

Firm Proposal – Filter Media

Ralston WTP

Arvada, CO



Prepared for:

PCL

7/6/2022



Xylem Water Solutions USA, Inc.
108 Tomlinson Dr – Suite 400
Zelienople, PA 16063
Mr. Wayne Steen
Direct: 724-453-2111
Mobile: 724-272-2905
Email: wayne.steen@xylem.com

7/6/2022

Project name : Arvada, CO
Project number : I19222

To Whom It May Concern:

Based on your inquiry, we are pleased to forward the following proposal to your attention. Thank you for the opportunity to offer our equipment and services for the Arvada, CO, Ralston WTP project.

We hope that our proposal meets your expectation. If you have any questions, please do not hesitate to contact me or our local representative.

Respectfully,

Wayne Steen
Senior Sales Engineer

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1 Technical Description

1.1 SCOPE OF SUPPLY

We are pleased to offer the following materials and services by Xylem Water Solutions USA, Inc. This quotation has been prepared using SECTION 44 43 30 FILTER MEDIA and the provided 30% drawings.

FILTER MEDIA:

(9) filter cells, 462 square feet each
TOTAL FILTER AREA: 4,158 square feet

4,184 cubic feet SILICA SAND 10" Depth plus
1 1/2" skimming allowance and 5% extra
Effective size: 0.55 mm to 0.65 mm
Uniformity coefficient: 1.40
209 Tons

10,741 cubic feet FILTER ANTHRACITE 28" Depth plus
3" skimming allowance
Effective Size: 1.00 mm to 1.10 mm
Uniformity coefficient: 1.40
269 Tons

(3) filter cells, 420 square feet each
TOTAL FILTER AREA: 1,260 square feet

1,268 cubic feet SILICA SAND 10" Depth plus
1 1/2" skimming allowance and 5% extra
Effective size: 0.55 mm to 0.65 mm
Uniformity coefficient: 1.40
64 Tons

3,255 cubic feet FILTER ANTHRACITE 28" Depth plus
3" skimming allowance
Effective Size: 1.00 mm to 1.10 mm
Uniformity coefficient: 1.40
82 Tons

Submittals:

Materials meet and/or exceed American Water Works Association Standard B100 (latest revision) for Filtering Material. Typical samples and/or test reports detailing the physical and chemical characteristics of the filtering material will be provided for review and approval as required by the specification. If independent testing is required per specification, test reports of the actual material produced will be submitted for approval prior to release for shipment.

Packaging and Placement of Materials:

Material will be packaged in semi-bulk containers, "Super Bags," with lifting sleeves and bottom discharge spout, containing approximately 2,000 to 4,000 pounds per sack. **Pallets are not included in this proposal and can be provided for an additional charge.**

Quantities:

Quantities indicated above are Xylem Water Solutions USA, Inc best calculations of the quantity requirements. Five percent (5%) extra sand is included to cover incidental damage or loss. Any additional loss of sand due to storage or handling is not covered by this proposal.

1.2 SERVICES

MANUFACTURER'S SERVICES:

Not Included. Services may be obtained at the current prevailing rate plus living and travel expenses.

2 Technical Clarification & Deviations

MEDIA AVAILABILITY FOR FIRST HALF SHIPMENT OF MATERIAL WOULD BE APPROXIMATELY NOV/DEC OF 2022 DUE TO PRIOR COMMITMENTS AND CURRENT WORKLOAD.

1. SECTION 44 43 30, 1.02, D, 2- Leopold does not perform delivered media testing or Installed media testing. Leopold performs pre-shipment testing only. Leopold takes exception to providing delivered and installed media testing. If you would like to witness sampling, you can visit our mill or do a zoom call to witness and you can watch the process.

Delivered or installed media sampling and testing must be performed by an independent laboratory experienced in both filter media sampling and testing and have the appropriate sampling tools. Leopold highly recommends Pennoni or GeoScience Engineering as

acceptable testing laboratories. Leopold is not providing cost for Delivered or installed media testing. This shall be provided by others. Additionally, delivered or installed media testing only needs to show that the delivered media meets the project specifications, as there are acceptable range(s) of test results allowed in many of the ASTM procedures of AWWA B100-16. Leopold is not responsible for delays due to onsite media acceptance testing variances from pre-shipment testing.

2. SECTION 44 43 30, 3.02, C, 4- Leopold does not perform delivered media testing or Installed media testing. Also, the act of skimming changes the gradation characteristics of the media since the finer grains (along with some coarse grains) are removed from the media. The media producers do not control the process nor the degree or effectiveness of the skimming. Typically installed media testing is conducted for informational purposes only, which would be acceptable. Leopold is not responsible for delays due to onsite media acceptance testing variances from pre-shipment testing.
3. SECTION 44 43 30, 3.02, D, 5- Leopold does not perform delivered media testing or Installed media testing. Also, the act of skimming changes the gradation characteristics of the media since the finer grains (along with some coarse grains) are removed from the media. The media producers do not control the process nor the degree or effectiveness of the skimming. Typically installed media testing is conducted for informational purposes only, which would be acceptable. Leopold is not responsible for delays due to onsite media acceptance testing variances from pre-shipment testing.

3 Price & Scope of Supply

3.1 MAIN SCOPE

BASIS of PRICING:

Any items and/or accessories not specifically called out in this quotation must be construed as being furnished by others.

This quotation is considered firm for 60 days. Any order received more than 60 days after the date of this quotation is reviewed by Xylem Water Solutions USA, Inc. before acceptance and is subject to changes in prices or delivery depending on conditions existing at the time of entry. Quoted prices are firm for delivery within 12 months from the delivery date stipulated in the plans & specifications or mutually agreed upon by Xylem Water Solutions USA, Inc. and Purchase Order issuer at time of order placement.

We do not include any applicable taxes.

Orders resulting from this quotation should be addressed to Xylem Water Solutions USA, Inc.
108 Tomlinson Drive Suite 400 – Zelienople, PA 16063, USA.

We propose to furnish the material described in this document for **a total selling price of \$549,890.00.**

Pricing for the equipment and field services outlined in this proposal, DAP Jobsite per Incoterms 2020.

For further information pertaining to the equipment contained in this proposal, please contact our area representative, who is:

isiWest
4175 Mulligan Dr.
Longmount, CO 80504
Phone: 970.535.0571
Cell: 970.691.0805

Attention: Chase Knox

Pricing is based on the following payment terms (net 30 days):

10% following initial submittal for approval

80% following the date of the respective shipments of the product

5% following installation, not to exceed 150 days after shipment of the product

(whichever comes first)

**5% following start-up, not to exceed 180 days after shipment of the product
(whichever comes first)**

4 Commercial Terms & Conditions

4.1 DELIVERY SCHEDULE

4.1.1 Production schedule

Submittal of mechanical drawings for approval 4 to 6 weeks after order acceptance.

4.1.2 Delivery time

See Media Availability note above. Pending timely receipt of PO.

FILTER MEDIA WARRANTY (if applicable): SELLER warrants that its filter media products will meet the standards established by the latest edition of AWWA (American Water Works Association) B100. SELLER shall be responsible for verifying that the filter media meets or exceeds the AWWA B100 Standard at the point of sale. Testing shall be by an independent laboratory, which regularly performs testing of filter media. BUYER shall notify Xylem Water Solutions USA, Inc. immediately upon discovery of any defective product. The SELLER shall have the right to inspect said product and BUYER shall, if requested, return the defective product to the SELLER with transportation prepaid. NO LIABILITY IS ASSUMED BY THE SELLER UNDER ANY CIRCUMSTANCES FOR LABOR, MATERIAL OR OTHER COSTS ASSOCIATED WITH THE REMOVAL OR REPLACEMENT OF MEDIA UNLESS PREVIOUSLY APPROVED IN WRITING BY AN AUTHORIZED EMPLOYEE OF THE SELLER.

4.2 TERMS AND CONDITIONS OF SALE – NORTH AMERICA

This order is subject to the Standard Terms and Conditions of Sale – Xylem Americas effective on the date the order is accepted. Terms are available at <http://www.xyleminc.com/en-us/Pages/terms-conditions-of-sale.aspx> and incorporated herein by reference and made a part of the agreement between parties.

Different terms are hereby rejected unless expressly assented to in writing.

AGREEMENT TO PURCHASE: BUYER agrees to purchase the equipment and services herein in accordance with the terms and conditions set forth above.

ACCEPTANCE: SELLER hereby accepts BUYER'S offer to purchase.

(BUYER)

Xylem Water Solutions USA, Inc.

BY: _____

BY: _____

_____, 20 _____

_____, 20 _____



ARVADA FILTERS, SOLIDS HANDLING, AND CLARIFIER REHABILITATION PROJECT
FILTER MEDIA BID PACKAGE

EXHIBIT A

INSTRUCTIONS TO BIDDERS

1. Complete bid proposals will be received by PCL Construction, Inc, the Construction Manager at Risk for the referenced project, at no later than **July 6th, 2022 @ 11:00am** for the **Filter Media Supply** scopes complete as shown on the Contract Drawings and the Specifications. Proposals shall be submitted electronically via email to Justin McRae (jwmcrae@pcl.com). Contact Justin McRae or Jessie Gloor (jgloor@pcl.com) with any questions on how to submit your proposal. All scopes shall be in conformance to all requirements detailed in the drawings and specifications including but not limited to the following:

DIVISION 0 – PROCUREMENT & CONTRACTING REQUIREMENTS (As it pertains to the Supplier's scope)(Upcoming)

DIVISION 1 – GENERAL REQUIREMENTS (As it pertains to the Supplier's scope)(Upcoming)

DIVISION 44 – POLLUTION AND WASTE CONTROL EQUIPMENT (As it pertains to the Supplier's scope)

Scope Clarification(s):

Work shall include, but not be limited to, the furnish of all;

- Filter media scope, namely, but not limited to:
 - Supply of all sand and anthracite per the drawings and specifications.
 - Delivery to site at the Ralston Treatment Plant.
 - Any additional media required for testing per the specifications.
 - Testing services per section 2.04 Source Quality Control.

The following scope is provided by others:

- Installation of supplied filter media.

The following documents are referenced in the preparation of bid:

- WXXZ9601_City_of_Arvada_Ralston_WTP_30% Drawings_Client_Review_05.25.22
- WXXZ9601_City_of_Arvada_Ralston_WTP_30% Spec List
- 44_43_30B_Filter_Media

2. PCL reserves the right to hold bid clarification meetings with the bidders after the bid date to ensure scope coverage and understanding of the project. After holding this clarification meeting, PCL reserves the right to reject bids that do not cover the entire scope of work addressed in this bid package.



ARVADA FILTERS, SOLIDS HANDLING, AND CLARIFIER REHABILITATION PROJECT
FILTER MEDIA BID PACKAGE

3. All bids must be submitted on the enclosed Bid Proposal Form (Exhibit C) with no exceptions taken to the scope of work. Through submission of a proposal, the Subcontractor will be bound by the terms and conditions as indicated therein.
4. The Notice to Proceed (NTP) date is tentatively scheduled for September 16th, 2022 – specifically in order to expedite procurement of . Required date for Substantial Completion of the ATS installation and transformer relocation is May 15, 2023 which will start warranties for all items associated with this scope of work. The Final Completion date of the overall project is projected as September 22, 2023.
5. All pricing shall remain valid for (120) one-hundred-twenty calendar days. Include anticipated escalation, if any, in bid price.
6. Bid bond, builders risk insurance, performance and payment bonds, as well as Colorado Sales Tax on permanent materials are to be excluded from the bid.
7. PCL reserves the right to waive any and all informalities or irregularities in any bid proposal received. Furthermore, PCL, along with Owner's approval, reserves the right to reject any and all bids.
8. The bidder is responsible to review the following attachments:
 - a. Sample Purchase Order Terms and Conditions
 - b. Prime Contract
 - c. Preliminary Project Schedule
9. Questions and/or requests for additional information should be directed to both Jessie Gloor (jgloor@pcl.com) and Justin McRae (jwmcrae@pcl.com). All comments and/or questions should be submitted in writing to PCL and not to the Design Engineer or the Owner. Questions must be received 5 days prior to bid deadline to be considered. Written responses will be distributed as an addendum to all bidders. (Only communication between bidder and PCL addressed in a written addendum will be considered during contract negotiations).



**ARVADA FILTERS, SOLIDS HANDLING, AND CLARIFIER REHABILITATION PROJECT
FILTER MEDIA BID PACKAGE**

EXHIBIT B

SUPPLIER ACKNOWLEDGEMENT

The subcontractor shall demonstrate acceptance by initialing each of the following items:

Acknowledgement

Bidder Initial

Bidder acknowledges and accepts the PCL contract standard Terms and Conditions attached to bid documents.

To be negotiated and also please see
Mutual Waiver and Limitation of Liability
included below

Bidder has reviewed and accepts all applicable divisions of Specifications.

Refer to exceptions included in proposal
I19222

Bidder shall include all freight charges necessary per preliminary PCL Schedule for a total of 4 separate deliveries.

WRS

Bidder will begin submittal process after receiving a Letter of Intent but prior to receiving a subcontract.

Submittal process to start after receipt of
Purchase Order

Bidder has reviewed and agreed to durations listed in project schedule for delivery dates. If durations are not agreed upon, clarify with suggested durations and submit with bid pricing.

Refer to delivery dates included in proposal
I19222

Mutual Waiver and Limitation of Liability

BUYER and SELLER (inclusive of their respective officers, directors, members, partners, subcontractors, and employees) shall not be liable to each other for loss of profit or revenue, loss of use or business opportunity, loss of contract, cost of obtaining alternative performance, or for any indirect, consequential, special, incidental and punitive damages. The aggregate liability of each party, whether under contract law, in tort, or otherwise, is limited to the Purchase Order price ("Cap"). This Cap does not apply to: (a) costs, losses, or damages asserted by third parties for destruction of tangible property, bodily injury, sickness, or death; or (b) gross negligence or willful misconduct. To the extent the Purchase Order provides a remedy for a given default, it is the sole and exclusive remedy available in lieu of any/all other remedies available at law, in equity, or otherwise. This Clause prevails over all other Purchase Order clauses.

Instructions:

The highlighted language should be changed as appropriate to how Xylem and our Customer are referred to in their document

Example: Instead of Buyer and Seller it could be: Purchaser and Vendor; Buyer and Supplier; Contractor and Sub-Contractor

Example: Instead of Purchase Order it could be: Material Contract, Contract Agreement, Sub-Contract, Agreement



ARVADA FILTERS, SOLIDS HANDLING, AND CLARIFIER REHABILITATION PROJECT
FILTER MEDIA BID PACKAGE

EXHIBIT C

BID PROPOSAL FORM

Please indicate your quote in the spaces provided below:

Filter Media Supply Complete \$ 549,890.00

TOTAL BID PRICE \$ 549,890.00

Submittal Lead Time Please refer to proposal I19222

Procurement Lead Time Please refer to proposal I19222

SIGNED BY:

(Supplier) Xylem Water Solutions, USA Inc. (Leopold Brand)

(Print Name) Wayne Steen

(Title) Territory Manager

(Signature and Date) July 7, 2022

60% Filters

Project: Ralston WTP - Filters 60%
City of Arvada, CO

Pipe Scope Sheet

[illegible]

[illegible]

CUSTOM PIPING SYSTEMS L.L.C.

PROVIDING CUSTOM FABRICATIONS FOR THE WATER & WASTEWATER INDUSTRIES

4230 Milling Rd. San Antonio, Texas 78219

Ph: 210-867-6356

Barry@custompipingsystems.com

09/26/2022

Core and Main

Attn: Scot Andreano

Ralston Water Treatment Plant

Materials for this quotation are globally sourced.

Pipe: ASTM A53 Grade Std Wt. Carbon Steel

Fittings: ASTM A234 Std Wt. Carbon Steel

Flanges: AWWA Class D 150#

Linings: Cement mortar per AWWA C205

Coatings: Prime coated Tnemec N140 4-6 mils DFT

[Material is quoted FFA](#)

1. 2ea 24" FLG X FLG SPOOLS DWG F-D-2005
2. 6ea 12" FLG X FLG SPOOLS DWG F-D-3005
3. 3ea 16X12 TEE WITH 16X 1/2" BLIND DWG F-D-3004
4. 6ea 12" FLG X FLG SPOOLS DWG F-D-3003
5. 9ea 12" FLG X FLG SPOOLS DWG F-D-2002

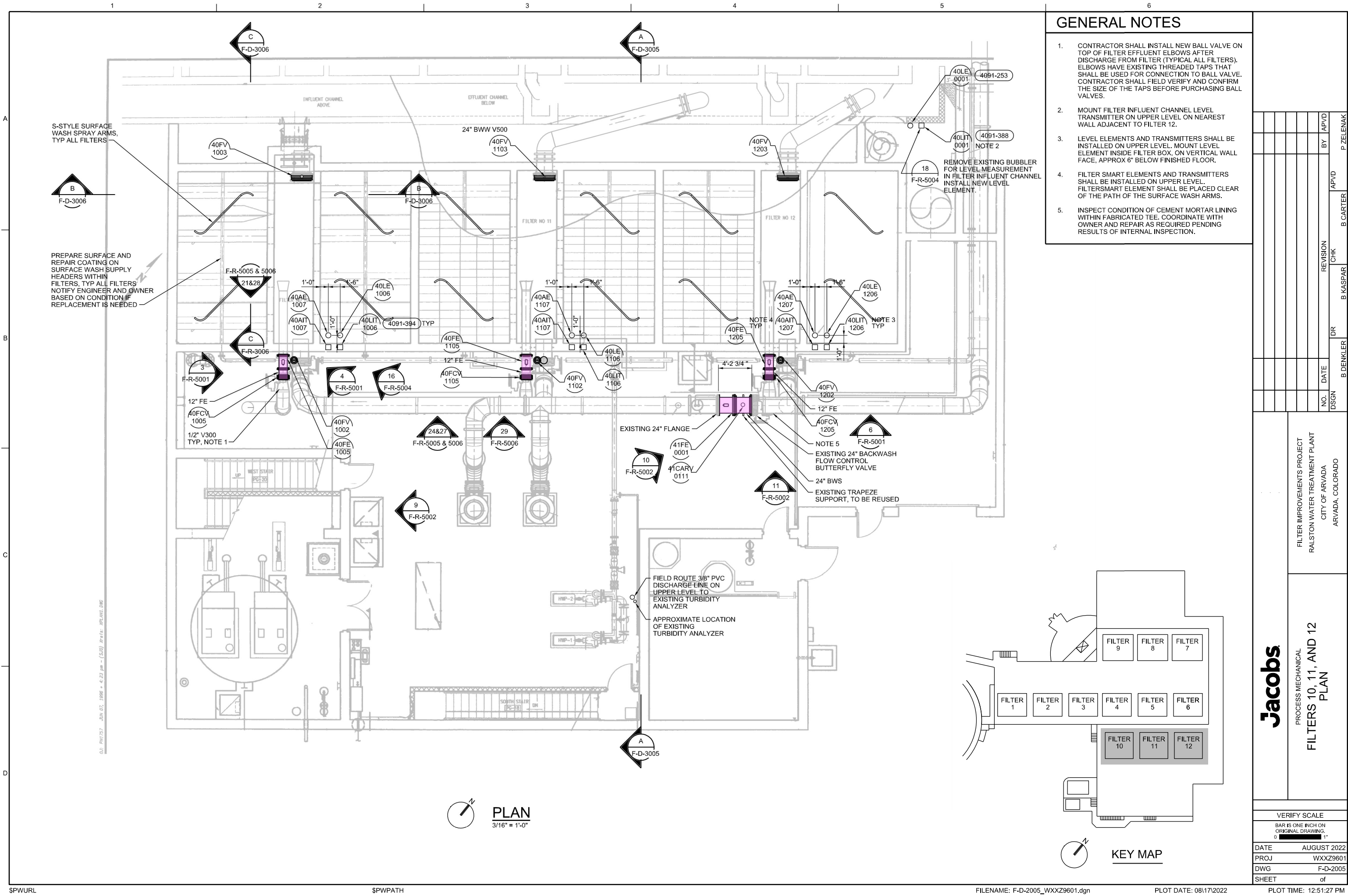
[\\$45,783.00 Lot](#)

Quote does not include NBGK, couplings, valves, monitoring equipment or nondestructive testing.

Sincerely,



Barry Golobek



GENERAL NOTES

- CONTRACTOR SHALL INSTALL NEW BALL VALVE ON TOP OF FILTER EFFLUENT ELBOWS AFTER DISCHARGE FROM FILTER (TYPICAL ALL FILTERS). ELBOWS HAVE EXISTING THREADED TAPS THAT SHALL BE USED FOR CONNECTION TO BALL VALVE. CONTRACTOR SHALL FIELD VERIFY AND CONFIRM THE SIZE OF THE TAPS BEFORE PURCHASING BALL VALVES.
- MOUNT FILTER INFLUENT CHANNEL LEVEL TRANSMITTER ON UPPER LEVEL ON NEAREST WALL ADJACENT TO FILTER 12.
- LEVEL ELEMENTS AND TRANSMITTERS SHALL BE INSTALLED ON UPPER LEVEL. MOUNT LEVEL ELEMENT INSIDE FILTER BOX, ON VERTICAL WALL FACE, APPROX 6" BELOW FINISHED FLOOR.
- FILTER SMART ELEMENTS AND TRANSMITTERS SHALL BE INSTALLED ON UPPER LEVEL. FILTERSMART ELEMENT SHALL BE PLACED CLEAR OF THE PATH OF THE SURFACE WASH ARMS.
- INSPECT CONDITION OF CEMENT MORTAR LINING WITHIN FABRICATED TEE. COORDINATE WITH OWNER AND REPAIR AS REQUIRED PENDING RESULTS OF INTERNAL INSPECTION.

JACOBS

PROCESS MECHANICAL

FILTERS 10, 11, AND 12

PLAN

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE AUGUST 2022

PROJ WXXZ9601

DWG F-D-2005

SHEET of

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DR B DENKLER

CHK B KASPAR

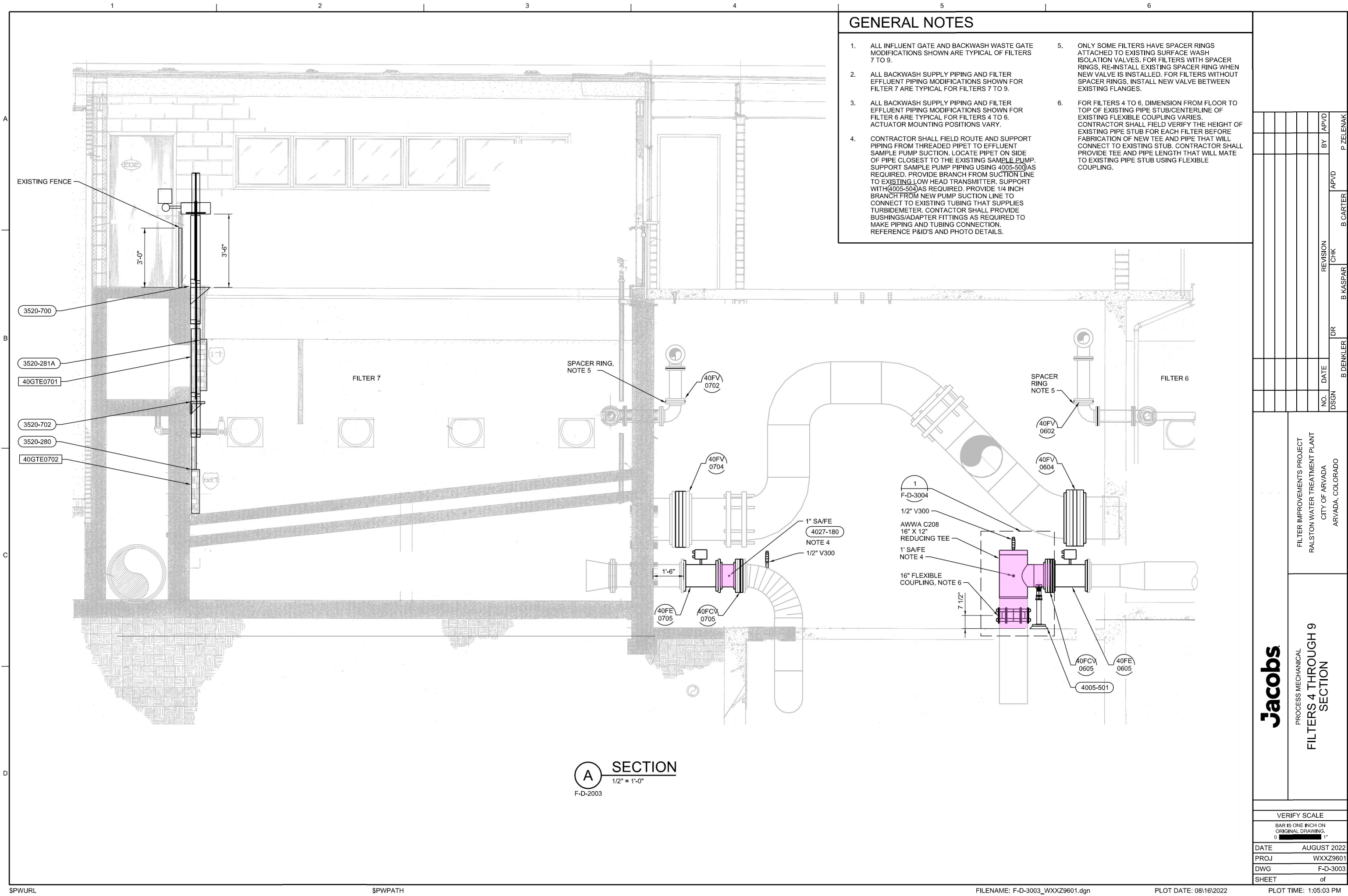
REVISION

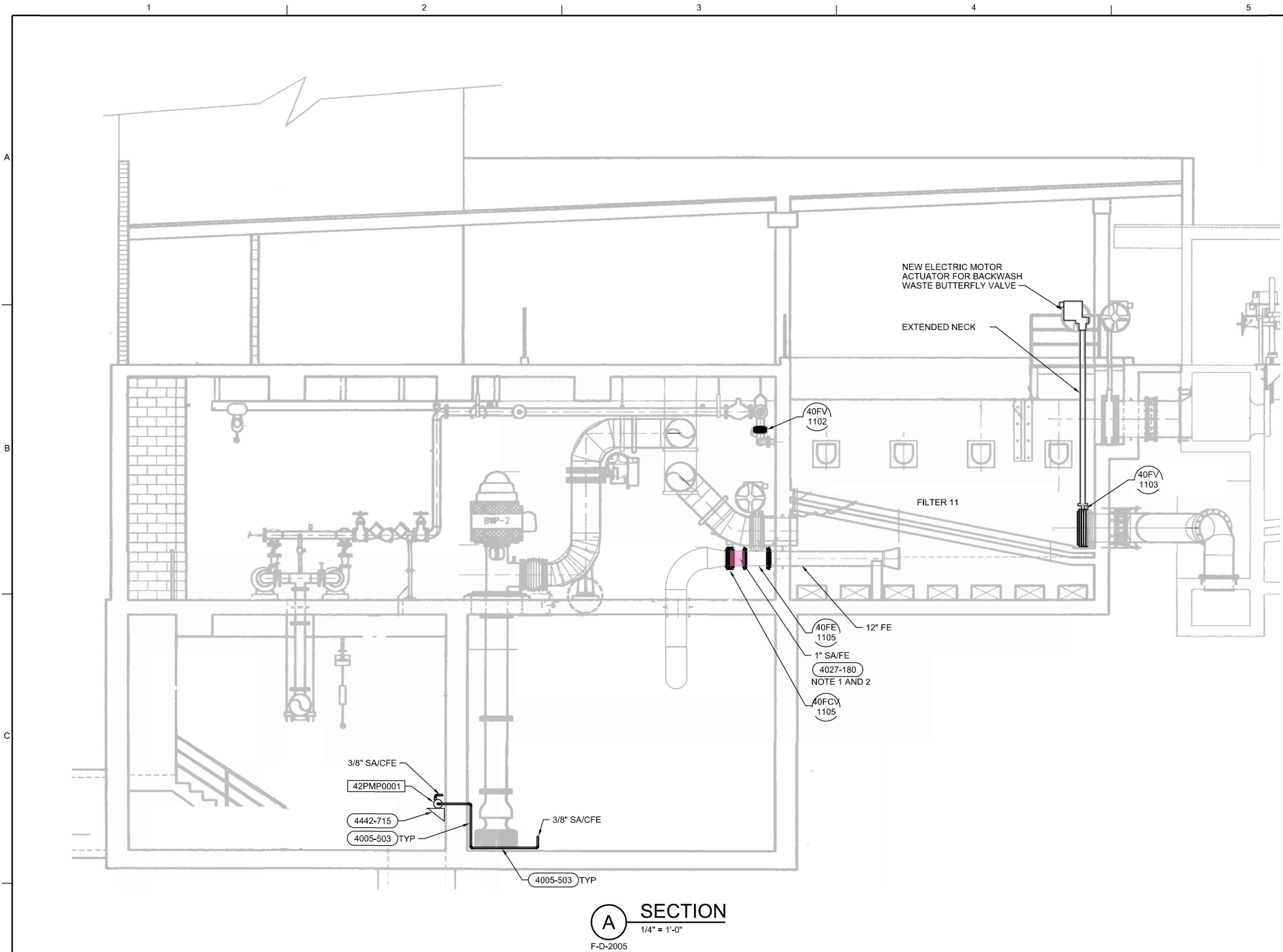
BY P ZELENAK

APVD

60% DESIGN

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GENERAL NOTES

- CONTRACTOR SHALL FIELD ROUTE AND SUPPORT PIPING FROM THREADED PIPET TO EFFLUENT SAMPLE PUMP SUCTION. LOCATE PIPET ON SIDE OF PIPE CLOSEST TO THE EXISTING SAMPLE PUMP. SUPPORT SAMPLE PUMP PIPING USING 4005-500 AND 4005-521 AS REQUIRED. REFERENCE P&IDS AND PHOTO DETAILS. REFERENCE P&IDS AND PHOTO DETAILS.
- CONTRACTOR SHALL FIELD ROUTE AND SUPPORT 1/2 INCH PIPING FROM THREADED PIPET TO EXISTING TURBIDITY ANALYZER. PROVIDE BRANCH AND ROUTE TO EXISTING LOW HEAD TRANSMITTER. FIELD VERIFY REQUIRED SIZE OF CONNECTION TO LOW HEAD TRANSMITTER. SUPPORT PIPING USING 4005-500 AND 4005-521 AS REQUIRED.
- MODIFICATIONS TO BWS, BWW, FE, AND SAMPLE PIPING AND VALVES SHOWN ON THIS SHEET ARE TYPICAL FOR FILTERS 10 THROUGH 12.

Jacobs

PROCESS MECHANICAL

FILTERS 10, 11, AND 12 SECTION

FILTER IMPROVEMENTS PROJECT
RALSTON WATER TREATMENT PLANT
CITY OF ARVADA
ARVADA, COLORADO

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.
0 1"

DATE AUGUST 2022

PROJ WXXZ9601

DWG F-D-3005

SHEET of

60% DESIGN

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P ZELENAK

B CARTER

B KASPAR

B DENKLER

DSGN

NO. DATE

DR

REVISION

CHK

BY

APVD

APVD

60% Solids

Supplier: _____
Contact: _____
Phone: _____

Project:

Ralston WTP
Arvada, CO

Pipe Scope Sheet

Pipe Materials Takeoff

Row #	Description	Q-ty	Unit	Group	UNIT Price, USD	Total Price, USD	Comments
	3/4" Washer HDG	80.	EA			0.45	
	1" All-Thread Rod 316SS	46.	LF			34	
	1" Nut 316SS	92.	EA			4.4	
	1" Washer SS	92.	EA			1.5	
	3" B+N Set STL150# A193 GrB8M	16.	EA			34.025	
	3" Gasket SBR 150#	16.	EA			2.8	
	3" Flange Insulation Kit 150#	16.	EA			67.15	
	4" B+N Set STL150# A193 GrB8M	4.	EA			67.55	
	4" B+N Set STL150# A307 GrB	40.	EA			14.9	
	4" x 1/8" EPDM Gasket	40.	EA			8.15	
	4" Gasket SBR 150#	4.	EA			4.5	
	4" Flange Insulation Kit 150#	4.	EA			98.125	
	6" B+N Set STL150# A193 GrB8M	16.	EA			102.075	
	6" B+N Set STL150# A307 GrB	76.	EA			24.65	
	6" x 1/8" EPDM Gasket	71.	EA			13.75	
	6" Gasket SBR 150#	16.	EA			7.4	
	12" B+N Set STL150# A193 GrB8M	4.	EA			239.225	
	12" Gasket SBR 150#	4.	EA			14.775	
	24" B+N Set STL150# A193 GrB8M	20.	EA			972.4	
	24" x 1/8" EPDM Gasket	17.	EA			94.025	
	4" Carbon Steel Dismantling Joint	6.	EA			758.15	
	6" Carbon Steel Dismantling Joint	4.	EA			901.57	
	24" Flanged Coupling Adapter	8.	EA			4979.2	
	3" DI FLG C110 Blind Flange	16.	EA			51.86	
	4" DI FLG C110 Blind Flange CM/ Prime	4.	EA			90.36	
	4" DI FLG C110 Tee CM/ Prime	4.	EA			348.08	
	4"X10" FXF Spool CL53 CM/Prime	6.	EA			364.28	
	4"X16" FXF Spool CL53 CM/Prime	2.	EA			451.21	
	4"X2" DI FLG C110 Tapped Blind Flange CM/ Prime	4.	EA			128.86	
	4"X30" FXF Spool CL53 CM/Prime	4.	EA			524	
	6" DI FLG C110 Blind Flange CML/ Prime	16.	EA			134.36	
	6" DI FLG C110 22 Bend CM/ Prime	4.	EA			249.86	
	6" DI FLG C110 45 Bend CM/ Prime	10.	EA			262.43	
	6" DI FLG C110 90 Bend CM/ Prime	2.	EA			295.43	
	6" DI FLG C110 Long Radius 90 Bend CM/ Prime	2.	EA			370.86	
	6" DI FLG C110 Tee CM/ Prime	6.	EA			432.15	
	6"X10" FXF Spool CL53 CM/Prime	8.	EA			458.27	
	6"X10" TFXTF Wall Pipe CL53 CML/Prime	8.	EA			708.01	
	6"X100" FXF Spool CL53 CM/Prime	8.	EA			1320.74	
	6"X130" FXF Spool CL53 CM/Prime	1.	EA			1608.23	
	6"X160" FXF Spool CL53 CM/Prime	1.	EA			1895.72	
	6"X20" FXF Spool CL53 CM/Prime	2.	EA			554.1	
	6"X30" FXF Spool CL53 CM/Prime	2.	EA			649.93	
	6"X40" FXF Spool CL53 CM/Prime	2.	EA			745.76	
	6"X4" DI FLG C110 Concentric Reducer CM/ Prime	2.	EA			203.5	
	6"X4" DI FLG C110 Reducer Eccentric CM/ Prime	2.	EA			242	
	6"X4" DI FLG C110 Tee CM/ Prime	4.	EA			477.72	
	6"X50" FXF Spool CL53 CM/Prime	2.	EA			841.59	
	6"X70" FXF Spool CL53 CM/Prime	2.	EA			1033.25	
	12" MEGALUG	2.	EA			121.43	
	12" DI MJ Accy Set Less Gland - 316SS T-bolts	2.	EA			172.45	
	12" DI PIPE MJ CM/Tar	2.	LF			76.19	
	12"X10" DI MJ C110 Long Sleeve CML/ Tar	1.	EA			398.37	
	24" DI FLG C110 90 Bend CML/ Prime	2.	EA			4537.57	
	24" DI FLG C110 Tee CML/ Prime	2.	EA			6461.06	
	24" MEGALUG	8.	EA			540.28	
	24" DI MJ Accy Set Less Gland	6.	EA			115.51	
	24" DI MJ Accy Set Less Gland - 316SS T-bolts	2.	EA			253.01	
	24" DI PIPE MJ CM/Tar	2.	LF			171.73	
	24"X10" DI MJ C153 Long Sleeve CML/ Tar	2.	EA			1595.82	
	24"X10" DI MJ C110 Long Sleeve CML/ Tar	1.	EA			1595.82	
	24" DI MJ C153 Tee CML/ Tar	2.	EA			3382.57	
	24" DI Pipe TR-Flex PC350 CML/ Tar	204.	LF			275.44	
	24"X160" FXF Spool CL53 CML/Prime 8" Holes, 5' OC (9 Total), 1" Holes at 10' OC, Top & Bottom (18 Total)	4.	EA				
	24"X6" DI FLG C110 Tapped Blind Flange CML/ Prime	4.	EA			2757.14	
	6" 316SS Blind Flange	5.	EA			181.21	
	6" SS316L Fabricated Piping	85.	LF				
	3" HDPE 45 Ell DR35	24.	EA			17.74	
	3" HDPE 90 Ell	8.	EA			17.74	
	3" HDPE End Cap	16.	EA			8.91	
	3" HDPE Flange Adapter DR35	16.	EA	na			
	3" HDPE Tee	16.	EA			14.25	
	3" Perforated HDPE	4,012.	LF			2.01	
	4" HDPE Pipe DR35	140.	LF			3.77	
	4" HDPE 90 Ell	8.	EA			17.74	
	4" HDPE Flange Adapter DR35	4.	EA	na			
	4" HDPE Tee DR35	4.	EA			14.25	
	4" Corrugated Transition Coupling	8.	EA			24.93	
	4" Perforated HDPE	80.	LF			2.01	
	4"x3" HDPE Reducer	8.	EA			5.17	
	6" Flange Spacer Ring (.25" Thickness)	5.	EA				
	1/4" STL Trash Ring	5.	EA				
	1/2" Conc Anchor	10.	EA				
	3" Fernco Coupling	16.	EA			24.41	
	4" Harness Rod/Dog Ear KIT (2-rod) HDG	6.	EA			380.01	
	6" Harness Rod/Dog Ear KIT (2-rod) HDG	4.	EA			410.01	
	24" Harness Rod/Dog Ear KIT (4-rod) HDG	8.	EA			750.01	
	Rubber Valve Box Top Hat	5.	EA			75.01	
	Valve Box w.Cast Iron Frame & Lid	5.	EA			325	
	Buried Valve Operator Extension 7'	5.	EA			143.73	
	Buried Valve Operator Extension SST 15'	8.	EA			215.01	
	6"-10" Mech Seal (IL400 x 7ea) Set	8.	EA			140.63	
	12"-16" Mech Seal (IL360 x 22ea) Set	4.	EA			441.98	
	4" SS Wall Bracket Pipe Supp (CL 2')	16.	EA				
	6" HDG Wall Bracket Pipe Supp (CL 1')	20.	EA				
	16" U-Bolt SS	16.	EA				
	4" HDG Wall Bracket Pipe Supp (CL 1')	8.	EA				
	P666 Vertical Pipe Sway Brace	20.	EA				
	1/2" PVC SCH80 Pipe	100.	LF			1.2	
	1/2" PVC SCH80 SW 90 Bend	8.	EA			1.7	
	1/2" PVC SCH80 SW Male Adapter	34.	EA			3.61	
	1/2" PVC SCH80 SW Tee	6.	EA			4.81	
	1/2" PVC SCH80 SW Union	34.	EA			6.33	
	1/2" PVC SCH80 SW Coupl	8.	EA			3.09	
	1/2" PVC TU SW Y-Strainer	2.	EA			165.41	
	6" PVC DWV Pipe	35.	LF			12.25	

ADS Discontinued the 3" ASTM F667, quoting all material as 4".
4" PVC SDR-35

	1/2" Galv Sch80 Coupling THD	4.	EA		5.87
	1/2"x3" Galv S80 Nipple THD	4.	EA		3.51
	2"x3" Galv S80 Nipple THD	4.	EA		5.3
	1/2" Ball Valve Bronze THD	8.	EA		22.01
	1/2" Pressure Reducing Valve	2.	EA		443.51
	1/2" Bronze THD Globe Valve	2.	EA		74.01
	1/2" Solenoid Valve 2-Way THD NEMA 4	2.	EA		231.01
	2" Ball Valve Bronze THD	4.	EA		161.2
	4" Plug Valve FLG CI Body HW	6.	EA		1218.75
	4" Plug Valve FLG CI Body EMO	4.	EA		9862.5
	4" Check Valve FLG	2.	EA		1437.5
	6" Plug Valve FLG CI Body HW	4.	EA		1737.5
	12" Butterfly Valve FLG CI Body HW	4.	EA		2062.5
	12" Plug Valve MJ CI Body 2" Opt Nut	1.	EA		4087.5
	24" Butterfly Valve FLG CI Body Op Nut	2.	EA		8625
	24" Butterfly Valve MJ CI Body Op Nut	1.	EA		8625
	6"X10" SST Wall Sleeve W/Seep Ring	4.	EA		231.01
	14"X10" STL HDG Wall Sleeve W/Seep Ring	4.	EA		435.01
	12" DI PIPE MJ CM/Tar	50.	LF		76.19
	12" MEGALUG	12.	EA		121.43
	12" DI MJ Accy Set Less Gland	12.	EA		52.86
	12"X10" DI MJ C110 Long Sleeve CM/ Tar	4.	EA		386.37
	12" DI MJ C153 Flange Adapter CM/Tar	4.	EA		453.37
	12" Dresser Style Coupling	4.	EA		1039.76
	12"x8" DI MJ C153 TEE CM/Tar	2.	EA		566.51
	8" DI PIPE MJ CM/Tar	54.	LF		46.17
	8" DI MJ C153 Flange Adapter CM/Tar	2.	EA		204.29
	8" Megalug	6.	EA		56.39
	8" DI MJ Accy Set Less Gland	6.	EA		38.23

Andrew Greene

From: Andreano, Scot <Scot.Andreano@coreandmain.com>
Sent: Friday, September 16, 2022 9:20 AM
To: Andrew Greene
Subject: RE: Ralston WTP - Arvada, CO - Missing Steel Package Scope
Attachments: Missing 20 BWW.pdf

[External Email]

Andrew,

These are \$11,905 ea.

Please let me know if you have any questions.

Thanks,

Scot Andreano
Account Manager
Core & Main

9451 Yosemite Street
Henderson, CO. 80640
720-629-6281

scot.andreano@coreandmain.com



This message is for intended addressee(s) only and may contain confidential, proprietary or privileged information, exempt from disclosure, and subject to terms at: <http://emailterms.coreandmain.com> [emailterms.coreandmain.com]

From: Andrew Greene <AGreene@pcl.com>
Sent: Friday, September 9, 2022 2:29 PM
To: Andreano, Scot <Scot.Andreano@coreandmain.com>
Subject: Ralston WTP - Arvada, CO - Missing Steel Package Scope

CAUTION: External

Scot,

Taking a deeper look and asking questions to my lead I found (3) assemblies that I didn't add to the package. Attached is the information for those 3 lines.

Andrew Greene
Junior Estimator

PCL Construction, Inc.
1711 W. Greentree Drive, Suite 201
Tempe, AZ 85284
T : (480) 829-6333

W : (480) 763-2796

M: (442) 202-7415

agreene@pcl.com

www.pcl.com [nam04.safelinks.protection.outlook.com]

TOGETHER WE BUILD SUCCESS

PCL Construction, Ltd.
Proprietary and Confidential

Ralston WTP
City of Arvada, CO

30% Pipe Scope Sheet

Pipe Materials Takeoff

Supplier:
Contact:
Phone:

Description	Q-ty	Unit	Group	Combo	
				Unit Price	COMBO
6" B+N Set STL150# A307 GrB	67.	EA	BNG	\$ 16.43	\$ 1,100.81
12" B+N Set STL150# A307 GrB	42.	EA	BNG	\$ 39.90	\$ 1,675.80
8" B+N Set HDG150# A307 GrB	2.	EA	BNG	\$ 36.25	\$ 72.50
14" B+N Set HDG150# A307 GrB	18.	EA	BNG	\$ 100.22	\$ 1,803.96
16" B+N Set HDG150# A307 GrB	6.	EA	BNG	\$ 132.69	\$ 796.14
24" B+N Set HDG150# A307 GrB	18.	EA	BNG	\$ 326.26	\$ 5,872.68
6" B+N Set 316SS 150#	24.	EA	BNG	\$ 45.85	\$ 1,100.40
14" STUD+N Set 316SS 150#	6.	EA	BNG	\$ 288.43	\$ 1,730.58
20" B+N Set 316SS 150#	12.	EA	BNG	\$ 698.26	\$ 8,379.12
6" x 1/8" Buna-N Gasket	91.	EA	BNG	\$ 8.63	\$ 785.33
8" x 1/8" Buna-N Gasket	2.	EA	BNG	\$ 12.07	\$ 24.14
12" x 1/8" Buna-N Gasket	42.	EA	BNG	\$ 23.86	\$ 1,002.12
14" x 1/8" Buna-N Gasket	24.	EA	BNG	\$ 29.14	\$ 699.36
16" x 1/8" Buna-N Gasket	6.	EA	BNG	\$ 36.50	\$ 219.00
20" x 1/8" EPDM Gasket	12.	EA	BNG	\$ 39.74	\$ 476.88
24" x 1/8" Buna-N Gasket	18.	EA	BNG	\$ 67.71	\$ 1,218.78
				\$ -	\$ -
6" GxF Adapter	2.	EA	CPLG	\$ 303.22	\$ 606.44
14" Stainless Steel Dismantling Joint	12.	EA	CPLG	\$ 3,314.12	\$ 39,769.44
				\$ -	\$ -
3"X3'6" FXF Spool CL53 CM/Prime	2.	EA	DIP	\$ 744.77	\$ 1,489.54
4"X3'0" FXF Spool CL53 CM/Prime	2.	EA	DIP	\$ 466.12	\$ 932.24
6" DI FLG C110 Blind Flange CM/ Prime	2.	EA	DIP	\$ 119.70	\$ 239.40
6" DI FLG C110 45 Bend CM/ Prime	2.	EA	DIP	\$ 244.94	\$ 489.88
6" DI FLG C110 90 Bend CM/ Prime	3.	EA	DIP	\$ 275.74	\$ 827.22
6" DI FLG C110 Tee CM/ Prime	5.	EA	DIP	\$ 403.34	\$ 2,016.70
6"X11'0" FXF Spool CL53 CM/Prime	2.	EA	DIP	\$ 1,255.61	\$ 2,511.22
6"X3" DI FLG C110 Concentric Reducer CM/ Prime	2.	EA	DIP	\$ 198.74	\$ 397.48
6"X4'0" FXF Spool CL53 CM/Prime	2.	EA	DIP	\$ 661.63	\$ 1,323.26
6"X4" DI FLG C110 Concentric Reducer CM/ Prime	2.	EA	DIP	\$ 189.94	\$ 379.88
6"X6'0" FXG Spool CL53 CM/Prime	2.	EA	DIP	\$ 831.34	\$ 1,662.68
6"X7'0" FXF Spool CL53 CM/Prime	2.	EA	DIP	\$ 916.19	\$ 1,832.38
				\$ -	\$ -
4" STL Fab Pipe CML&C	480.	LF	STL	\$ 120.00	\$ 57,600.00
8" STL Fab Pipe CML&C	25.	LF	STL	\$ 312.00	\$ 7,800.00
12" STL Fab Pipe CML&C	45.	LF	STL	\$ 429.00	\$ 19,305.00
14" STL Fab Pipe CML&C	30.	LF	STL	\$ 390.00	\$ 11,700.00
16" STL Fab Pipe CML&C	15.	LF	STL	\$ 585.00	\$ 8,775.00
24" STL Fab Pipe CML&C	300.	LF	STL	\$ 630.00	\$ 189,000.00
				\$ -	\$ -
4" HDPE Perforated	4,000.	LF	HDPE	\$ 25.54	\$ 102,160.00
6" HDPE Perforated	260.	LF	HDPE	\$ 40.25	\$ 10,465.00
				\$ -	\$ -
1-1/2" Cam Lock	2.	EA	MISC	\$ 55.00	\$ 110.00
6"X 6" SST Tapping Sleeve	3.	EA	MISC	\$ 1,064.07	\$ 3,192.21
12" Flange Slip-On STL 150#	48.	EA	MISC	\$ 247.40	\$ 11,875.20
16"x2" Blind Tapped Flange STL 150#	3.	EA	MISC	\$ 747.14	\$ 2,241.42
16" Flange Slip-On STL 150#	6.	EA	MISC	\$ 302.86	\$ 1,817.16
Cast Iron Valve Box w/ 10'-0" Extension	1.	EA	MISC	\$ 788.79	\$ 788.79
Buried Valve Operator Extension 7'	12.	EA	MISC	\$ 175.00	\$ 2,100.00
Buried Valve Operator Extension 8'	4.	EA	MISC	\$ 195.00	\$ 780.00
				\$ -	\$ -
6"-10" Mech Seal (IL400 x 7ea) Set	4.	EA	MSEAL	\$ 145.81	\$ 583.24
12"-16" Mech Seal (IL360 x 22ea) Set	3.	EA	MSEAL	\$ 498.30	\$ 1,494.90
				\$ -	\$ -
1/2" HDG Unistrut Clamp	10.	EA	PS	\$ 1.76	\$ 17.60
1-3/8"x1-5/8" 316SS Uni Strut	17.	LF	PS	\$ 47.61	\$ 809.37
1-3/8"x1-5/8" HDG Uni Strut	10.	LF	PS	\$ 7.89	\$ 78.90
1" 316SS Unistrut Clamp	5.	EA	PS	\$ 11.16	\$ 55.80
1-1/4" 316SS Unistrut Clamp	12.	EA	PS	\$ 12.83	\$ 153.96

6" HDG Wall Bracket Pipe Supp (CL 1')	12.	EA	PS	\$	650.00	\$	7,800.00
12" SS Adjust Pipe Supp (CL 2')	9.	EA	PS	\$	842.44	\$	7,581.96
14" SS Adjust Pipe Supp (CL 2')	3.	EA	PS	\$	842.44	\$	2,527.32
24"x 2" SS Pipe Straps (Invert Pipe to Top)	40.	EA	PS	\$	250.00	\$	10,000.00
						\$	-
1/2" PVC SCH80 SW WYE	2.	EA	PVC	\$	28.31	\$	56.63
1/2" PVC SCH80 Pipe	100.	LF	PVC	\$	1.62	\$	162.00
1/2" PVC SCH80 SW Male Adapter	12.	EA	PVC	\$	3.81	\$	45.72
1/2" PVC SCH80 SW Union	12.	EA	PVC	\$	6.20	\$	74.40
1/2" PVC TU Ball Valve SW	10.	EA	PVC	\$	69.87	\$	698.70
1" PVC SCH80 Pipe	25.	LF	PVC	\$	3.20	\$	80.00
1" PVC SCH80 SW 90 Bend	4.	EA	PVC	\$	3.73	\$	14.92
1" PVC SCH80 SW Tee	3.	EA	PVC	\$	6.66	\$	19.98
1" PVC SCH80 SW Coupl	4.	EA	PVC	\$	4.56	\$	18.24
1" PVC TU Ball Valve SW	4.	EA	PVC	\$	98.35	\$	393.40
1-1/4" PVC SCH80 Pipe	62.	LF	PVC	\$	6.58	\$	407.96
1-1/4" PVC SCH80 SW 90 Bend	6.	EA	PVC	\$	4.97	\$	29.82
1-1/4" PVC SCH80 SW Coupl	6.	EA	PVC	\$	6.92	\$	41.52
1-1/4" PVC TU Ball Valve SW	1.	EA	PVC	\$	155.87	\$	155.87
1-1/4"X 1" PVC SCH80 Reducer Coupling	1.	EA	PVC	\$	15.84	\$	15.84
1"x6" PVC SCH80 Nipple THD	2.	EA	PVC	\$	11.24	\$	22.48
						\$	-
8" PVC SDR26 Pipe	30.	LF	SDR26	\$	18.04	\$	541.20
						\$	-
1/2" Galv Cap THD	24.	EA	SM	\$	4.45	\$	106.80
1/2"x3" Galv S80 Nipple THD	24.	EA	SM	\$	3.10	\$	74.40
1" Galv Union THD	3.	EA	SM	\$	28.70	\$	86.10
2"x1" THD Galv Reducer	3.	EA	SM	\$	24.64	\$	73.92
						\$	-
1" Air Release Valve	3.	EA	V	\$	722.00	\$	2,166.00
1/2" Ball Valve Bronze THD	3.	EA	V	\$	76.18	\$	228.54
6" Butterfly Valve Wafer SS Body EMO	12.	EA	V	\$	8,500.00	\$	102,000.00
8" Butterfly Valve FLG CI Body Op Nut	1.	EA	V	\$	1,600.00	\$	1,600.00
12" Butterfly Valve Wafer SS Body EMO	9.	EA	V	\$	12,500.00	\$	112,500.00
14" Butterfly Valve Wafer SS Body HW	3.	EA	V	\$	6,000.00	\$	18,000.00
20" Butterfly Valve FLG CI Body EMO	12.	EA	V	\$	12,000.00	\$	144,000.00
20" Butterfly Valve Lug CI Body EMO	3.	EA	V	\$	12,000.00	\$	36,000.00
24" Butterfly Valve Lug CI Body EMO	9.	EA	V	\$	14,000.00	\$	126,000.00
1/2" Check Valve THD	2.	EA	V	\$	244.75	\$	489.50
6" Check Valve FLG	2.	EA	V	\$	2,500.00	\$	5,000.00
1/2" Bronze THD Globe Valve	2.	EA	V	\$	235.80	\$	471.60
6" Plug Valve FLG CI Body HW	12.	EA	V	\$	1,100.00	\$	13,200.00
6" Plug Valve FLG CI Body CW	2.	EA	V	\$	1,300.00	\$	2,600.00
1/2" Pressure Regulating Valve THD	2.	EA	V	\$	337.80	\$	675.60
						\$	-
12"X2'0" Wall Pipe FxP Seep Ring 316SS	6.	EA	WP	\$	2,478.00	\$	14,868.00
						\$	-
6"X1'6" STL HDG Wall Sleeve W/O SR	4.	EA	WS	\$	295.00	\$	1,180.00
12"X1'0" STL HDG Wall Sleeve W/O SR	3.	EA	WS	\$	520.00	\$	1,560.00
Total						\$	1,127,907.33



Flo Trend LLC

WWW.FLOTRENDLLC.COM

Quote

Jul 7, 2022

Valid Until: Jul 14, 2022

Quote Number : Q22Q13813

Job Number: F

1400 Kowis St | Houston, TX 77093 | ph: 713-699-0152 | email: sales@flotrendllc.com

BILL TO:

PCL Construction
Raymond Torrejon
2000 S Colorado Blvd. Building 2 suite 500
Denver, CO 80222

Phone: 720.357.6253
Email: rtorrejon@pcl.com

SHIP TO:

PCL Construction

Engineered Drawing

N/A

Delivery

Currently in Stock

Please Note Our Terms Below:

Terms	FOB	Rep:	PO#
100% with PO		Chad Naquin	

#	Qty	Model #	Description	Unit Price (EA)	Ext Price
1.	28	MED-MVR-300-2.0	Media-Mover-300 with at 2.0 cy Chemical Feed Hopper Rental Unit (Billed on 28-day cycle) Media-Mover 300 with 2.0 cubic yard Chemical Feed Hopper Model: MED-MVR-300-2.0 Model 300 Jet Hopper with 3" eductor and 2.0 yd. hopper. Eductor will be made from carbon steel with a 3" npt inlet and pressure gauge and a 3" npt outlet. Inlet fitting will have four 1/2" outlets with ball valve and hoses that are attached to nozzles in the body of the hopper. Aluminum cam lock fittings will be provided on the inlet and outlets. Removable UHMW nozzle and venturi will be installed in the eductor body. A 2.0 cu. yd. carbon steel pyramid shaped hopper will be mounted on a forkliftable frame. The eductor will be attached to the bottom of the hopper with a 3" polypropylene ball valve.	\$ 95.00	\$ 2,660.00
2.	1	3" ID UHMW Nozzle to fit 3" Eductor	UHMW Nozzle to fit 3" Eductor 3" I.D. "UHMW" Nozzle to fit 3" Eductor	\$ 425.00	\$ 425.00
3.	1	3" ID "UHMW" Diffuse to fit 3" Eductor	"UHMW" Diffuse to fit 3" Eductor 3" I.D. "UHMW" Diffuser to fit 3" Eductor	\$ 480.00	\$ 480.00
4.	2	Estimated Freight	Delivery and Return Estimate. Actual Freight charges will be billed at readiness to ship and once shipping address has been confirmed.	\$ 2,800.00	\$ 5,600.00
5.	1	MED-MVR-300-2.0	Media-Mover-300 with at 2.0 cy Chemical Feed Hopper Purchase Option - Media-Mover 300 with 2.0 cubic yard Chemical Feed Hopper Model: MED-MVR-300-2.0 Model 300 Jet Hopper with 3" eductor and 2.0 yd. hopper. Eductor will be made from carbon steel with a 3" npt inlet and pressure gauge and a 3" npt outlet. Inlet fitting will have four 1/2" outlets with ball valve and hoses that are attached to nozzles in the body of the hopper. Aluminum cam lock fittings will be provided on the inlet and outlets. Removable UHMW nozzle and venturi will be installed in the eductor body. A 2.0 cu. yd. carbon steel pyramid shaped hopper will be mounted on a forkliftable frame. The eductor will be attached to the bottom of the hopper with a 3" polypropylene ball valve.	\$ 16,250.00	\$ 16,250.00

* All prices are in U.S. dollars unless otherwise noted.

* This is a preliminary quote. Prices and description are subject to change upon receipt of final specifications.

* Specialty Parts must be specified at the time of order to avoid production delays and surcharges.

* This quote is valid until the date that is listed above. If you desire to place an order past the "valid until" date, you must contact us to obtain another valid quote

* Transportation via contract truck; off-load equipment and labor by others; site preparation, electrical hookup, and sludge line connections by others. No cutoff valves, drainage hoses, or control hoses included.

* **Equipment Warranty/Rental Information:** begins upon the day of delivery. Rental period begins when equipment is loaded at Flo Trend LLC for delivery to job site and ends when loaded at job site for return to Flo Trend LLC. Failure to perform regular maintenance or use of the equipment in a way other than its intended purpose voids the manufacturer's warranty.



Kinetic Energy Services LLC
PO Box 530
Milliken, CO 80543
United States
(970) 775-3230
www.kineticindustry.com

Estimate
15892

Prepared For

PCL Construction Inc
1711 W Greentree Dr Ste 201
Tempe AZ 85284
United States

Date 07/05/2022
Expires 08/04/2022

Project Name	Company Man	Jobsite Address	AFE/PO/CC	Start Date	End Date
Media Filter Removal - Ralston Water Treatment Plant	Justin McRae	18975 W 66th Ave, Arvada, CO 80007			

Item	Quantity	Units	Rate	Amount
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Hydrovac Truck - Standard	1	Dy	\$2,950.00	\$2,950.00
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RATE PER DAY (BASED ON A 10-HOUR PORT-TO-PORT DAY)
With 8-Hours Onsite. Includes Fuel Surcharge.

- Hydrovac Truck w/ Operator & Laborer

Filter Size: 31 CY Per Filter (Based on Client's Measurements) -
This quote is based on cleaning (1) Filter (which we anticipate taking (1) day to complete), however we are willing to clean additional filters at the same rate if the dimensions/cubic yardage/circumstances are all the same when ready.

Scope: Remove (31CY) consisting of 10" of Gravel, 4" of Garnet, 9" of Sand, 21" of Anthracite = 44" total. Non-Contaminated. All material to be taken off-site for disposal.
• Material beyond 31CY will be invoiced hourly at \$295/hr. + rates shown below.

RATE IS BASED ON ALL DISPOSALS TO BE MADE OFF-SITE

EQUIPMENT:

** All Kinetic trucks quoted above are top-of-the-line Hydrovac Trucks with 6000 CFM, 20 GPM Pumps, 13.5 CY Debris Tanks, 2200 Gallon Water Storage.

Please make sure any bids are apples-to-apples when assessing for value. Kinetic customers routinely experience faster project completion times which will save you time and money in overall completion allowing facility to be operational quicker, and less onsite supervision/labor hours needed.

Semi Transport	1	per	\$1,890.00	\$1,890.00
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ROLL-OFF SEMI TRANSPORTATION - PER DAY FOR VAC BOXES TO BE TRANSFERRED TO DISPOSAL SITE.

**We anticipate taking (2) load (15 to 20 cu yds per each container) per day to disposal site (30 to 40 CY total per day). Based on 14-hour day and includes time at the beginning and end of day for on-boarding and off-boarding vacuum boxes at Kinetic yard.

Equipment Rental	1	per	\$135.00	\$135.00
-------------------------	---	-----	----------	----------

ROLL-OFF CONTAINERS (2) (Per Day)



15892



Kinetic Energy Services LLC
PO Box 530
Milliken, CO 80543
United States
(970) 775-3230
www.kineticindustry.com

Estimate
15892

Item	Quantity	Units	Rate	Amount
Support Pickup - Flat Rate SUPPORT PICKUP & TRAILER - (Per Day) ● Support vehicle to bring Remote Hose, Confined Space Supervisor transportation, and Return of Hose.	1	per	\$250.00	\$250.00
Equipment Rental ADDITIONAL HOSE (Per Day) ● Remote Hose - 150' of 6" Hose	1	per	\$450.00	\$450.00
Water BOBTAIL TRUCK (Per Day) - For additional water if needed - Excludes Water	0	per	\$1,300.00	\$0.00
Water WATER - OFF-SITE PER LOAD (If needed) ● Water is assumed to be available onsite.	0	per	\$70.00	\$0.00
Misc Charge/Labor ANALYTICAL TESTING (If Needed) - Actual cost to be invoiced once known.	0	per	\$0.00	\$0.00
Disposal - Standard DISPOSAL (Per CY) - Based on 31 CY of Non-Contaminated/ Non-Hazardous spoils.	31	per	\$35.00	\$1,085.00
Confined Space Entry - Standard Confined Space Supervisor - Per Day (Based on 10-hours port to port)	1	Dy	\$550.00	\$550.00
Description **THE FOLLOWING ITEMS ARE CLARIFICATIONS AS TO THE INTENTIONS OF THIS PROPOSAL AND MUST BE ATTACHED TO ANY SUBCONTRACTS OR PURCHASE ORDERS IF KINETIC SHALL BE AWARDED THIS WORK. SCHEDULE DELAY - Rates above may apply for any delays caused by other trades not the fault of KES. EXCLUSIONS: Permits, Traffic Control, Contaminated Spoils Disposal, Protective Materials for Floor/Walls etc., or Night Work. **No inclusions have been provided for analytic testing of materials. If analytics are required by the Contractor or Owner, Contractor shall pay for testing. If testing indicates unacceptable levels NORM or other hazardous substances, the fees associated with this type of waste disposal is not included.**				

Subtotal	\$7,310.00
Tax Total (0%)	\$0.00
Total	\$7,310.00



15892



Kinetic Energy Services LLC
PO Box 530
Milliken, CO 80543
United States
(970) 775-3230
www.kineticindustry.com

Estimate
15892

Terms and Conditions

1. Incorporation of Terms.

These terms and conditions govern the agreement formed by your acceptance of this estimate given to you by Kinetic Energy Services LLC ("KES"). These terms are incorporated by reference into this estimate and control over any inconsistent terms in your purchase order or other acceptance.

2. Services, Schedule and Specifications.

Upon acceptance by PCL Construction Inc, KES will perform the services described in this estimate. Any additional services requested by PCL Construction Inc and not covered by this estimate will incur additional charges. The services will be completed in accordance with the schedule in this estimate, or as otherwise approved by the parties in writing. The services will be performed in substantial conformity with the specifications in this estimate, or as otherwise approved by the parties in writing.

3. Changes.

This estimate provided is based entirely upon scheduling, quantities and specifications provided by PCL Construction Inc. PCL Construction Inc agrees that variances in actual quantities or specifications exceeding a comparative threshold of 5% or greater, whether intentional or unintentional, are not covered by this estimate and will incur additional charges. Changes requested or approved by PCL Construction Inc will be invoiced to PCL Construction Inc as a Change Order to the project.

4. Charges, Taxes and Payment Terms.

The charges for the services are described in this estimate, subject to adjustment as provided in these terms, PCL Construction Inc agrees to pay to KES for such charges. PCL Construction Inc will be responsible for payment of all applicable federal, state and local taxes and assessments (including sales, use and similar taxes) levied on the transaction contemplated by this estimate. No tax exemption will be recognized unless a valid exemption certificate is provided. **All invoices for services covered by this estimate are Due on receipt.**

5. Late Charges.

Past due invoices are subject to a late payment charge of 2.0% per month on any unpaid balances. PCL Construction Inc shall be responsible for all fees associated with the collection of unpaid balances.

6. Governing Law, Venue and Legal Fees.

This estimate and these terms will be interpreted and construed under the laws of the State of Colorado, without regard to its conflicts of laws provisions. Venue of any action to construe or enforce this estimate and these terms will lie in Weld County, Colorado. If either party brings an action or proceeding arising out of this estimate or these terms, or on account of any breach or default thereof, the prevailing party will be entitled to receive from the other party its reasonable attorneys' fees, expert witness fees, investigation fees and other related fees, costs and expenses incurred in connection with the proceeding.

Statement of Acceptance

I _____ (PRINTED NAME AND TITLE) represent that I am an authorized agent of PCL Construction Inc and that I accept this Estimate and related Terms and Conditions recorded above on _____ (DATE).

Kinetic Energy Services LLC

Signature

Printed Name and Title

Date

PCL Construction Inc

Signature

Printed Name and Title

Date

Justin McRae

From: Jessie Gloor <jgloor@pcl.com>
Sent: Thursday, July 7, 2022 2:44 PM
To: Justin McRae
Subject: Fwd: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget
Attachments: Arvada, CA Filter Media - Bid Package.pdf; I19222 Leopold Filtration Equipment (media) REV00 7-6-22.docx; I19222 Leopold Filtration Equipment (und for 10-12 agit for all) REV00 7-7-22.docx

Jessie Gloor
Project Engineer

PCL Construction, Inc.
2000 S Colorado Blvd.
Building 2 suite 500
Denver, CO 80222
T: 480-582-2573
M: 720-682-9371
jgloor@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>
Sent: Thursday, July 7, 2022 2:32:50 PM
To: Jessie Gloor <jgloor@pcl.com>; Raymond Torrejon <rtorrejon@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Jessie,

Filter Media:
Complete quote and bid form attached.

Filtration Equipment:
A budgetary filtration equipment quote is also attached. A good budget for the filtration equipment is around \$900,000. Honestly I imagine that number will be less than the budget price, seeing as this is likely to bid by the end of the month. That said, I / Leopold really (REALLY) hates to give low budget numbers and then something changes, usually isn't "a good look" so to speak.

Can I ask, what is the intent with the existing underdrains and filtration equipment for filters 1-9? Are the original underdrains going to be used? Are there any plans for upgrading those underdrains as well?

Thanks

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Jessie Gloor <jgloor@pcl.com>
Sent: Thursday, July 7, 2022 1:22 PM
To: Raymond Torrejon <rtorrejon@pcl.com>; Chase Knox <cknox@isiwest.com>
Subject: Re: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Hey chase can we bug you on this again? Any new updates? It's early in the day but just wanted to check in.
Thanks!

Jessie Gloor
Project Engineer

PCL Construction, Inc.
2000 S Colorado Blvd.
Building 2 suite 500
Denver, CO 80222
T: 480-582-2573
M: 720-682-9371
jgloor@pcl.com

www.pcl.com

TOGETHER WE BUILD SUCCESS

From: Raymond Torrejon <rtorrejon@pcl.com>
Sent: Wednesday, July 6, 2022 3:59:39 PM
To: Chase Knox <cknox@isiwest.com>; Jessie Gloor <JGloor@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Chase,

Thanks for the update.

Raymond Torrejon
Project Manager

PCL Construction, Inc.
2000 S Colorado Blvd. Building 2 suite 500
Denver, CO 80222
P: 720.357.6253
E: rtorrejon@pcl.com

www.pcl.com

TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>
Sent: Wednesday, July 6, 2022 3:59 PM
To: Raymond Torrejon <rtorrejon@pcl.com>; Jessie Gloor <JGloor@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Ray,

I just got an email from Leopold, they said they will have both proposals tomorrow (budget for underdrains, hard quote for media).

October 28, 2022

WGC# ICO14370-V2

PCL
2000 S. Colorado Blvd., Suite 500
Denver
Phone: 720-682-9371

Attn: Jessie Gloor

Reference: City of Arvada – Ralston WTP – Filter and Solids Handling Improvements

Weifield Group Contracting, Inc. is pleased to provide our probable cost lump sum proposal on the referenced project.

PRICING (ELECTRICAL, INSTRUMENTATION, & CONTROL):

Filter Improvements	\$1,444,939.00
Solids Handling	\$517,129.00
Fixed General Expenses	\$86,293.00
Variable General Expenses	\$475,085.00
Temporary Power	\$12,283.00
Generator Quick Connect Switchboard	\$98,534.00
Suggested material escalation	\$45,000.00
Suggested estimating contingency	\$35,000.00

Weifield / Timber Line VE options

- Eliminate custom MCC in Solids and replace with individual VFD's fed from MCC from existing spare breakers or add new breakers **<\$30,000.00>**
- Change 200HP VFD manufacture to Yaskawa **<\$10,000.00>**
- Utilize the exiting 400A circuit breakers and demo out starters for 200hp Pumps **<\$10,000.00>**
- Use Rosemount radar units over the filters (No display) in lieu of EH Ultrasonics with controllers **<\$15,000.00>**
- Generator Quick Connection Cabinet alternate manufacture **<\$17,000.00>**
(Based on final design utilize an OEM, Easter Owens or Metron)

CLARIFICATIONS:

1. In this proposal the term “provide” shall mean to furnish and install, complete and ready for intended use.
2. In this proposal the acronym “FBO” shall mean Furnished by Others.
3. In this proposal the acronym “PBO” shall mean Provided by Others.
4. Our proposal is based on the contract documents listed below:
 - a. Filter Specifications dated: October 2022
 - b. Filter Drawings dated: October 2022
 - c. Solids Specifications dated: October 2022
 - d. Solids Drawings dated: October 2022
5. Our proposal is based on a mutually agreeable lump sum contract to be determined.
6. Our proposal is based on a mutually agreeable schedule within 30 days of the Notice to Proceed.
7. Our proposal is based on a 40-hour work week and anticipates a construction duration of 16 months.
8. Our proposal remains valid for 60 days.
9. Others shall not hold Weifield Group Contracting, Inc. liable for errors, omissions, inadequacies of materials, or equipment specified or supplied by others.
10. We have not included provisions for differing site conditions.
11. We have not included temporary environmental controls, de-watering, surveying, utility locates, potholing, or traffic control.
12. We will provide cleanup of our own identifiable debris to onsite waste and recycle containers furnished by the General Contractor.
13. Our proposal is based on all electrical materials being stored on site. We anticipate up to 1 Conex storage containers for the duration of the project and to utilize sharing of office trailer with PCL.
14. We have offered an allowance for Temporary trailer construction power as an add.
15. Temporary construction power will utilize existing power sources
 - a. Task lighting and extension cord are provided by individual trades.
16. We have included Safe-Off only for all demolition.
17. Start-up and Commissioning of Filter Train is figure to be 5 working days per each.

INCLUSIONS:

1. Permit Fees
2. Sales Taxes (Non-Permanent material & equipment)
3. One Year Warranty
4. All safety equipment and tools for our scope
5. Mobilization of electrical equipment and supplies
6. All submittals, drawings, factory tests, field inspections, field testing, and operator/maintenance training for equipment furnished by WGC
7. Electrical and I&C Connections to Process Equipment
 - a. As indicated on drawings
8. Instrumentation and Controls
 - a. As indicated on drawings
 - b. Timber Line BOM
8. Selective Demolition of Electrical Systems
 - a. Render safe for mechanical equipment for removal and disposal by others
 1. Valves
 2. Inline instruments
 3. Sample Pumps
 4. Bubbler Panels
9. Heat Tracing
 - a. As indicated on drawings

EXCLUSIONS:

1. Bond premium (Can be added at \$34,063.00)
2. Sales Tax (Permanente materials)
3. Delays and/or extension of the project schedule
4. Builders Risk Insurance
5. Utility company development fees for permanent and temporary service and consumption charges
6. Handling or disposing of hazardous materials
7. Cut, patch, and replacement of concrete, asphalt, landscaping, and any other existing to remain surfaces
8. Excavation, backfill, export spoils, dewatering, concrete, and rebar
 - a. Trenching – 510'
 - b. Excavation cu/yds – 175
 - c. Export of spoils cu/yds – 99
 - d. Backfill cu/yds – 78
 - e. Concrete cu/yds – 80
 - f. Rebar
 - i. Horizontal – 3,513'
 - ii. Hoops – 255 at 1,953'
9. All concrete including housekeeping pads, protective bollards, etc.
 - a. MCC's – 2
 - b. Transformers – 2
 - c. VFD's – 2
10. Demolition of Concrete and Conduits embedded in Concrete
11. Painting
12. Cathodic Protection
13. Furnish and installation for Backwash Pumps 41-PMP-0101 and 41-PMP-0201, Insulated NDE Bearings and Shaft Grounding devices (Reference drawing F-E-1001 sheet Keyed Note 3)
14. Installation of any equipment or instruments into inline process piping (mag flow meters, flow tubes, etc.)
15. Furnish and Installation of Spool Pieces and Flanges for instruments
16. All taps or associated equipment (valves, pressure reducers, solenoids, etc.) needed in process piping including tubing for analytical instruments
17. Seismic Engineering and Calculation (Reference 01 88 15 Anchorage & Bracing and 01 81 50 Design Criteria)
18. Furnishing and Installation of all motors (Reference 26 20 00 Low-Voltage AC Induction Motors and 26 05 06 Voltage Motors up to 500 Horsepower)
19. Removal of existing owner items for new electrical installation requirements
20. Furnishing and Installation of Stilling Wells and blind flanges – 4 (Reference drawing 00TN01 detail NL900)
21. Grouting of equipment stands
 - a. Jacobs reference details 4091-163, 4091-382 and 4091-394G
 - b. Carollo reference drawing 00TE3 details EM202 and EM210

Sincerely,

WEIFIELD GROUP CONTRACTING

Robb Herder

Estimator
720.230.6374



ELECTRICAL CONTRACTING

Curtis Miller

VP of Industrial
Cell: 303.669.3702

City of Arvada Ralston WTP

Filter & Solids Handling Improvements

30% Design to Current Design

Carollo Design

1. Added electrical work for the Solids Handling Lagoons
 - a. New MCC section at MCC-3 and VFD's for Solids Handling Pumps
 - b. Demo of existing electrical, ductbank and Mini Power Center LPS
 - c. New requirements at MCC-4 and new Mini Power Center LPS
 - d. Ductbank
 - e. General Power Receptacles
 - f. Heat Tracing at Stilling Wells
 - g. Instrumentation
2. Generator Tap cabinet

Jacobs Design

1. New location for Backwash Pump VFDs
 - a. New Feeders (Primary and Secondary)
2. New breakers in MCC2
3. New Panelboard DP5
4. New Instrumentation Devices
 - a. 41FIT-0001
 - b. Second AE Instrumentation device associated with 40AIT TURB/Level at Filters
5. Deleted Instrumentation Devices
 - a. AIT/AE for Combined Effluent Sample Pump
 - b. 40FCV-0705 and similar valves at Filters 10, 11 and 12
6. Demolition
 - a. Combined Filter Sample Pump
 - b. Filter Influent Gate and Actuator
 - c. Bubbler Panels

7. Relocation of existing conduit at Filter 3 Surface Wash Piping location for Backwash Pumps
 - a. New Feeders
8. Demolition for feeders associated with MCC-1
9. Added Disconnects for Flow and Control Valves
10. New work at Reaction Basin
11. Added New Panelboards PP5-A, PP5-B and PP-3A
12. Demo work at Panelboard LP-1
13. Added Remote Staters for Air Compressor 2 and 3

Manual Motor Control Switches and Disconnects Square D™ MD Enclosed Motor Disconnect Switch

Square D™ MD Enclosed Motor Disconnect Switch



Schneider Electric's Square D brand has been an industry leader in safety switches for over 100 years and is recognized as the market leader in product quality, durability, and reliability. The latest addition to the MD motor disconnect family is a non-receptacle switch for UL 508 listed applications.

This MD motor disconnect switch serves as a local on/off switch for a motor when the motor branch circuit protection is in a central enclosure. It is in a compact NEMA 4X enclosure and is available in 30 A and 60 A versions.

Key Benefits

- Lowers costs—significantly less expensive than stainless steel motor disconnect switches.
- Enhances safety—handle interlock prevents cover from being removed while in the On position.
- Maximizes space—one of smallest footprints on the market.

Key Features

- Water-tight NEMA 4X polycarbonate enclosure—ideal for use in wash down or rugged industrial applications. Covers additional enclosure types, such as NEMA 1, 12, 3R, and 4.
- Standard 3-pole design—optional additional power pole
- Available in 30 A and 60 A sizes
- Horsepower rated
- Clear On/Off indication
- Front padlockable handle complies with OSHA lockout/tagout requirements—accepts up to three 8 mm padlocks
- cULus certified—UL File E164864

Table 45: NEMA 4X Enclosed Switches

Approvals	Maximum Horsepower Rating			Catalog Number
	Three Phase			
	220–240 Vac	440–480 Vac	600 Vac	
UL 508	7.5	20	25	MD3304X
UL 508	20	40	40	MD3604X

Table 46: Accessories

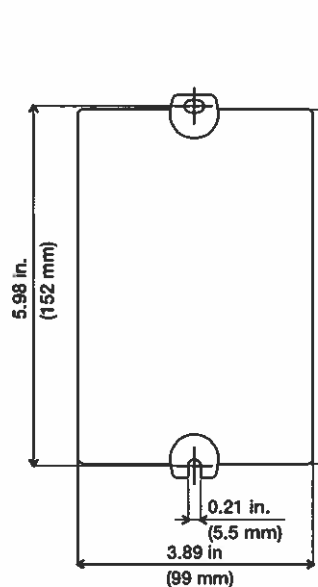
Description	Catalog Number
2 normally open auxiliary contact module	MDSAN20
1 normally open + 1 normally closed auxiliary contact module	MDSAN11
Additional 30 A power pole	MDS30P

} TBD

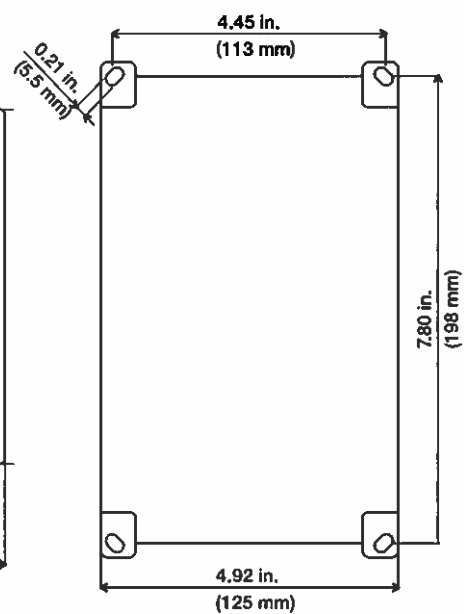
Manual Motor Control Switches and Disconnects

Square D™ MD Enclosed Motor Disconnect Switch

**30 A Enclosed Switch
Mounting Diagram**



**60 A Enclosed Switch
Mounting Diagram**



Justin McRae

From: Chase Knox <cknox@isiwest.com>
Sent: Monday, October 31, 2022 9:42 AM
To: Justin McRae
Cc: Frank Henderson
Subject: RE: City of Arvada - Rolston WTP - Filter Agitators
Attachments: I19222 Leopold Filtration Equipment (60% p&s) REV00 10-27-22.docx

Justin,

Please see the attached Leopold filter agitators quote for the City of Arvada, Rolston WTP project.

The price for the attached scope is \$233,100.00

Please let me know if you have any questions.

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Justin McRae JWMcRae@pcl.com
Sent: Friday, October 28, 2022 2:35 PM
To: Chase Knox cknox@isiwest.com
Cc: Frank Henderson fhenderson@isiwest.com
Subject: RE: City of Arvada - Rolston WTP - Filter Agitators

Rough Order of Magnitude

Basically an educated guess of the cost from your experience.

Let me know if they still plan on provide numbers today.

Thanks,

Justin McRae
Senior Estimator

PCL Construction, Inc.
1711 W. Greentree Drive Ste 201
Tempe, Arizona 85284
M: 407-427-0656
jwmcrae@pcl.com

www.pcl.com

TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>
Sent: Tuesday, October 25, 2022 10:28 AM
To: Justin McRae <JWMcRae@pcl.com>
Cc: Frank Henderson <fhenderson@isiwest.com>
Subject: RE: City of Arvada - Rolston WTP - Filter Agitators

Sorry, not familiar with ROM\$?

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Justin McRae <JWMcRae@pcl.com>
Sent: Tuesday, October 25, 2022 10:22 AM
To: Chase Knox <cknox@isiwest.com>
Cc: Frank Henderson <fhenderson@isiwest.com>
Subject: RE: City of Arvada - Rolston WTP - Filter Agitators

Can you provide of ROM\$ before that. I promised the City of Arvada a heads up on my final number for the entire project tomorrow?

Thanks

Justin McRae
Senior Estimator

PCL Construction, Inc.
1711 W. Greentree Drive Ste 201
Tempe, Arizona 85284
M: 407-427-0656
jwmcrae@pcl.com

From: Chase Knox <cknox@isiwest.com>
Sent: Tuesday, October 25, 2022 9:10 AM
To: Justin McRae <JWMcRae@pcl.com>
Cc: Frank Henderson <fhenderson@isiwest.com>
Subject: RE: City of Arvada - Rolston WTP - Filter Agitators

Justin,

I was just informed that Leopold is currently running around a two week lead time for proposals. That said, they have committed to having numbers by the end of the week. Is that acceptable?

Thanks

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Chase Knox
Sent: Thursday, October 20, 2022 5:30 PM
To: Justin McRae <JWMcRae@pcl.com>
Cc: Frank Henderson <fhenderson@isiwest.com>
Subject: RE: City of Arvada - Rolston WTP - Filter Agitators

I'm on it as well.

Thanks

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Justin McRae <JWMcRae@pcl.com>
Sent: Thursday, October 20, 2022 4:50 PM
To: Chase Knox <cknox@isiwest.com>
Cc: Frank Henderson <fhenderson@isiwest.com>
Subject: City of Arvada - Rolston WTP - Filter Agitators

Chase,

I need pricing on 44 31 31 Filter Agitators (L.B. Leopold; Palmer S Type).

See attached 90% specification and link to full docs.

Thanks

Justin McRae
Senior Estimator

PCL Construction, Inc.
1711 W. Greentree Drive Ste 201
Tempe, Arizona 85284
M: 407-427-0656
jwmcrae@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>
Sent: Thursday, October 20, 2022 1:25 PM
To: Justin McRae <JWMcRae@pcl.com>
Cc: Frank Henderson <fhenderson@isiwest.com>
Subject: RE: City of Arvada - Rolston WTP - Slide Gates

[External Email]

Justin,

Please see the attached Rodney Hunt gate scope for the City of Arvada.

Pricing should be available in the coming days.

Please let me know if you have questions.

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Justin McRae <JWMcRae@pcl.com>
Sent: Thursday, October 13, 2022 2:05 PM

To: Chase Knox <cknox@isiwest.com>; Frank Henderson <fhenderson@isiwest.com>

Subject: FW: City of Arvada - Rolston WTP - Slide Gates

See attached specs and drawings.

Justin McRae
Senior Estimator

PCL Construction, Inc.
1711 W. Greentree Drive Ste 201
Tempe, Arizona 85284
M: 407-427-0656
jwmcrae@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

From: Justin McRae

Sent: Thursday, October 13, 2022 1:01 PM

To: cknox@isiwest.com; fhenderson@isiwest.com

Cc: Andrew Greene <AGreene@pcl.com>

Subject: City of Arvada - Rolston WTP - Slide Gates

We have a project for the City of Arvada called Rolston WTP Solids Improvements. We are going to final GMP on the 60% documents due to schedule constraints.

Please see attached 40 05 59 Fabricated Stainless Steel Slide Gates specs and drawings and link below for full set of documents. The gates in question are in the SOLIDS Drawing package.

<https://pcl.egnyte.com/fl/j2kS8q5G4l> [pcl.egnyte.com]

I need pricing by 10/25.

SLIDE GATE SCHEDULE										
PROCESS UNIT #	TAG ID	LOCATION	SIZE (FEET)		HEAD (FEET)		CLOSURE TYPE	GATE TYPE	OPERATOR	REMARKS
			W	H	SEAT	UNSEAT				
70	70G0101	LAGOON 1 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0102	LAGOON 1 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
70	70G0201	LAGOON 2 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0202	LAGOON 2 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
70	70G0301	LAGOON 3 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0302	LAGOON 3 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
70	70G0401	LAGOON 4 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0402	LAGOON 4 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
NOTE: ALL GATES SHALL BE NONRISING STEM.										
ABBREVIATIONS: CLOSURE TYPE: OF = OPEN FRAME (NON-SELF CONTAINED); FM = FRAME MOUNTED (SELF CONTAINED) GATE TYPE: DO = DOWNWARD OPENING; UO = UPWARD OPENING OPERATOR TYPE: HCN = HAND CRANK W/ 2" SQUARE NUT; HW = HANDWHEEL; PED = PEDESTAL; FBN = FLOOR BOX W/ 2" SQUARE NUT; M = MOTOR OPERATOR										

Regards,

Justin McRae
Senior Estimator

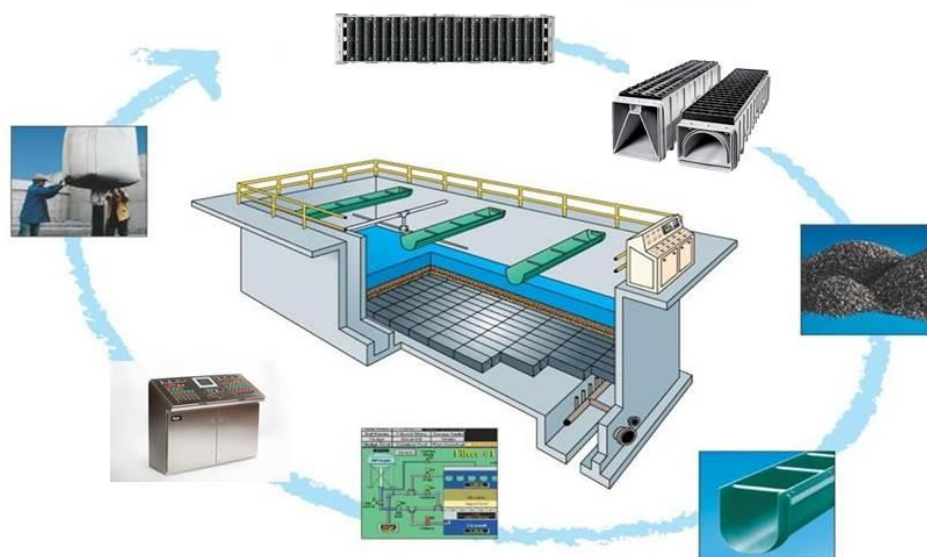
PCL Construction, Inc.
1711 W. Greentree Drive Ste 201
Tempe, Arizona 85284
M: 407-427-0656
jwmcrae@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

Firm Proposal

Ralston WTP

Arvada, CO



Prepared for:

PCL

10/27/2022



Xylem Water Solutions USA, Inc.
108 Tomlinson Dr – Suite 400
Zelienople, PA 16063
Mr. Wayne Steen
Direct: 724-453-2111
Mobile: 724-272-2905
Email: wayne.steen@xylem.com

10/27/2022

Project name : Arvada, CO
Project number : I19222

To Whom It May Concern:

Based on your inquiry, we are pleased to forward the following proposal to your attention. Thank you for the opportunity to offer our equipment and services for the Arvada, CO, Ralston WTP project.

We hope that our proposal meets your expectation. If you have any questions, please do not hesitate to contact me or our local representative.

Respectfully,

Wayne Steen
Senior Sales Engineer

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1 Technical Description

1.1 SCOPE OF SUPPLY

We are pleased to offer the following materials and services by Xylem Water Solutions USA, Inc. This quotation has been prepared using specification section 44 43 31 along with the 60% drawings.

AGITATORS (Filters 1-3):

Under this section, we propose to furnish 12 Leopold Type S Filter Agitators, 8'-9" in diameter, with flexi-jet nozzles, and QJ end caps.

Agitators will have delrin center bearing assembly with type 316 stainless steel lateral arms.

Also included under this item will be 6' brass indicator rod with Lexan flag.

AGITATORS (Filters 4-12):

Under this section, we propose to furnish 36 Leopold Type S Filter Agitators, 10'-0" in diameter, with flexi-jet nozzles, and QJ end caps.

Agitators will have delrin center bearing assembly with type 316 stainless steel lateral arms.

Also included under this item will be 6' brass indicator rod with Lexan flag.

EXTRA MATERIALS:

Under this section, we propose to furnish 26 extra nozzles and 1 center bearing assembly per filter (12 total).

1.2 SERVICES

MANUFACTURER'S SERVICES (FILTER EQUIPMENT):

The services of a qualified Leopold technical representative to instruct the Contractor's personnel about the proper installation technique of the **agitator equipment** will be provided for a period of 3 days (8 hr/day) on site plus 2 days travel time to and from the job-site in 1 trip. Additional services may be obtained at the current prevailing rate plus living and travel expenses.

2 Technical Clarification & Deviations

1. Specification Section 44 43 31, 2.02,C,4- The center bearing shall have a 316 stainless steel Tee in lieu of a Bronze Tee.
2. Specification Section 44 43 31, 2.02,D,1- The lateral arms shall be type 316 stainless steel in lieu of type 304 stainless steel.

3 Price & Scope of Supply

3.1 MAIN SCOPE

BASIS of PRICING:

Any items and/or accessories not specifically called out in this quotation must be construed as being furnished by others.

This quotation is considered firm for 60 days. Any order received more than 60 days after the date of this quotation is reviewed by Xylem Water Solutions USA, Inc. before acceptance and is subject to changes in prices or delivery depending on conditions existing at the time of entry. Quoted prices are firm for delivery within 12 months from the delivery date stipulated in the plans & specifications or mutually agreed upon by Xylem Water Solutions USA, Inc. and Purchase Order issuer at time of order placement.

We do not include any applicable taxes.

Orders resulting from this quotation should be addressed to Xylem Water Solutions USA, Inc.
108 Tomlinson Drive Suite 400 – Zelienople, PA 16063, USA.

We propose to furnish the material described in this document for **a total selling price of**
\$ _____.

Pricing for the equipment and field services outlined in this proposal, DAP Jobsite per Incoterms 2020.

For further information pertaining to the equipment contained in this proposal, please contact our area representative, who is:

isiWest
4175 Mulligan Dr.
Longmont, CO 80504
Phone: 970.535.0571
Cell: 970.691.0805

Attention: Chase Knox

Pricing is based on the following payment terms (net 30 days):

10% following initial submittal for approval

80% following the date of the respective shipments of the product

5% following installation, not to exceed 150 days after shipment of the product

(whichever comes first)

5% following start-up, not to exceed 180 days after shipment of the product

(whichever comes first)

4 Commercial Terms & Conditions

4.1 DELIVERY SCHEDULE

4.1.1 Production schedule

Submittal of mechanical drawings for approval 4 to 6 weeks after order acceptance.

4.1.2 Delivery time

Delivery of fabricated items 12 to 16 weeks after drawing approval.

4.2 TERMS AND CONDITIONS OF SALE – NORTH AMERICA

This order is subject to the Standard Terms and Conditions of Sale – Xylem Americas effective on the date the order is accepted. Terms are available at <http://www.xyleminc.com/en-us/Pages/terms-conditions-of-sale.aspx> and incorporated herein by reference and made a part of the agreement between parties.

Different terms are hereby rejected unless expressly assented to in writing.

AGREEMENT TO PURCHASE: BUYER agrees to purchase the equipment and services herein in accordance with the terms and conditions set forth above.

ACCEPTANCE: SELLER hereby accepts BUYER'S offer to purchase.

(BUYER)

Xylem Water Solutions USA, Inc.

BY: _____

BY: _____

_____, 20 _____

_____, 20 _____



QUOTATION NO: 21969

Division of ISE METAL Inc.

20 Windsor Rd

Sherbrooke, QC

J1C 0E5

Ph.: 819-769-0157

www.ISEaquanox.com

info@ISEaquanox.com

Date: 2022-10-24

To: 0

Att of: 0

PROJECT: Ralston WTP Solids Improvements

Arvada, CO

IMPORTANT NOTICE

The current volatility of raw material cost, especially stainless steel, has reached a point that makes us unable to provide prices for our products that are fixed in time. It is therefore very important to note that the price presented in the attached quotation will not necessarily be maintained for the duration of this project. These prices can only be considered as an indication of the price that we think could apply to your project, based on our best estimations. Fontaine-Aquanox will not assume the risk of material cost escalation. Bidding contractors should take this risk into account in establishing their project cost. In order to help as much as we can, we offer the information to below describing the parameters that were used to prepare our quotation.

Quantity of material that will need to be used for this project:

	(Lb)	(Kg)
Grade: 316L	0	0
Grade: 304L	5637	2553
Aluminium	0	0

1. The cost in \$/lb used to prepare this quote is based on the peak (maximum) price forecasted by MEPS International 12 months prediction for Hot Rolled Coiled Plate
2. The cost in \$/lb used in this quotation will be made available before placing purchase order.
3. Any cost increase of more than 0.20\$/lb compared to the cost used in this quotation will have to be charged to the customer with a 15% margin.
4. The cost of the material used for fabrication will established 100 days before the ship date agreed at time of submittal approval. It will be based on ISE Metal's most recent purchase order of the same grade at that time.
5. A copy of purchase orders will be supplied on request at time of release for production.

Division of ISE METAL Inc.

20 Windsor Rd

Sherbrooke, QC

J1C 0E5

Ph.: 819-769-0157

www.ISEaquanox.com
info@ISEaquanox.com

Date: 2022-10-24

To:

Att of:

PROJECT: Ralston WTP Solids Improvements
Arvada, CO

Itm	Description	Qty	Unit USD	Total USD
01	Tag: 70G0101, 0201, 0301, 0401 Fontaine-Aquanox Series 40 Weir Gate Model: 402-Y2X-60x48-B-CW-8 Dimensions: 60in x 48in Design Pressure (On/Off): 8.0ft/8.0ft Installation depth: 6.50ft Self contained frame, Single Non-rising Stem Mounting: Face of Wall Material: 304L stainless steel Operator: Yoke mounted gearbox and crank Anchors included, hardware only, adhesive not included, 316s.s. (Dia.: 0.50in, Qty=32) Certification: AWWA C561-14	4	10 703	42 812
02	Tag: 70G0102, 0202, 0302, 0402 Fontaine-Aquanox Series 20 Inverted Slide Gate Model: 202-Y2X-36x36-B-CW-10-INV Dimensions: 36in x 36in Design Pressure (On/Off): 10.0ft/10.0ft Installation depth: 8.50ft Self contained frame, Single Non-rising Stem Mounting: Face of Wall Material: 304L stainless steel Operator: Yoke mounted gearbox and crank Anchors included, hardware only, adhesive not included, 316s.s. (Dia.: 0.50in, Qty=41) Certification: AWWA C561-14	4	7 730	30 920
Sub-Total:				73 732
Freight Charges:				5 069
Field Service: (2 visits, 5 days on site):				11 989
Total Net Price (USD):				90 790

NOTES:

1. 60% documents. This quotation is subject to change upon receipt of additional information and/or project specifications.
2. We quoted nonrising stem as per slide gates schedule, but we recommend rising stems. Price does not change.
3. Design and calculations signed by a professional engineer registered in Canada.
4. Bottom seal: We offer EPDM instead of neoprene.

CONDITIONS:

Lead Times:
Submittal Drawings: 3-4 Weeks
Gate(s) Shipment: 12-14 Weeks after approval

Above lead times are based on average shop loading and are subject to change depending on actual work load at the time of the order.

Taxes: All applicable taxes extra
Currency: USD
Payment Terms: Net 30 days
Freight (Incoterms): FCA (freight prepaid) to destination
Via LTL dry box, not unloaded.
Validity: 30 days
Field Service: Not included, unless indicated in price above
If required: 1200/day, plus travel and living expenses

Enrique Scoccimarro

Inside Sales Representative

enrique.scoccimarro@iseaquanox.com

819-769-0157 ext 371

For more information on this quote:

Scott Marshall

Misco Water

4670 S Ash Ave, Suite 103 Tempe, AZ, 85282

303-309-6150 Cell: 303-601-5215

smarchall@miscowater.com

QUOTE #2210047

Date: October 21, 2022

Project Name: Ralston WTP Solids Improvements – Arvada, CO

Bid Date: October 25, 2022

Representative: Beau Javernick – Municipal Treatment Equipment – 303-231-9175

We are pleased to offer for your consideration the following equipment for this project.

Quantities and descriptions listed in this quotation were based on the following:
Emailed information only. Specifications and drawings based on 60% design documents.

Please note these prices are based on receiving the entire order. Adjustments to item quantities or specifications may alter the pricing.

- Prices and lead times quoted are firm for acceptance within 30 days of the bid date and apply to this quotation only, subject to attached Terms & Conditions. Prices do not include sales or use tax. If this proposal is not accepted within 30 days after bid, Hydro Gate reserves the right to re-quote and price escalation may be necessary.

The equipment we have quoted meets or exceeds the specifications with the following clarifications:

NOTE: We have received no addendums for this project.

1. If awarded to Hydro Gate, we will need to be supplied with a full set of plans and specifications.
2. Prices do not include third party inspection services of gates and equipment unless specifically required by specifications that supplier (Hydro Gate) be responsible for cost of these inspections.
3. Hydro Gate will provide digital copies of all relevant Operation and Maintenance manuals. Contact Hydro Gate should custom manuals be required.
4. Please note these prices are based on receiving the entire order. Adjustments to item quantities or specifications may alter the pricing.
5. Prices do not include taxes.
6. Non-machined, submerged ferrous surfaces to be blast cleaned and painted with 2 shop coats of manufacturer's standard epoxy paint.

7. This quotation reflects our policy of sourcing raw materials in the most cost effective manner. Any requirement for specific U.S content shall require a revised quotation.
8. Prices do not include installation of gates and equipment or lubricants for stems, gear units and bearings.
9. Mastic, grout, gaskets and epoxy capsules for anchors not by Hydro Gate.
10. Upon placing an order with Hydro Gate, buyer must ensure that the approval of equipment be provided to Hydro Gate within 30 days of receiving submittals. Failure to do so may result in an increase of price in relation to market fluctuation of raw material costs.
11. **Please address all purchase orders to Henry Pratt Company, LLC 12000 East 47th Ave., Suite 200, Denver, CO 80239.**
12. Submittal and Production Lead times are subject to change at the time of order.
13. Hydro Gate Standard Terms and Conditions of Sale apply to this quotation and can be found at www.hydrogate.com/support.

Quotation Number: 2210047

Item Number : 01
Location : Lagoon Outlet Structures
Designation : 70G0101, 70G0201, 70G0301, & 70G0401
Qty/Size : 4 – 60" x 48"
Gate : Fabricated weir gate Model HG561 with type 304 stainless steel frame and slide, and stainless steel fasteners. Self-contained frame, polymer bearing bars in guide grooves, UHMW seals, and downward opening slide.
Mounting : Stainless Steel anchor bolts.
Lift : Yoke mounted offset lift with 2" square nut, non-rising type 304 stainless steel stem and tee wrench.
Frame Height: 9.50' (from centerline)
Gate Ship : 14-16 weeks after drawing and credit approval.
Price Each : \$ 11,263.00

Item Number : 02
Location : Lagoon Outlet Structures
Designation : 70G0102, 70G0202, 70G0302, & 70G0402
Qty/Size : 4 – 36" x 36"
Gate : Fabricated weir gate Model HG561 with type 304 stainless steel frame and slide, and stainless steel fasteners. Self-contained frame, polymer bearing bars in guide grooves, UHMW seals, and downward opening slide.
Mounting : Stainless Steel anchor bolts.
Lift : Yoke mounted offset lift with 2" square nut, non-rising type 304 stainless steel stem and tee wrench.
Frame Height: 11.00' (from centerline)
Gate Ship : 14-16 weeks after drawing and credit approval.
Price Each : \$ 7,412.00

Item Number : 03
Misc. : Field service will be provided for 3 trips and 5 days in compliance with specification section 40 05 59.20. If additional field service is required, please contact Hydro Gate for pricing adjustment.

Total price for items listed above: \$74,700.00

The delivery lead times are based on stock inventory at the time of quotation. Stock quantities and quoted delivery times must be re-evaluated and verified at time of order and/or time of release to manufacturing.

Please see notes 1 through 13 in this quotation.

Quotation No.: 2210047

FREIGHT:

F.O.B. shipping point, full freight allowed. Seller will pay freight charges for standard shipments. Additional freight cost incurred to comply with buyer's special requirements will be added to the invoice.

FIELD SERVICE:

Hydro Gate will make every effort to provide a representative to meet your schedule, but due to conflicting requirements a request should be made no later than fourteen (14) days before a representative is required. Where previous commitments have been made, some flexibility in your schedule should be anticipated. All field service trips will require a written confirmation prior to arriving at the site.

DRAWINGS:

Submittal drawing lead time is 8 to 10 weeks after receipt of your written purchase order.

Thank you for your interest in our product. If any questions arise regarding this quotation, please contact Hydro Gate.



Erik Mustain

Hydro Gate® Application Engineer

12000 E. 47th Avenue - Suite 200 Denver, Colorado 80239
office: 303.374.2169 | muellerwp.com



MUNICIPAL TREATMENT EQUIPMENT

Quote No:
2628

17301W. Colfax Ave, Unit 105, Golden, CO 80401
(303) 231-9175 | www.municipaltreatment.com

Sold To:

PCL CONSTRUCTION, INC
1711 W GREENTREE DRIVE, SUITE
TEMPE, AZ 85284

Ship To:

PCL-ARVADA WTP
18975 W 66TH AVE
ARVADA, CO 80007

Date	Ship Via	Terms	Taxable	Salesperson	Customer ID
10/09/2022	BEST WAY FFA	Net 30	N	BEAU	PCL2020

Product Code	Product Name	Quantity	Price	Extension
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ACTUATOR	IQ19, WT, FA TYPE A, 29 RPM, 480/3/60 - OPEN CLOSE WD#110B0000 DISCRETE CONTROL 120v LEAD TIME 18-20 WEEKS PRICE INCLUDES START-UP INSTALLATION AND WIRING IS BY OTHERS QUOTE VALID FOR 90 DAYS	15.00 EA	7,325.00	109,875.00
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Subtotal	USD	\$ 109,875.00
Total	USD	\$ 109,875.00



RW GATE COMPANY
79 102nd Street – Suite 100
TROY, NEW YORK 12180
OFFICE: 518-874-4750
FAX: 518-274-0210
WEBSITE: www.rwgate.com

QUOTATION

October 3, 2022

To: Jessie Gloor @ PCL Construction

Quotation #QT01023009 rev 2

Project: Arvada, CO – Ralston Filters & Solids Improvements Project – 60% Design
Jacobs / Carollo / HDR Engineers
Bid Date: 'already bid'

Dear Jessie:

Following is our quotation for **SECTION 35 20 16.25 – FABRICATED SLIDE GATES** on the referenced project. Our offering is as follows:

Item No. 01 – Filters 1 - 3

Qty. - Size: Three (3) Model RW750-S Slide Gates - 30" wide x 24" tall

Distance from the Invert of the Opening to the Operating Floor: 4.67' (approx.)

Design Seating Head / Design Unseating Head (invert to MWL): 3.75' / 3.25'

Tag No.: 40GTE0101, 40GTE0201, 40GTE0301

Dwg No.: F-D-2002, F-D-3002

Description: The AWWA C561 compliant, self-contained, upward-opening slide gates will be constructed of 304L stainless steel with self-adjusting UHMWPE seals along the sides and top and an EPDM flush bottom invert seal. A single, rising, 316 stainless steel operating stem and clear plastic stem cover with mylar indicator strips will be provided.

Operating Mechanism: floor stand mounted on yoke, Rotork IQ electric actuator (480v – 3 phase power, open-close duty, NEMA 4X housing)

Mounting Style: Gate frames will have wall surface mounted guides and a wall surface mounted top seal member with 316 stainless steel adhesive anchors and non-shrink grout. Additional bolt holes will be provided in the frame. If an existing wall thimble is present, the installer may have to drill through the flange of the thimble and the concrete behind the flange. Anchor studs, nuts and washers are included.

NOTE: Rotork IQ electric actuators to be provided by others. RW Gate will coordinate with Rotork local representative.

Item No. 02 – Filters 4 – 6

Qty. - Size: Three (3) Model RW750-S Slide Gates - 30" wide x 24" tall

Distance from the Invert of the Opening to the Operating Floor: 5.0' (approx.)

Design Seating Head / Design Unseating Head (invert to MWL): 3.75' / 3.25'

Tag No.: 40GTE0401, 40GTE0501, 40GTE0601

Dwg No.: F-R-2001, F-D-2003, F-D-3002, F-D-3004

Description: The AWWA C561 compliant, self-contained, upward-opening slide gates will be constructed of 304L stainless steel with self-adjusting UHMWPE seals along the sides and top and an EPDM flush bottom invert seal. A single, rising, 316 stainless steel operating stem and clear plastic stem cover with mylar indicator strips will be provided.

Operating Mechanism: floor stand mounted on yoke, Rotork IQ electric actuator (480v – 3 phase power, open-close duty, NEMA 4X housing)

Mounting Style: Gate frames will have one guide that is wall surface mounted and one guide that is in-channel mounted (low-profile design) and a wall surface mounted top seal member with 316 stainless steel adhesive anchors and non-shrink grout. Additional bolt holes will be provided in the frame. If an existing wall thimble is present, the installer may have to drill through the flange of the thimble and the concrete behind the flange. Anchor studs, nuts and washers are included.

NOTES:

1. Rotork IQ electric actuators to be provided by others. RW Gate will coordinate with Rotork local representative.
2. RW Gate will provide new lift nuts for the existing gearboxes attached to the Limitorque L120 electric actuators. The lift nuts will be machined with internal threads to match the stem threads.

Item No. 03 – Filters 7 - 9

Qty. - Size: Three (3) Model RW750-S Slide Gates - 18" wide x 24" tall

Distance from the Invert of the Opening to the Operating Floor: 5.0' (approx.)

Design Seating Head / Design Unseating Head (invert to MWL): 3.75' / 3.25'

Tag No.: 40GTE0701, 40GTE0801, 40GTE0901

Dwg No.: F-R-3001, F-D-2003, F-D-3003, F-D-3004

Description: The AWWA C561 compliant, self-contained, upward-opening slide gates will be constructed of 304L stainless steel with self-adjusting UHMWPE seals along the sides and top and an EPDM flush bottom invert seal. A single, rising, 316 stainless steel operating stem and clear plastic stem cover with mylar indicator strips will be provided.

Operating Mechanism: floor stand mounted on yoke, Rotork IQ electric actuator (480v – 3 phase power, open-close duty, NEMA 4X housing)

Mounting Style: Gate frames will have wall surface mounted guides and a wall surface mounted top seal member with 316 stainless steel adhesive anchors and non-shrink grout. Additional bolt holes will be provided in the frame. If an existing wall thimble is present, the installer may have to drill through the flange of the thimble and the concrete behind the flange. Anchor studs, nuts and washers are included.

NOTE: Rotork IQ electric actuators to be provided by others. RW Gate will coordinate with Rotork local representative.

Item No. 04 – Filters 4 - 6

Qty. - Size: Three (3) Model RW750-S Slide Gates - 21" wide x 24" tall

Distance from the Invert of the Opening to the Operating Floor: 10.5' (assumed)

Design Seating Head / Design Unseating Head (invert to MWL): 10' / 0'

Tag No.: 40GTE0402, 40GTE0502, 40GTE0602, 40GTE0702, 40GTE0802, 40GTE0902

Dwg No.: F-2-2001, F-R-3001, F-D-2003, F-D-3004

Description: The AWWA C561 compliant, non self-contained, upward-opening slide gates will be constructed of 304L stainless steel with self-adjusting UHMWPE seals along the sides and top and an EPDM flush bottom invert seal. A single, rising, 316 stainless steel operating stem and clear plastic stem cover with mylar indicator strips will be provided. 304L stainless steels stem guides with UHMWPE bushings will be provided.

Operating Mechanism: floor stand mounted, Rotork IQ electric actuator (480v – 3 phase power, open-close duty, NEMA 4X housing)

Mounting Style: Gate frames will have wall surface mounted guides and a wall surface mounted top seal member with 316 stainless steel adhesive anchors and non-shrink grout. Invert member will mount to the existing floor. Additional bolt holes will be provided in the frame. If an existing wall thimble is present, the installer may have to drill through the flange of the thimble and the concrete behind the flange. Anchor studs, nuts and washers are included.

NOTES:

1. Rotork IQ electric actuators to be provided by others. RW Gate will coordinate with Rotork local representative.
2. RW Gate will provide new lift nuts for the existing gearboxes attached to the Limitorque L120 electric actuators. The lift nuts will be machined with internal threads to match the stem threads.
3. The drawings are somewhat unclear but if the stem is to penetrate through an intermediate slab, we have not included any bushings to seal between the stem and cored opening in the floor.

Item No. 05 – Filters 7 - 9

Qty. - Size: Three (3) Model RW750-S Slide Gates - 21" wide x 24" tall

Distance from the Invert of the Opening to the Operating Floor: 10.5' (assumed)

Design Seating Head / Design Unseating Head (invert to MWL): 10' / 0'

Tag No.: 40GTE0402, 40GTE0502, 40GTE0602, 40GTE0702, 40GTE0802, 40GTE0902

Dwg No.: F-2-2001, F-R-3001, F-D-2003, F-D-3004

Description: The AWWA C561 compliant, non self-contained, upward-opening slide gates will be constructed of 304L stainless steel with self-adjusting UHMWPE seals along the sides and top and an EPDM flush bottom invert seal. A single, rising, 316 stainless steel operating stem and clear plastic stem cover with mylar indicator strips will be provided. 304L stainless steels stem guides with UHMWPE bushings will be provided.

Operating Mechanism: floor stand mounted, Rotork IQ electric actuator (480v – 3 phase power, open-close duty, NEMA 4X housing)

Mounting Style: Gate frames will have wall surface mounted guides and a wall surface mounted top seal member with 316 stainless steel adhesive anchors and non-shrink grout. Invert member will mount to the existing floor. Additional bolt holes will be provided in the frame. If an existing wall thimble is present, the installer may have to drill through the flange of the thimble and the concrete behind the flange. Anchor studs, nuts and washers are included.

NOTES:

1. Rotork IQ electric actuators to be provided by others. RW Gate will coordinate with Rotork local representative.
2. The drawings are somewhat unclear but if the stem is to penetrate through an intermediate slab, we have not included any bushings to seal between the stem and cored opening in the floor.

Item No. 06 – Filter Influent Channel to Isolate Filters 1 – 3

Qty. - Size: One (1) Model RW750-S Slide Gate - 48" wide x 57" tall

Distance from the Invert of the Opening to the Operating Floor: 6' (assumed)

Design Seating Head / Design Unseating Head (invert to MWL): 4.75' / 0'

Tag No.: 40GTE0001

Dwg No.: F-S-2001, F-D-2003

Description: The AWWA C561 compliant, self-contained, upward-opening slide gate will be constructed of 304L stainless steel with self-adjusting UHMWPE seals along the sides and an EPDM flush bottom invert seal. No top seal. Manual limit switches are included in accordance with Par. 2.05.A.7. A single, rising, 316 stainless steel operating stem and clear plastic stem cover with mylar indicator strips will be provided.

Operating Mechanism: yoke mounted, manual handwheel

Mounting Style: Gate frame will have in-channel mounted guides with 316 stainless steel adhesive anchors and non-shrink grout. Additional bolt holes will be provided in the frame. Anchor studs, nuts and washers are included.

Item No. 07– FIELD SERVICE

Two (2) trips consisting of a total of three (3) days at the project site is included in accordance with Par. 3.03.A. *Rotork field service to be provided by others.*

TOTAL SELLING PRICE: \$ _____

CLARIFICATIONS: RW Gate intends to use materials of construction that are known to comply with NSF requirements. RW Gate is not NSF 61 certified at this time. Manual gearboxes are being offered for temporary use until the electric actuators arrive onsite.

GENERAL: Our quotation is based on our best interpretation of the plans and specifications and the description listed herein. Please review the quotation and advise our local representative, **Brian Dieke at Engineering Equipment Solutions at 303-921-2846**, if there are any discrepancies between the details on this quotation and the actual requirements. The pricing and deliveries listed in the body of the quotation will be held for 120 days from the bid date on Page 1.

RW Gate is ISO 9001:2015 certified. RW Gate complies with AIS and Buy American requirements.

INCLUDED: Submittal drawings, installation instructions and O&M manuals. Installation instructions will be forwarded with the equipment. Information will be sent electronically unless otherwise indicated by the customer. Spare parts are included in accordance with Par. 1.05.A.

EXCLUDED: The following items are specifically excluded; demolition, installation, field measurements, seismic calculations, PE stamp on submittals, electric actuators, control panels, remote control stations, instrumentation, wiring, conduit, junction boxes, disconnects, wall thimbles, wall pipes, floor sleeves, bulkheads, blind flanges, plugs, concrete, grout, gaskets, mastic, lubricants, grating, handrail, cover plates, epoxy for anchors and all taxes including local and state sales tax.

PAYMENT: Net 30 days. Please contact RW Gate prior to payment via credit card. An additional charge may be necessary when paying by credit card.

FREIGHT: Full freight to project site is included. Please contact the factory if separate, partial shipments are necessary as a price adder will be required. Unloading by others.

STANDARD DELIVERY: Submittal drawings will ship within 4 weeks of receipt of a purchase order and detailed mechanical drawings. The gate assemblies will ship 14 weeks after receipt of approved submittal drawings. The electric actuators will ship "TDB by supplier" after receipt of approved submittal drawings. Electric actuators will ship direct to the project site from the original manufacturer. Please contact us for expedited delivery dates. A price adder will be required for expedited submittals and shipments.

FIELD SERVICE: Field service is included as described in Item No. 07. If additional field service is required, please contact our local representative for revised pricing. Please provide a 3-week notice for field service.

Best Regards,

Evan Whipps

Evan Whipps
RW Gate Company
ewhipps@rwgate.com



www.RWGATE.com

Justin McRae

From: Jessie Gloor <jgloor@pcl.com>
Sent: Thursday, July 7, 2022 2:44 PM
To: Justin McRae
Subject: Fwd: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget
Attachments: Arvada, CA Filter Media - Bid Package.pdf; I19222 Leopold Filtration Equipment (media) REV00 7-6-22.docx; I19222 Leopold Filtration Equipment (und for 10-12 agit for all) REV00 7-7-22.docx

Jessie Gloor
Project Engineer

PCL Construction, Inc.
2000 S Colorado Blvd.
Building 2 suite 500
Denver, CO 80222
T: 480-582-2573
M: 720-682-9371
jgloor@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>
Sent: Thursday, July 7, 2022 2:32:50 PM
To: Jessie Gloor <jgloor@pcl.com>; Raymond Torrejon <rtorrejon@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Jessie,

Filter Media:
Complete quote and bid form attached.

Filtration Equipment:
A budgetary filtration equipment quote is also attached. A good budget for the filtration equipment is around \$900,000. Honestly I imagine that number will be less than the budget price, seeing as this is likely to bid by the end of the month. That said, I / Leopold really (REALLY) hates to give low budget numbers and then something changes, usually isn't "a good look" so to speak.

Can I ask, what is the intent with the existing underdrains and filtration equipment for filters 1-9? Are the original underdrains going to be used? Are there any plans for upgrading those underdrains as well?

Thanks

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Jessie Gloor <jgloor@pcl.com>
Sent: Thursday, July 7, 2022 1:22 PM
To: Raymond Torrejon <rtorrejon@pcl.com>; Chase Knox <cknox@isiwest.com>
Subject: Re: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Hey chase can we bug you on this again? Any new updates? It's early in the day but just wanted to check in.
Thanks!

Jessie Gloor
Project Engineer

PCL Construction, Inc.
2000 S Colorado Blvd.
Building 2 suite 500
Denver, CO 80222
T: 480-582-2573
M: 720-682-9371
jgloor@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

From: Raymond Torrejon <rtorrejon@pcl.com>
Sent: Wednesday, July 6, 2022 3:59:39 PM
To: Chase Knox <cknox@isiwest.com>; Jessie Gloor <JGloor@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Chase,

Thanks for the update.

Raymond Torrejon
Project Manager

PCL Construction, Inc.
2000 S Colorado Blvd. Building 2 suite 500
Denver, CO 80222
P: 720.357.6253
E: rtorrejon@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>
Sent: Wednesday, July 6, 2022 3:59 PM
To: Raymond Torrejon <rtorrejon@pcl.com>; Jessie Gloor <JGloor@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Ray,

I just got an email from Leopold, they said they will have both proposals tomorrow (budget for underdrains, hard quote for media).

That is a day late but that is what they have... I will send it the moment I get it.

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Raymond Torrejon <rtorrejon@pcl.com>

Sent: Wednesday, July 6, 2022 8:43 AM

To: Chase Knox <cknox@isiwest.com>; Jessie Gloor <JGloor@pcl.com>

Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Hey bud, any luck?

Raymond Torrejon
Project Manager

PCL Construction, Inc.

2000 S Colorado Blvd. Building 2 suite 500

Denver, CO 80222

P: 720.357.6253

E: rtorrejon@pcl.com

www.pcl.com

TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>

Sent: Tuesday, July 5, 2022 4:12 PM

To: Raymond Torrejon <rtorrejon@pcl.com>; Jessie Gloor <jgloor@pcl.com>

Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

I followed up for an update. I haven't heard back from them yet.

They do know the bid is due tomorrow.

I will touch base with them again tomorrow as well.

Thanks

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Raymond Torrejon <rtorrejon@pcl.com>

Sent: Tuesday, July 5, 2022 3:41 PM

To: Jessie Gloor <jgloor@pcl.com>; Chase Knox <cknox@isiwest.com>

Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Chase,

Do you have an update on the requested pricing? Are we tracking to have this in our court by tomorrow?

Thanks,

Raymond Torrejon
Project Manager

PCL Construction, Inc.

2000 S Colorado Blvd. Building 2 suite 500

Denver, CO 80222
P: 720.357.6253
E: rtorrejon@pcl.com

www.pcl.com
TOGETHER WE BUILD SUCCESS

From: Jessie Gloor <jgloor@pcl.com>
Sent: Wednesday, June 29, 2022 10:53 AM
To: Chase Knox <cknox@isiwest.com>; Raymond Torrejon <rtorrejon@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Chase,

I mis-typed below; sorry!

We are going to ask for a bid at 60%, which we expect on 7/27. We are pushing to beat that if we can, but that is what we're looking at right now. We'll be able to make a selection quickly after the pricing phase is complete and roll right into submittals. We did get some lead times from Frank a few months ago, but if you can update us on the current lead times we'd appreciate it.

Yes, please use the Leopold calcs below and disregard my initial quantity that I sent out.

Thank you,

Jessie Gloor
Project Engineer

PCL Construction, Inc.
2000 S Colorado Blvd.
Building 2 suite 500
Denver, CO 80222
M: 720-682-9371
jgloor@pcl.com

www.pcl.com
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From: Chase Knox <cknox@isiwest.com>
Sent: Wednesday, June 29, 2022 10:36 AM
To: Jessie Gloor <jgloor@pcl.com>; Raymond Torrejon <rtorrejon@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Jessie,

Thanks!

A couple of quick follow-up questions.

- Any idea when 90% is scheduled to be completed? I only ask because of the delivery schedule you note below. I want to run it by Leopold so we are all on the same page there. That gives them an opportunity to look at current and anticipated backlog and make comments regarding deliver and timing.
- To be clear, you want us to make the Leopold calculations. I just want to get it right. I already feel bad that we are late.

Moving forward I'll be running with project so feel free to direct everything to me.

Thank you for your help.

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Jessie Gloor <jgloor@pcl.com>

Sent: Wednesday, June 29, 2022 10:22 AM

To: Chase Knox <cknox@isiwest.com>; Raymond Torrejon <rtorrejon@pcl.com>

Subject: Re: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Good morning Chase,

I can answer these for you.

This is budgetary at this point in time. The project is at 30% and we won't ask for the official bid until 90%.

Delivery timeframe would be this fall. If design progresses per schedule, we'll need these in September. This is a phased project and we can only take down a max of 6 filters at a time, so we don't need the complete length but we do need at least enough to do the first set of three filters. The next three will be taken offline in mid-October.

Please use the quantity in the specs to base your quote (higher quantity). There was a discrepancy between the specs and drawings. I had planned on sending out an update email today and extend the bid due date to this Friday.

Please let me know if there are any other open questions or anything requiring additional clarification.

Thank you,

Jessie Gloor
Project Engineer

PCL Construction, Inc.
2000 S Colorado Blvd.
Building 2 suite 500
Denver, CO 80222
T: 480-582-2573
M: 720-682-9371
jgloor@pcl.com

www.pcl.com

TOGETHER WE BUILD SUCCESS

From: Chase Knox <cknox@isiwest.com>

Sent: Wednesday, June 29, 2022 10:16:16 AM

To: Raymond Torrejon <rtorrejon@pcl.com>

Cc: Jessie Gloor <JGloor@pcl.com>

Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

[External Email]

Apparently the two gentlemen working on this at Leopold had a couple of questions and they both thought the other party had reached out to me / us. Obviously they hadn't.

They needed to confirm a couple of things.

- They asked for some clarity if this is an “official bid” or budgetary.
- Either way they wanted to know the time line, what the delivery time frame for this project would be. (FYI – Fright is really high right now so they are trying to make note of that as best they can).
- Finally, they had some discrepancies on the calculations. You requested 360 cy of anthracite and 70 cy of sand; however, when they do the calculations for the media required for all 12 filters as shown in the drawings. 28” anthracite and 10” sand. This comes to 273 tons sand and 351 tons anthracite. They use 50 lbs per cf for ant and 100 lbs per cf for sand.

Can you please confirm those items?

Thanks and again, sorry for the delay.

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Chase Knox
Sent: Tuesday, June 28, 2022 4:53 PM
To: Raymond Torrejon <rtorrejon@pcl.com>
Cc: Jessie Gloor <JGloor@pcl.com>
Subject: RE: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Ray,

I heard form Leopold on Friday morning that they had this in the que to be done today.

I followed up with them again today and haven’t seen anything. I touched base with Frank as well and he hadn’t heard anything either.

Even if it is too late I will get you whatever they send me the moment I get it.

Thanks

Chase Knox | www.isiWEST.com [nam05.safelinks.protection.outlook.com] | c. 970.691.0805

From: Raymond Torrejon <rtorrejon@pcl.com>
Sent: Thursday, June 23, 2022 3:29 PM
To: Chase Knox <cknox@isiwest.com>
Cc: Jessie Gloor <JGloor@pcl.com>
Subject: FW: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Chase,

See attached.

Cheers,

Raymond Torrejon
Project Manager

PCL Construction, Inc.

2000 S Colorado Blvd. Building 2 suite 500
Denver, CO 80222
P: 720.357.6253
E: rtorrejon@pcl.com

www.pcl.com

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From: Jessie Gloor <jgloor@pcl.com>
Sent: Thursday, June 23, 2022 8:25 AM
To: Raymond Torrejon <rtorrejon@pcl.com>
Subject: FW: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Jessie Gloor
Project Engineer

PCL Construction, Inc.
2000 S Colorado Blvd.
Building 2 suite 500
Denver, CO 80222
M: 720-682-9371
jgloor@pcl.com

www.pcl.com

TOGETHER WE BUILD SUCCESS

From: Jessie Gloor
Sent: Wednesday, June 15, 2022 12:38 PM
To: Frank Henderson <fhenderson@isiwest.com>
Subject: Arvada Filters, Solids Handling, and Clarifier Rehab - Media Quote and Underdrain Budget

Frank,

As discussed please see attached for our filter media spec and our 30% design drawings for the filter scope on the Arvada project.

I am looking for your best number for the filter media as this scope will be competitively bid and there will not be another round of pricing for this item. We will send out a formal bid package on Friday, but I wanted to get this in front of you ASAP. The quantities we are looking for are:

Anthracite: 360 CY
Sand: 77 CY

Please note, we will likely need two separate deliveries for this media. The first will likely be this fall and the second sometime in the winter.

We are also looking for a budgetary price for the Leopold underdrain system on Filters 10-12, as noted in the drawings. We are expecting to send out specs on this late next month.

I am looking for numbers on both no later than June 28th. If you have any questions please send them my way.

Thank you!

Jessie Gloor

Project Engineer

Upcoming PTO: June 20th to June 29th

PCL Construction, Inc.

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Building 2 suite 500

Denver, CO 80222

M: 720-682-9371

jgloor@pcl.com

www.pcl.com

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Exhibit B

AMENDMENT NO. 3

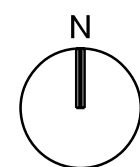
**TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND PCL
CONSTRUCTION, INC. ESTABLISHING CONTRACTOR'S GUARANTEED MAXIMUM
PRICE III OF THE "CONSTRUCTION MANAGEMENT/GENERAL CONTRACTOR
AGREEMENT FOR PRECONSTRUCTION SERVICES FOR THE REHABILITATION AND
MODIFICATION OF THE FILTER AND SOLIDS HANDLING SYSTEMS AT THE RALSTON
WATER TREATMENT PLANT," IN AN AMOUNT NOT TO EXCEED \$3,518,653.00**

6

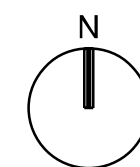
ARVADA PROJECT NUMBER: 21-WA-52



COLORADO



LOCATION MAP



VICINITY MAP

[illegible]

	RALSTON WATER TREATMENT PLANT FILTER IMPROVEMENTS PROJECT CITY OF ARVADA ARVADA, COLORADO
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Jacobs

GENERAL

COVER SHEET

01	01	22	FINAL DESIGN
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VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

DATE	OCTOBER 2022
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PROJ	WXXZ9601
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DWG	F-G-0001
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EXHIBIT
B

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4	F-G-0004	GENERAL - ABBREVIATIONS AND GENERAL LEGEND
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6	F-G-0014	GENERAL - STRUCTURAL STATEMENT OF INSPECTIONS 1
7	F-G-0015	GENERAL - STRUCTURAL STATEMENT OF INSPECTIONS 2
8	F-G-0020	GENERAL - PROCESS MECHANICAL LEGEND
9	F-G-0021	GENERAL - PIPE SCHEDULE
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[illegible]

RALSTON WATER TREATMENT PLANT
 FILTER IMPROVEMENTS PROJECT
 CITY OF ARVADA
 ARVADA, COLORADO

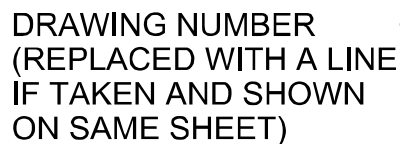
Jacobs

GENERAL

INDEX OF DRAWINGS

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BAR IS ONE INCH ON ORIGINAL DRAWING, 0  1"	
DATE	OCTOBER 2022
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SECTION (LETTER) OR
DETAIL (NUMERAL)
DESIGNATION _____



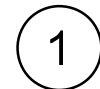
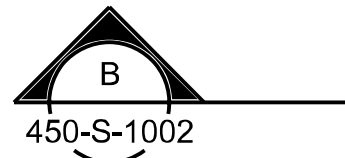
ON DRAWING WHERE SECTION
IS SHOWN:

2

ON DRAWING WHERE DETAIL
IS SHOWN:

SCALE

I



A diagram showing a circular loop with a vertical rod passing through its center. The rod is labeled 'N' at the top.

DESIGN DETAIL —
DESIGNATION
(NUMERAL)
SHOWN ON DESIGN
DETAIL DRAWING(S)

NOTES:

ON DRAWING WHERE PHOTO IN TAKEN



1. THIS IS A STANDARD LEGEND SHEET.
THEREFORE, NOT ALL OF THE INFORMATION
SHOWN MAY BE USED ON THIS PROJECT.

[illegible]

	GENERAL ABBREVIATIONS AND GENERAL LEGEND
	RALSTON WATER TREATMENT PLANT FILTER IMPROVEMENTS PROJECT CITY OF ARVADA ARVADA, COLORADO

VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0  1"	
DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-G-0004
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FINAL DESIGN

DESIGN CRITERIA

- | | | |
|----|--|--|
| 1. | APPLICABLE CODE: 2018 INTERNATIONAL BUILDING CODE (IBC) | |
| 2. | REFER TO THE DRAWINGS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS. | |
| 3. | ALL LOADS SHOWN ARE SERVICE LEVEL (UNFACTORED) UNLESS SPECIFICALLY NOTED OTHERWISE. | |
| 4. | DEAD LOADS:
A. SELF WEIGHT
SEISMIC LOADS: (STRENGTH LEVEL, FACTORED) | |
| 5. | MAPPED SPECTRAL RESPONSE ACCELERATIONS | $S_s = 0.24g$
$S_1 = 0.062g$ |
| | DESIGN SPECTRAL RESPONSE ACCELERATIONS | $S_{DS} = 0.256g$
$S_{D1} = 0.100g$ |
| | SITE CLASS | = D ASSUMED |
| | SEISMIC DESIGN CATEGORY | = C |
| | IMPORTANCE FACTOR, I_e | = 1.5 |
| 6. | SPECIAL LOADS: | SEE PLANS FOR STRUCTURE SPECIFIC LOADS |
| 7. | HYDRAULIC LOADS: | SEE PLANS FOR STRUCTURE SPECIFIC LOADS |

GENERAL INFORMATION

1. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS; PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
2. DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE INDIVIDUALLY CALLED OUT.
3. VERIFY FINAL OPENING DIMENSIONS IN WALLS, SLABS, AND DECKS WITH OTHER DISCIPLINE DRAWINGS PRIOR TO CONSTRUCTION OF THESE ELEMENTS.
4. FOR NUMBER, TYPE, SIZE, ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS, SEE OTHER DISCIPLINE DRAWINGS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO PLACING SLABS, WALLS AND FOUNDATIONS. COORDINATE PIPING OPENINGS WITH OTHER DISCIPLINE DRAWINGS.
5. DO NOT CUT OR MODIFY STRUCTURAL MEMBERS FOR PIPES, DUCTS, ETC., UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.
6. VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT ENGINEER IS GUARANTOR OF CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR THE COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, OR SAFETY AT THE JOB SITE.
7. INFORMATION (DETAILING, DIMENSIONS, CONFIGURATIONS, AND ELEVATIONS, ETC.) OF EXISTING CONSTRUCTION SHOWN REFLECTS AVAILABLE EXISTING DESIGN DOCUMENTS, AND DOES NOT NECESSARILY REPRESENT THE AS-CONSTRUCTED CONDITIONS. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS, ELEVATIONS AND DETAILING OF THE EXISTING STRUCTURES PRIOR TO UNDERTAKING ANY WORK THAT IS AFFECTED BY THE EXISTING STRUCTURE. NOTIFY ENGINEER IF CONDITIONS VARY FROM THAT SHOWN PRIOR TO STARTING WORK

WELDING

1. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS);
D1.1, STRUCTURAL WELDING CODE STEEL
D1.2, STRUCTURAL WELDING CODE ALUMINUM
D1.3, STRUCTURAL WELDING CODE SHEET STEEL
D1.4, STRUCTURAL WELDING CODE REINFORCING STEEL
D1.6, STRUCTURAL WELDING CODE STAINLESS STEEL
2. REPAIR WELDS FOUND DEFECTIVE IN ACCORDANCE WITH AWS D1.1 SECTION 5.26.
3. USE INTERMITTENT WELDS AT FIELD WELDS OF EMBED PLATES AND ANGLES TO AVOID SPALLING OR CRACKING OF THE EXISTING CONCRETE.
4. BUTT JOINT WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

STRUCTURAL STEEL AND METAL FABRICATIONS

- | | | |
|----|---|---|
| 1. | STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:
W-SHAPES
MISCELLANEOUS SHAPES INCLUDING
ANGLES, CHANNELS, PLATES, ETC.
HOLLOW STRUCTURAL SECTIONS (HSS)
STEEL PIPE
STAINLESS STEEL SHAPES | A992

A36
A500, GRADE B
A53, GRADE B
A276 |
| 2. | ALUMINUM SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:
STRUCTURAL SHAPES
PLATES | B308
B209 |
| 3. | STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, CURRENT EDITION, AND CURRENT OSHA STANDARDS. | |
| 4. | FASTENERS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO THE FOLLOWING ASTM STANDARDS EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE:
UNLESS SHOWN OTHERWISE
ANCHOR BOLTS (AB)
STAINLESS STEEL
STEEL OR GALVANIZED STEEL
MACHINE BOLTS (MB)
STEEL
STAINLESS STEEL
GALVANIZED STEEL
ALUMINUM | A325-N

F593, AISI TYPE 316, CONDITION CW
F1554, GR 36 / A153

A307
F593, AISI TYPE 316, CONDITION CW
A307 / A153
F468, ALLOY 2024-T4 |
| 5. | ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE CLEAN AND FREE OF OIL, DIRT AND PAINT. | |
| 6. | NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STRUCTURAL STEEL IS PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER. | |

DEFERRED SUBMITTALS

1. DEFERRED SUBMITTALS ARE THOSE PORTIONS OF THE DESIGN WHICH ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION AND WHICH ARE TO BE SUBMITTED TO THE PERMITTING AGENCY FOR ACCEPTANCE PRIOR TO INSTALLATION OF THAT PORTION OF THE WORK OR ARE REQUIRED TO BE SUBMITTED FOR REVIEW ONLY BY THE ENGINEER.
2. WHERE DEFERRED SUBMITTALS INCLUDE ADDITIONAL MATERIALS, INSTALLATION, ANCHORAGE, OR CERTIFICATION OF COMPONENTS THAT REQUIRE SPECIAL INSPECTION AND/OR STRUCTURAL OBSERVATION TO MEET CODE REQUIREMENTS, THE DEFERRED SUBMITTAL SHALL INCLUDE SPECIFIC LINE ITEMS TO BE ADDED TO THE APPROPRIATE TABLES IN THE PROJECT'S STATEMENT OF SPECIAL INSPECTIONS PLAN IF THEY ARE NOT ALREADY IDENTIFIED.
3. THE FOLLOWING IS A LIST OF DEFERRED SUBMITTALS PER IBC SECTION 107.3.4.2 OF 2009 IBC THAT ARE EXPECTED TO CONTAIN STRUCTURAL CALCULATIONS OR SAFETY RELATED SYSTEM INFORMATION FOR REVIEW TO MEET BUILDING PERMITTING REQUIREMENTS FOR DESIGNED SYSTEMS. PRIOR TO INSTALLATION OF THE INDICATED STRUCTURAL ELEMENT, EQUIPMENT, DISTRIBUTION SYSTEM, OR COMPONENT OR ITS ANCHORAGE, THE CONTRACTOR SHALL SUBMIT THE REQUIRED CALCULATIONS AND SUPPORTING DATA AND DRAWINGS FOR REVIEW AND ACCEPTANCE BY THE ENGINEER. ADDITIONALLY, ACCEPTANCE INDICATED ON THE ENGINEER'S COMMENT FORM, ALONG WITH THE COMPLETED, FINAL SUBMITTAL SHALL THEN BE SUBMITTED BY THE CONTRACTOR TO THE PERMITTING AGENCY AND APPROVED PRIOR TO INSTALLATION OF THESE ITEMS.

SPECIFICATION SECTION	CODE REQUIRED DEFERRED SUBMITTALS FOR REVIEW BY PERMITTING AGENCY
01 88 15	ANCHORAGE AND BRACING
OTHER	ANY EQUIPMENT OR COMPONENT IN WHICH A TECHNICAL SPECIFICATION REQUIRES SUBMITTAL OF EQUIPMENT OR ANCHORAGE SYSTEM CALCULATIONS

INSPECTION AND TESTING

1. SPECIAL INSPECTION DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY FOR INSPECTIONS REQUIRED BY THE BUILDING OFFICIAL. THE CONTRACTOR SHALL SCHEDULE BOTH INSPECTIONS.
2. SPECIFIED CONCRETE AND MASONRY AND OTHER MATERIAL TESTING RELATED TO SPECIAL INSPECTION DURING CONSTRUCTION WILL BE OWNER FURNISHED.
3. SPECIFIED LABORATORY TEST MIXES AND SIMILAR TEST RESULTS TO VERIFY MATERIAL QUALITY AND CONFORMANCE TO SPECIFICATIONS, AND SUBMITTED FOR REVIEW PRIOR TO ACCEPTANCE FOR USE ON THE PROJECT, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. SPECIAL INSPECTION, TESTING AND OBSERVATION (OWNER FURNISHED) IS REQUIRED IN ACCORDANCE WITH [A: IBC SECTIONS 109 AND 1704] [B: IBC SECTIONS 110 AND 1704] AS INDICATED IN THE STATEMENT OF SPECIAL INSPECTIONS. REFER TO DRAWINGS [xxx] TO [xxx].

FORMWORK, SHORING, AND BRACING

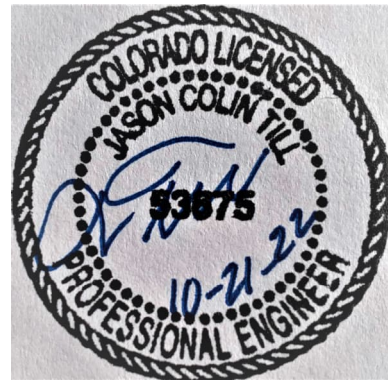
1. STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. DESIGN SHOWN DOES NOT INCLUDE NECESSARY COMPONENTS OR EQUIPMENT FOR STABILITY OF THE STRUCTURES DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.
2. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL ELEVATED CONCRETE FLOOR OR SLABS HAVE REACHED 80 PERCENT OF THE 28 DAY COMPRESSIVE STRENGTH AS DETERMINED BY FIELD CYLINDER BREAKS.
3. "BURY" BARS OR "CARRIER" BARS ARE NOT ALLOWED FOR THE BOTTOM MATS OF REINFORCING IN ALL ELEVATED SLABS AND ARE NOT ALLOWED FOR THE TOP MATS OF REINFORCING IN ELEVATED SLABS LESS THAN 12 INCHES THICK.

CONCRETE REINFORCING

1. REINFORCING STEEL:
TYPICAL: ASTM A615, GRADE 60
2. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
3. 90 DEGREE BENDS, UNLESS OTHERWISE SHOWN, SHALL BE ACI 318 STANDARD HOOKS.

CAST IN PLACE CONCRETE

1. 28-DAY COMPRESSIVE STRENGTHS:
ALL CONCRETE: 4500 PSI
2. ROUGHEN AND CLEAN CONSTRUCTION JOINTS IN WALLS AND SLABS AS SPECIFIED PRIOR TO PLACING ADJACENT CONCRETE.
3. COORDINATE PLACEMENT OF OPENINGS, PIPE PENETRATIONS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS AND INSERTS PRIOR TO PLACEMENT OF CONCRETE.

[illegible]

**FILTER IMPROVEMENTS PROJECT
KALSTON WATER TREATMENT PLANT
CITY OF ARVADA
ARVADA, COLORADO**

Jacobs

GENERAL

STRUCTURAL NOTES 1

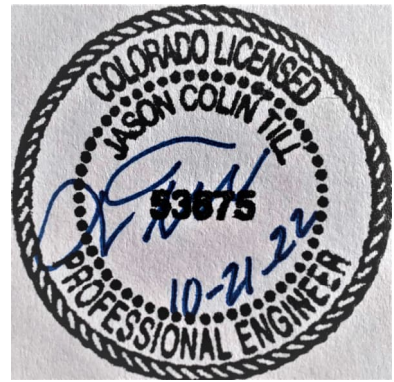
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VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
0	1"
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TABLE 2 (CONTINUED) REQUIRED STRUCTURAL SPECIAL INSPECTION REFER TO SPECIFICATION SECTION 01 45 33						
SYSTEM	2018 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC SPECIAL INSPECTION	CONTINUOUS SPECIAL INSPECTION	COMMENTS	TESTING FOR SPECIAL INSPECTION
ALUMINUM						
1. MATERIAL VERIFICATION OF ALUMINUM:						
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	1705.1.1 ITEM 2		X			
B. MANUFACTURERS' CERTIFIED MILL TEST REPORTS	1705.1.1 ITEM 2		X			
2. INSPECTION OF WELDING:						
A. NONDESTRUCTIVE INSPECTION	1705.1.1 ITEM 2	AWS D1.2	X		CONTRACTOR SHALL PROVIDE CWI IN ACCORDANCE WITH AWS D1.1, SECTIONS 6.1.2 & 6.6, AND SPECIFICATION 05 05 23, AND REFERENCED WELDING CODES.	ALSO SEE REQUIREMENTS OF SPEC. SECTION 05 05 23

TABLE 3 TESTING FOR REQUIRED SPECIAL INSPECTION REFER TO SPECIFICATION SECTION 01 45 33						
MATERIAL	TYPE OR SCOPE	STANDARD	2018 IBC CODE REFERENCE	FREQUENCY	BY WHOM	COMMENTS
GEOTECHNICAL						
COMPACTED FILL	GRADATION	ASTM C117, C136	1705.6	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S TESTING AGENCY	
COMPACTED FILL	COMPACTION	ASTM D698 OR D1557 AS SPECIFIED	1705.6	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S TESTING AGENCY	
COMPACTED FILL	DENSITY	ASTM D698 OR D1557 AS SPECIFIED	1705.6	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S TESTING AGENCY	
PREPARED SUBGRADE	DENSITY	ASTM D698 OR D1557 AS SPECIFIED	1705.6	SECTION 31 23 13, SUBGRADE PREPARATION	OWNER'S TESTING AGENCY	
CONCRETE						
CONCRETE	STRENGTH	ASTM C39	1705.3	ONCE EACH DAY, BUT NOT LESS THAN ONE SAMPLE FOR EACH 150 CUBIC YARDS OR 5,000 SF OF WALLS OR SLABS PLACED	OWNER'S TESTING AGENCY	
CONCRETE	SLUMP	ASTM C143, C94	1705.3	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	
CONCRETE	AIR CONTENT	ASTM C231, C94	1705.3	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	
CONCRETE	TEMPERATURE	ASTM C1064	1705.3	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	

TABLE 5 TESTING FOR SEISMIC RESISTANCE REFER TO SPECIFICATION SECTION 01 45 33						
MATERIAL	TYPE OR SCOPE	STANDARD	2018 IBC CODE REFERENCE	FREQUENCY	BY WHOM	COMMENTS
OTHER						
DESIGNATED SEISMIC SYSTEM COMPONENTS (AND ASSOCIATED ANCHORAGES) SUBJECT TO PROVISIONS OF ASCE 7 SECTION 13.2.2	CERTIFICATE OF COMPLIANCE	ASCE 7 SECTION 13.2.2	1705.13.3	EACH SYSTEM OR COMPONENT	MANUFACTURER	BASIS ON ACTUAL TEST ON SHAKE TABLE, BY THREE-DIMENSIONAL SHOCK TESTS, BY AN ANALYTICAL METHOD
DESIGNATED SEISMIC SYSTEM COMPONENTS (AND ASSOCIATED ANCHORAGES) SUBJECT TO PROVISIONS OF ASCE 7 SECTION 13.2.1	CERTIFICATE OF COMPLIANCE	ASCE 7 SECTION 13.2.1	1705.13.2	EACH SYSTEM OR COMPONENT	MANUFACTURER	USING DYNAMIC CHARACTERISTICS AND FORCES, BY THE USE OF EXPERIENCE DATA, OR BY MORE RIGOROUS ANALYSIS
SEISMICALLY ISOLATED STRUCTURES	NONDESTRUCTIVE TESTING	ASCE 7 SECTION 17.8	1705.13.4	CONTINUOUS	MANUFACTURER	

[illegible]

	FILTER IMPROVEMENTS PROJECT RALSTON WATER TREATMENT PLANT CITY OF ARVADA ARVADA, COLORADO
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GENERAL

STRUCTURAL STATEMENT
OF INSPECTIONS 2

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PIPING SCHEDULE													
SERVICE	FLOW STREAM	SIZE(S) (INCHES) (NOTE 1)	EXPOSURE (NOTE 2)	PIPING MATERIAL (NOTE 3)	SPECIFICATION SECTION	JOINT TYPE (NOTE 4)	FLANGE	LINING (NOTE 5)	COATING (NOTE 6)	TEST PRESSURE AND TYPE (PSIG) (H = HYDROSTATIC, G = GRAVITY, P = PNEUMATIC) (NOTE 7)	PIPE / LABEL BACKGROUND COLOR (NOTE 8)	LETTER COLOR	NOTES
SURFACE WASH	SFW	ALL	IN EXP	CIP	40 27 00.06	FL, S	AWWA C115	N/A FOR NEW	SYSTEM 1	SERVICE	BLUE	WHITE	OUTSIDE FILTERS MATCH EXISTING COLOR
	SFW	ALL	SUB	CS	40 27 00.07	S	N/A	SYSTEM 1	SYSTEM 1	SERVICE	BEIGE	WHITE	INSIDE FILTERS MATCH EXISTING COLOR
BACKWASH WASTE	BWW	ALL	SUB ENC	WS	35 05 01.01	W, FLG	AWWA C207 CLASS D	CML	SYSTEM 1 (SUBMERGED) SYSTEM 7 (ENCASED)	SERVICE	BROWN	WHITE	MATCH EXISTING COLOR
BACKWASH SUPPLY	BWS	ALL	IN EXP	WS	35 05 01.01	W, FLG	AWWA C207 CLASS D	CML	SYSTEM 4	SERVICE	BLUE	WHITE	MATCH EXISTING COLOR
FILTER EFFLUENT	FE	ALL	IN EXP	WS	35 05 01.01	W, FLG	AWWA C207 CLASS D	CML	SYSTEM 4	SERVICE	BLUE	WHITE	MATCH EXISTING COLOR
SAMPLE - FILTER EFFLUENT	SA/FE	ALL	IN EXP	CS	40 27 00.03	W, S	N/A	N/A	SYSTEM 4	SERVICE	BLUE	N/A	MATCH EXISTING COLOR
SAMPLE - COMBINED FILTER EFFLUENT	SA/CFE	ALL	IN EXP SUB	PVC	40 27 00.10	SLV, S	N/A	N/A	N/A	SERVICE	BLUE	WHITE	DO NOT PAINT PIPE, APPLY LABELS ONLY
PLANT AIR	PA	ALL	IN EXP	COP	40 27 00.13	W, S	N/A	N/A	SYSTEM 10	PNEUMATIC SERVICE TEST, 135	GREEN	N/A	MATCH EXISTING COLOR

NOTES:

1. ">" GREATER THAN
 "<" LESS THAN
 "<=" LESS THAN OR EQUAL TO
 ">=" GREATER THAN OR EQUAL TO
 "ALL" ALL SIZES

2. EXPOSURE TYPE:

- ALL - ALL
BUR - BURIED
IN EXP - INSIDE EXPOSED
SUB - SUBMERGED
OUT EXP - OUTDOOR EXPOSED
ENC - ENCASED IN CONCRETE

3. PIPING MATERIAL:

- GIP - CAST IRON PIPE
- COP - COPPER
- CPVC - CHLORINATED POLYVINYL CHLORIDE
- CS - CARBON STEEL
- DIP - DUCTILE IRON PIPE
- DWCP - DOUBLE WALL CONTAINED PIPE
- FRP - FIBERGLASS REINFORCED PLASTIC
- HDPE - HIGH DENSITY POLYETHYLENE
- PVC - POLYVINYL CHLORIDE
- PVDF - POLYVINYLDIENE FLUORIDE
- SST - STAINLESS STEEL
- WS - WELDED STEEL

4. JOINT TYPE:

- FB - FUSION BONDED
FLG - FLANGED
GE - GROOVED END
HU - HUB AND SPIGOT
MJ - MECHANICAL JOINT
PRJ - PROPRIATARY RESTRAINED JOINT
RGK - RUBBER GASKET
S - SCREWED
SLV - SOLVENT WELD OR ADHESIVE
W - WELDED, SOCKET WELDED, BRAZED/SOLDERED

5. LINING TYPE:

- CML-CEMENT MORTAR LINED
GLASS - GLASS LINING
EPX - EPOXY

6. COATING SYSTEM NUMBER AS SPECIFIED IN SECTION 09 90 00, PAINTING AND COATING.

7. REFER TO SPECIFICATION SECTION 40 80 01 PROCESS PIPING LEAKAGE TESTING FOR PROCESS PIPING.

8. REFER TO IDENTIFICATION REQUIREMENTS SPECIFIED IN 40 27 00, PROCESS PIPING AND SECTION 09 90 00, PAINTING AND COATING. ALL SERVICES CONNECTED TO EXISTING PIPING IN THE PLANT SHALL MATCH EXISTING LABELING AND COLOR CODING SYSTEM. CONTRACTOR SHALL VERIFY ALL PIPE LABEL AND LETTERING COLORS WITH RESIDENT PROJECT REPRESENTATIVE PRIOR TO INSTALLATION.

[illegible]

ARLSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

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GENERAL PIPE SCHEDULE

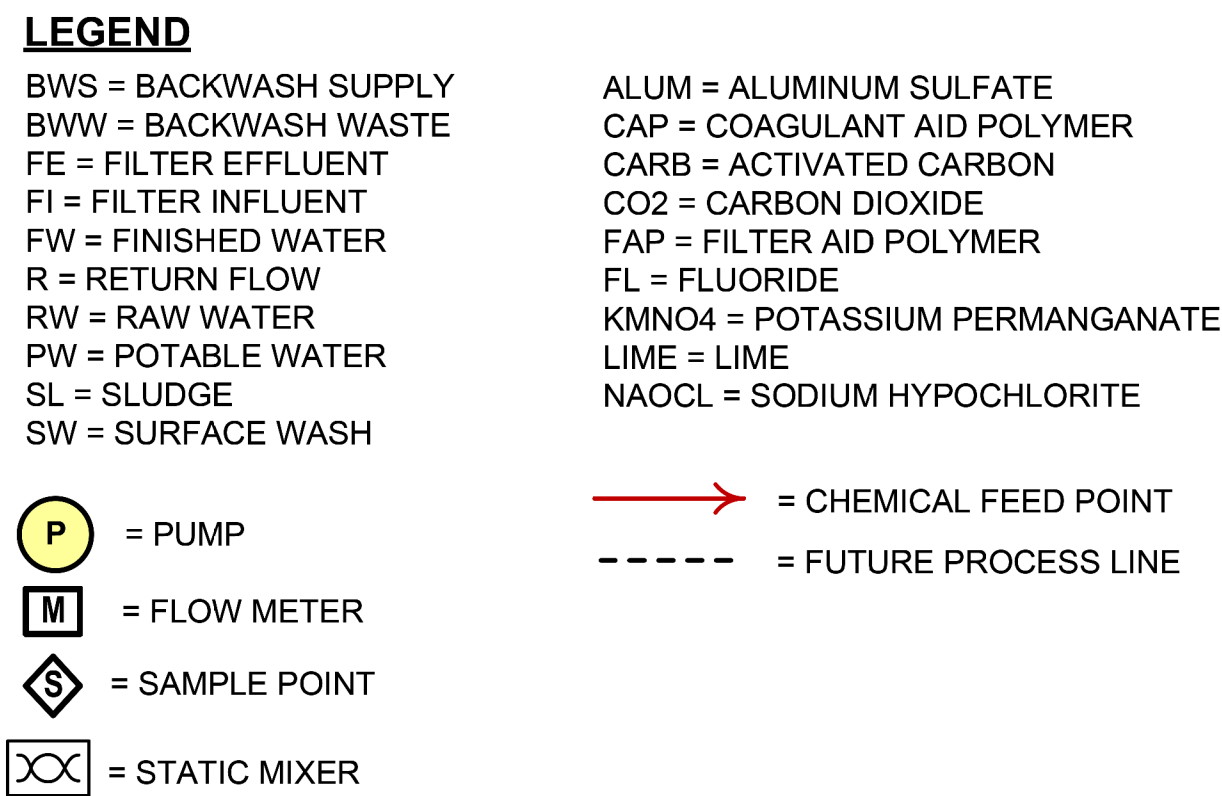
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0  1"	
DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-G-0021
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1	1	2
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FINAL DESIGN

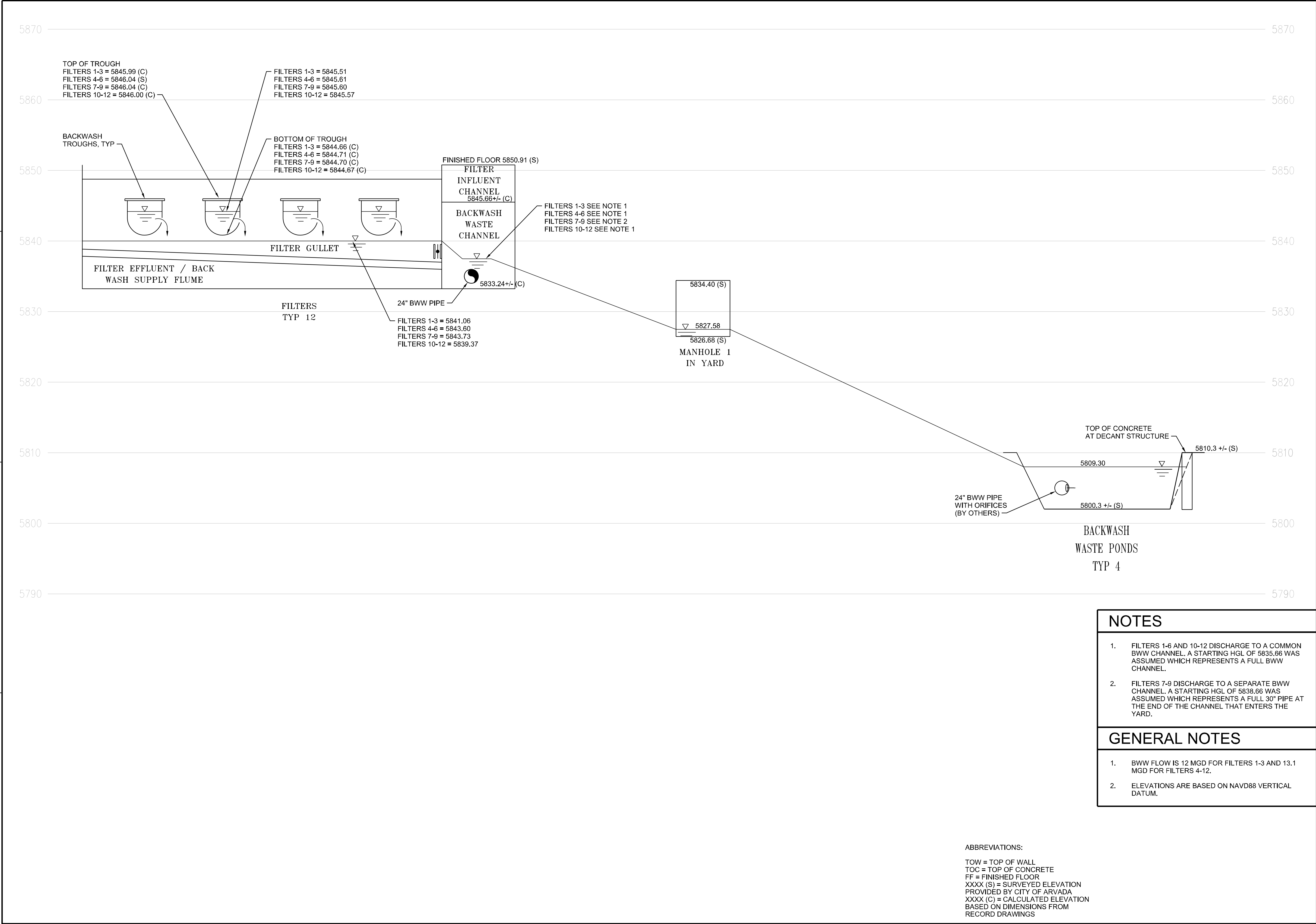
	F. ZELENAN	D. NAUFAN	D. CARTER	F. ZELENAN
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WG	F-G-0031
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FINAL DESIGN



40363

Holly Link

PROFESSIONAL ENGINEER

NO.

DATE

DR

H LINK

REVISION

CHK

APVD

BY

APVD

P ZELENAK

GENERAL

HYDRAULIC PROFILE

BACKWASH WASTE

FILTER IMPROVEMENTS PROJECT

RALSTON WATER TREATMENT PLANT

CITY OF ARVADA

ARVADA, COLORADO

DATE

OCTOBER 2022

PROJ

WXXZ9601

DWG

F-G-0033

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ABBREVIATIONS:

TOW = TOP OF WALL

TOC = TOP OF CONCRETE

FF = FINISHED FLOOR

XXXX (S) = SURVEYED ELEVATION

PROVIDED BY CITY OF ARVADA

XXXX (C) = CALCULATED ELEVATION

BASED ON DIMENSIONS FROM

RECORD DRAWINGS

VERIFY SCALE

BAR IS ONE INCH ON

ORIGINAL DRAWING.

0 1"

FINAL DESIGN

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EXAMPLE SYMBOLS



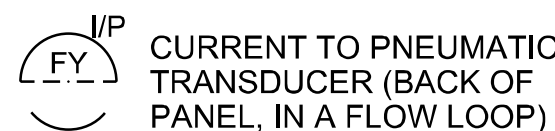
LETTER	FIRST-LETTER		SUCCEEDING-LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION
A	ANALYSIS (+), AIR		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
C	USER'S CHOICE (*)			CONTROL	
D	DENSITY (S.G.)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT, SENSOR		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE (*)		GLASS, GAUGE VIEWING DEVICE	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION				MIDDLE, INTERMEDIATE
N	TORQUE		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
O	USER'S CHOICE (*)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE	RELIEF		
R	RADIATION		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI VARIABLE		MULTI FUNCTION	MULTI FUNCTION	MULTI FUNCTION
V	VIBRATION, MECHANICAL ANALYSIS	VACUUM		VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (*)	X AXIS	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TABLE BASED ON THE INSTRUMENTATION, SYSTEMS, AND AUTOMATION SOCIETY (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.
(*) WHEN USED, DEFINE THE MEANING HERE FOR THE PROJECT.

A	ANALOG	I	CURRENT
D	DIGITAL	P	PNEUMATIC
E	VOLTAGE	PF	PULSE FREQUENCY
F	FREQUENCY	PD	PULSE DURATION
H	HYDRAULIC	R	RESISTANCE

EXAMPLE

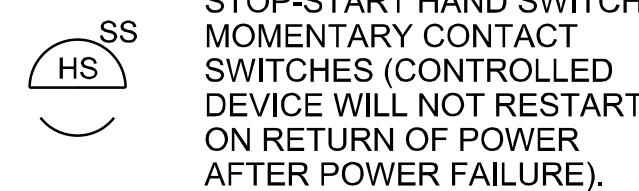
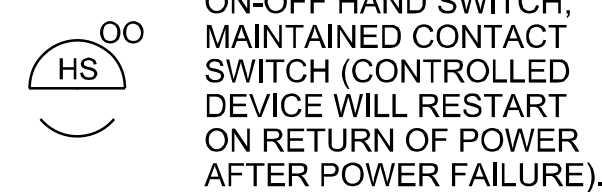


A	ALARM
C	CONTROLLER
I	INDICATOR
R	RECORDER
S	SWITCH
T	TRANSMITTER
X	UNCLASSIFIED

EXAMPLE



 ON AND OFF EVENT LIGHTS



	PRIMARY PROCESS (CLOSED CONDUIT, DASHED LINE INDICATES ALTERNATE FLOW STREAM)
	SECONDARY PROCESS
	BYPASS PROCESS
	PROCESS (OPEN CHANNEL)
	ANALOG SIGNAL (4 TO 20 mAdc, ETC.)
	DISCRETE (ON/OFF, ETC.)
	PNEUMATIC SIGNAL
	FILLED SYSTEM SIGNAL
	HYDRAULIC SYSTEM SIGNAL
	DATA LINK
	BUILDING OR FACILITY BOUNDARY
	PACKAGE SYSTEM EQUIPMENT
	SIMILAR SYSTEMS
	HEAT-TRACED PIPE

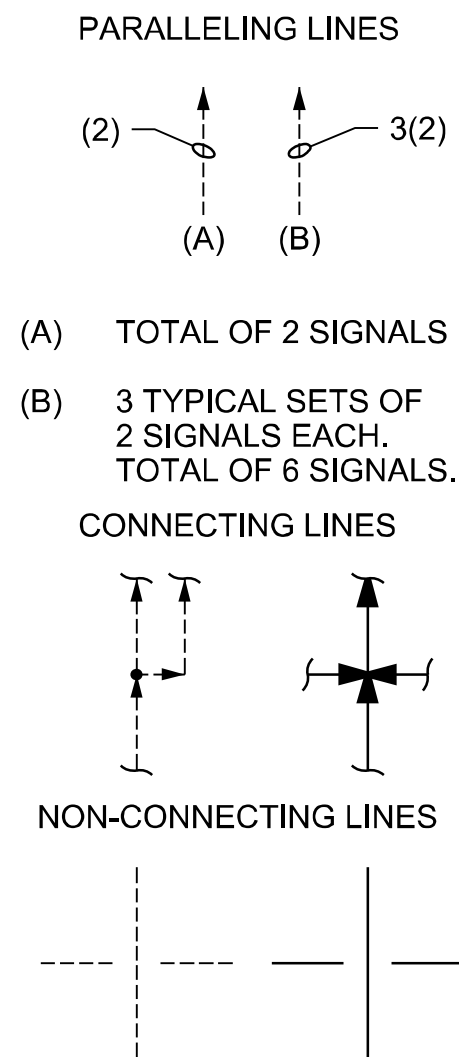


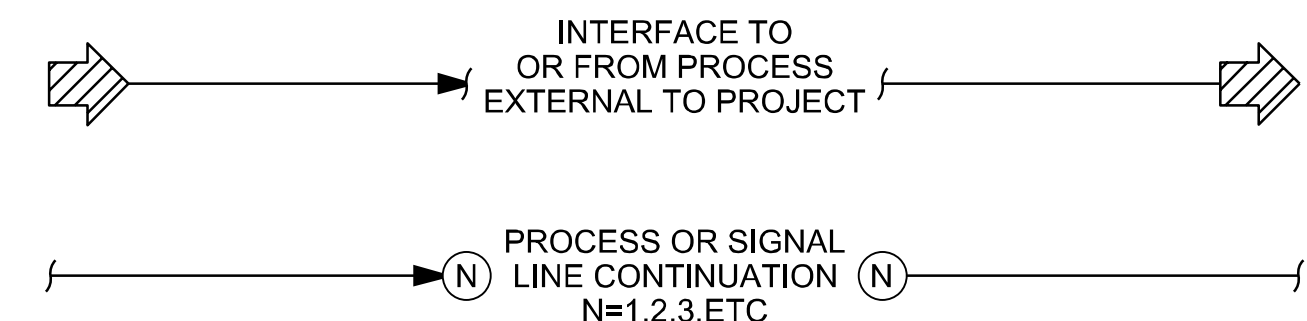
Diagram illustrating the structure of a drawing title block:

PROCESS INTERFACE: A box divided into two sections: **WA** (Source Unit Process No.) and **S** (Source Drawing No.).

SIGNAL INTERFACE: A box divided into two sections: **WA** (Source Unit Process No.) and **D** (Destination Drawing No.).

Legend:

- W SOURCE UNIT PROCESS NO. (1 OR 2 DIGITS)
- A INTERFACE NO. (2 DIGITS)
- D DESTINATION DRAWING NO.
- S SOURCE DRAWING NO.



D-XXXX	
D	ARV AIR RELEASE VALVE
	AVRV AIR AND VACUUM RELEASE VALVE
	CMP COMPRESSOR
	E EJECTOR
	G GATE
	I INJECTOR
	M MECHANICAL EQUIPMENT
	P PUMP
	PRV PRESSURE RELIEF VALVE
	SS SAFETY SHOWER
	T TANK
X	LOOP NUMBER

AC	ALTERNATING CURRENT
ACC	AREA CONTROL CENTER
AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CCS	CENTRAL CONTROL SYSTEM
CL ₂ etc.	CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATIONS)
CLSD	CLOSED
CM	COMPUTER-MANUAL
COD	CHEMICAL OXYGEN DEMAND
CP-X	CONTROL PANEL NO. X
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DCU	DISTRIBUTED CONTROL UNIT
DO	DISSOLVED OXYGEN
FCL ₂	FREE CHLORINE RESIDUAL
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP-W-X	FIELD PANEL NO. WX (W=UNIT PROCESS NUMBER X=PANEL NUMBER)

FR	FORWARD-REVERSE
GNG	GO-NO GO
HOA	HAND-OFF-AUTO
ISR	INTRINSICALLY SAFE RELAY
JB	JUNCTION BOX
LCP	LOCAL CONTROL PANEL
LEL	LOWER EXPLOSIVE LIMIT
LOS	LOCKOUT STOP
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MC	MODULATE-CLOSE
MCC-X	MOTOR CONTROL CENTER NO. X
MCP	MECHANICAL CONTROL PANEL
MSC	MANUFACTURER SUPPLIED CABLE
OC	OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
OPND	OPENED
pH	HYDROGEN ION CONCENTRATION
PLC	PROGRAMMABLE LOGIC CONTROLLER
REM	REMOTE
RIO	REMOTE I/O UNIT
RM-X	REMOTE MULTIPLEXING MODULE NO. X
RTU-X	REMOTE TELEMETRY UNIT NO. X
SF	SLOWER-FASTER
SHK	SPEED HAND CONTROL
SHWR	SHOWER
SS	START-STOP
SSC	SUPERVISORY SET POINT CONTROL
TCL 2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
VCP	VIBRATION CONTROL PANEL
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
Δ	DIFFERENCE
Σ	SUM
x	MULTIPLY
÷	DIVIDE
F(X)	CHARACTERIZED
X ⁿ	RAISED TO THE Nth POWER
√	SQUARE ROOT
AVG	AVERAGE
1:1	REPEAT OR BOOST
>	SELECT HIGHEST SIGNAL
<	SELECT LOWEST SIGNAL
}	BIAS
%	GAIN OR ATTENUATE

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK (*) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (**) ARE TO BE PROVIDED UNDER DIVISION 26, ELECTRICAL.
3. COMPONENTS SHOWN WITH A TRIPLE ASTERISK (***) ARE OWNER FURNISHED.

[illegible]

WATER TREATMENT PLANT
IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

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INSTRUMENTATION & CONTROLS

VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0  1"	
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012
FINAL DESIGN

1
2

VALVE SYMBOLS

	GATE		PINCH		PRESSURE RELIEF
	KNIFE GATE		NEEDLE		AIR AND/OR VACUUM RELEASE
	BUTTERFLY		SWING CHECK		REGULATED SIDE PRESSURE CONTROL
	GLOBE		BALL CHECK		PRESSURE REGULATION (CLAY-TYPE)
	BALL		BACKFLOW PREVENTER		MULTI-PORT VALVE (GATE VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
	VEE-BALL		ROTARY		ANGLE GATE
	PLUG		TELESCOPE		
	SEAT PORT ECCENTRIC PLUG		SAMPLE		
	DIAPHRAGM		MUD		
	DUCK BILL CHECK VALVE				
	SLEEVE VALVE				

GATE SYMBOLS

	SLUICE / WEIR		FABRICATED SLIDE
	BUTTERFLY		FLAP
			STOP LOG
			SHEAR

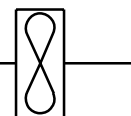
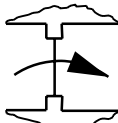
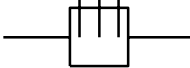
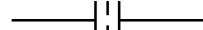
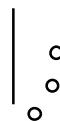
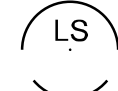
ACTUATOR SYMBOLS

	PNEUMATIC DIAPHRAGM SPRING-OPPOSED, SINGLE OR DOUBLE ACTING		VALVE POSITIONER		MANUAL
	PNEUMATIC CYLINDER SINGLE OR DOUBLE ACTING ACTUATED BY ONE INPUT		HYDRAULIC		
	ELECTRIC MOTOR		DIAPHRAGM, DIFFERENTIAL PRESSURE		
	SOLENOID		ELECTROHYDRAULIC		

NOTE:
ON LOSS OF PRIMARY POWER
(PNEUMATIC, ELECTRICAL, OR
HYDRAULIC)

XX:	FO	FAIL OPEN
	FC	FAIL CLOSED
	FLP	FAIL TO LAST POSITION

PRIMARY ELEMENT SYMBOLS

	PARSHALL FLUME		PROPELLER OR TURBINE METER		LEVEL (FLOAT)
	WEIR		THERMAL FLOWMETER		ROTAMETER
	ORFICE PLATE		LEVEL (BUBBLER TUBE)		DENSITY METER
	FLOW TUBE		SUBMERSIBLE PRESSURE LEVEL SENSOR		GENERIC
	PITOT-STATIC		VORTEX METER		LEVEL (ULTRASONIC)
	ULTRASONIC FLOWMETER		ELECTROMAGNETIC FLOWMETER		LEVEL (RADAR)
	CORIOLIS FLOWMETER				LEVEL (TUNING FORK)

3		4	
MISCELLANEOUS SYMBOLS			
	VENT TO ATMOSPHERE		PANEL OUTLINE PANEL NAME
	AIR GAP		PANEL CONTINUED ON SAME OR OTHER DRAWING
	DRIP TRAP		120 VOLT, 60 HZ POWER
	PIG INSERT POINT		120 VOLT, UNINTERRUPTIBLE SUPPLY 60 HZ POWER
	PIG CATCH POINT		480 VOLT, 60 HZ POWER
	SELF CONTAINED AIR SUPPLY		24 VOLT, 60 HZ POWER
	AIR PURGE SET		AIR SET XX = SUPPLY PRESSURE IN PSIG.
	FLUSHING CONNECTION		PLUG
	SEAL WATER SET SEAL PLAN (REFER TO STANDARD DETAIL 4027-207)		RECEPTACLE
	WATER PURGE SET		RUPTURE DISK (VACUUM)
	FLEXIBLE CONNECTION		RUPTURE DISK (PRESSURE)
	AERATOR		TV MONITOR
	DIAPHRAGM SEAL		TV CAMERA
	ANNULAR DIAPHRAGM SEAL		LOGIC ELEMENT: IF A AND NOT B THEN C
	COMPOSITE SAMPLER		LOGIC ELEMENT: IF A OR B THEN C
	FLAME TRAP		RADIO ANTENNA
	CALIBRATION COLUMN		INTERLOCK, SEE CONTROL DIAGRAMS
	INLINE SILENCER		BASKET STRAINER
	DISMANTLING JOINT		VOICE COMMUNICATION POINT
	BLIND FLANGE		SKIMMING MECHANISM
	PIPE CAP		SCREW CONVEYOR
	STRAINER		MIXER (NON-SUBMERSIBLE)
	FILTER		MIXER (SUBMERSIBLE)
	PULSATION DAMPENER		ELECTRIC MOTOR
	EXPANSION CHAMBER		POLYMER BLENDING UNIT
	SAMPLE POINT		CARRIER PIPE
	DIGITAL POWER MONITOR		INJECTOR
	POWER SUPPLY		OUTDOOR SILENCER
	REDUNDANCY MODULE		
	SURGE PROTECTION DEVICE		
	UNINTERRUPTIBLE POWER SUPPLY		
	INTERPOSING RELAY		

PUMP AND COMPRESSOR SYMBOLS

	CENTRIFUGAL PUMP (DRY PIT)		CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
	CENTRIFUGAL PUMP		RECIPROCATING OR METERING PUMP (POSITIVE DISPLACEMENT)
	PROGRESSING CAVITY PUMP		PISTON PUMP
	COMPRESSOR (CENTRIFUGAL)		SUBMERSIBLE PUMP
	COMPRESSOR (PISTON)		ROTARY LOBE PUMP
	BLOWER OR FAN (CENTRIFUGAL)		VACUUM PUMP
	ROTARY LOBE BLOWER		SCREW PUMP
	DOUBLE DIAPHRAGM PUMP		PERISTALTIC PUMP
	DIAPHRAGM PUMP		VERTICAL TURBINE PUMP
	GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)		

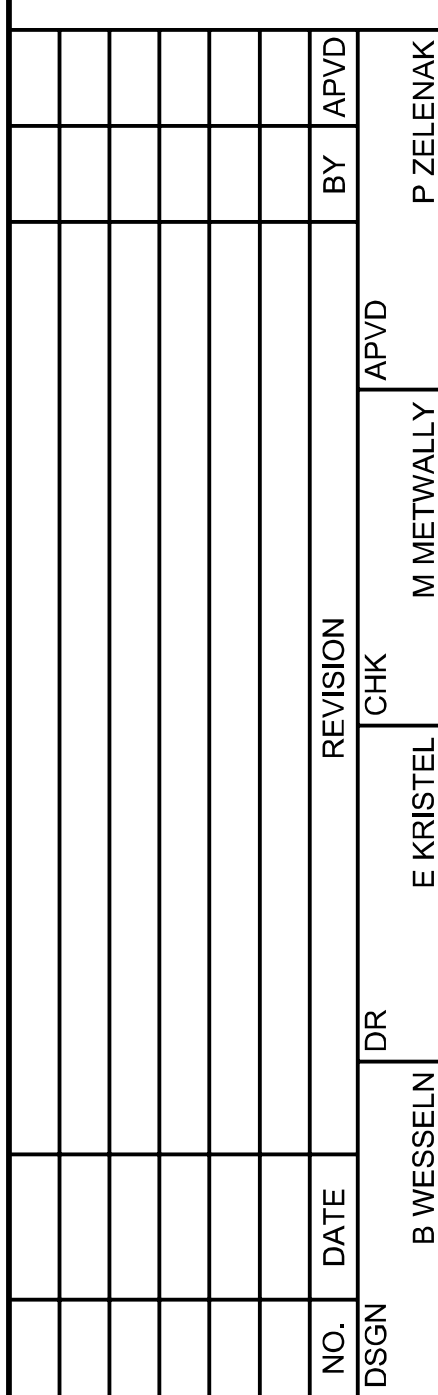
XX: AS ADJUSTABLE SPEED
CS-1 CONSTANT SPEED (SINGLE SPEED)
CS-2 CONSTANT SPEED (TWO SPEED)
CS-R CONSTANT SPEED (REVERSING)

LINE IDENTIFICATION

The diagram shows a horizontal line with a point labeled 'P' on the left. A downward-pointing arrow is positioned above the line. A label 'FLOW STREAM IDENTIFICATION (SEE BELOW)' is connected to the line by a line and an arrow pointing to the point 'P'.

FLOW STREAM IDENTIFICATION

BWS	BACKWASH SUPPLY
BWW	BACKWASH WASTE
CFE	COMBINED FILTER EFFLUENT
FE	FILTER EFFLUENT
FI	FILTER INFLUENT
FW	FINISHED WATER
PA	PLANT AIR
SA	SAMPLE
SFW	SURFACE WASH



RALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO



GENERAL

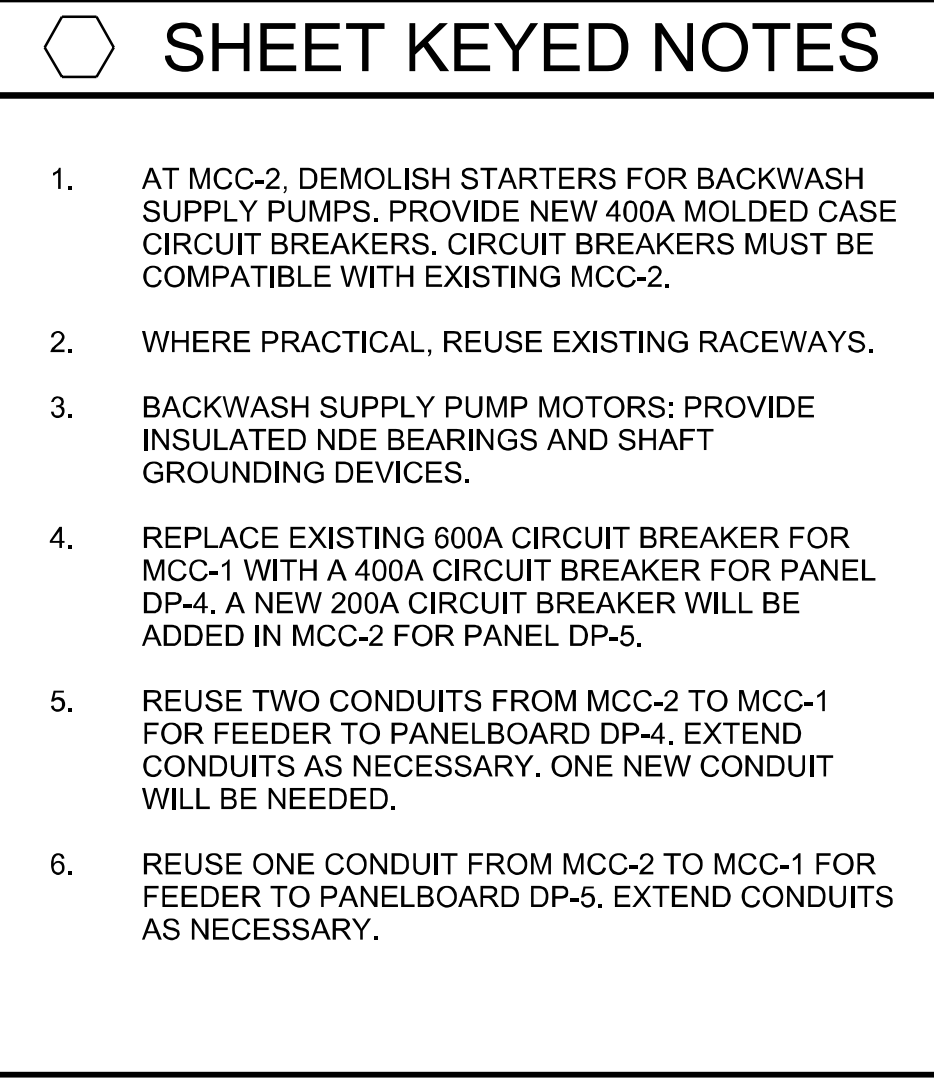
INSTRUMENTATION & CONTROLS

LEGEND 2

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 [REDACTED] 1"	
DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-G-0041
SHEET	15 of 68

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[illegible]

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FINAL DESIGN

[illegible]

FILTER IMPROVEMENTS PROJECT
RALSTON WATER TREATMENT PLANT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

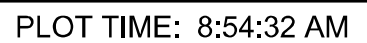
SITE ELECTRICAL
MCC-1
ONE-LINE DIAGRAM

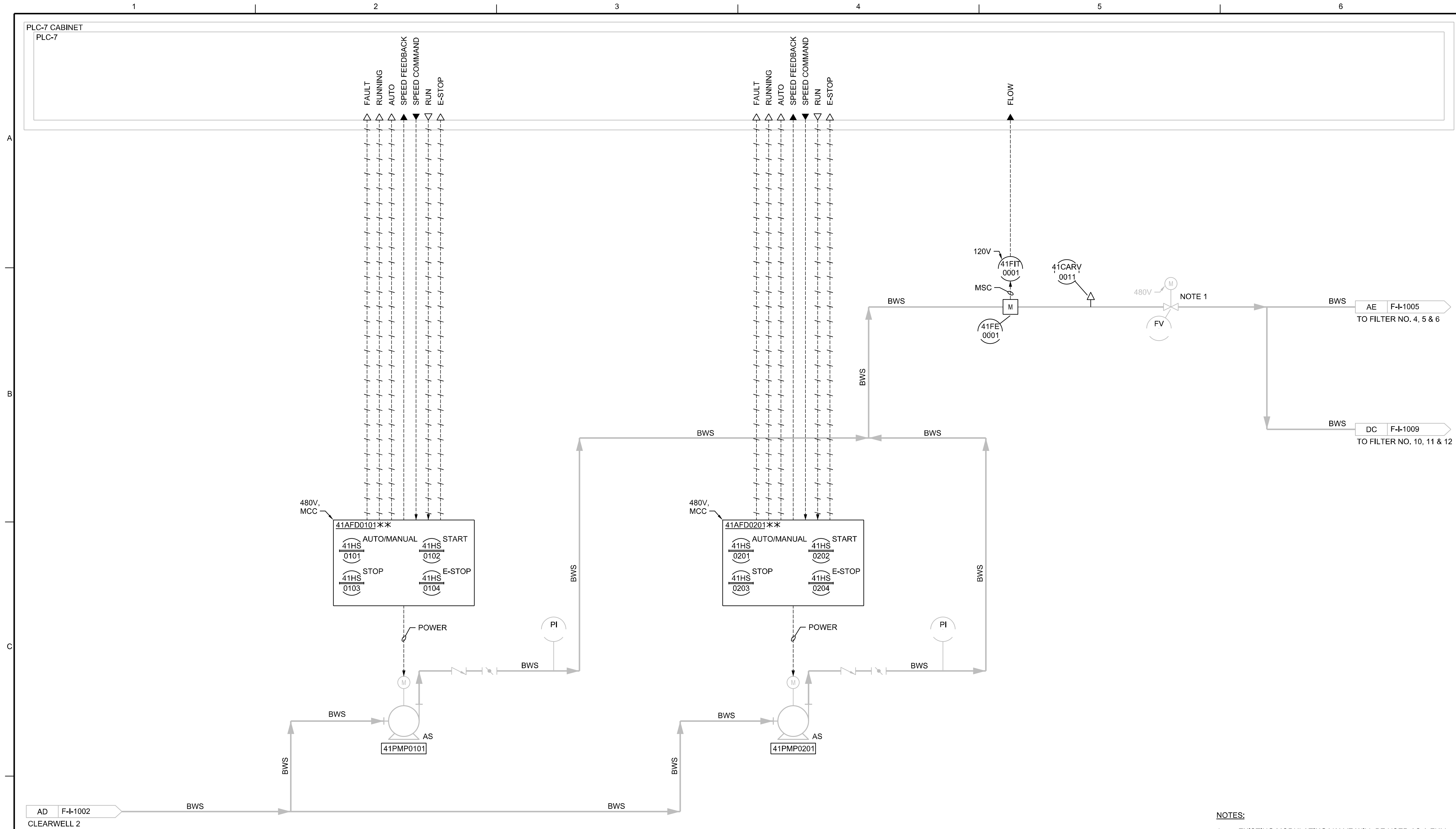
VERIFY SCALE
 BAR IS ONE INCH ON
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 0  1"

DATE OCTOBER 2022
 PROJ WXXZ960
 DWG F-E-1002
 SHEET 20 of 68

FINAL DESIGN

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NOTES:

1. EXISTING MODULATING VALVE WILL BE USED AS A FULL OPEN AND FULL CLOSED ISOLATION VALVE ONLY.

[illegible]

RALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

INSTRUMENTATION & CONTROLS

**FILTER BACKWASH SYSTEM
PUMPS AND FLOW CONTROL
P&ID**

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

DATE OCTOBER 2022

PROJ WXXZ9601

DWG F-I-1001

SHEET 22 of 68

PLOT TIME: 8:54:25 AM

FINAL DESIGN

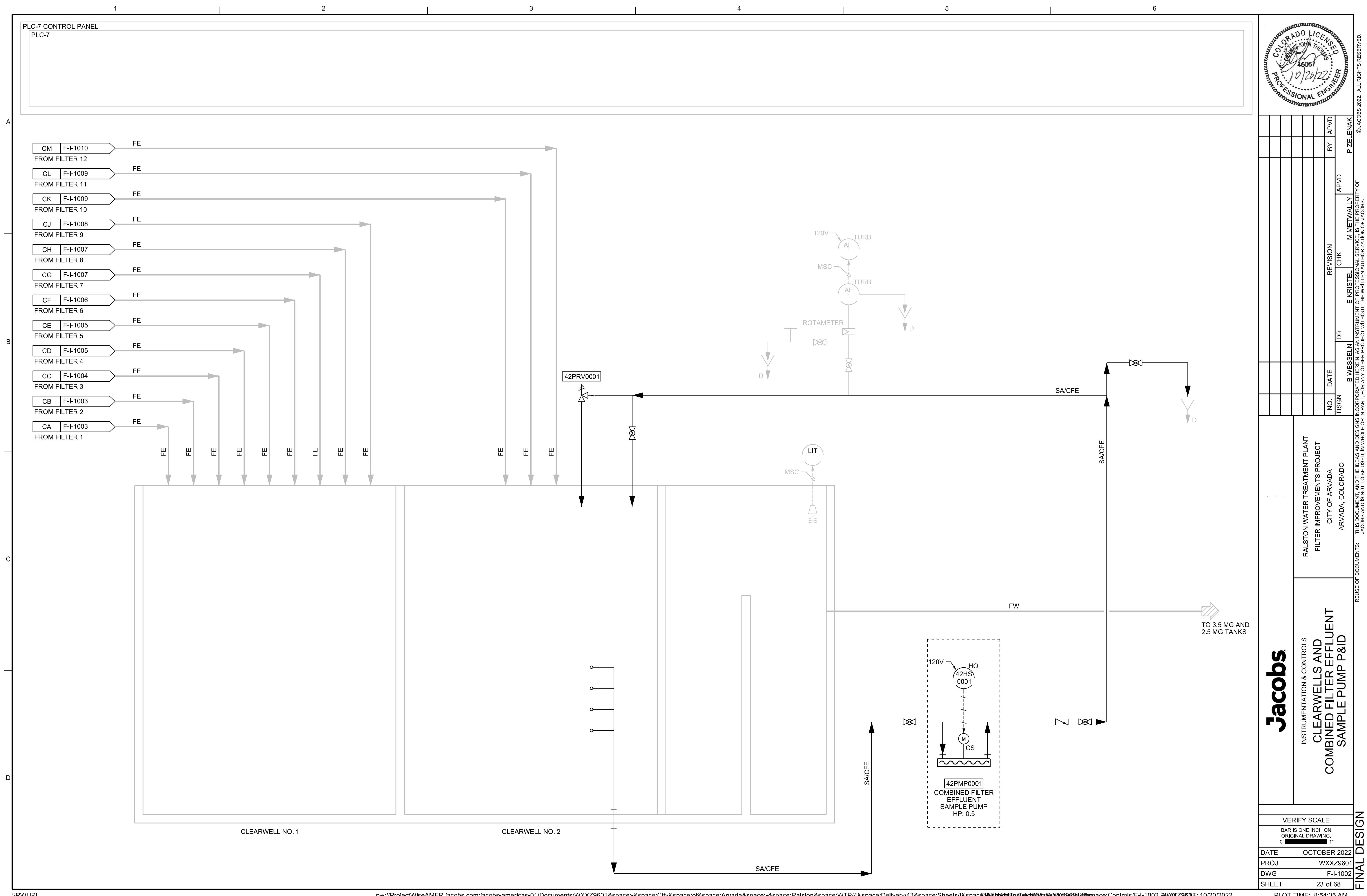
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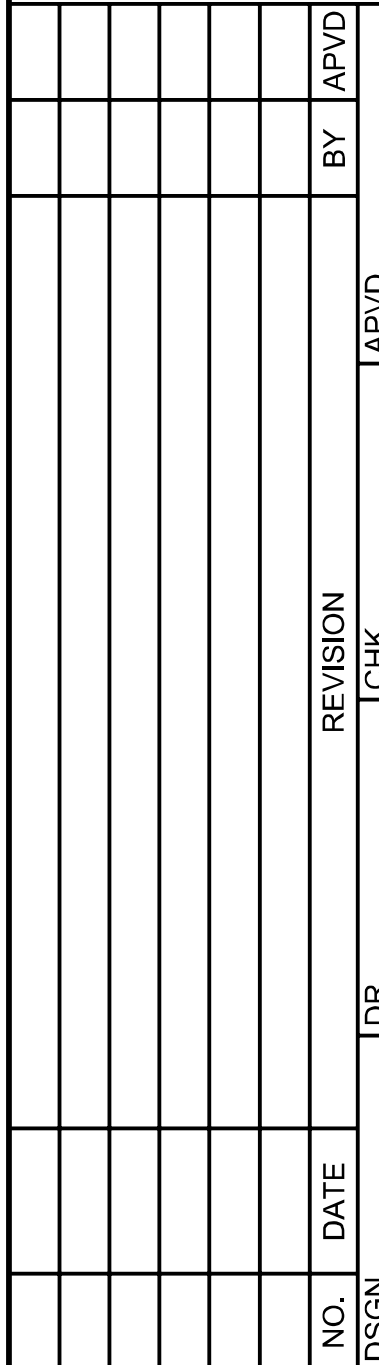
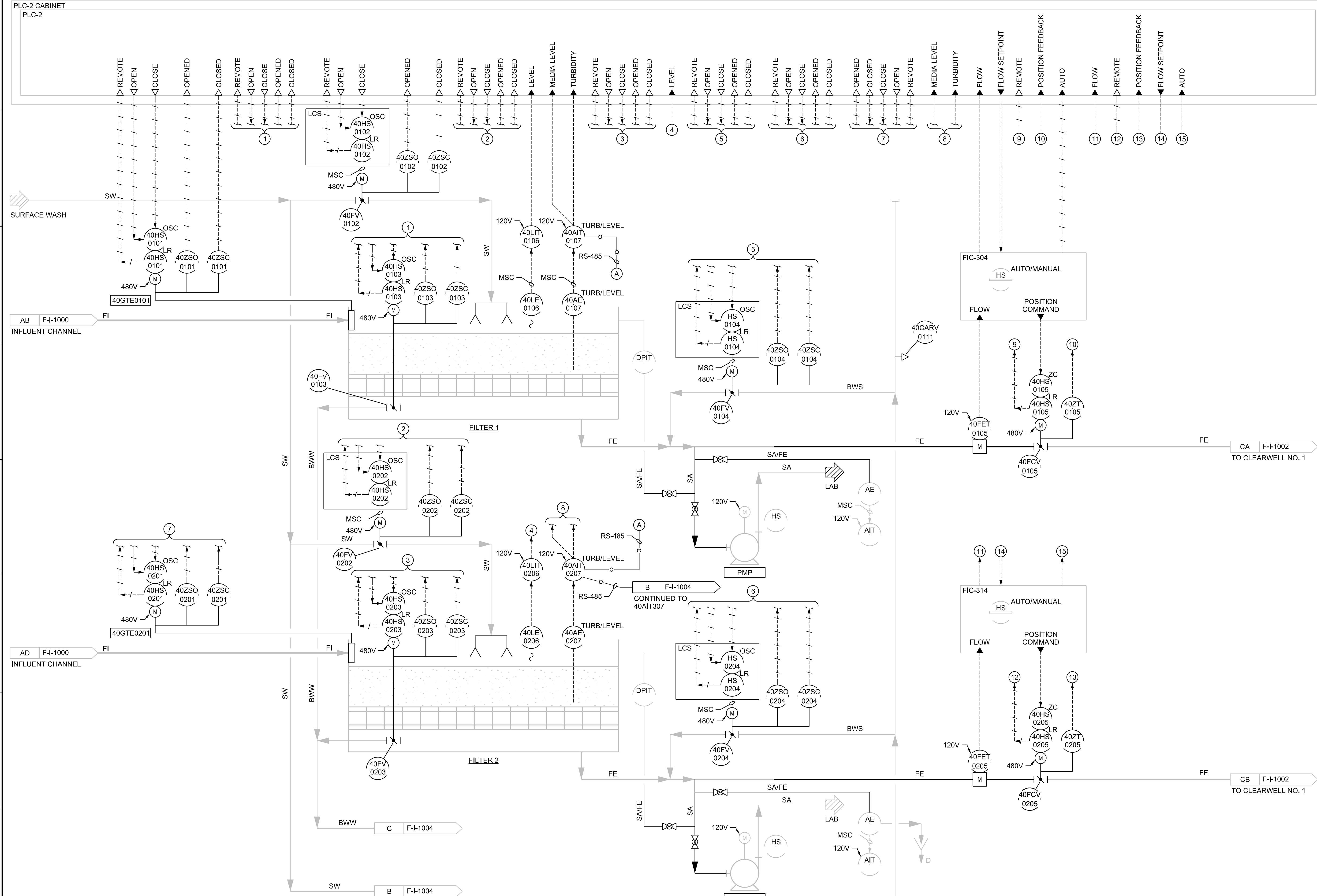
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\$PWURL

pw://ProjectWiseAMER.jacobs.com;jacobs-americas-01/Documents/WXXZ9601&space=-&space;City&space=of&space;Arvada&space=-&space;space;Ralston&space;WTP/4&space;Delivery/43&space;Sheets/1&space;F-1-1001/WXXZ9601&space;Controls/F-1-1001 PWXXZ9601: 10/20/2022

PLOT TIME: 8:54:25 AM

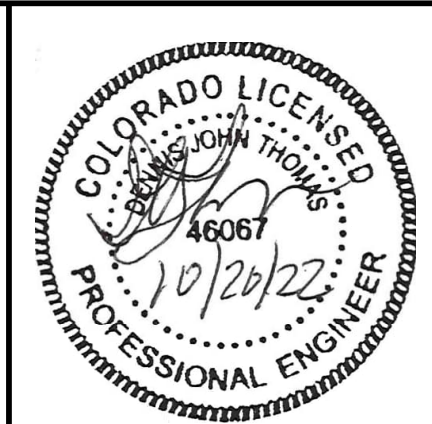




Jacobs

INSTRUMENTATION & CONTROLS
FILTERS 1 AND 2
P&ID

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING, 0  1"	
DATE	OCTOBER 2
PROJ	WXXZY
DWG	F-1-1
SHEET	24 of 68

[illegible]

	DATE RECEIVED	BY ATTORNEY	DATE RETURNED
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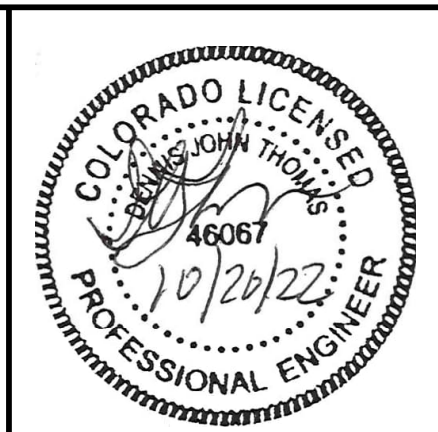
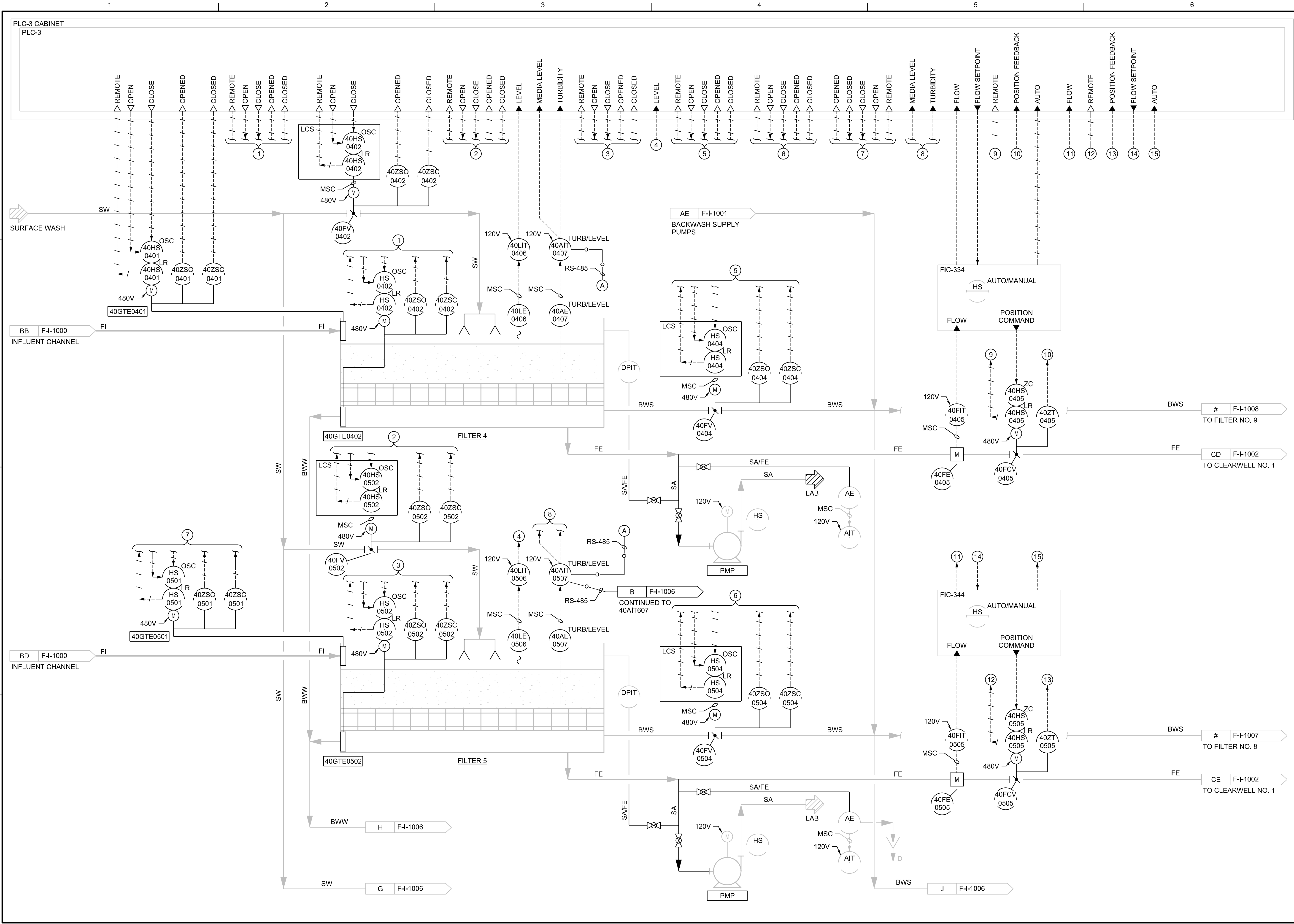
INSTRUMENTATION & CONTROLS

FILTER 3 P&ID

RALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
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DATE	OCTOBER
PROJ	WXXZ
DWG	F-I-
SHEET	25 of 6

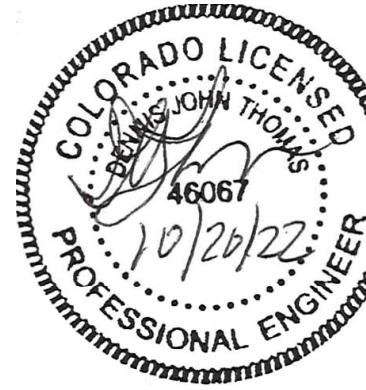
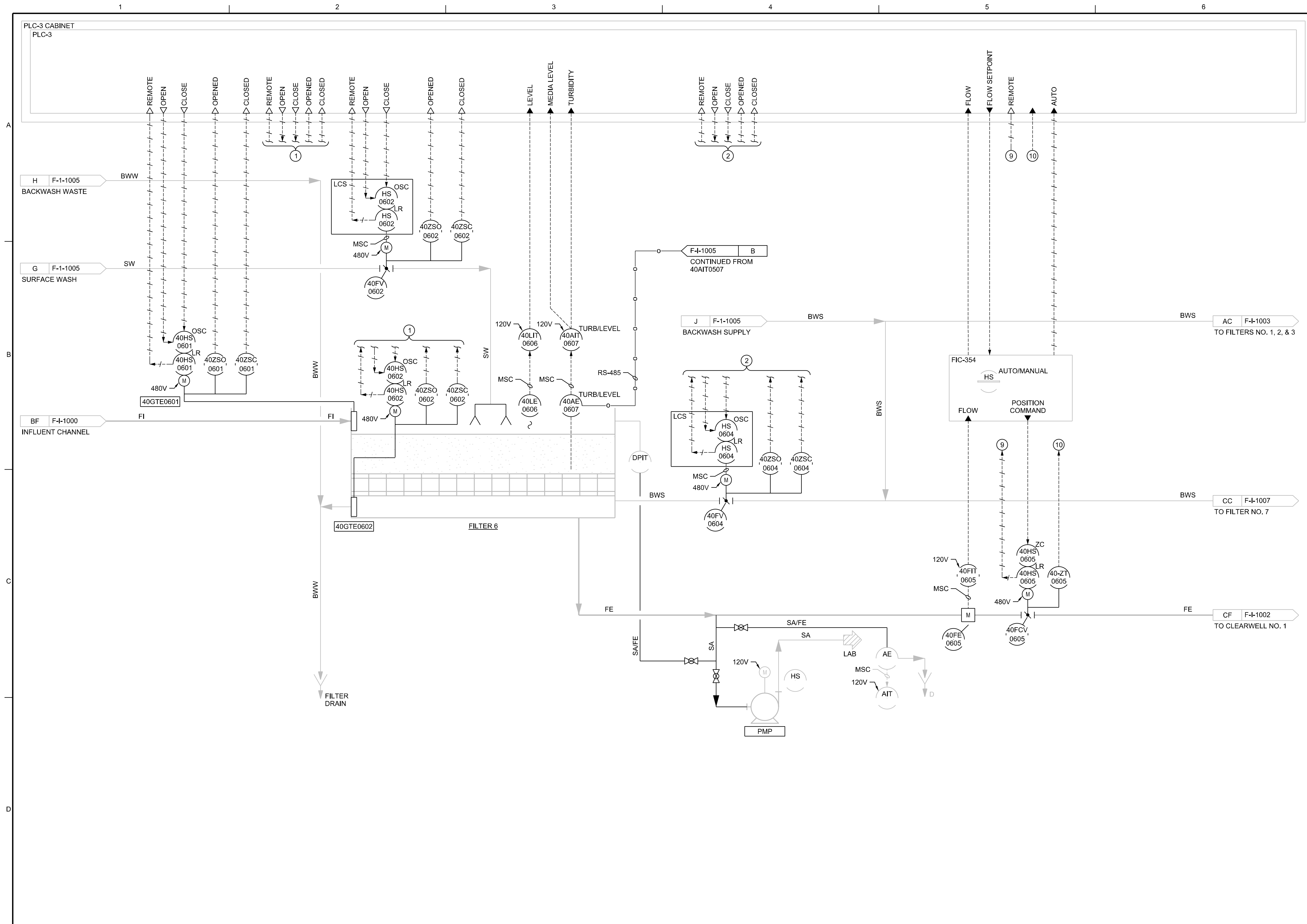
FINAL DESIGN



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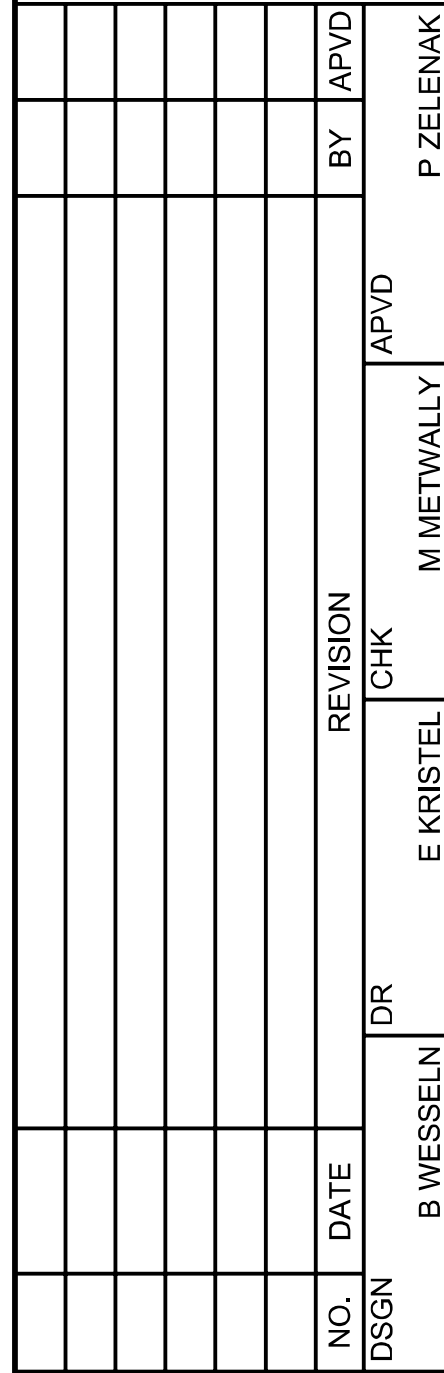
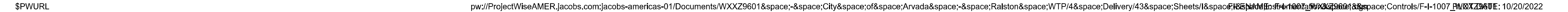
RALSTON WATER TREATMENT PLANT FILTER IMPROVEMENTS PROJECT CITY OF ARVADA ARVADA, COLORADO	INSTRUMENTATION & CONTROLS FILTERS 4 AND 5 P&ID

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE OCTOBER 2022
PROJ WXXZ9601
DWG F-I-1005
SHEET 26 of 68

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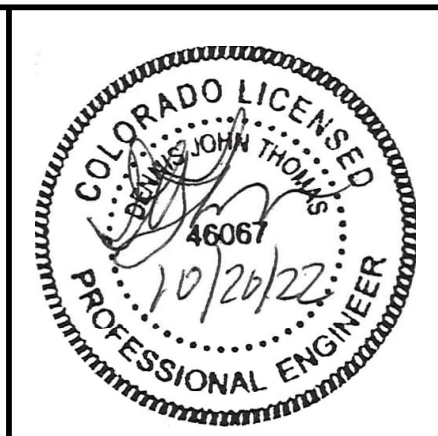
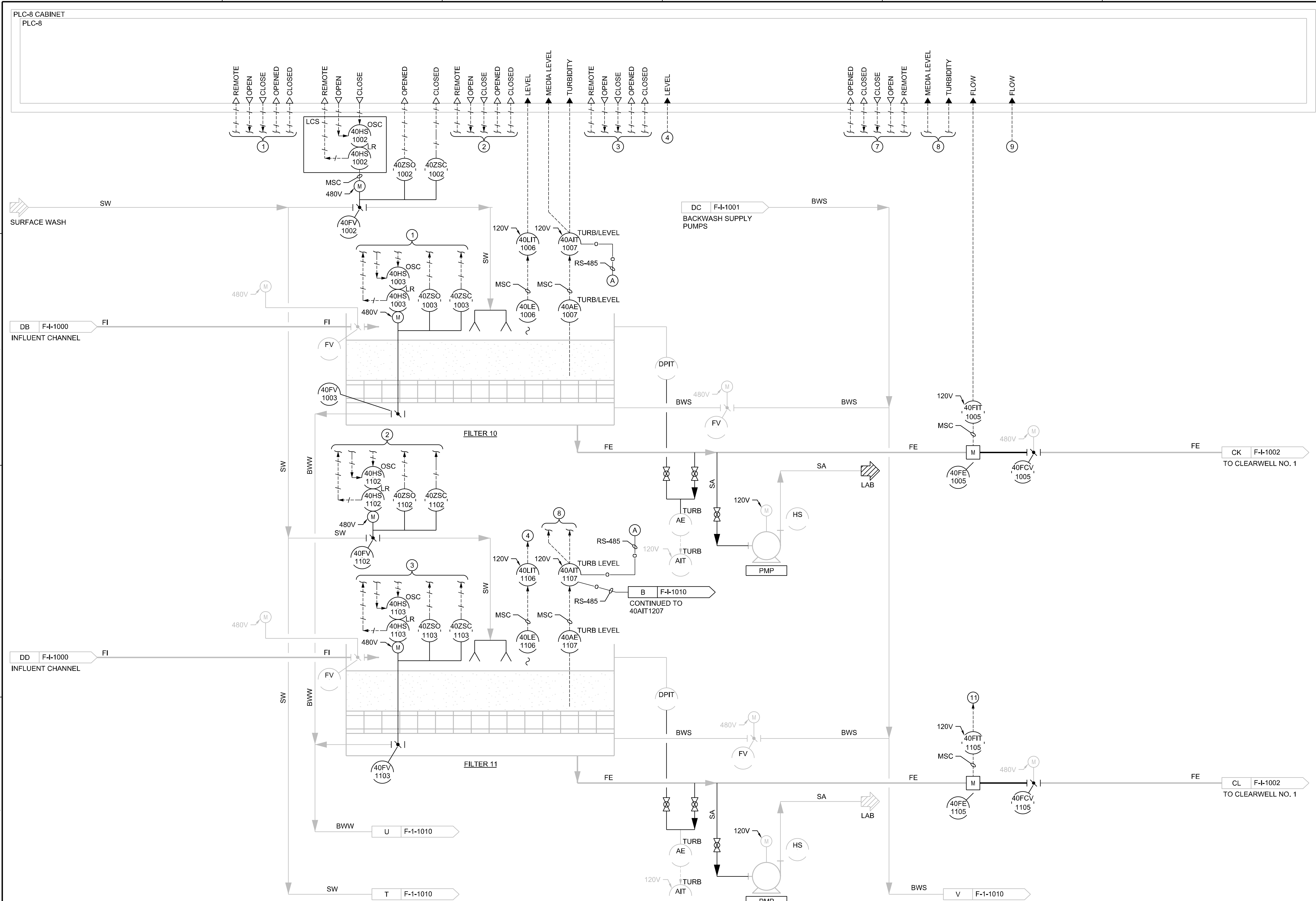
	INSTRUMENTATION & CONTROLS FILTER 6 P&ID	RALSTON WATER TREATMENT PLANT FILTER IMPROVEMENTS PROJECT CITY OF ARVADA ARVADA, COLORADO
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VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0  1"	
DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-I-1006
SHEET	27 of 68



Jacobs

PLOT TIME: 8:54:17 AM

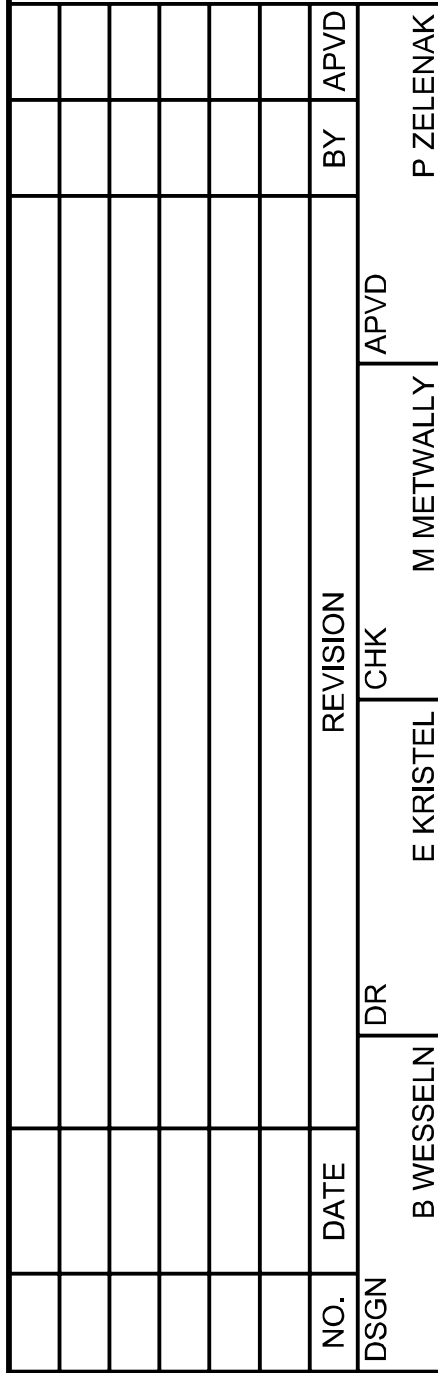


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RALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs
INSTRUMENTATION & CONTROLS
FILTERS 10 AND 11
P&ID

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING, 1"
DATE OCTOBER 2022
PROJ WXXZ9601
DWG F-I-1009
SHEET 30 of 68



RAILSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

INSTRUMENTATION & CONTROLS

FILTER 12

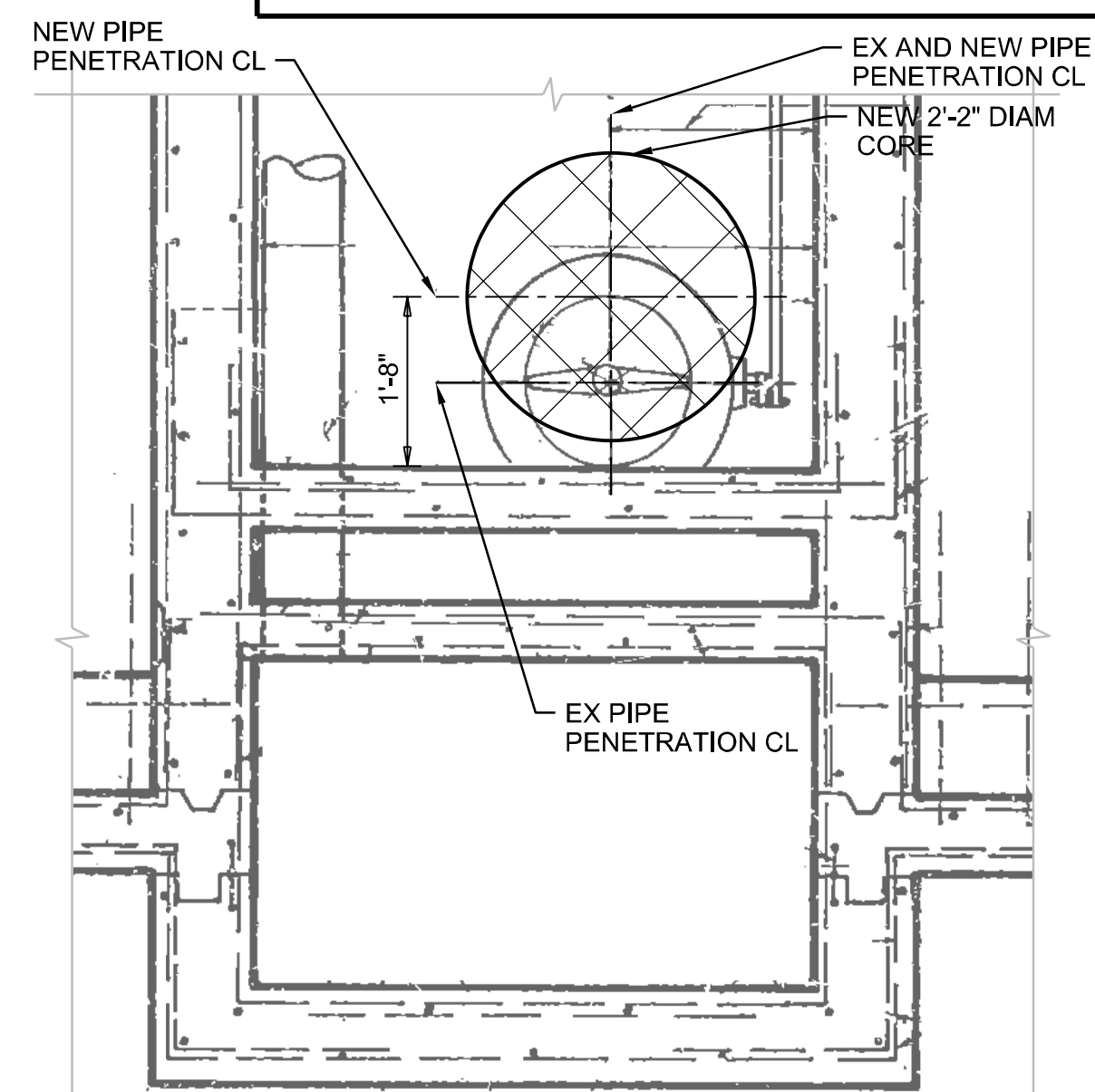
P&ID

VERIFY SCALE	
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DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-I-1010
SHEET	31 of 68

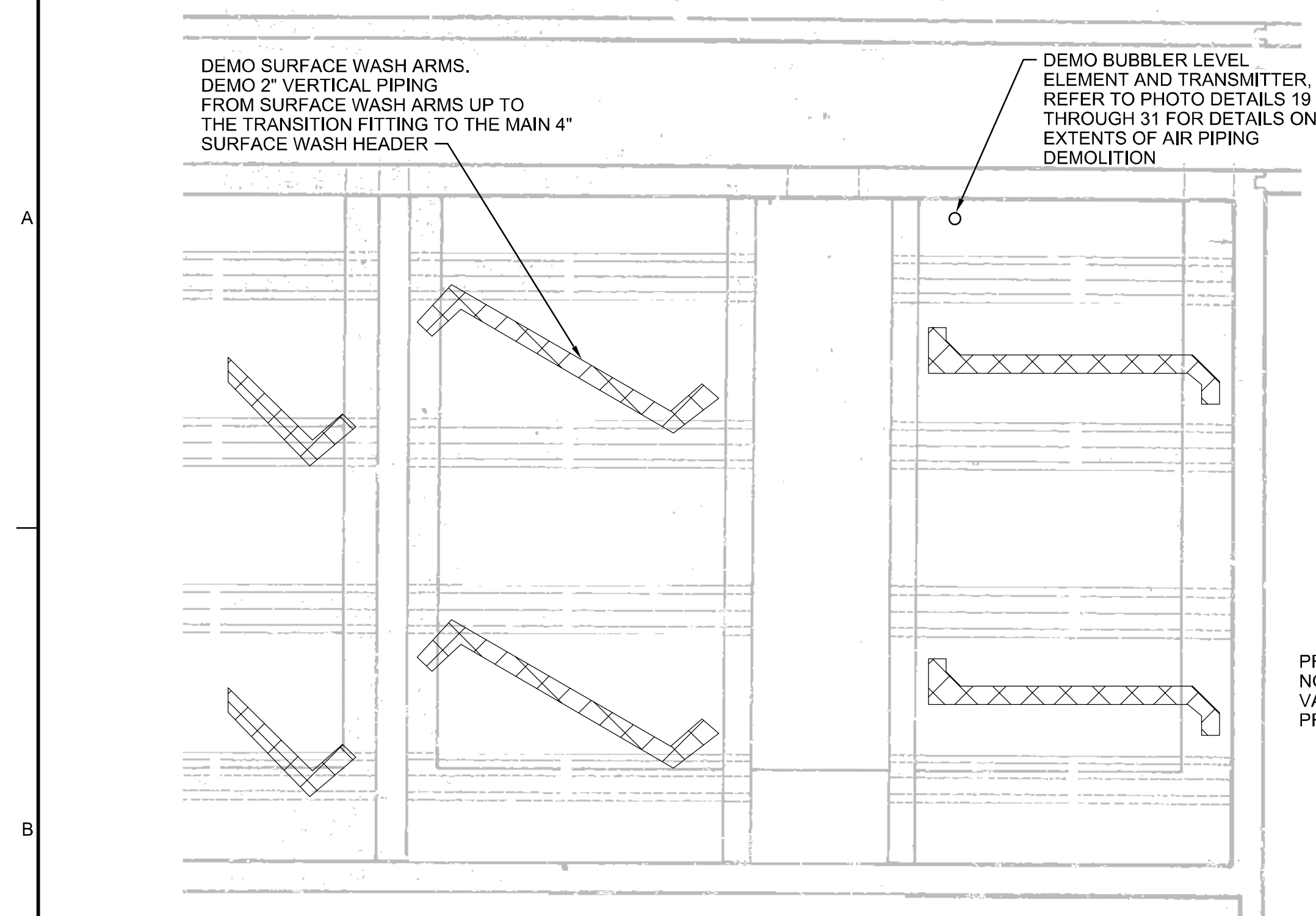
FINAL DESIGN



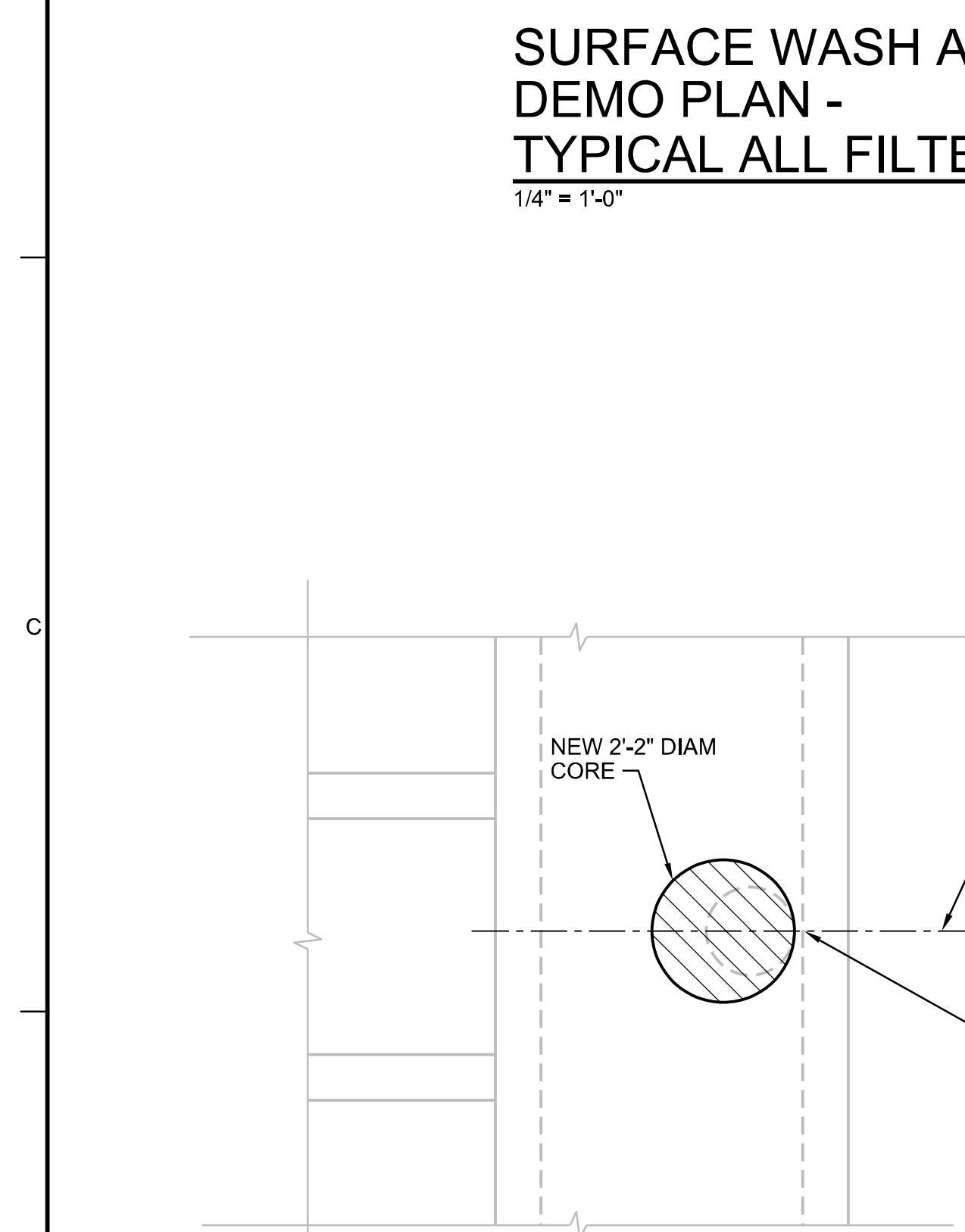
1. PRIOR TO START OF EXCAVATION BELOW
INFLUENT CHANNEL:
A. SEE SPECIFICATION 31 41 00. SUBMIT
SHORING PLAN AND INSTALL SHORING.
B. FILTER BASINS AND INFLUENT CHANNEL
MUST COMPLETELY EMPTY OF WATER.

[illegible]

Filter 1-3 Wall
Demo Section
NTS

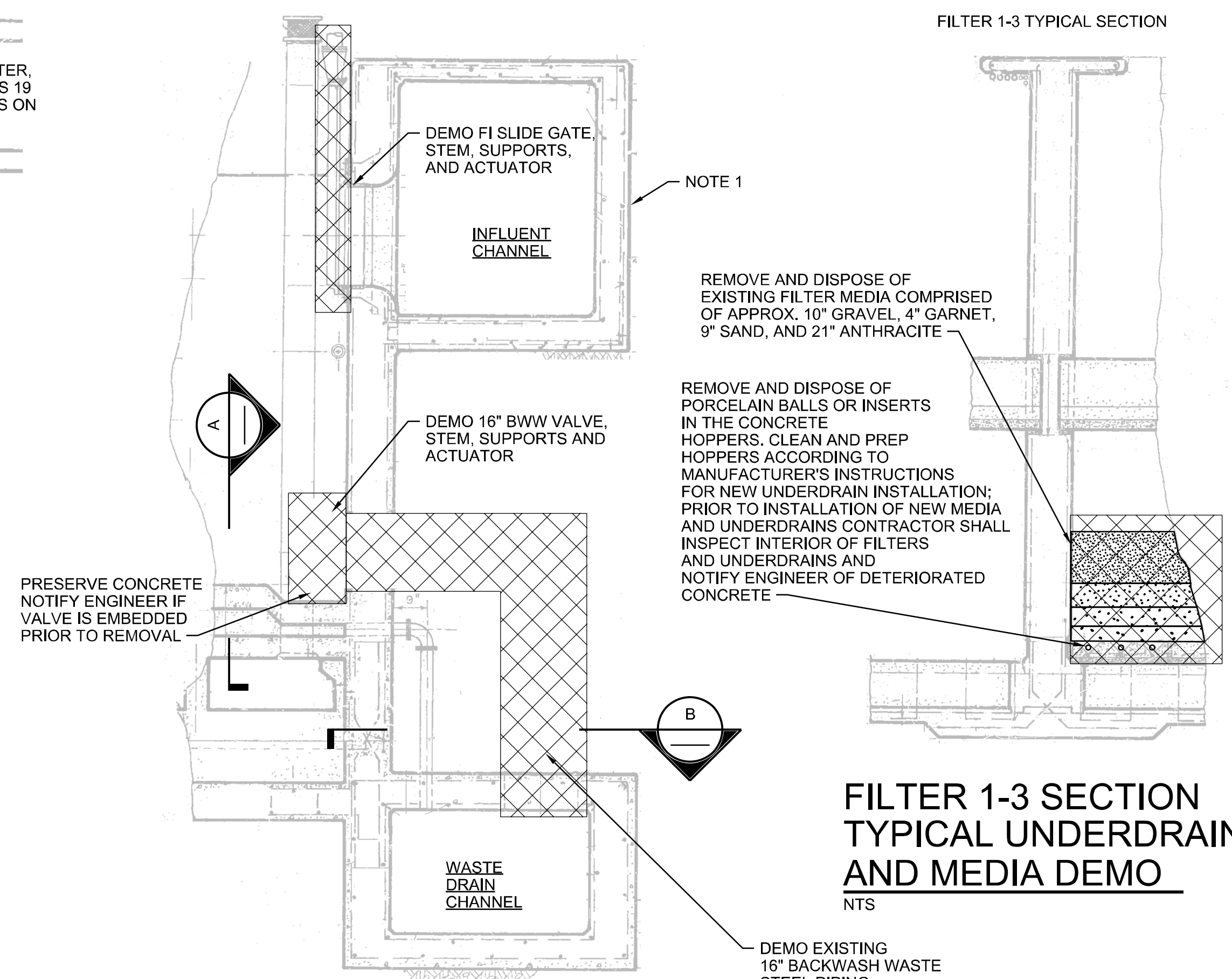


SURFACE WASH ARM AND BUBBLER DEMO PLAN - TYPICAL ALL FILTERS

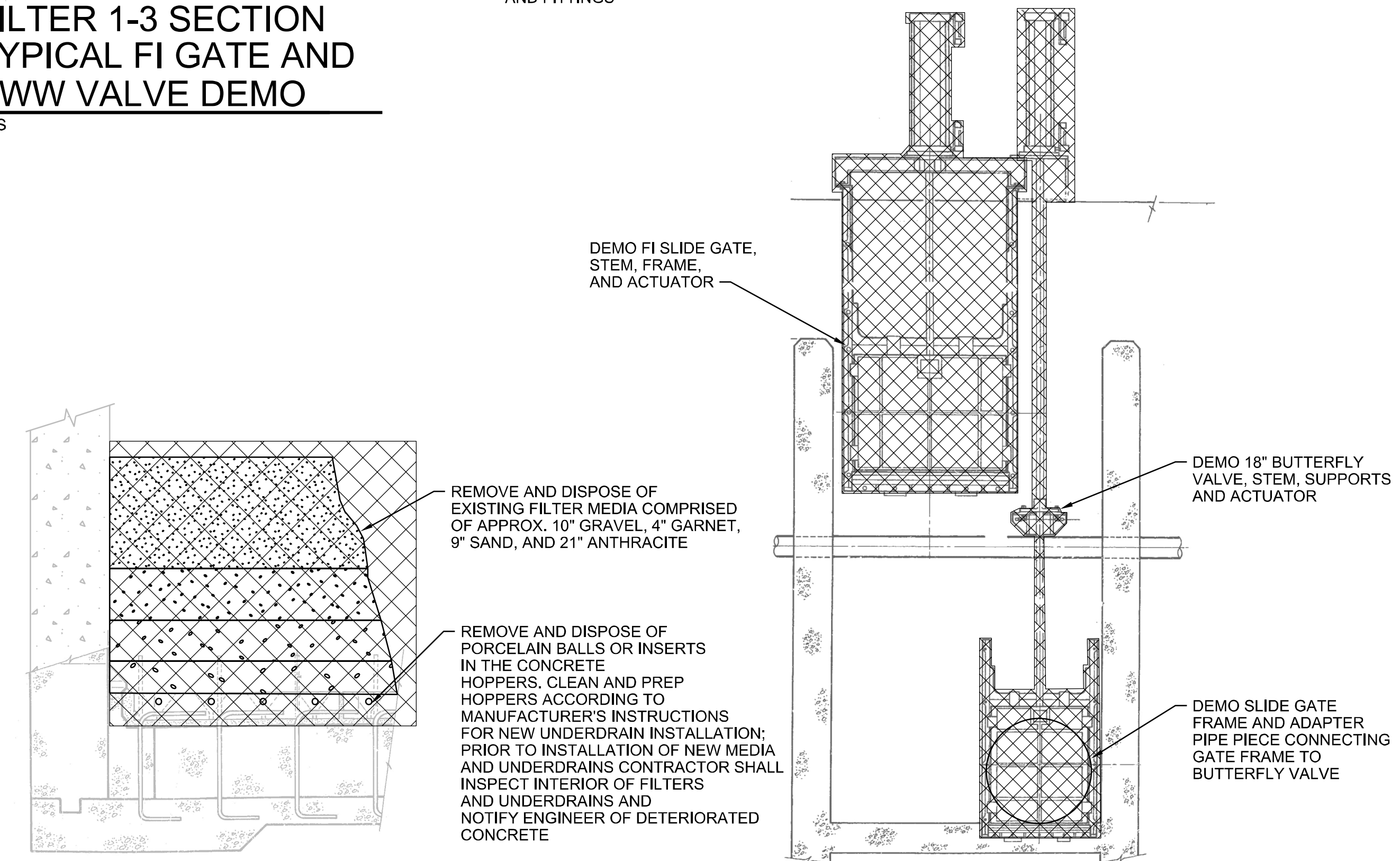


FILTER 1-3 SLAB
DEMO PLAN

NTS



FILTER 1-3 SECTION TYPICAL FI GATE AND BWW VALVE DEMO



FILTER 4-6 SECTION TYPICAL UNDERDRAIN AND MEDIA DEMO

FILTER 4-6 SECTION TYPICAL FI AND BWW GATE DEMO

Jacobs.

DEMOLITION FILTERS 1-6 DEMO & TYPICAL SURFACE WASH DEMO

RALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

		H LINK	B KASPAR	B CARTER	P ZELENAK
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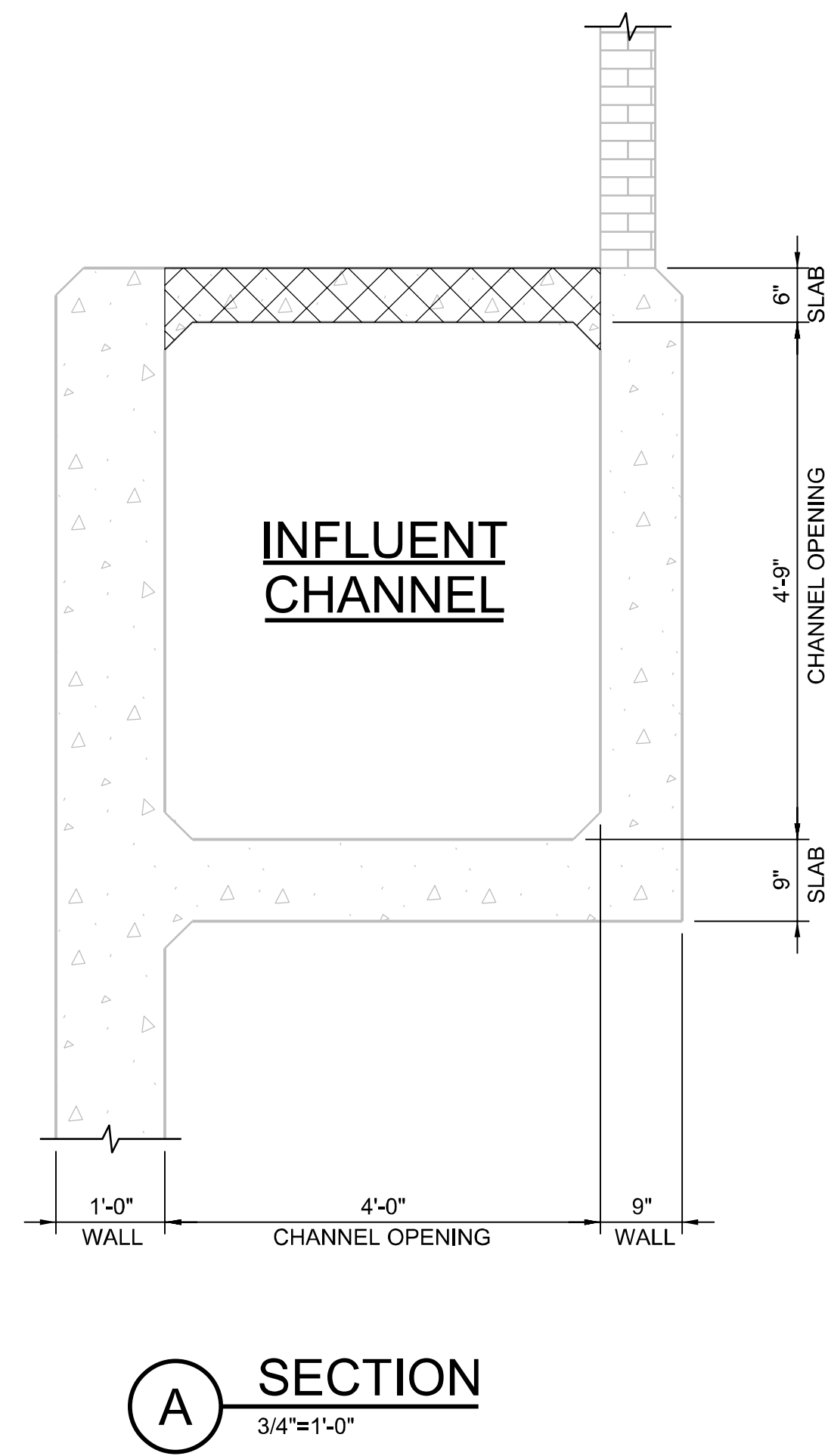
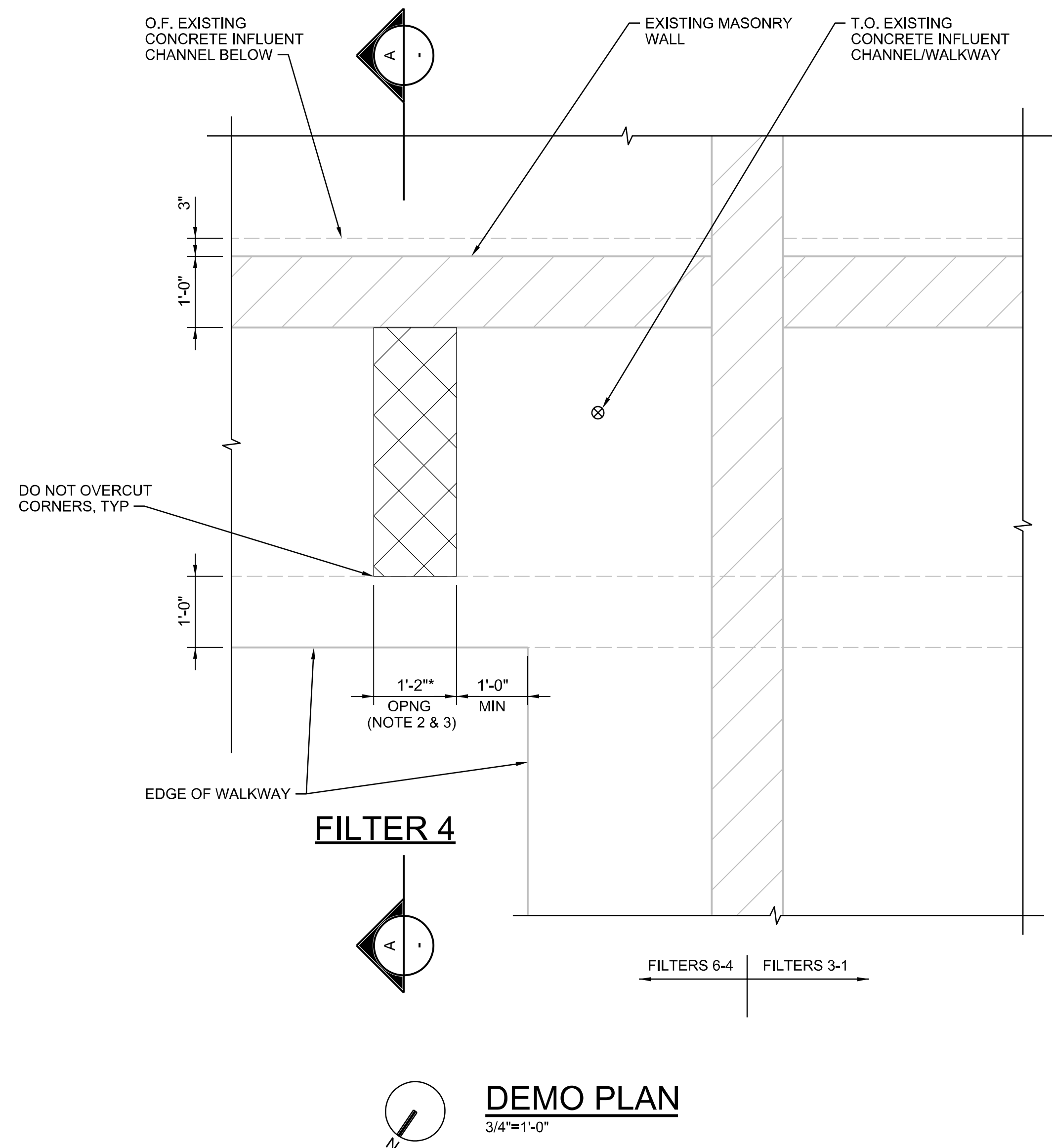
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING, 0  1"	
DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-R-2001
SHEET	32 of 68

01	01	22
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FINAL DESIGN

GENERAL NOTES

1. ALL EXISTING DIMENSIONS AND WALL THICKNESSES SHOWN ON THIS SHEET WERE TAKEN FROM THE RECORD DRAWINGS PROVIDED BY THE OWNER ENTITLED "CITY OF ARVADA COLORADO PROJECT NO. 65-6-W" PREPARED BY T.V. GAREL CONSULTING ENGINEER, MARCH 1966. ACTUAL DIMENSIONS MAY VARY AND SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO START OF DEMOLITION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF DISCREPANCIES.
2. COORDINATE OPENING SIZE WITH GATE MANUFACTURER.
3. SCAN SLAB FOR EXISTING REINF AND LOCATE NEW OPENING FOR GATE SO THAT EXISTING REINF IS PRESERVED IF POSSIBLE. SUBMIT PLANNED LOCATION FOR REVIEW AND ACCEPTANCE BY ENGINEER PRIOR TO THE START OF DEMOLITION.

[illegible]

FILTER IMPROVEMENTS PROJECT
KALSTON WATER TREATMENT PLANT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

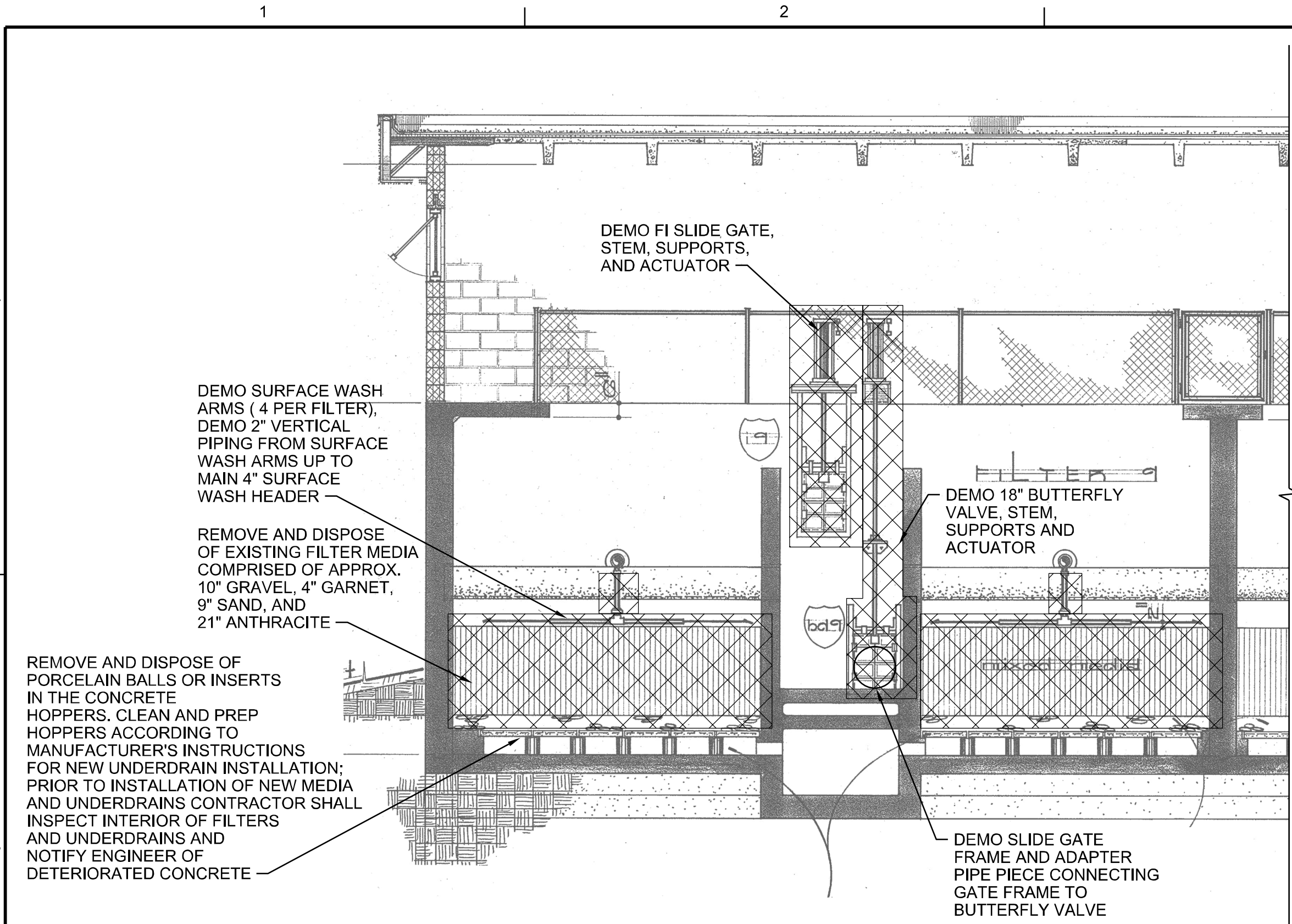
DEMOLITION
INFLUENT CHANNEL
GATE MODIFICATIONS
PLAN AND SECTION

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
0	1"
DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-R-2002
SHEET	33 of 68

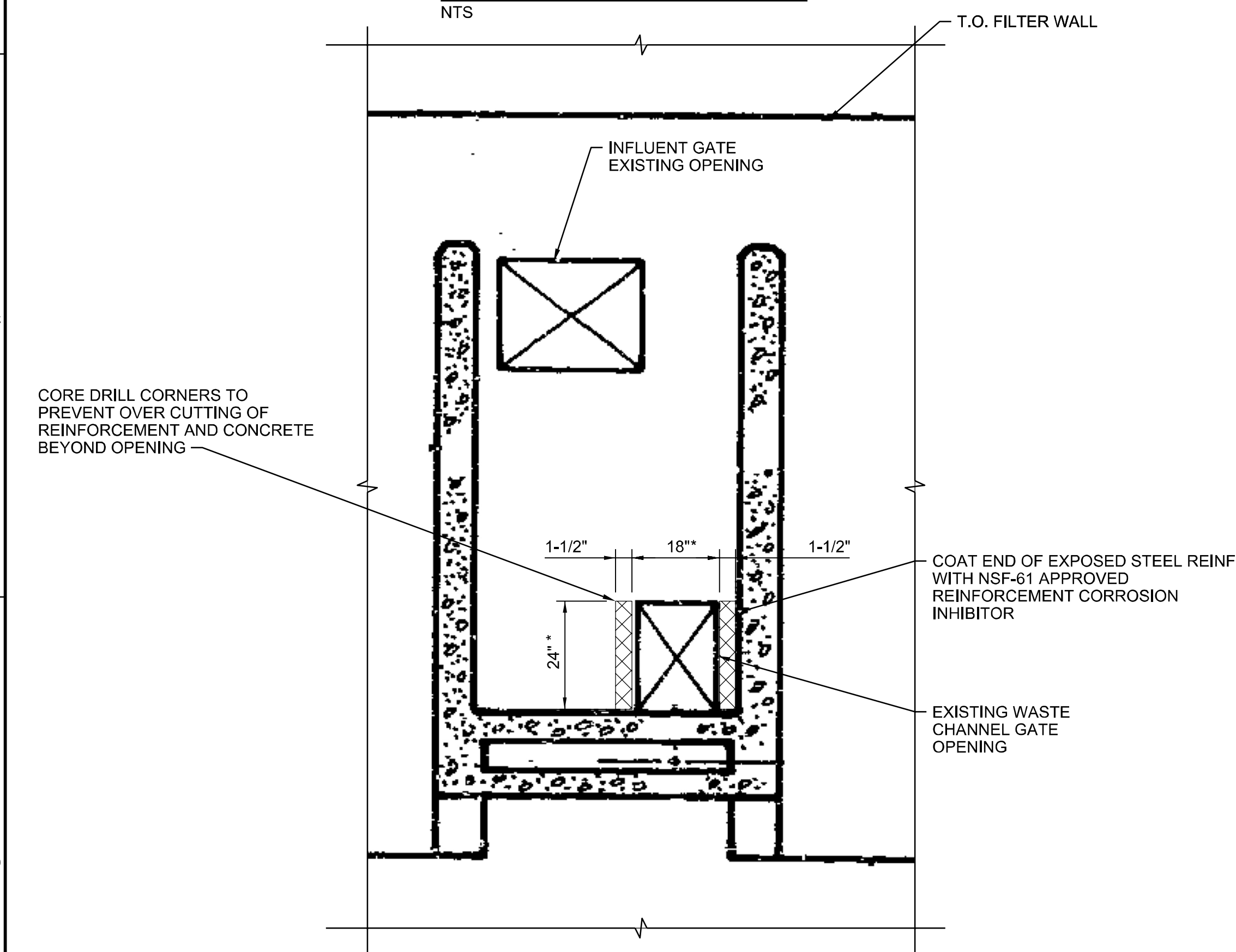
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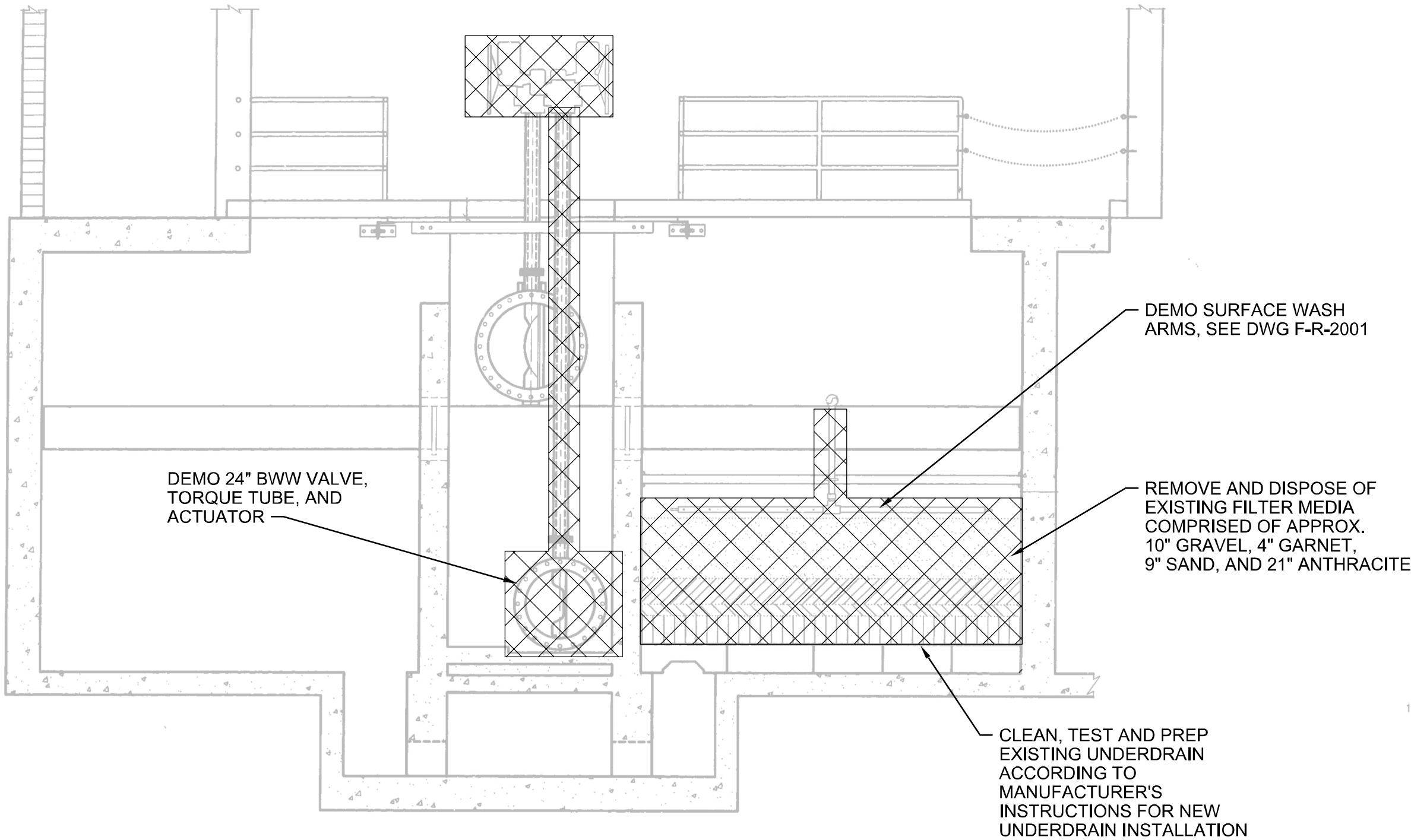
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FILTERS 7-9 SECTION - TYPICAL FI GATE AND BWW VALVE, MEDIA AND UNDERDRAIN DEMO



FILTERS 4-9 SECTION - TYPICAL WASTE CHANNEL GATE OPENING DEMO



FILTERS 10-12 SECTION - TYPICAL FI AND BWW GATE AND MEDIA DEMO



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JACOBS	RALSTON WATER TREATMENT PLANT FILTER IMPROVEMENTS PROJECT CITY OF ARVADA ARVADA, COLORADO
	DEMOLITION FILTERS 7-12 DEMO SECTIONS

DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-R-3001
SHEET	34 of 68

A

B

C

D



F-D-2002

A large industrial facility, likely a water treatment plant, featuring massive blue pipes, yellow overhead cranes, and various mechanical components. The scene is filled with complex piping, structural steel, and industrial equipment, creating a sense of scale and industrial complexity.

F-D-2002

[illegible]

ARLSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

	P ZELENAK	B KASPAR	B CARTER	P ZELENAK
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DEMOLITION DEMO AND PHOTO DETAILS

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

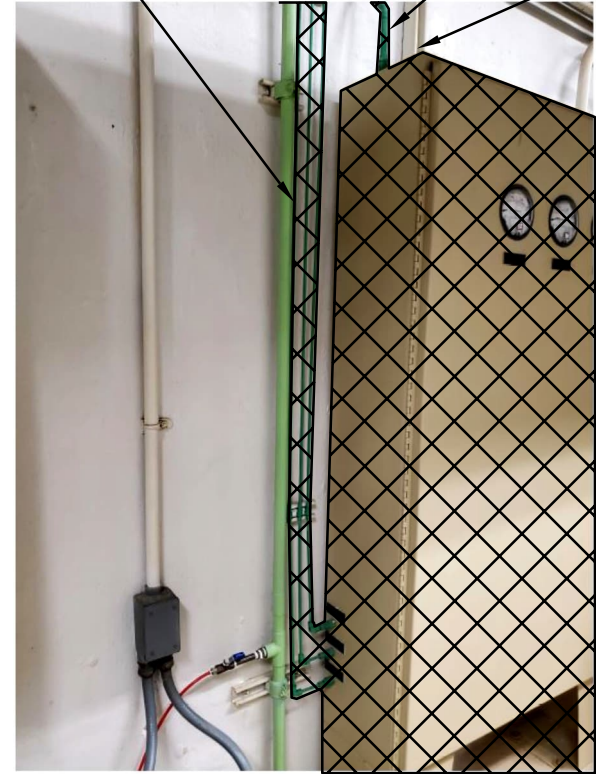
DATE	OCTOBER 2022
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PROJ	WXXZ9601
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DWG	F-R-5003
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SHEET 37 of 68

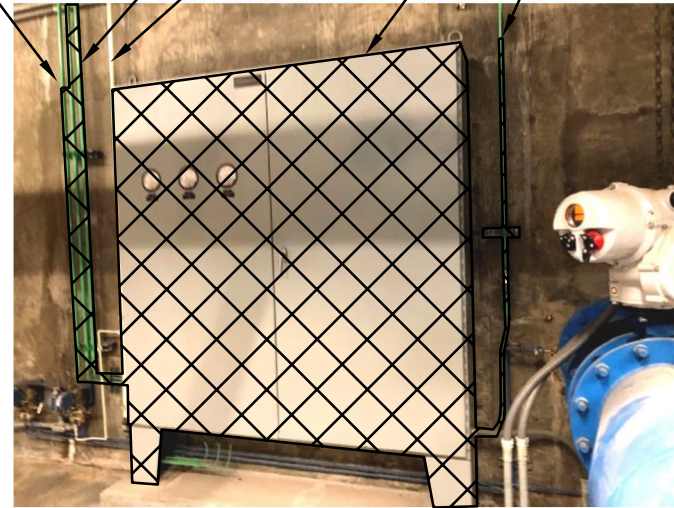
312



25 PHOTO
NTS
F-D-2002



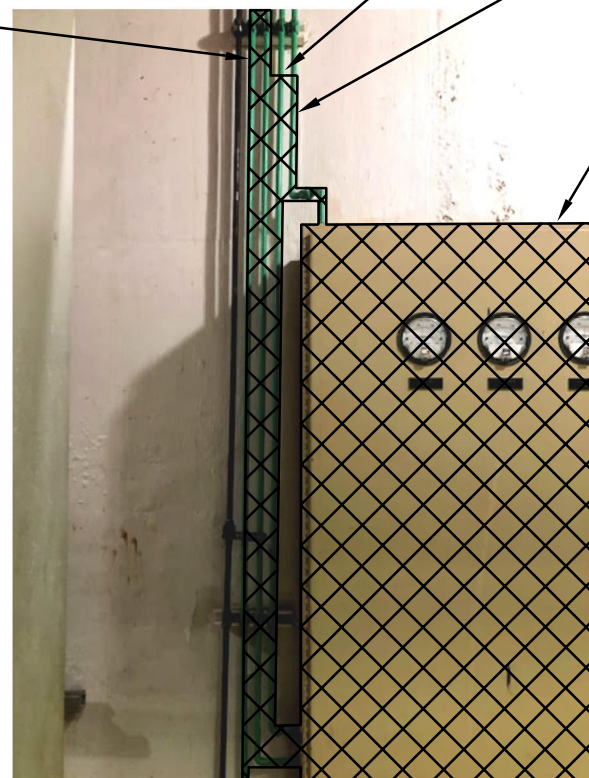
26 PHOTO
NTS
F-D-2002



27 PHOTO
NTS
F-D-2005



28 PHOTO
NTS
F-D-2005



29 PHOTO
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F-D-2003



30 PHOTO
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F-D-2003



31 PHOTO
NTS
F-D-2003

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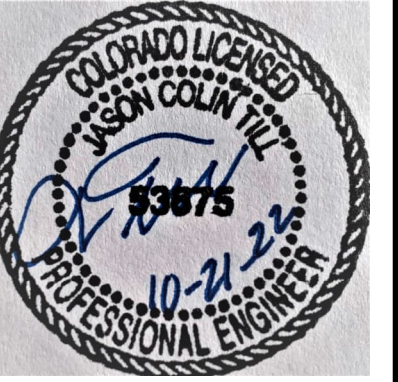
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DEMOLITION DEMO AND PHOTO DETAILS

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING. 0  1"	
DATE	OCTOBER 2022
PROJ	WXXXZ9601
DWG	F-R-5006
SHEET	40 of 68

612 FINAL DESIGN

[illegible]

WALSTON WATER TREATMENT PLANT
CITY OF ARVADA
ARVADA, COLORADO

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BACKWASH PIPING REPLACEMENT MODIFICATIONS PLAN

SCALE

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ORIGINAL DRAWING.

DATE OCTOBER 2022

ROJ	WXXZ9601
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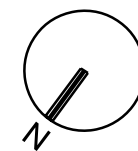
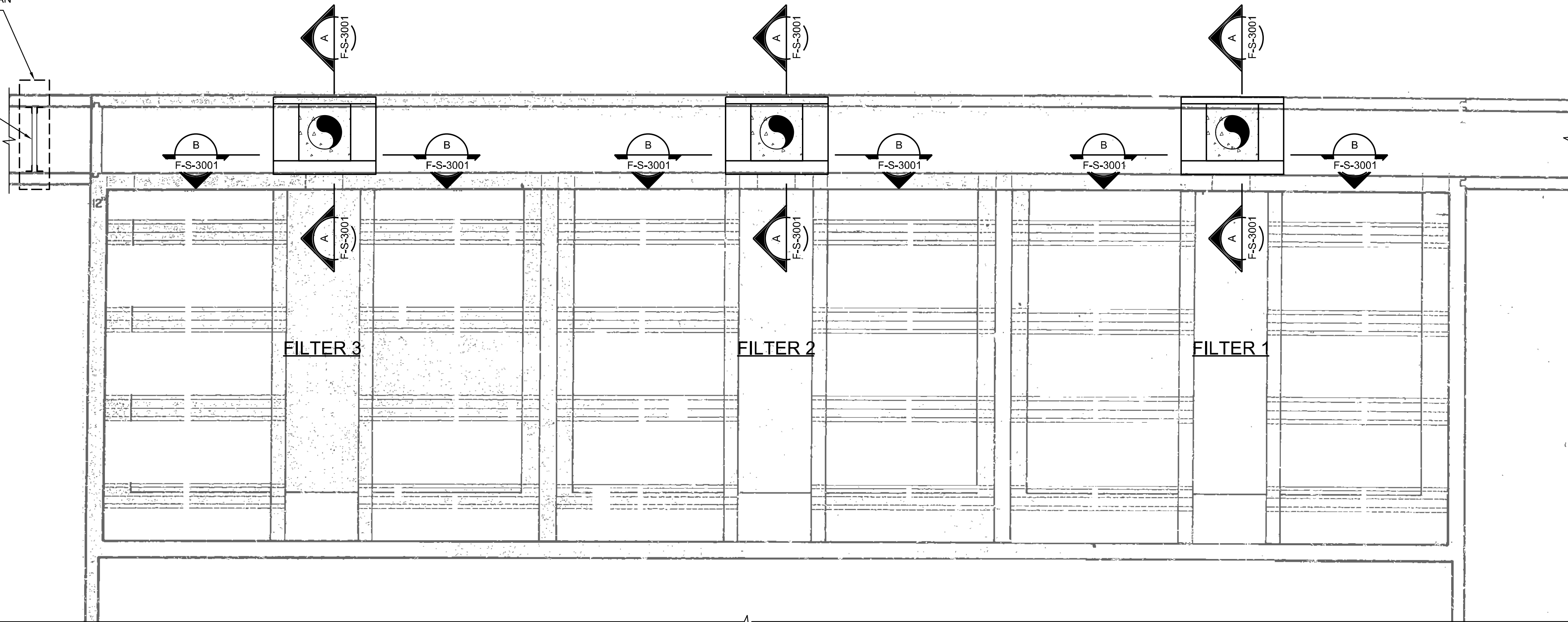
WG	F-S-2001
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HEET 42 of 68

FINAL DESIGN



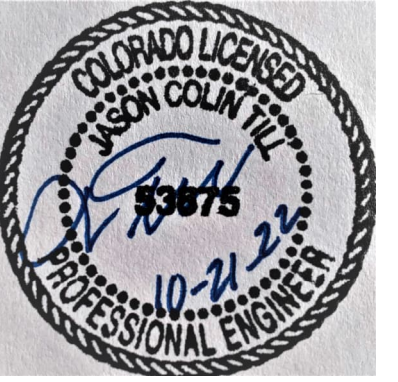
NEW GATE, SEE MECH
PLANS



TYPICAL FILTER PLAN FOR FILTERS 1-3

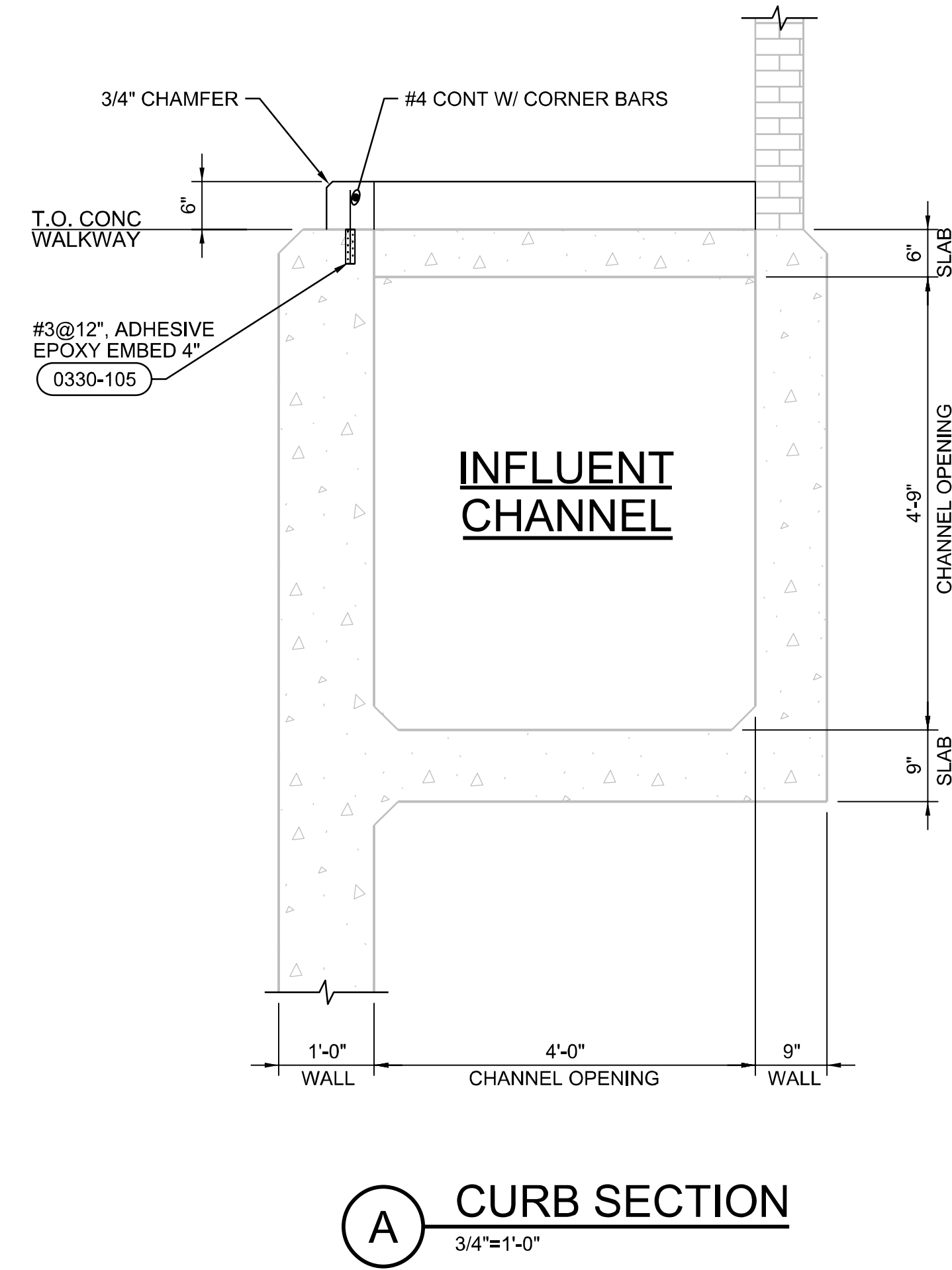
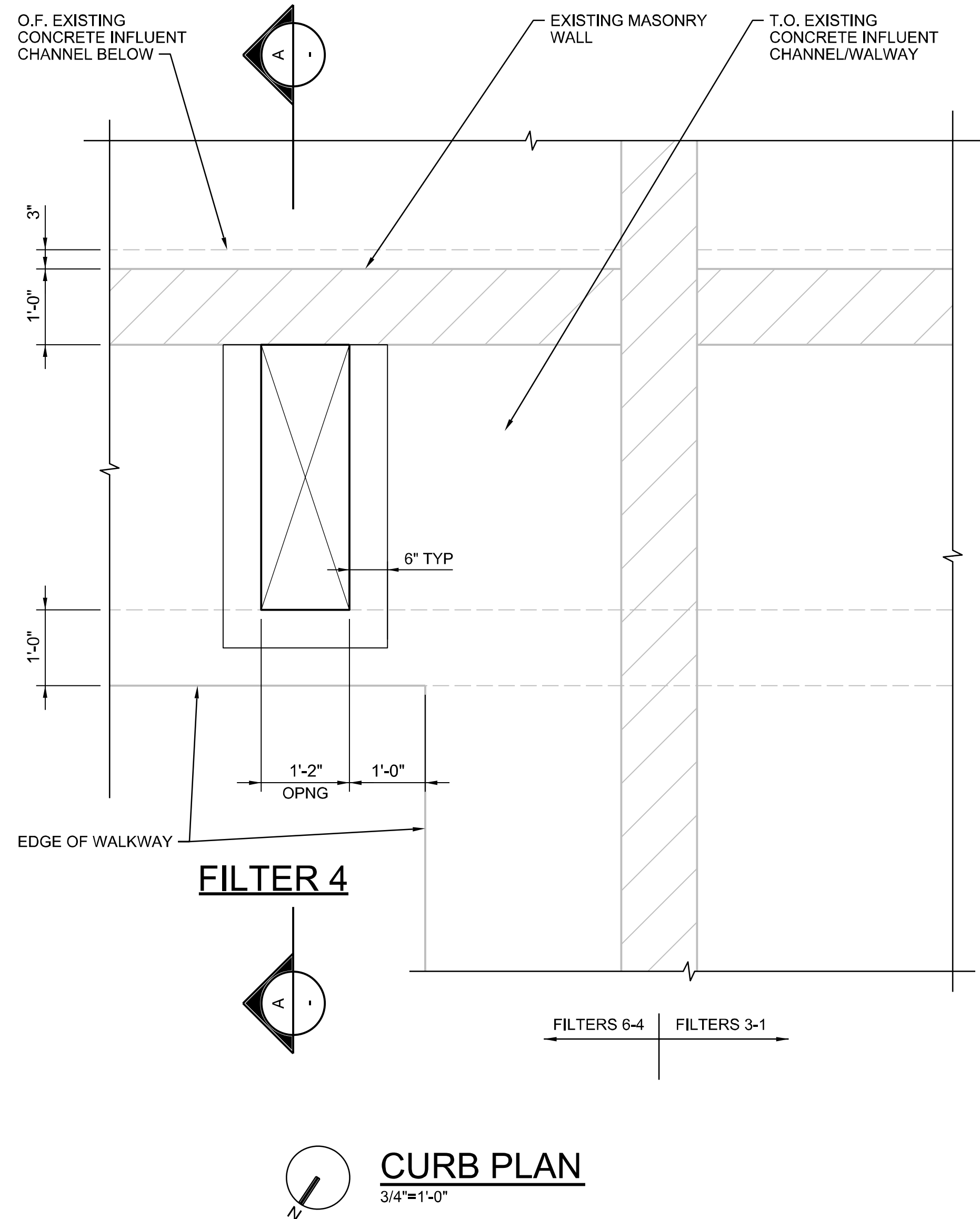
GENERAL NOTES

1. ALL EXISTING DIMENSIONS AND WALL THICKNESSES SHOWN ON THIS SHEET WERE TAKEN FROM THE RECORD DRAWINGS PROVIDED BY THE OWNER ENTITLED "CITY OF ARVADA COLORADO PROJECT NO. 65-6-W" PREPARED BY T.V. GAREL CONSULTING ENGINEER, MARCH 1966. ACTUAL DIMENSIONS MAY VARY AND SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO START OF DEMOLITION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF DISCREPANCIES.

[illegible]

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STRUCTURAL DEMO PLAN AND DETAILS FOR INFLUENT CHANNEL ISOLATION GATE

FILTER IMPROVEMENTS PROJECT
ALSTON WATER TREATMENT PLANT
CITY OF ARVADA
ARVADA, COLORADO

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

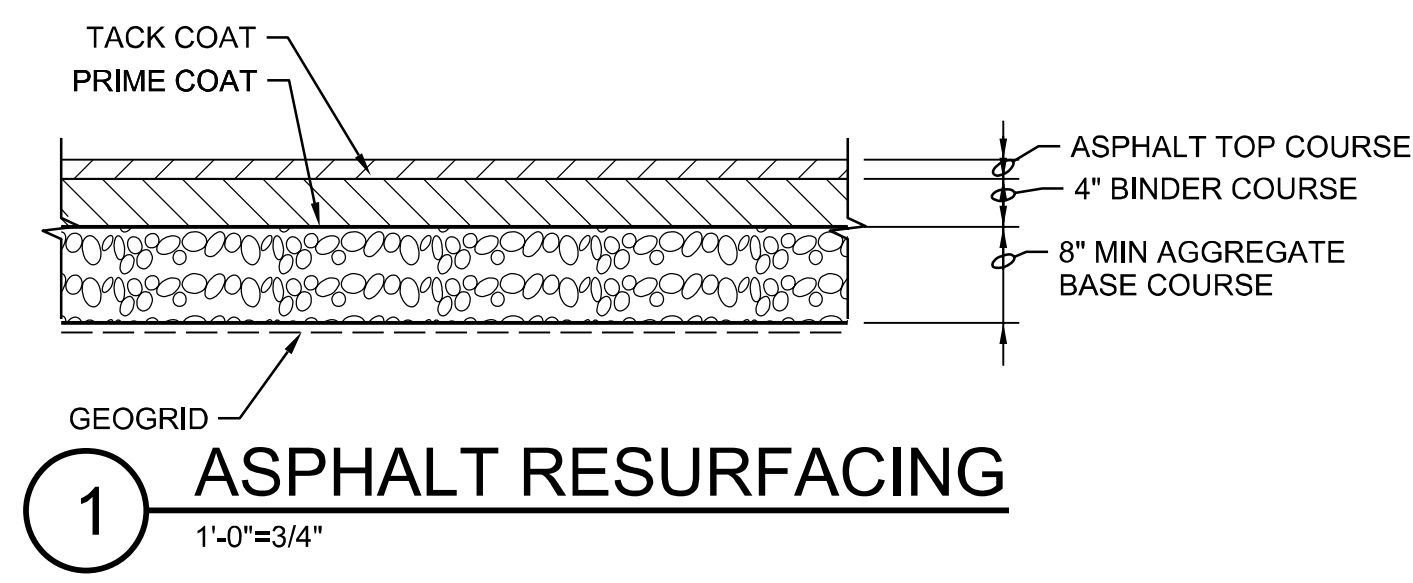
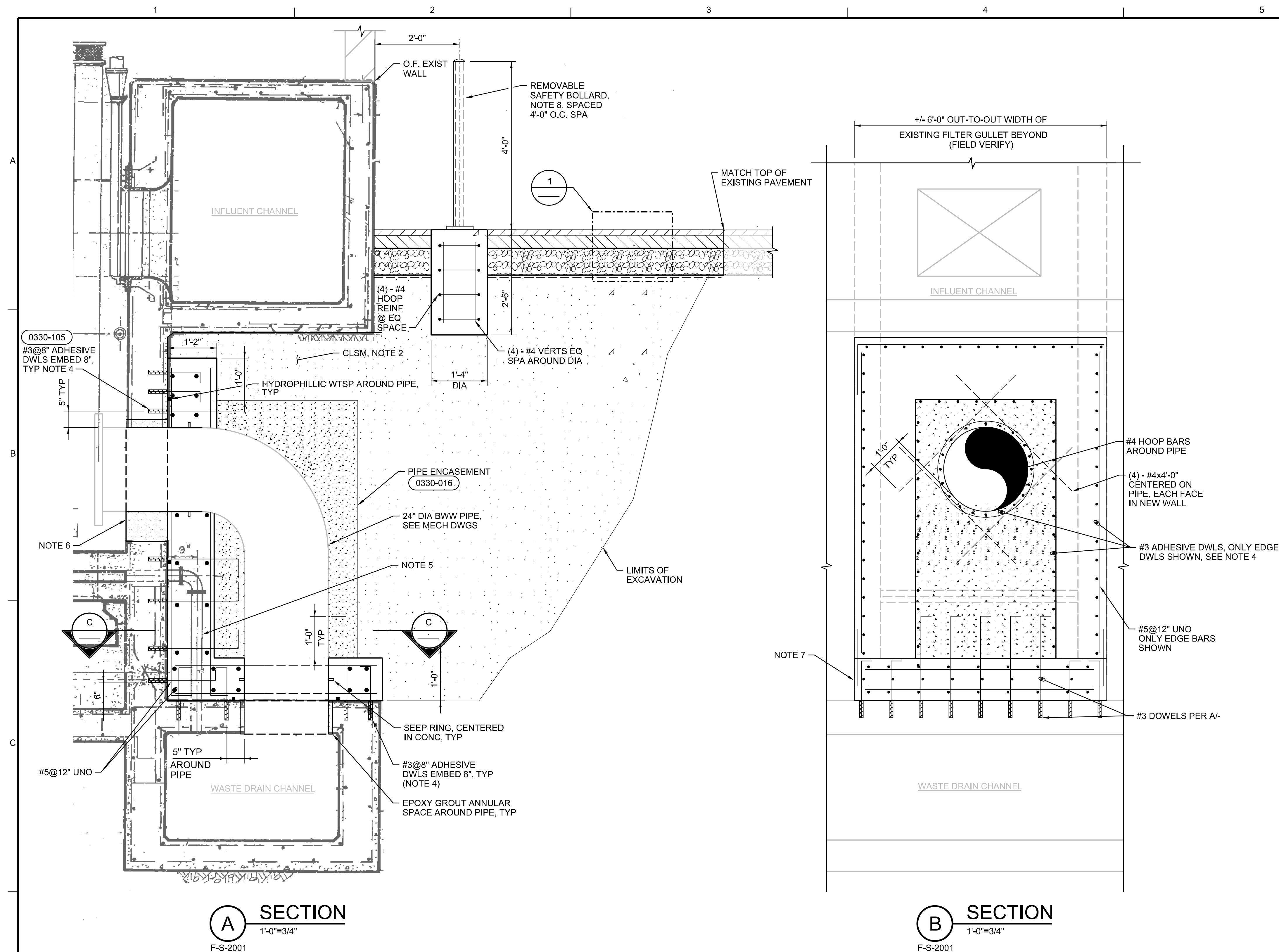
DATE	OCTOBER 2022
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PROJ	WXXZ9601
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DWG	F-S-2002
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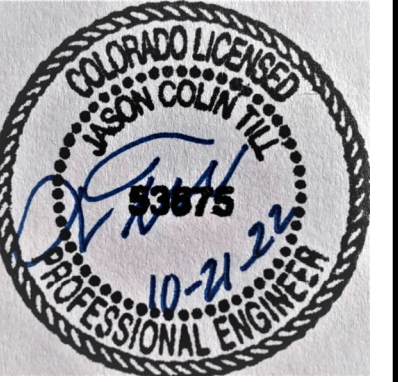
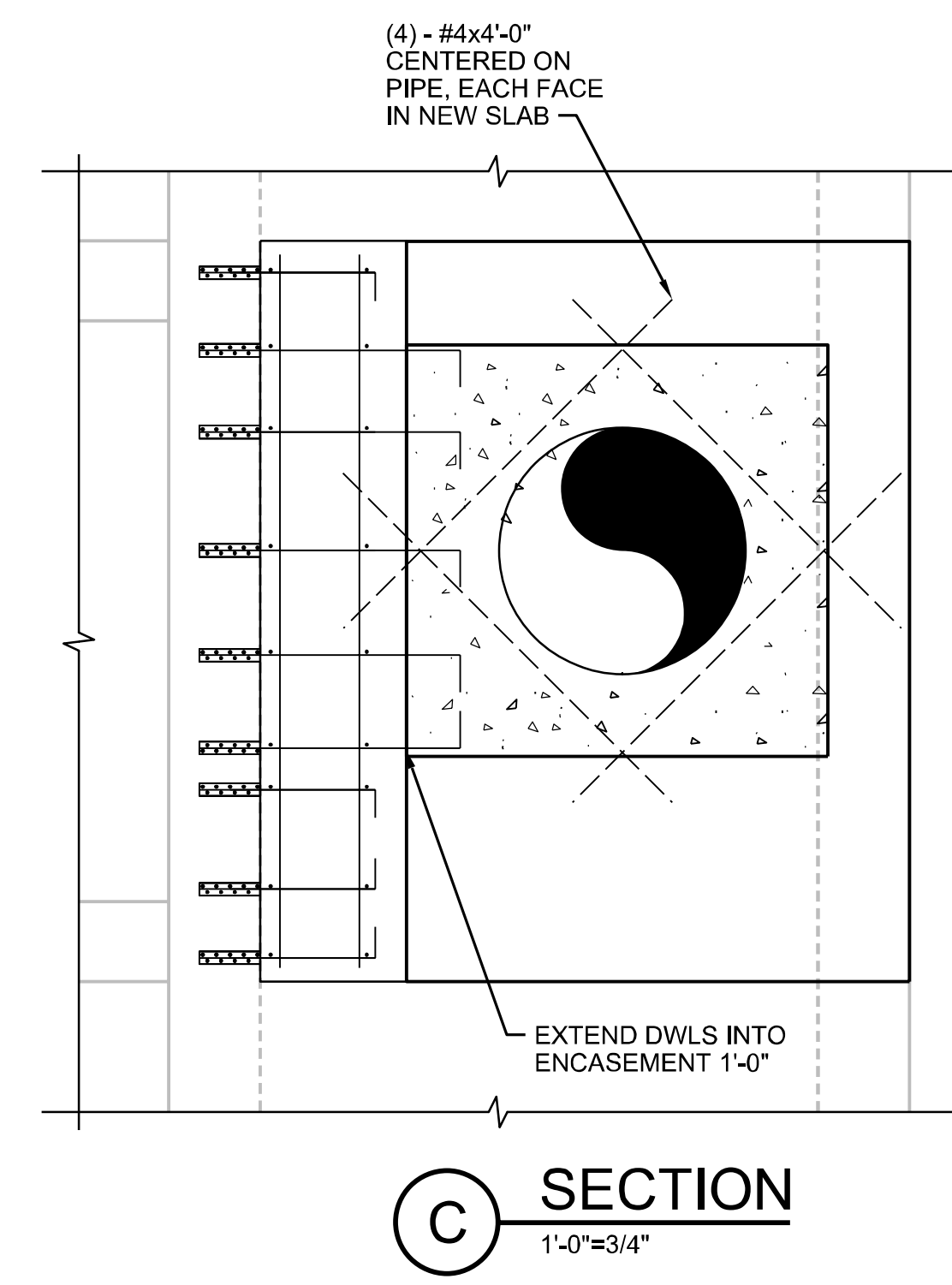
SHEET 43 of 68

FINAL DESIGN



GENERAL NOTES

1. ALL EXISTING DIMENSIONS AND WALL THICKNESSES SHOWN ON THIS SHEET WERE TAKEN FROM THE RECORD DRAWINGS PROVIDED BY THE OWNER ENTITLED "CITY OF ARVADA COLORADO PROJECT NO. 65-6-W" PREPARED BY T.V. GAREL CONSULTING ENGINEER, MATCH 1966. ACTUAL DIMENSIONS MAY VARY AND SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE START OF DEMOLITION. CONTRACTOR SHALL NOTIFY ENGINEER OF DISCREPANCIES.
2. BACKFILL ENTIRE EXCAVATION WITH CLSM. CLSM SHALL BE PLACED IN MAXIMUM LIFTS OF 2 FEET.
3. INFLUENT CHANNEL SHORING SHALL NOT BE REMOVED PRIOR TO CLSM BEING INSTALLED AND REACHING DESIGN STRENGTH. SHORING MAY BE DESIGNED TO STAY IN PLACE AFTER CONSTRUCTION.
4. DOWELS ARE SPACED IN A GRID HORIZONTALLY AND VERTICALLY ACROSS ENTIRE SURFACE WHERE NEW CONCRETE IS IN CONTACT WITH EXISTING. PRIOR TO DRILLING HOLES, SCAN AND LOCATE EXST REINF IN CONC. ADJUST LOCATION OF REINF TO AVOID EXST REINF BARS. DO NOT CUT EXST REINF. ROUGHEN ENTIRE SURFACE TO 1/4" AMPLITUDE PRIOR TO PLACING NEW CONCRETE.
5. VERIFY LOCATION OF EXST DRAIN PIPE IN FIELD. PROVIDE MINIMUM 2" CONC COVER OVER PIPE.
6. FILL SPACE BETWEEN PIPE AND EXST CONC WITH CONCRETE REPAIR MORTAR OR REPAIR GROUT. FOR DEPTHS EXCEEDING 4", CONCRETE REPAIR MORTAR IS REQUIRED.
7. SLAB MUST ACHIEVE FULL DESIGN STRENGTH PRIOR TO PLACING WALL AND PIPE ENCASEMENT.
8. PROVIDE VESTIL BOL-RF-48-4.5 SURFACE MOUNTED REMOVABLE STEEL PIPE SAFETY BOLLARDS, 4-1/2" OD, 48" HEIGHT, YELLOW (OR EQUAL).

[illegible]

SECTION
1'-0"=3/4"

NT ON	FILTER IMPROVEMENTS PROJECT RALSTON WATER TREATMENT PLANT CITY OF ARVADA ARVADA, COLORADO
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Jacobs.

BACKWASH PIPING REPLACEMENT MODIFICATIONS PLAN AND SECTION

VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0  1"	
DATE	OCTOBER 2022
PROJ	WXXZ9601
WG	F-S-3001
SHEET	44 of 68

FINAL DESIGN

GENERAL NOTES

1. LEVEL ELEMENTS AND TRANSMITTERS SHALL BE INSTALLED ON UPPER LEVEL. MOUNT LEVEL ELEMENT INSIDE FILTER BOX, ON VERTICAL WALL FACE A MAXIMUM OF 6" BELOW FINISHED FLOOR. LEVEL ELEMENT SHALL BE PLACED CLEAR OF THE PATH OF THE SURFACE WASH ARMS.
2. FILTER SMART ELEMENTS AND TRANSMITTERS SHALL BE INSTALLED ON UPPER LEVEL. FILTERSMART ELEMENT SHALL BE PLACED CLEAR OF THE PATH OF THE SURFACE WASH ARMS.
3. INSTALL V301 ISOLATION BALL VALVE AND NEW COMBINATION AIR VALVE ON EXISTING 2" NIPPLE AFTER DEMOLISHING EXISTING 2" AIR/VACUUM VALVE.
4. CONTRACTOR SHALL PERFORM TESTING TO VERIFY FUNCTIONALITY OF ALL EXISTING AIR RELEASE VALVES ON THE BACKWASH SUPPLY PIPING SYSTEM. NOTIFY OWNER IF ANY AIR RELEASE VALVES ARE NOT FUNCTIONAL.
5. DIMENSION IS DISTANCE FROM EDGE OF OVERHANG.
6. WHERE CONNECTING NEW PIPING AND ACCESSORIES TO EXISTING PIPING, CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS TO ENSURE PROPER FIT-UP AND CONNECTION WITH EXISTING PIPING.

[illegible]

ARLSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

PROCESS MECHANICAL FILTERS 1, 2, AND 3 PLAN

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING

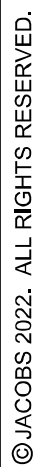
DATE	OCTOBER 2022
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PROJ	WXXZ9601
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DWG F-D-2002

SHEET 45 of 68

FINAL DESIGN



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PROCESS MECHANICAL
FILTERS
COMBINED FILTER EFFLUENT
SAMPLE PUMP PLAN

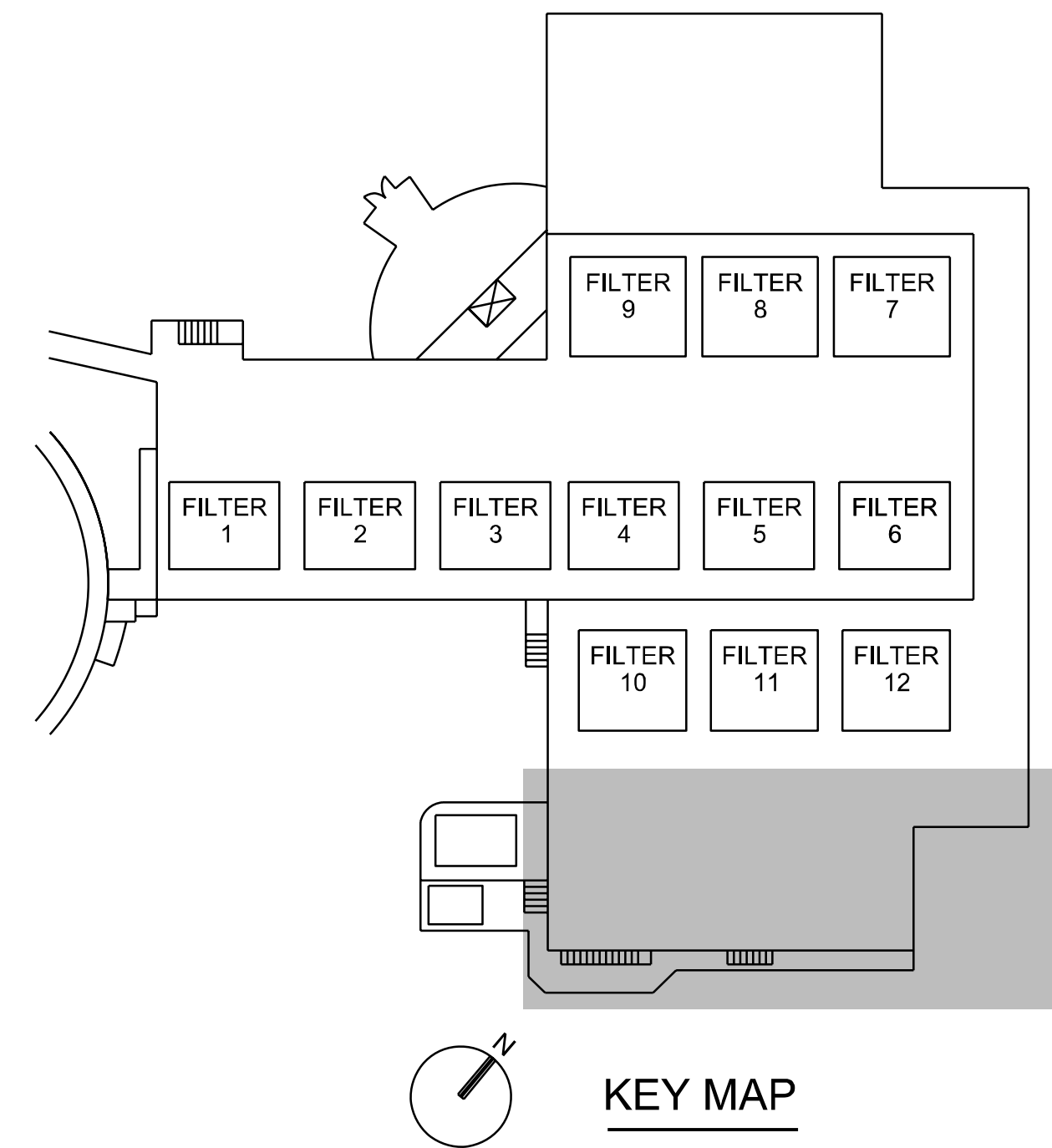
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FILTERS COMBINED FILTER EFFLUENT SAMPLE PUMP PLAN

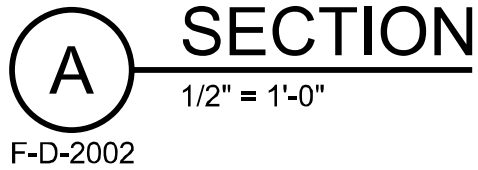
06	01	22	FINAL DESIGN
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BAR IS ONE INCH ON
ORIGINAL DRAWING.

SHEET 48 of 68



KEY MAP



1. FILTER 1 BACKWASH AND EFFLUENT PIPING AND VALVE MODIFICATIONS ARE IDENTICAL TO MODIFICATIONS SHOWN FOR FILTER 2.
2. CONTRACTOR SHALL INSTALL NEW BALL VALVE ON TOP OF FILTER EFFLUENT ELBOWS AFTER DISCHARGE FROM FILTER (TYPICAL ALL FILTERS). ELBOWS HAVE EXISTING THREADED TAPS THAT SHALL BE USED FOR CONNECTION TO BALL VALVE. CONTRACTOR SHALL FIELD VERIFY AND CONFIRM THE SIZE OF THE TAPS BEFORE PURCHASING BALL VALVES.
3. EXISTING FLEXIBLE COUPLING SHALL BE TEMPORARILY REMOVED AND RE-INSTALLED. NEW GASKETS SHALL BE PROVIDED FOR THE EXISTING COUPLING. EXISTING THRUST TIE LUGS ON ELBOW SHALL BE REUSED, NEW THRUST TIE LUGS SHALL BE PROVIDED ON THE NEW PIPING AND NEW TIE RODS SHALL BE INSTALLED.
4. CONTRACTOR SHALL FIELD ROUTE AND SUPPORT PIPING FROM THREADED OUTLET TO EFFLUENT SAMPLE PUMP SUCTION. LOCATE OUTLET ON SIDE OF PIPE CLOSEST TO THE EXISTING SAMPLE PUMP. SUPPORT SAMPLE PUMP PIPING, AND INSTRUMENT TUBING, USING 4005-500, 4005-527, AND 4005-521 AS REQUIRED. PROVIDE BRANCH FROM SUCTION LINE TO EXISTING LOW HEAD TRANSMITTER. FIELD VERIFY REQUIRED SIZE FOR CONNECTION TO EXISTING LOW HEAD TRANSMITTER. PROVIDE 1/4 INCH BRANCH FOR CONNECTION TO EXISTING TURBIDITY ANALYZER.

[illegible]

ARLSTON WATER TREATMENT PLANT
FILTRE IMPROVEMENT'S PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

PROCESS MECHANICAL
FILTERS 1, 2, AND 3
SECTION

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING, 0  1"	
DATE	OCTOBER 2022
PROJ	WXXZ9601
DWG	F-D-3001
SHEET	49 of 68

FINAL DESIGN

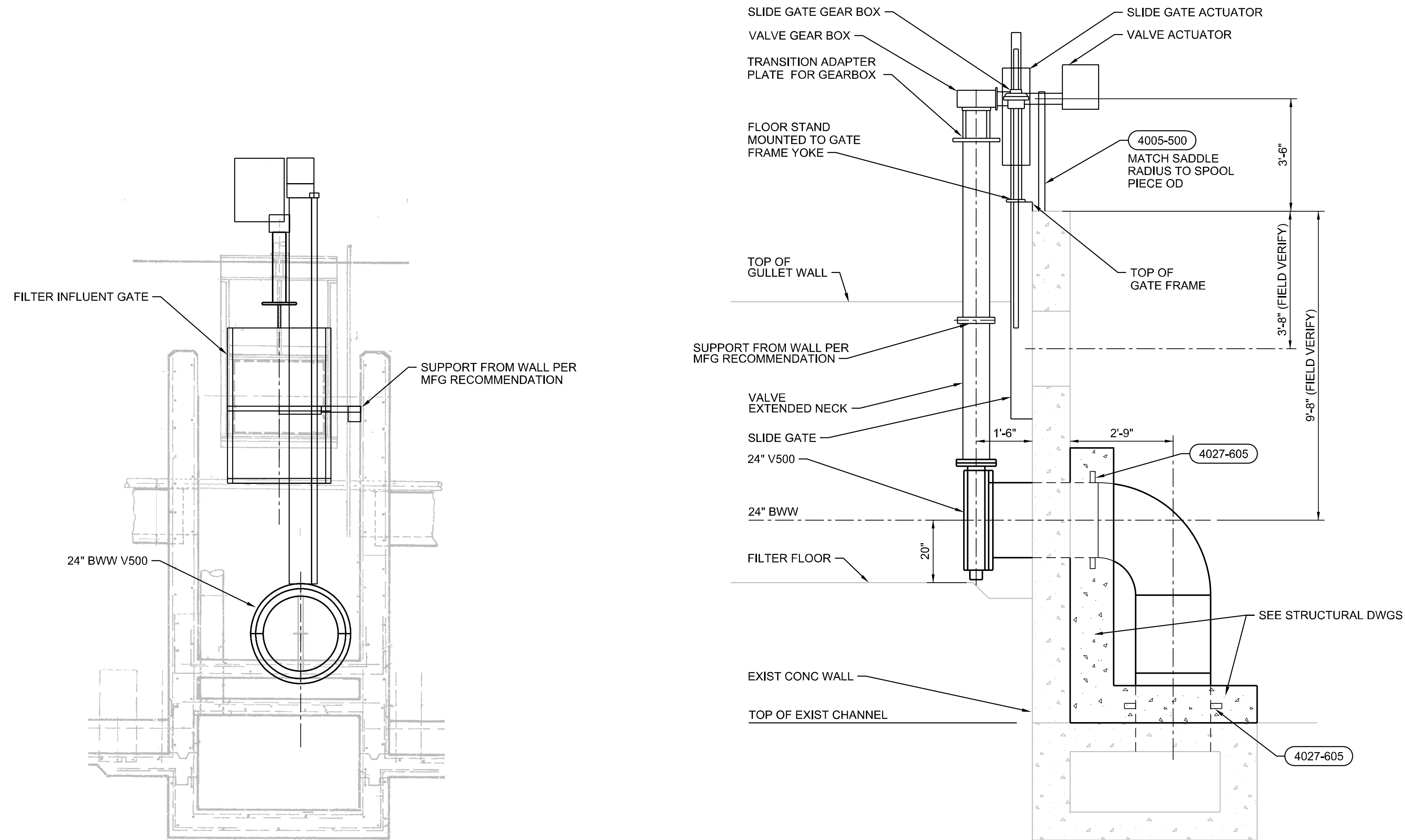
GENERAL NOTES

1. FILTER 1 BACKWASH AND EFFLUENT PIPING AND VALVE MODIFICATIONS ARE IDENTICAL TO MODIFICATIONS SHOWN FOR FILTER 2.
2. CONTRACTOR SHALL INSTALL NEW BALL VALVE ON TOP OF FILTER EFFLUENT ELBOWS AFTER DISCHARGE FROM FILTER (TYPICAL ALL FILTERS). ELBOWS HAVE EXISTING THREADED TAPS THAT SHALL BE USED FOR CONNECTION TO BALL VALVE. CONTRACTOR SHALL FIELD VERIFY AND CONFIRM THE SIZE OF THE TAPS BEFORE PURCHASING BALL VALVES.

[illegible]

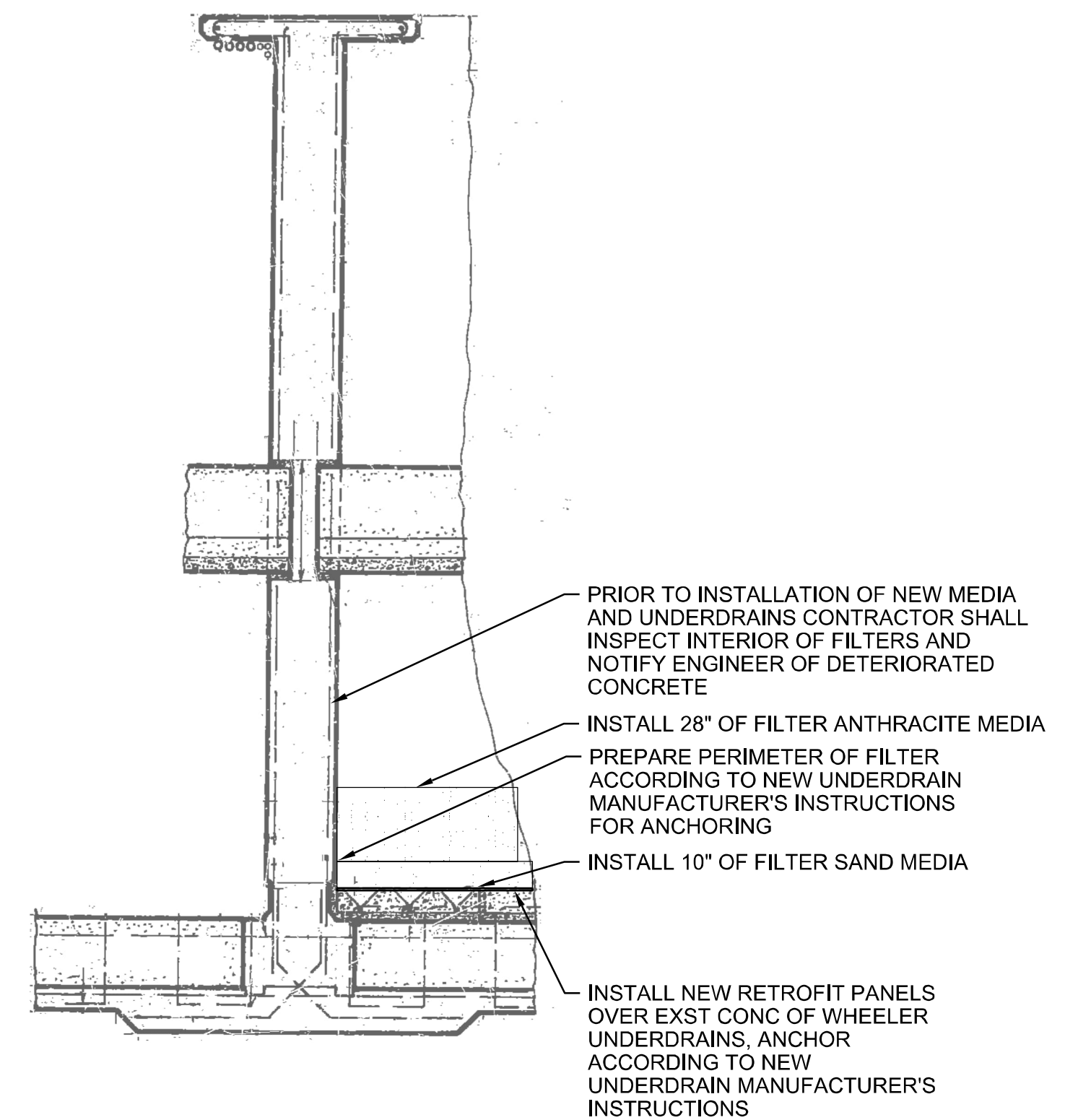
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B SECTION
1/2"=1'-0"
F-D-2002

SECTION
1/2"=1'-0"
F-D-2002



TYPICAL UNDERDRAIN AND MEDIA

D SECTION
NTS
F-D-2002

Jacobs

PROCESS MECHANICAL FILTERS 1, 2, AND SECTIONS

ARLSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

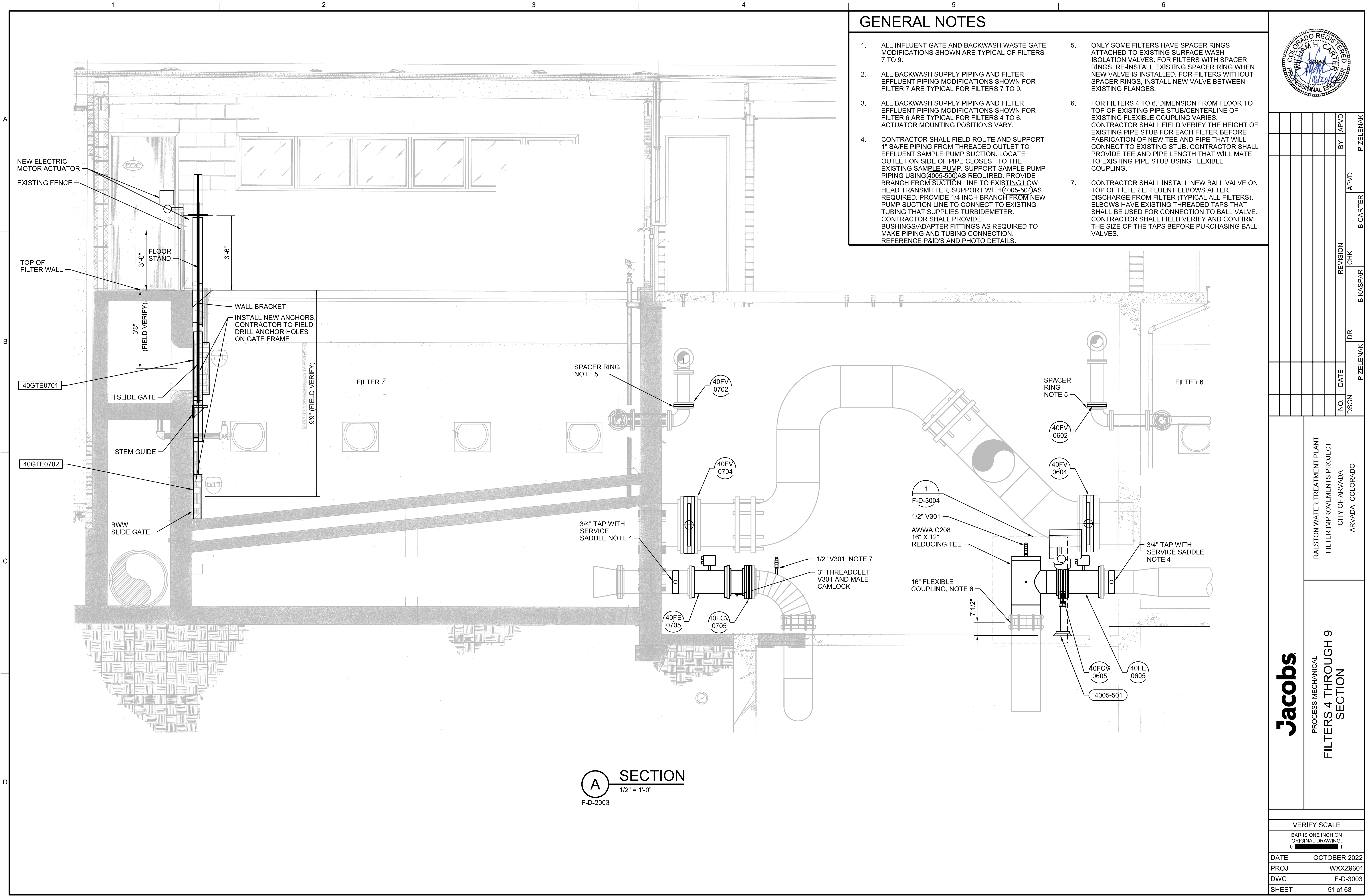
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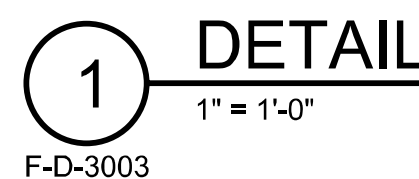
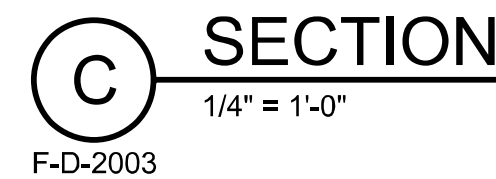
PROJ	WXX79601
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DWG	E-D-3002
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SHEET 50 of 68

FINAL DESIGN





1. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING THE EXISTING 16" EFFLUENT PIPE OD BEFORE FABRICATION OF TEE TO NSURE TEE CAN BE COUPLED TO EXISTING PIPE.
2. EXISTING DRAWINGS INDICATE PIPE STUB EXTENDS 7.5" FROM FLOOR, BUT FIELD CONDITIONS SHOW EXISTING COUPLINGS HAVE VARYING LENGTHS AND DISTANCES FROM FLOOR. CONTRACTOR IS RESPONSIBLE FOR VERIFYING REQUIRED TEE LENGTHS AND/OR MAKING FIELD ADJUSTMENTS AS REQUIRED TO ENSURE PROPER CONNECTION OF TEE TO EXISTING PIPE.

[illegible]

RALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

DEMOLITION FILTERS MCC-1 DEMOLITION PLAN AND FLOOR PLAN

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

DATE OCTOBER 2022

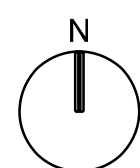
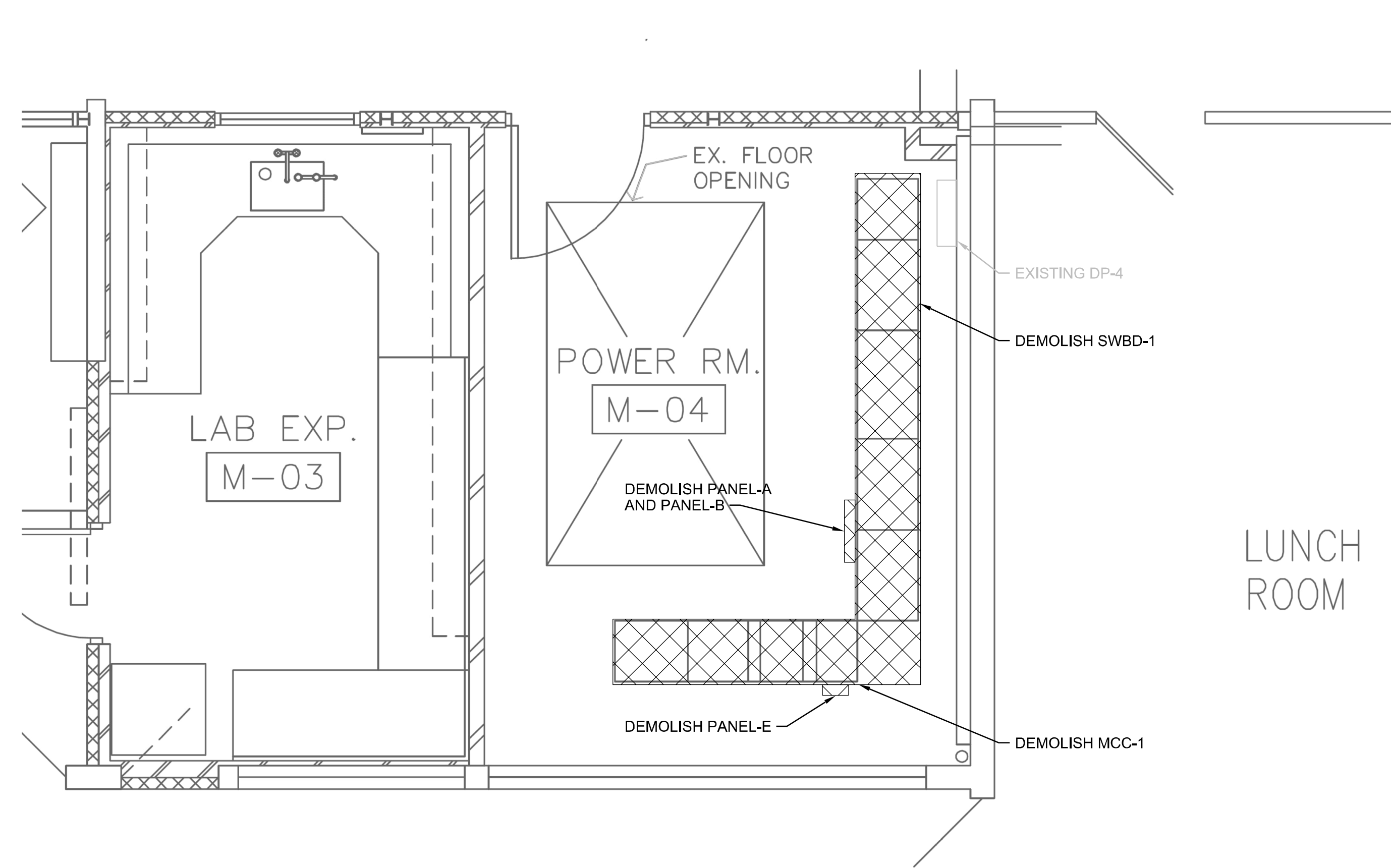
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WG	E-E-2001
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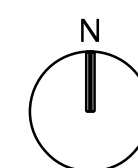
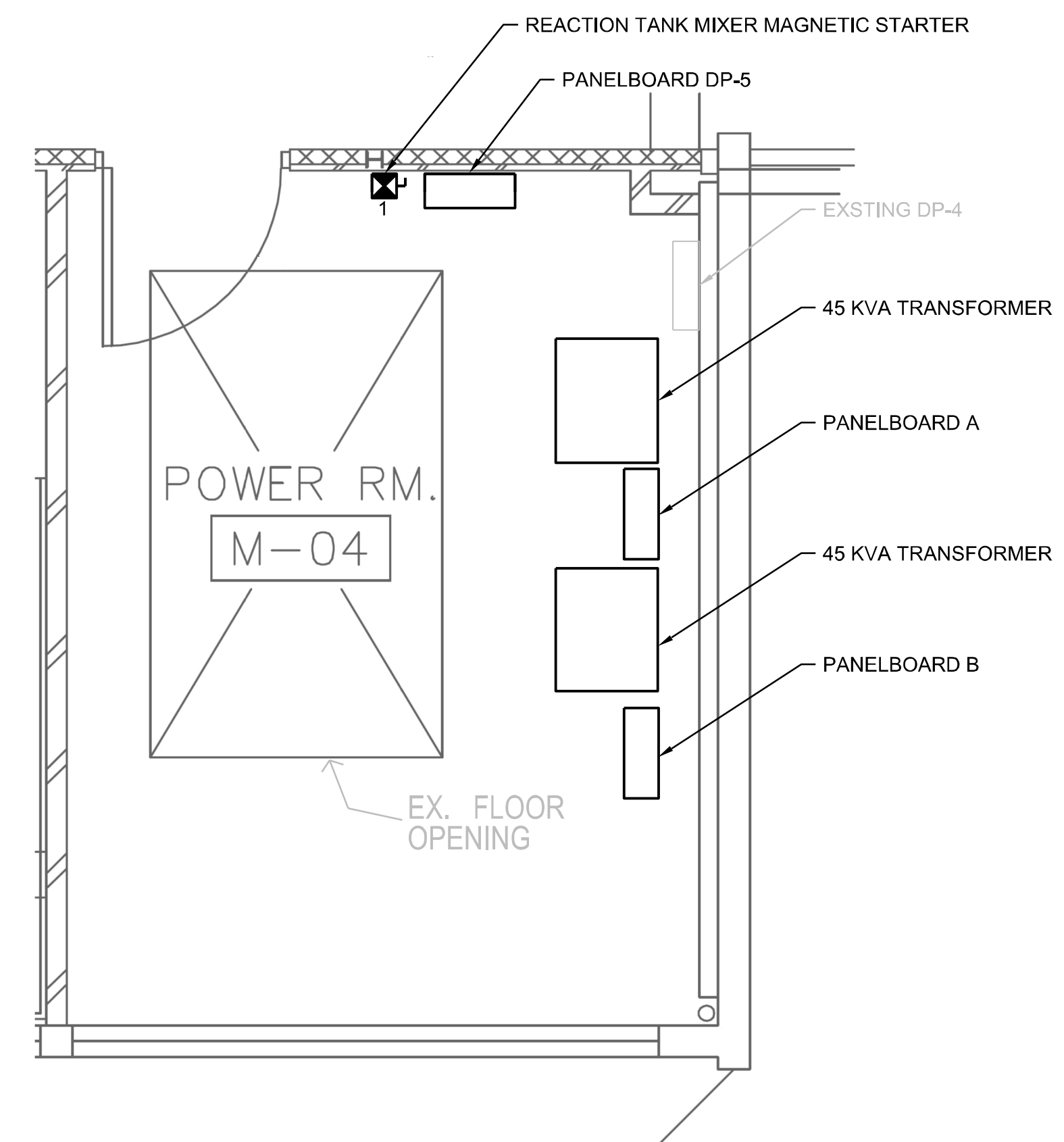
55 of 68

PILOT TIME: 12:50:33 PM

FINAL DESIGN



MCC-1 - DEMOLITION PLAN



MCC-1 ROOM - PLAN



SHEET KEYNOTES

1. EQUIPMENT OR DEVICES LOCATED ON UPPER LEVEL.
2. EQUIPMENT OR DEVICES LOCATED ON LOWER LEVEL.
3. REMOVE SURFACE WASH VALVES 1-9 FROM LP-1 AND INSTALL THEM ON PP-5.

[illegible]

RALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

ELECTRICAL FILTERS 1, 2, AND 3 PLAN

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.
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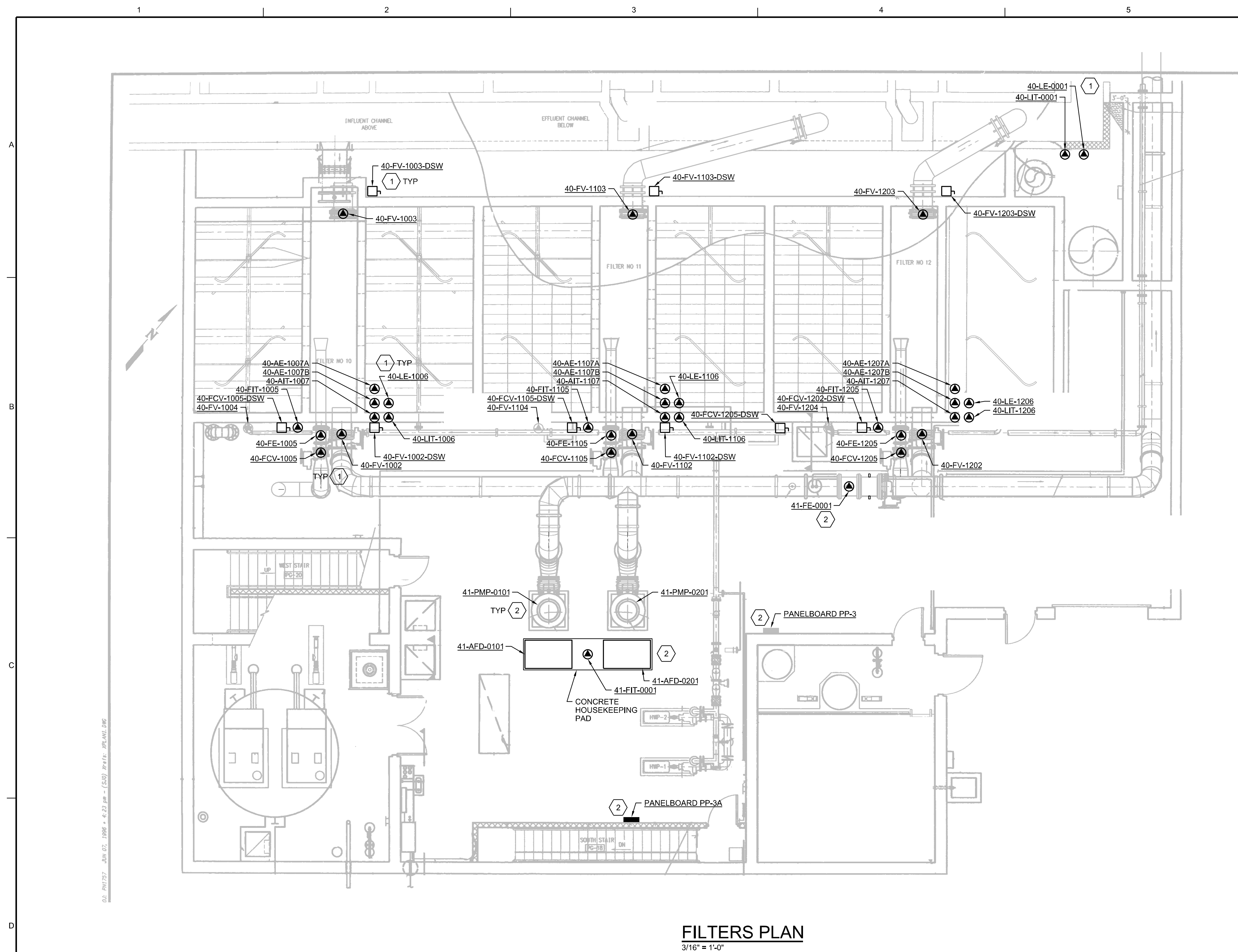
DATE	OCTOBER 2022
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PROJ	WXXZ9601
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DWG	F-E-2002
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SHEET 56 of 68

FINAL DESIGN



GENERAL NOTES

1. EXCEPT WHERE NOTED, DISCONNECT SWITCHES FOR GATE AND VALVE ACTUATORS ARE 30A, 3-POLE, WITH NEMA TYPE 4X 316 STAINLESS STEEL ENCLOSURE.
2. PANEL PP-3A IS FED FROM PANEL PP-3.



 SHEET KEYNOTES

1. EQUIPMENT OR DEVICES LOCATED ON UPPER LEVEL.
2. EQUIPMENT OR DEVICES LOCATED ON LOWER LEVEL.

[illegible]

	J NINSIWAN	A CUGLIATI	A COA	F ZELENAN
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ELECTRICAL
FILTERS 10, 11, AND 12
PLAN

4	1	2
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FINAL DESIGN

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

DATE	OCTOBER 2022
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PROJ	WXXZ9601
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DWG	F-E-2004
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SHEET 58 of 68

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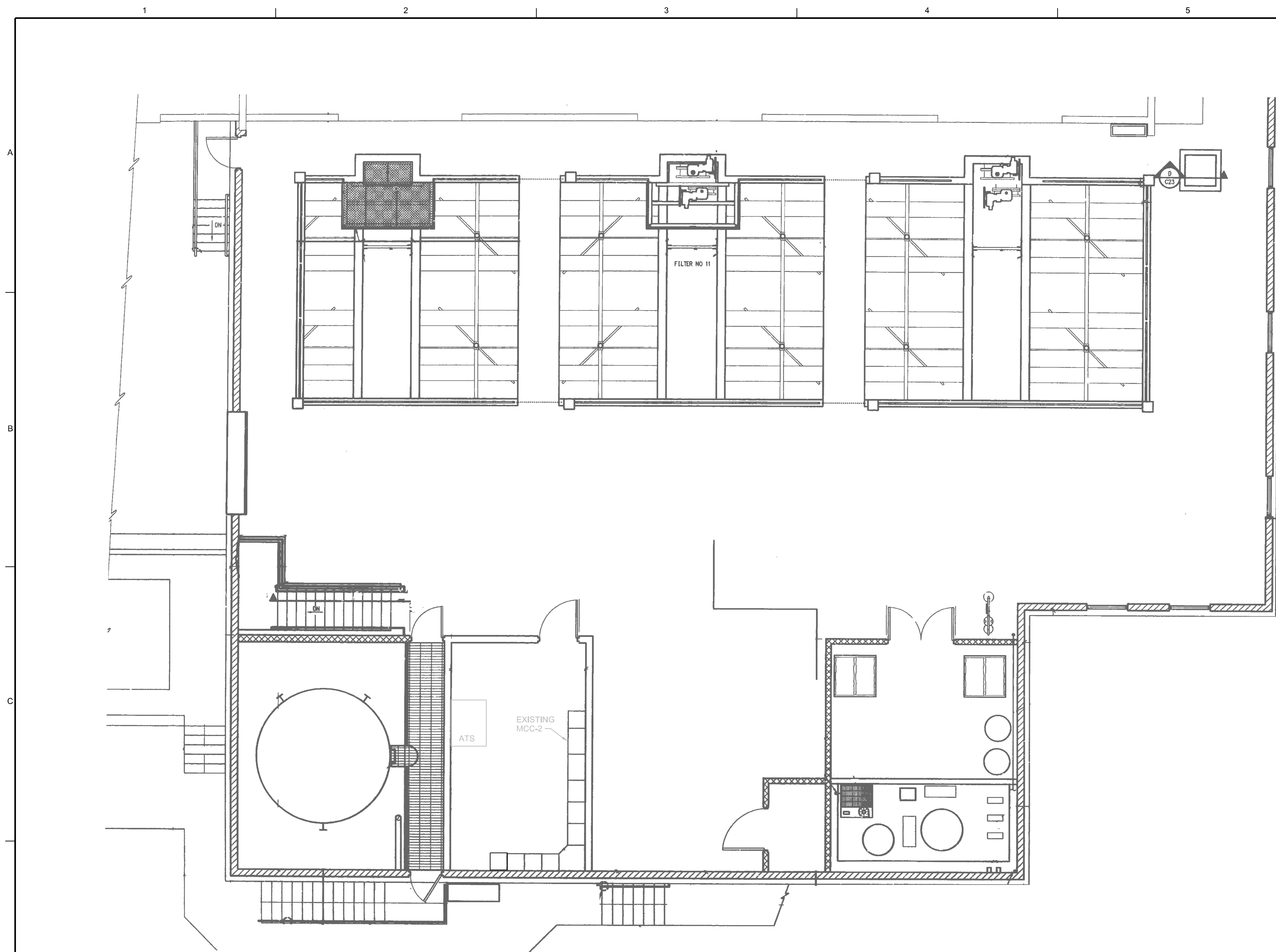
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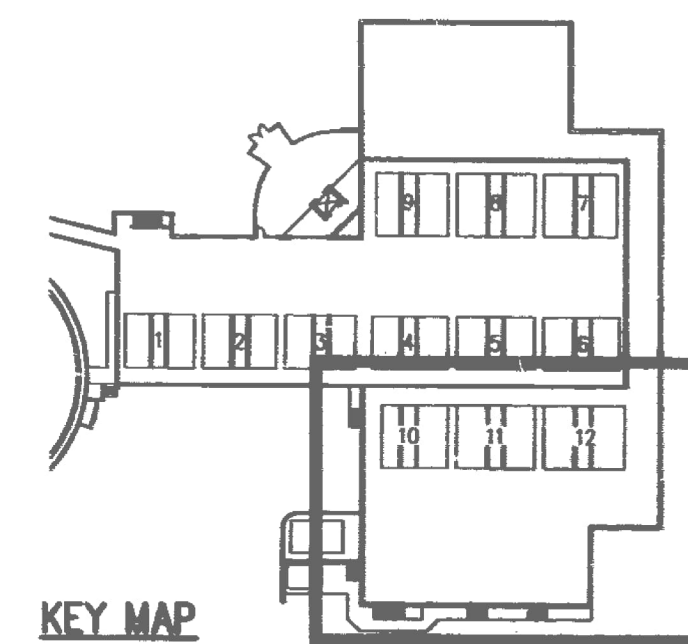
PLOT TIME: 2:58:11 PM

FILTERS PLAN

$$\underline{3/16'' = 1'-0''}$$



MAIN LEVEL PLAN

$$\underline{3/16'' = 1'-0''}$$


KEY MAP

[illegible]

FILTER IMPROVEMENTS PROJECT
 BRALSTON WATER TREATMENT PLANT
 CITY OF ARVADA
 ARVADA, COLORADO

Jacobs

ELECTRICAL

FILTERS 10, 11, AND 12

MAIN LEVEL PLAN

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

DATE	OCTOBER 2022
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PROJ	WXXZ9601
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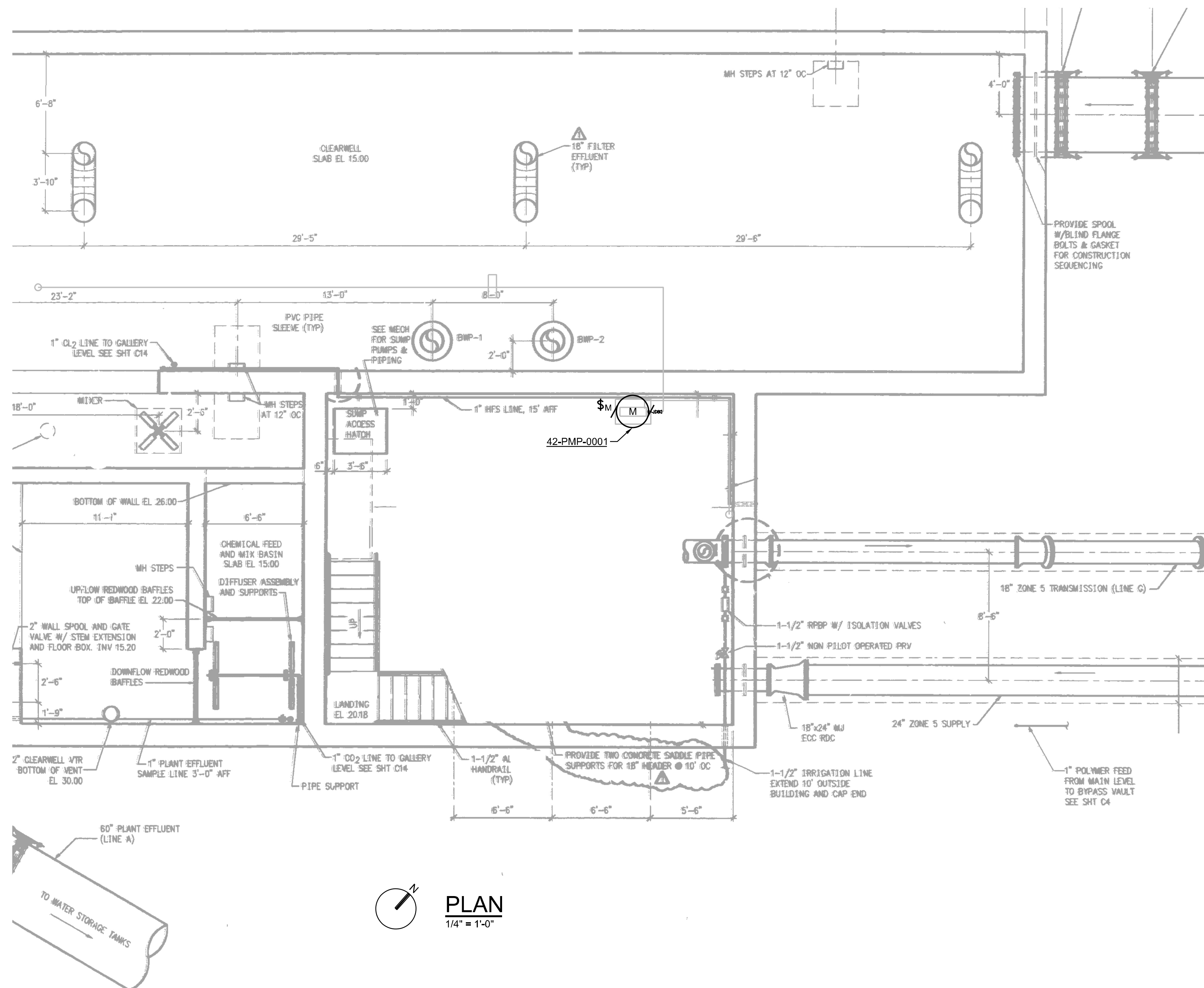
DWG	F-E-2005
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SHEET 59 of 68

PLOT TIME: 3:01:34 PM

05	01	22	FINAL DESIGN
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GENERAL NOTES

1. PUMP IS FED FROM PNL-A.

[illegible]

WALSTON WATER TREATMENT PLANT
FILTER IMPROVEMENTS PROJECT
CITY OF ARVADA
ARVADA, COLORADO

Jacobs

ELECTRICAL
FILTERS
FILTER EFFLUENT SAMPLE PUMP
PLAN

VERIFY SCALE

BAR IS ONE INCH ON
ORIGINAL DRAWING.

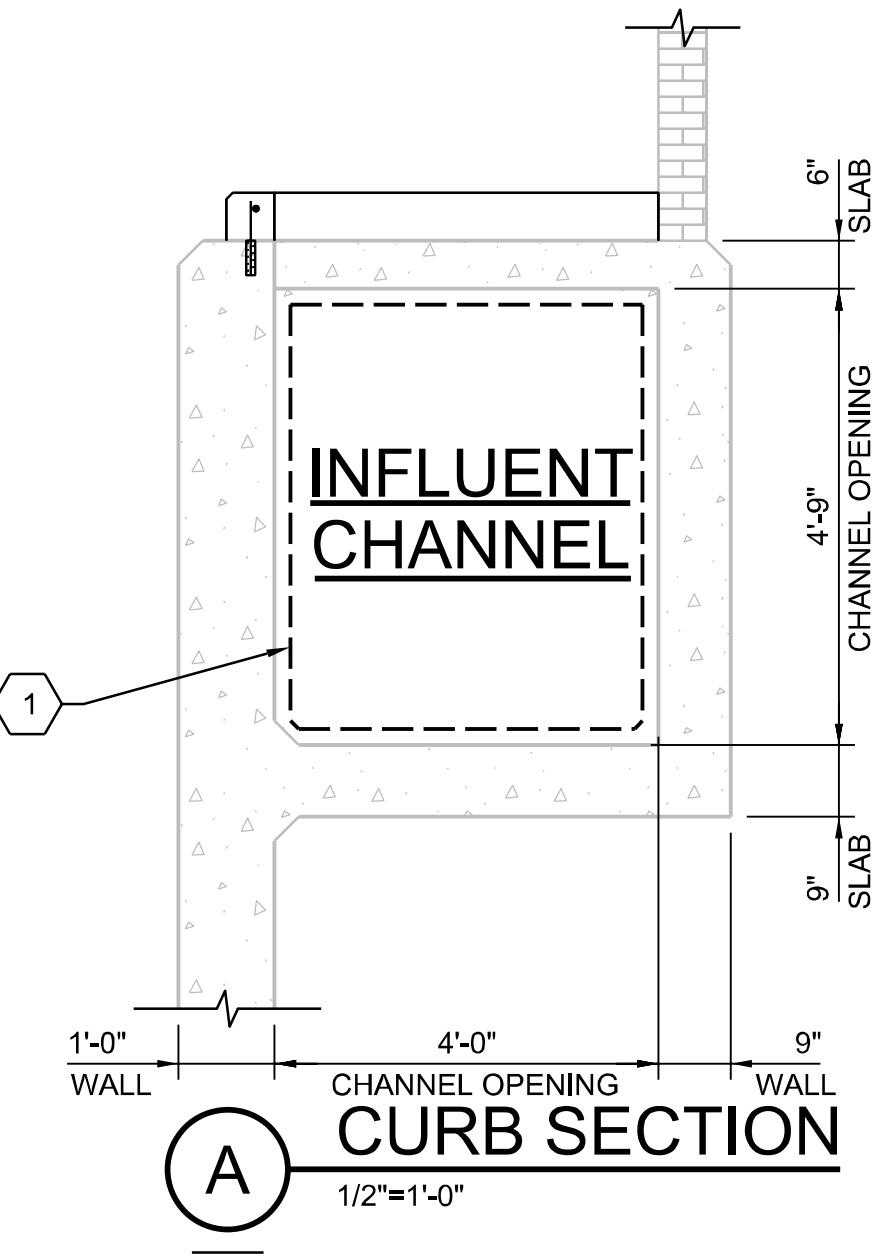
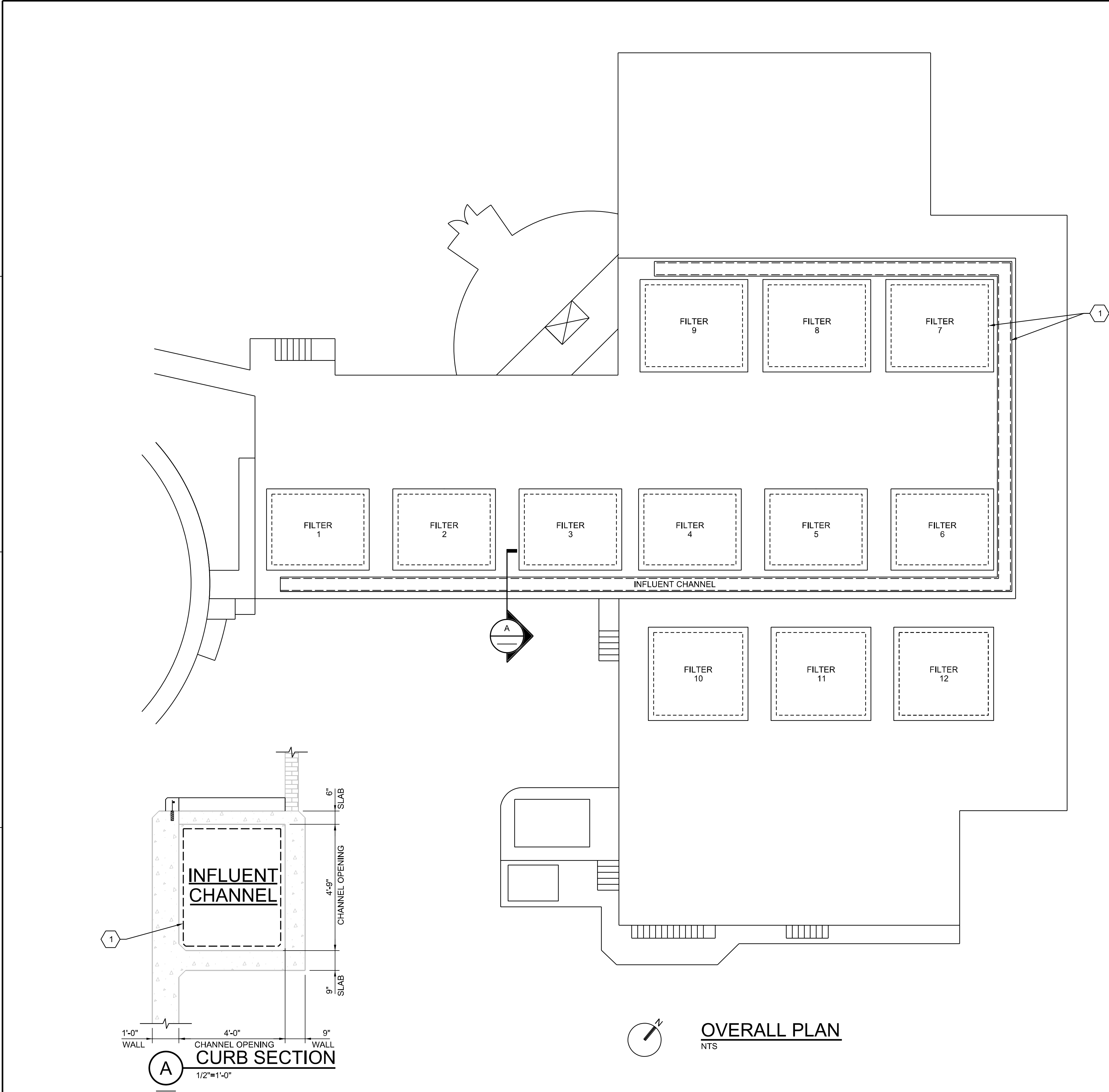
DATE	OCTOBER 2022
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DATE	SEP 20 1992
PROJ	WXXZ9601

DWG	F-E-2006
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SHEET	60 of 68
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FINAL DESIGN



SHEET KEYNOTES

1.

LINE FILTERS AND INFLUENT CHANNELS IN ACCORDANCE WITH 09 96 35, FILTER SHALL BE LINED ON ALL WALLS AND FLOOR, INFLUENT CHANNEL SHALL BE LINED ON ALL FLOOR, WALLS AND CEILING. CONSTRUCTION JOINTS INSIDE INFLUENT CHANNEL SHALL BE SEALED WITH SIKADUR-COMBIFLEX SG SYSTEM. TERMINATE LINER SYSTEM AND JOINT SEAL SYSTEM AS SHOWN IN THE TERMINATION DETAIL. FINAL COATING EXTENT TO BE COORDINATED WITH, AND DETERMINED BY, OWNER PRIOR TO INSTALLATION.

COLORADO LICENSED

CRS ALLEN

50753

10/24/2022

PROFESSIONAL ENGINEER

NO.

DATE

DSGN

DR

CHK

BY

APVD

REVISION

NO.

DATE

DSGN

DR

CHK

BY

APVD

P ZELENAK

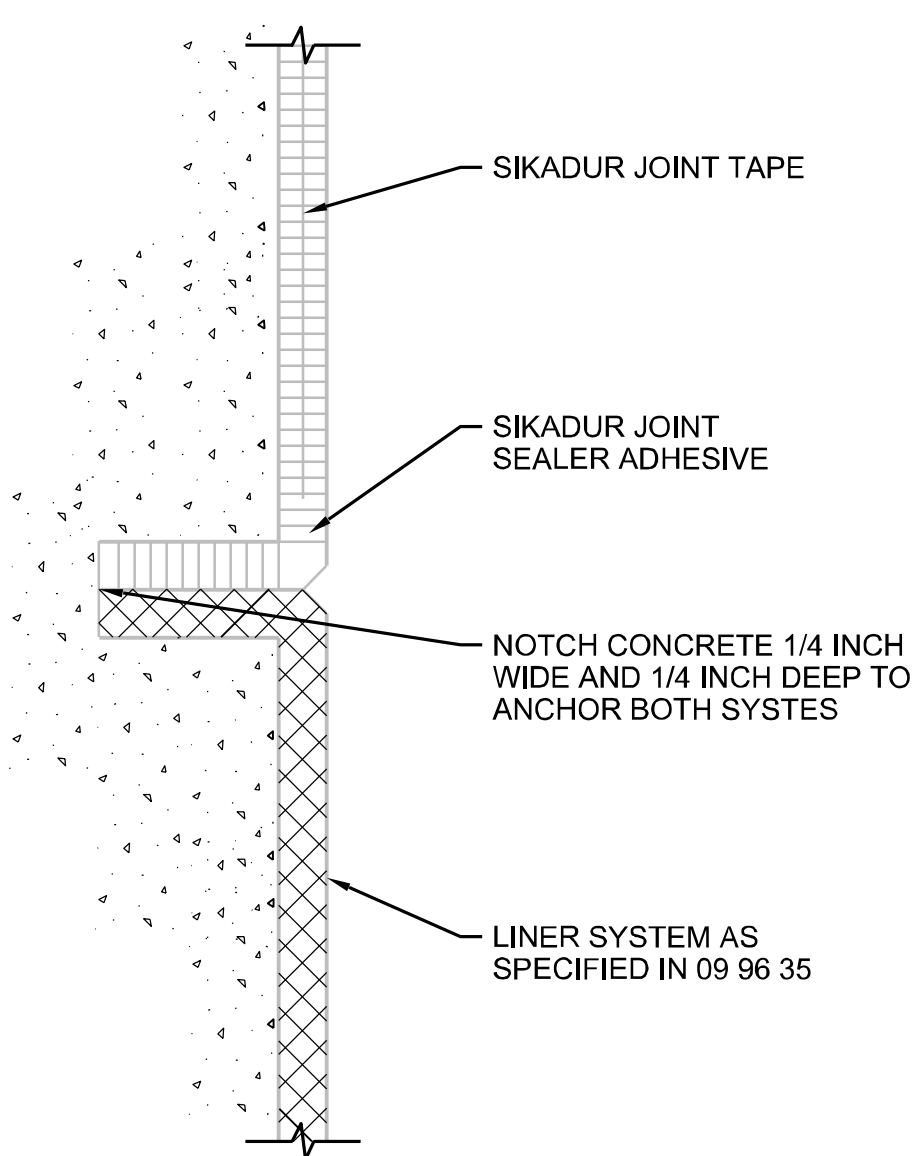
P ZELENAK

N CRUM

C VANHORN

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1

TERMINATION DETAIL

NTS

OVERALL PLAN

NTS

JACOBS

CORROSION CONTROL

FILTERS 1 THROUGH 12

OVERALL PLAN

FILTER IMPROVEMENTS PROJECT

RALSTON WATER TREATMENT PLANT

CITY OF ARVADA

ARVADA, COLORADO

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

0 1"

DATE

OCTOBER 2022

PROJ

WXXZ9601

DWG

F-X-2001

SHEET

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FINAL DESIGN

Exhibit C

AMENDMENT NO. 3

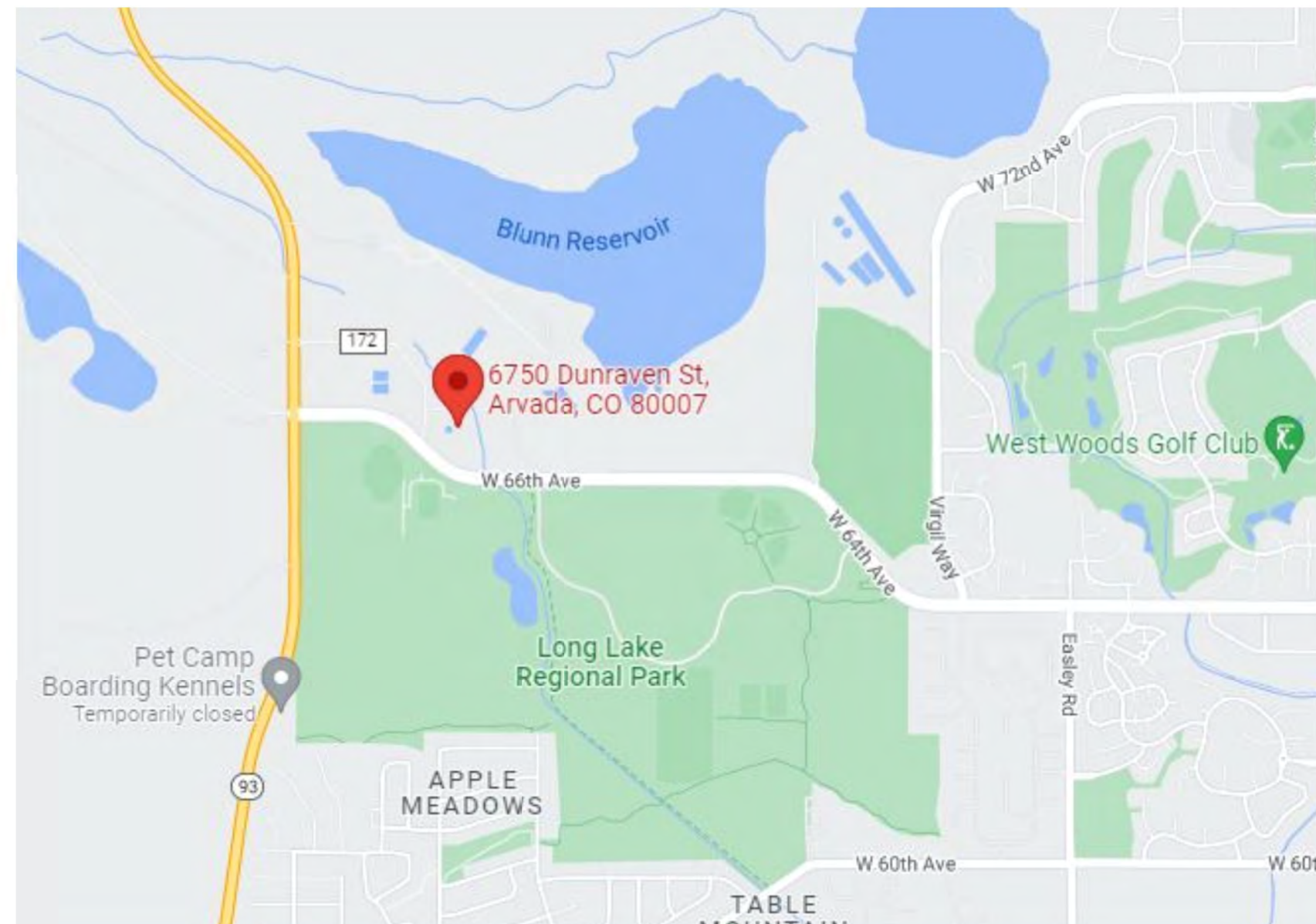
**TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND PCL
CONSTRUCTION, INC. ESTABLISHING CONTRACTOR'S GUARANTEED MAXIMUM
PRICE III OF THE "CONSTRUCTION MANAGEMENT/GENERAL CONTRACTOR
AGREEMENT FOR PRECONSTRUCTION SERVICES FOR THE REHABILITATION AND
MODIFICATION OF THE FILTER AND SOLIDS HANDLING SYSTEMS AT THE RALSTON
WATER TREATMENT PLANT," IN AN AMOUNT NOT TO EXCEED \$3,518,653.00**

Plot Date: 13-OCT-2022 11:14:50 AM
User: svcPW
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1
trea

RALSTON WTP SOLIDS IMPROVEMENTS CITY OF ARVADA, COLORADO

6750 DUNRAVEN STREET
ARVADA, CO 80007

60% SUBMITTAL



VICINITY MAP



LOCATION MAP

OCTOBER 2022
VOLUME 2 OF 2



390 INTERLOCKEN CRESCENT, SUITE 800
BROOMFIELD, COLORADO 80021

Exhibit C

JOB NO. 201351
DRAWING NO. 00G01
SHEET NO. 1 OF XX

Plot Date: 13-OCT-2022 8:24:32 AM
User: svcPW
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1
LAST SAVED BY: trea

DRAWING INDEX												
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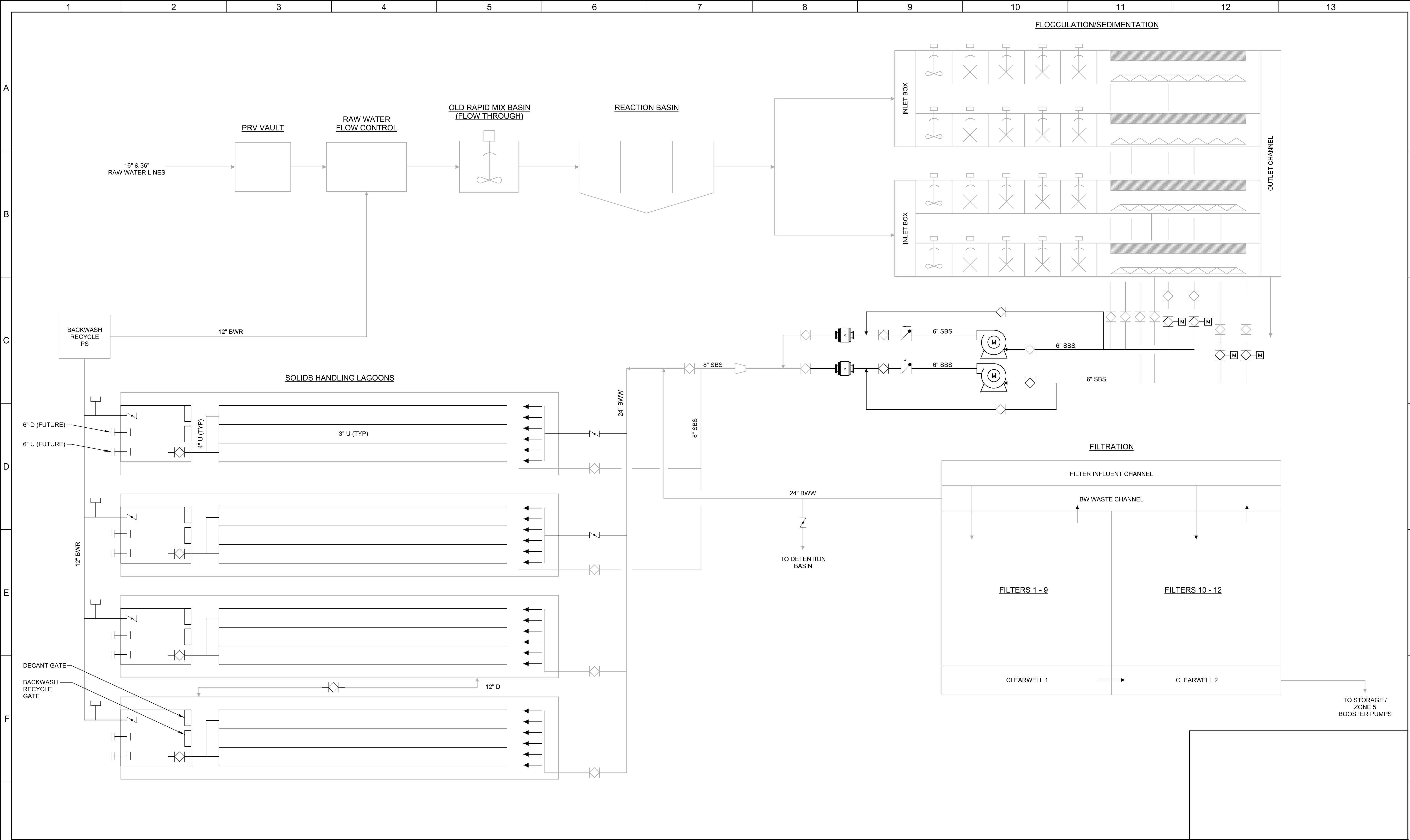
PROJECT NO. 201351-100000 FILE NAME: 20135100G03.dgn

Plot Date: 28-SEP-2022 1:51:53 PM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

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60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			DESIGNED SH	carollo CITY OF ARVADA			CITY OF ARVADA, COLORADO RALSTON WTP SOLIDS IMPROVEMENTS GENERAL PROCESS FLOW DIAGRAM			VERIFY SCALES	JOB NO. 201351
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Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: trea

GENERAL NOTES				LINE WORK				DETAIL REFERENCES				HATCH PATTERNS				
1. FOLLOWING NOTES ARE GENERAL AND APPLY TO ALL SHEETS OF THESE CONTRACT DOCUMENTS AS IF THEY WERE WRITTEN IN THEIR ENTIRETY ON EACH SHEET. 2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS INCLUDING LOCATION AND DIMENSIONS OF ALL EXISTING CONSTRUCTION AND UTILITIES. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE IS A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONSTRUCTION BEFORE PROCEEDING WITH WORK. 3. UNLESS DETAILED, SPECIFIED, OR OTHERWISE INDICATED ON THE DRAWINGS, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS SHALL APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS ON DRAWINGS. 4. WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF WORK, DETAILS SHALL BE IN THE SAME AS FOR OTHER SIMILAR WORK. 5. CONTRACTOR SHALL COMPLY WITH LOCAL CONSTRUCTION STORM WATER DISCHARGE REGULATIONS AND REQUIREMENTS. 6. PRIOR TO EXCAVATION FOR NEW STRUCTURES, ELECTRICAL CONDUIT, FABRICATION OF NEW PIPING AND/OR OTHER PROPOSED UTILITIES, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING PIPING AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL TEMPORARILY RELOCATE CONFLICTING EXISTING UTILITIES AT TIE-IN/CONNECTION LOCATIONS AND REINSTALL THEM AS REQUIRED TO ELIMINATE THE CONFLICT AT NO ADDITIONAL COST TO THE OWNER. 7. ALL PIPELINES 12" AND LARGER SHALL HAVE A MINIMUM COVER OF 36" UNLESS THE COVER DEPTH IS SPECIFICALLY INDICATED ON THE DRAWINGS. PIPE SMALLER THAN 12" SHALL HAVE A MINIMUM COVER OF 30" UNLESS NOTED OTHERWISE. PIPES SHALL BE ROUTED AS SHOWN UNLESS MINOR REVISIONS ARE NECESSARY TO MISS EXISTING PIPES, STRUCTURES, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL FITTINGS AND ADAPTERS REQUIRED TO MAKE THE ROUTING CHANGES AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL INCLUDE COST FOR THIS IN THE BID. 8. EXISTING FACILITY AND UTILITY INFORMATION SHOWN ON THE DRAWINGS WAS OBTAINED FROM AVAILABLE RECORDS OR ELECTRONIC FILES. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR FACILITIES AND UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS, SIZES, MATERIAL TYPES, AND ELEVATIONS SHOWN AROUND OR NEAR AREAS OF NEW CONSTRUCTION PRIOR TO START OF CONSTRUCTION. 9. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT FROM DAMAGE EXISTING FACILITIES AND UTILITIES SHOWN OR NOT SHOWN THAT ARE TO REMAIN IN PLACE. ALL FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED TO THE ORIGINAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION. 10. CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING PIPE, EQUIPMENT, ETC. AS REQUIRED AND SHALL PROVIDE ALL FITTINGS, ADAPTERS, AND APPURTENANCES REQUIRED TO MAKE THE CONNECTIONS. PROVIDE ALL SUPPORTS REQUIRED FOR A RIGIDLY SUPPORTED COMPLETE AND WORKING SYSTEM. 11. ADJUST ALL VALVE BOXES, VAULTS, PULL BOXES, AND MANHOLES TO FINISHED GRADE UNLESS OTHERWISE SHOWN OR DIRECTED. MANHOLES IN OPEN FIELDS SHALL BE SET TWELVE INCHES ABOVE FINISHED GRADE AND VAULTS SHALL BE SIX INCHES ABOVE FINISHED GRADE. 12. THE CONTRACTOR SHALL CONTACT THE PROPER UTILITY REPRESENTATIVE AS FOLLOWS FOR QUESTIONS OR COORDINATION OF CONSTRUCTION RELATED TO EXISTING UTILITIES. STATE/REGION/MUNICIPALITY SPECIFIC: 1-800-XXX-XXXX 13. CONTRACTOR SHALL VERIFY THAT PIPING SHOWN TO BE ABANDONED OR AS ABANDONED PREVIOUSLY IS NO LONGER IN SERVICE. LINES IN SERVICE SHALL BE MAINTAINED UNTIL NO LONGER REQUIRED BY THE PLANT. 14. ALL EXISTING PIPES THAT ARE TO BE ABANDONED IN PLACE OR REMOVED MAY NOT BE SHOWN. WHERE PIPING IS TO BE ABANDONED AND MUST REMAIN IN SERVICE UNTIL COMPLETION OF OTHER PHASES OF WORK, AND IT CONFLICTS WITH NEW PIPING, TEMPORARILY RELOCATE PIPING AS REQUIRED TO MAINTAIN SERVICE BY THE PLANT. 15. CONTRACTOR SHALL REROUTE THE EXISTING PIPING IF REQUIRED TO MISS THE PROPOSED STRUCTURES. THE EXISTING PIPE SHALL REMAIN IN SERVICE UNTIL NEW PIPING IS READY TO BE PLACED INTO SERVICE. DOWNTIME SHALL BE A MAXIMUM OF 2 HOURS, UNLESS SPECIFIED OR SHOWN OTHERWISE. 16. ALL SIDEWALKS TO BE 3'-0" WIDE UNLESS SHOWN OTHERWISE. 17. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS IN THE VICINITY OF ANY OVERHEAD ELECTRIC LINES. CONTRACTOR SHALL ABIDE BY THE NATIONAL ELECTRIC CODE AND ANY REQUIREMENT BY THE OWNER OF THE ELECTRIC LINES. 18. PROVIDE ALL SHEETING/SHORING REQUIRED TO PROTECT EXISTING STRUCTURES, PIPES AND FACILITIES. 19. CONTRACTOR SHALL VERIFY LOCATION OF ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL ITEMS BEFORE PLACING ANY STRUCTURAL STEEL OR CONCRETE. ALSO, STRUCTURAL DIMENSIONS AND OPENINGS CONTROLLED BY ARCHITECTURAL, MECHANICAL, OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. 20. MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES, AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS, THAT ARE REQUIRED BY OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.				CONSTRUCTION FENCE GUARDRAIL FUTURE CONSTRUCTION CENTER LINE HIDDEN LINE REMOVE AND/OR ABANDON GATE MATCH LINE NEW EXISTING MATCH LINE SEE DWG ##X##				PLAN VIEW DESCRIPTION, AS NECESSARY VIEW DESCRIPTION FILE: FILE PLAN NOT REFERENCED SECTION CUT VIEW == SHOWN ON SAME DRAWING ##X## = SEE INDICATED DRAWING SECTION OR DETAIL VIEW TITLE W/ REFERENCE ALPHA = SECTION NUMERIC = DETAIL DESCRIPTION SCALE: SCALE FILE: FILE DRAWING CUT ORIGINATION DETAIL OR ENLARGED PLAN CALL OUT AREA DESIGNATOR (WHEN APPLICABLE) DISCIPLINE DESIGNATOR SHEET NUMBER TYPICAL DETAIL # (TYP) (TYP) - INDICATES THE TYPICAL DETAIL IS USED IN MULTIPLE LOCATIONS WITHIN THE DRAWING EXTERIOR ELEVATION VIEWS SEE INDICATED DRAWING PHOTO LOCATION ARROW INDICATES POINT OF VIEW SEE INDICATED DRAWING GRID BUBBLE TYPICAL DETAIL NUMBER TYPICAL DETAIL TITLE MOD MODIFICATION NOTE S = STANDARD J = JOB SPECIFIC R = REVISED N = NOTE TO TYPICAL DETAIL USER INDICATES LOCATED ON TYPICAL DETAIL SHEETS SHT # OF # SHEETS IN DETAIL VER DATE DATE CREATED (REVISED)				AGGREGATE BASE COURSE (ABC) GRAVEL ALUMINUM GRATING ASPHALT PAVING LANDSCAPING BEDROCK RUBBER BRICK OR BLOCK SAND OR GROUT BRONZE, BRASS, OR COPPER EXISTING/ UNDISTURBED SOIL CAST IRON OR FIBERGLASS STRUCTURAL FILL OR BACKFILL CLSM STEEL CONCRETE (ALL CLASSES) TREAD PLATE DRAIN ROCK WOOD				
				SYMBOLS								MISCELLANEOUS				
				BRACKET BREAK LINE PIPE BREAK PLAN VIEW PIPE BREAK CROSS SECTION SCALE NORTH ARROW/PLANT NORTH EQUIPMENT/DEVICE TAG AND NUMBER PIPE TAG UNDERGROUND/ OVERHEAD WARNING (STATE/REGION SPECIFIC) PIPE CONTINUATION (SINGLE LINE) KEY TAG KEY NOTE REVISION DELTA EXISTING ELEVATION ELEVATION 0 50' 100' 200' 30° TRUE PLANT XXX-XX-XXXX EQUIPMENT EX-EQUIP = EXISTING EQUIPMENT EF-EQUIP = FUTURE EQUIPMENT PIPE SIZE FLOW STREAM SIZE FLOW STREAM EX-SIZE FLOW STREAM = EXISTING EF-SIZE FLOW STREAM = FUTURE Avoid overhead power line contact. It's costly. 811 Know what's below. Call before you dig. Call before you OVERHEAD Replace with Regional Phone Number												
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REV DATE BY DESCRIPTION												VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY JOB NO. 201351 DRAWING NO. 00G05 SHEET NO. OF				
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PROJECT NO. 201351-100000

FILE NAME: 20135100G05.dgn

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FILE NAME: 201351.00GC02.dwg

PROJECT NO. 201351

LAST SAVED BY: jpecyna

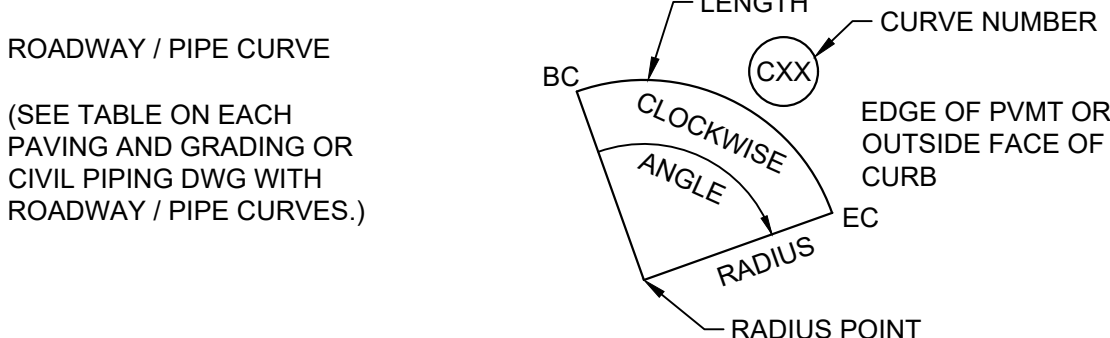
LINE WORK

NEW STRUCTURES OR EDGE OF PAVEMENT	
EXISTING STRUCTURES (SCREENED)	
NEW PIPING (TRIPLE LINES)	
NEW PIPING (SINGLE LINE)	
EXISTING PIPING (TRIPLE LINES) (SCREENED)	
EXISTING PIPING (SINGLE LINE)(SCREENED)	
HIDDEN LINE OR TRAIL EDGE	
CENTER, MONUMENT, OR SURVEY LINE	
GUARDRAIL	
EXISTING CONTOURS (SCREENED)	
NEW CONTOURS	
NEW FENCE	
EXISTING FENCE (SCREENED)	
REMOVE OR ABANDONED (CROSS HATCHING: FENCE SHOWN AS EXAMPLE)	
POWER POLE & LINE	
CABLE TV (UNDERGROUND)	
FIBER OPTIC	
FUEL	
NATURAL GAS	
UNDERGROUND ELECTRIC	
SANITARY SEWER	
FORCEMAIN SANITARY SEWER	
STORM DRAIN	
TELEPHONE	
WATER	
PROPERTY LINE OR RIGHT OF WAY	
SLOPE	
NEW ROAD	
EXISTING ROAD (SCREENED)	
FUTURE ROAD, WATER EDGE OR RIDGE	
CURB & GUTTER	
CURB	
SWALE	
FLOWLINE	
SHORING	
RAILROAD TRACKS	
LIMITS OF CONSTRUCTION	
SILT FENCE	
EASEMENT	
EXISTING EASEMENT	
CITY LIMITS	
EXISTING GRADE (PROFILE)	
PROPOSED GRADE (PROFILE)	

COORDINATES / ELEVATION

COORDINATES	
CONTROL POINT	
SPOT ELEVATION	
EXISTING SPOT ELEVATION	
SLOPE CALLOUT	

ROADWAY / PIPE CURVES



HATCH PATTERNS

AGGREGATE BASE COURSE (ABC)		GRATING	
ASPHALT PAVING		LANDSCAPING	
RECYCLED CONCRETE		RIPRAP	
BEDROCK		EXISTING/ UNDISTURBED SOIL	
CLSM		STRUCTURAL FILL OR BACKFILL	
CONCRETE (ALL CLASSES)		STEEL	
DRAIN ROCK		STAGING AREA	
GRAVEL		CONTRACTOR PARKING	

SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	EXISTING CONTROL POINT		CABLE TV		CLEANOUT
	EXISTING MONUMENT		POWER TOWER		AIR RELEASE VALVE
	CONTROL POINT		GATE		BLOW OFF VALVE
	SOIL BORING LOCATIONS		GUARD POST		HOSE BIBB / YARD HYDRANT
	POTHOLE		HEADWALL		SERVICE CONNECTION
	POTHOLE NUMBER		ROCK WALL		BURIED VALVE
	FLOW/SLOPE DIRECTION		SHRUB/HEDGE		FLANGE
	MANHOLE (PLAN)		TREE		BALL VALVE
	MANHOLE (PROFILE)		SIGN/SIGN POST		BUTTERFLY VALVE
	CATCH BASIN		LIGHT		CHECK VALVE
	ELECTRICAL MANHOLE AND PULL BOX		UTILITY POLE		GATE VALVE
	METER BOX		UTILITY POLE GUY WIRE		PLUG VALVE
	PULL BOX		POWER POLE		PIPE CAP OR CONNECTION
	TELEPHONE PEDESTAL		FIRE HYDRANT		REDUCER

NOTE: ALL SYMBOLS SHOWN AS NEW. EXISTING SYMBOLS ARE SCREENED.

BRACKET

BREAK LINE

PIPE BREAK PLAN VIEW

PIPE BREAK CROSS SECTION

SCALE

PIPE CONTINUATION (SINGLE LINE)

KEY NOTE

REVISION DELTA

EXISTING ELEVATION

ELEVATION

MATCH LINE

EQUIPMENT/DEVICE KEY TAG

EQUIPMENT/DEVICE NUMBER

PIPE TAG

*PIPE SIZE

FUTURE PIPING (WHERE APPLICABLE)

*FOR EXISTING PIPING SHOW AS EX SIZE FLOW STREAM

811

UNDERGROUND/ OVERHEAD WARNING (STATE/REGION SPECIFIC)

NORTH ARROW/ PLANT NORTH

NOTE: ALL SYMBOLS SHOWN AS NEW. EXISTING SYMBOLS ARE SCREENED.

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION				DESIGNED RJF							CITY OF ARVADA, COLORADO			VERIFY SCALES	JOB NO. 201351
				DRAWN JJP							RALSTON WTP SOLIDS IMPROVEMENTS			BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. 00GC02
				CHECKED BLG							CIVIL			0 1"	SHEET NO.
				DATE OCTOBER 2022							CIVIL LEGEND AND SYMBOLS			IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	XX OF
REV	DATE	BY	DESCRIPTION												

Plot Date: 10/12/2022 11:44:52 AM

FILE NAME: 20135100GC03.dwg

PROJECT NO. 201351

LAST SAVED BY: jpecyna



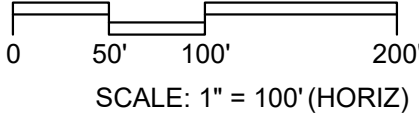
PLAN
FILE: 201351C0900

SURVEY CONTROL TABLE			
CONTROL POINT	NORTHING	EASTING	DESCRIPTION
104	123706.78	79648.23	CP 104 BK 365 PG 55
107	123499.10	79768.25	CP 107 BK 365 PG 55
120	123462.90	80689.58	CP 120
123	123079.97	80181.96	CP 123 BK 365 PG 55
124	122600.31	80183.17	CP 124 COA CAP 23FT OFF SE COR
125	122527.09	80005.51	CP 125 2.5IN CAP SW COR OF CHEM
126	122749.80	79897.91	CP 126 5 RBR 3.0 E OF TBC 7.9
127	122845.25	79718.91	CP 127 5 REBAR 25.8 WSW FH 6.5
128	123046.73	79906.80	CP 128 MAG NAIL E SIDE ENTRANCE
136	122604.48	79988.67	CP 136
139	123662.63	80594.65	CP 139
140	123913.42	80221.21	CP 140
202	123413.48	79716.29	CP 202 BK 365 PG 55
658	122999.35	80109.92	TBM 658 COA
1013	123741.95	79560.48	CP 1013 BK 365 PG 55, BENCHMARK
1074	123413.48	79716.32	OIP 1074 DEWBERRY

BASIS OF BEARING					
POINT	COLORADO CENTRAL STATE PLANE NAD88 COORDINATES		ELEVATION NAVD88	DEWBERRY PROJECT COORDINATES	
	NORTHING	EASTING		NORTHING	EASTING
C 1/4 SEC 3 T3S, R70W	1723706.44	3080830.04	N/A	123708.73	80970.99
CW 1/16 SEC 3 T3S, R70W	1723704.50	3079507.64	N/A	123706.78	79648.23
C 1/4 SEC 3 T3S, R70W	N/A	N/A	5829.91	123741.95	79560.48

- SURVEY NOTES:**
- BENCHMARK #1013
ELEV = 5829.91 NAVD88
DESCRIPTION: CHISELED SQUARE ON TOP OF NORTHERLY WINGWALL OF OUTLET STRUCTURE ON THE SOUTH BOULDER DIVERSION CANAL.
 - PUBLISHED UNITS ARE IN U.S. SURVEY FEET: 1 SURVEY FOOT = (1200/3937) METERS.
 - PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE COORDINATES, DERIVED FROM DEWBERRY SURVEY CONTROL PLAN & SURVEY CONTROL POINT TABLE SHEET G-3B, CITY OF ARVADA RALSTON WATER TREATMENT PLANT PIPELINE RELOCATIONS AHEAD OF DENVER WATER CONDUIT 16 IMPROVEMENTS.

STRUCTURE COORDINATE CONTROL POINTS			
POINT	NORTHING	EASTING	DESCRIPTION
1	123027.52	80987.55	N CORNER DRYING PAD
2	122954.95	81086.86	E CORNER DRYING PAD
3	122887.93	81037.89	S CORNER DRYING PAD
4	122960.50	80938.58	W CORNER DRYING PAD



GENERAL NOTES:

- SEE EROSION CONTROL SHEET 00EC01 FOR REQUIRED CONSTRUCTION BMPS.

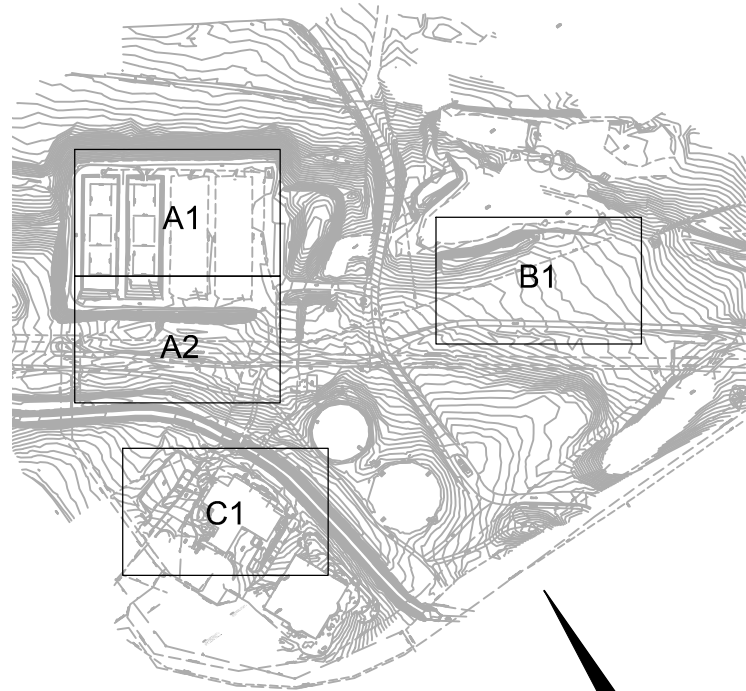
KEY NOTES:

- CONTRACTOR MATERIAL DELIVERY ROUTE.
- BRIDGE NOT TO BE USED FOR CONSTRUCTION ACCESS OR DELIVERY.



Know what's below.
Call before you dig.

KEY MAP



KEY MAP
NORTH

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			
REV	DATE	BY	DESCRIPTION
1			
2			
3			

DESIGNED RJF
DRAWN JJP
CHECKED BLG
DATE OCTOBER 2022



CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

CIVIL

OVERALL SITE, ACCESS, SURVEY
CONTROL PLAN

VERIFY SCALES

BAR IS ONE INCH ON
ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

JOB NO.
201351

DRAWING NO.
00GC03

SHEET NO.
SHT OF

Plot Date: 12-OCT-2022 9:37:39 AM

User: svcPW

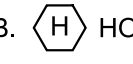
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DesignScript: Carollo Std Pen_v0905.pen

PlotScale: 1:1

LAST SAVED BY: jbaumbarger

	1	2	3	4	5	6	7	8	9	10	11	12	13			
A	GENERAL NOTES: 1. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH PROJECT DRAWINGS BY OTHER DISCIPLINES AND WITH THE SPECIFICATIONS. 2. UNLESS DETAILED, SPECIFIED, OR INDICATED OTHERWISE, CONSTRUCTION SHALL BE AS INDICATED IN THE GENERAL NOTES AND TYPICAL DETAILS. 3. PRESENTATION CONVENTIONS FOR STRUCTURAL DRAWINGS: A. SCREENED LINE WORK INDICATES EXISTING CONDITIONS. B. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED SIZES. C. PLANS ARE TREATED AS HORIZONTAL SECTIONS. (I.E.: "PLAN AT ELEVATION 110" SHOWS CONSTRUCTION AT AND BELOW ELEVATION 110.) 4. VERIFY DIMENSIONS AND CONDITIONS BEFORE BEGINNING WORK. ADVISE ENGINEER IMMEDIATELY OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DIMENSIONS, AND INFORMATION SHOWN ON THESE DRAWINGS. CONFIRM THE FOLLOWING BEFORE PREPARATION AND SUBMITTAL OF SHOP DRAWINGS: A. DIMENSIONS AND WEIGHTS FOR EQUIPMENT SELECTED. B. SIZES AND LOCATIONS OF EQUIPMENT PADS FOR EQUIPMENT SELECTED. 5. TYPICAL DETAILS ARE INCLUDED ON THE "TS" DRAWINGS. A. TYPICAL DETAILS ARE INTENDED TO APPLY AT LOCATIONS DESCRIBED BY THEIR TITLES, EVEN WHEN NOT SPECIFICALLY REFERENCED ON THE DRAWINGS. B. IN STRUCTURAL TYPICAL DETAILS, ORIENTATION OF BARS IN EACH MAT OF REINFORCEMENT (WHETHER "LINES" OR "DOTS" ARE CLOSER TO THE FACE OF THE CONCRETE) IS GENERALLY ARBITRARY. SEE DRAWINGS OF EACH STRUCTURE FOR ORIENTATION REQUIRED AT THAT STRUCTURE. 6. SEE CIVIL DRAWINGS FOR STRUCTURE COORDINATES. POINTS ON THE STRUCTURES TO WHICH SITE COORDINATES REFER ARE SHOWN ON THE STRUCTURAL PLANS. 7. DRAWINGS PREPARED BY OTHER DISCIPLINES INCLUDE OPENINGS, ANCHORS, PIPES, CONDUITS, AND OTHER ITEMS THAT ARE EMBEDDED INTO OR PASS THROUGH STRUCTURES. A. CONFIRM SIZE AND LOCATIONS OF OPENINGS, PENETRATIONS AND EMBEDMENT FOR ITEMS AND EQUIPMENT FURNISHED. B. IN GENERAL, OPENINGS, EMBEDMENTS, AND PENETRATIONS LESS THAN 12 INCHES IN DIAMETER ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. C. SEE MECHANICAL DRAWINGS FOR DETAILS OF PIPE PENETRATIONS, PIPE SUPPORTS, AND ASSOCIATED STRUCTURAL REQUIREMENTS. D. SEE MECHANICAL DRAWINGS FOR EQUIPMENT PADS AND PIPE SUPPORTS.			GEOTECHNICAL REPORT / FOUNDATION DESIGN CRITERIA: 1. GEOTECHNICAL INVESTIGATION REPORT: TITLE: ARVADA RALSTON WTP IMPROVEMENTS PROJECT. PREPARED BY: LITHOS ENGINEERING. REPORT NO: 22086 DATED: JULY 26, 2022. 2. FOUNDATION DESIGNS ARE BASED ON RECOMMENDATIONS IN THE GEOTECHNICAL INVESTIGATION REPORT. A. NET ALLOWABLE BEARING PRESSURE SEE PLANS. B. FROST DEPTH: 36 INCHES C. LATERAL EARTH PRESSURE (UNO): SURCHARGE: EQUIVALENT TO 2 FEET OF SOIL ABOVE FINISHED GRADE. STATIC ACTIVE (PSF/FT): 51 AT REST (PSF/FT): 72 PASSIVE (PSF/FT): 308 SLIDING COEFFICIENT OF FRICTION: 0.35 TYPICAL STRUCTURAL MATERIALS: 1. MATERIALS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS. 2. SEE PROJECT SPECIFICATIONS AND NOTES ON DRAWINGS OF SPECIFIC STRUCTURES FOR DETAILED AND LOCATION-SPECIFIC REQUIREMENTS. REINFORCING STEEL (FOR CONCRETE AND MASONRY): 1. DEFORMED BARS: A. TYPICAL: ASTM A 615, GRADE 60. B. WHERE INDICATED ON THE DRAWINGS: ASTM A 706. 2. WELDED WIRE FABRIC: ASTM A 1064. CONCRETE: 1. NORMAL DENSITY. 2. MINIMUM SPECIFIED CONCRETE COMPRESSIVE STRENGTH, f _c (AT 28 DAYS UNO). A. STRUCTURES: "CLASS A" OR "CLASS B" f _c = 4500 PSI. B. FILL AND THRUST BLOCKS: "CLASS C" f _c = 2500 PSI. C. PIPE ENCASEMENT: "CLASS C" f _c = 2500PSI. D. ELECTRICAL DUCT ENCASEMENT: "CLASS CE" f _c = 2500 PSI. E. PRECAST AND PRECAST-PRESTRESSED MEMBERS: "CLASS D" f _c = 5000 PSI. STRUCTURAL STEEL: 1. SECTIONS A. SHAPES W, WT: ASTM A 992 (Fy = 50 KSI) B. SHAPES S, ST, M, MT, HP, C, MC, L: ASTM A 36 (Fy = 36 KSI) C. PLATES AND BARS: ASTM A 36 (Fy = 36 KSI) D. PIPES: ASTM A 53, GRADE B (Fy = 35 KSI) E. HOLLOW STRUCTURAL SECTIONS: ROUND: ASTM A 500, GRADE B (Fy = 42 KSI) SQUARE AND RECTANGULAR: ASTM A 500, GRADE B (Fy = 46 KSI) 2. CONNECTIONS: A. BOLTS - STEEL TO-STEEL: ASTM F 3125 GRADE A325 HIGH-STRENGTH BOLTS, WITH LOAD INDICATOR WASHERS. B. BOLTS - STEEL TO CONCRETE OR MASONRY: ANCHOR BOLTS WITH HEX FORGED HEAD. ASTM A 193, STAINLESS TYPE 316 (304) ASTM F 1554, GRADE 36 GALVANIZED. C. WELDS - SHIELDED METAL ARC PROCESS USING E70-XX ELECTRODES. STAINLESS STEEL: 1. ANSI TYPE 316/316L EXCEPT WHERE TYPE 304/304L IS INDICATED ON THE DRAWINGS. 2. SECTIONS: SHAPES AND BARS: ASTM A 276. 3. BOLTED CONNECTIONS - BOLTS AND ANCHOR BOLTS: A. MATCH ALLOY OF THE STRUCTURAL MEMBERS CONNECTED. B. TYPE 316/316L: ASTM F 593, GRADE B8M, CLASS 1, HEAVY HEX. C. TYPE 304/304L: ASTM F 593, GRADE B8, CLASS 1, HEAVY HEX. 4. WELDED CONNECTIONS: A. TYPE 316L: E316L-15 ELECTRODES. B. TYPE 304L: E304L-15 ELECTRODES. STRUCTURAL ALUMINUM: 1. SECTIONS A. SHAPES: ASTM B 308, ALLOY 6061-T6. B. SHEET AND PLATE: ASTM B 209, ALLOY 6061-T6. 2. BOLTED CONNECTIONS - BOLTS AND ANCHOR BOLTS: A. STAINLESS STEEL - TYPE 316, ASTM F 593, GRADE B8M, CLASS 1, HEAVY HEX. 3. WELDED CONNECTIONS: A. GAS METAL ARC (MIG) OR GAS TUNGSTEN ARC (TIG) PROCESS USING FILLER ALLOY 4043 ELECTRODES.			CONSTRUCTION: CONFORM TO THE FOLLOWING REQUIREMENTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS. EXCAVATION AND BACKFILLING: 1. EXPOSE AND PREPARE SUBGRADE AS SHOWN ON THE DRAWINGS AND SPECIFIED. OBTAIN ENGINEER'S OBSERVATION OF SUBGRADE SURFACES, AS EXPOSED AND AS PREPARED, BEFORE PROCEEDING WITH FOUNDATION CONSTRUCTION. 2. DO NOT PLACE BACKFILL AGAINST WALLS UNTIL STRUCTURES SUPPORTING THE TOP OF THE WALL ARE IN PLACE, ARE COMPLETE, AND (IN THE CASE OF CONCRETE) HAVE CURED TO THEIR MINIMUM SPECIFIED 28-DAY COMPRESSIVE STRENGTH. 3. WHERE BACKFILL MUST BE PLACED AGAINST WALLS BEFORE STRUCTURES ABOVE ARE COMPLETE, PROVIDE BRACING FOR WALLS. KEEP BRACING IN PLACE UNTIL THE STRUCTURE ABOVE IS COMPLETE AND (IN THE CASE OF CONCRETE) HAS CURED TO ITS MINIMUM SPECIFIED 28-DAY COMPRESSIVE STRENGTH. CONCRETE: 1. SEE S101/TYP FOR CONCRETE NOTES, INCLUDING CLEAR COVER AND LAP SPLICE LENGTH REQUIREMENTS FOR REINFORCING. 2. SUBMIT LOCATIONS OF CONSTRUCTION JOINTS NOT SHOWN ON THE DRAWINGS FOR ACCEPTANCE BY THE ENGINEER BEFORE FORM LAYOUT. 3. PROVIDE CHAMFER AT EXPOSED EDGES OF CAST-IN-PLACE CONCRETE. SEE SPECIFICATION 03_11_07 FOR CHAMFERS. 4. PROVIDE REINFORCING: A. AT CORNERS AND JUNCTIONS - AS INDICATED IN S144/TYP, SUPPLEMENT WITH ADDED BARS WHERE INDICATED ON THE DRAWINGS. B. AT OPENINGS - AS INDICATED IN S180/TYP. 5. WELDING OF REINFORCING IS NOT PERMITTED UNLESS DETAILED ON THE DRAWINGS OR ACCEPTED IN ADVANCE BY THE ENGINEER. 6. MAINTAIN MINIMUM 3 INCHES CLEAR CONCRETE COVER BETWEEN REINFORCING AND EMBEDMENTS. 7. FINISH CONCRETE AS SPECIFIED IN SECTION 03_36_60. 8. CONCRETE PADS A.  EQUIPMENT PAD SEE S302/TYP. B.  HOUSEKEEPING PAD FOR ELECTRICAL EQUIPMENT SEE S350/TYP. MASONRY: 1. SEE S400/TYP FOR MASONRY NOTES, INCLUDING LAP SPLICE LENGTHS. 2. PROVIDE REINFORCING: A. AT CORNERS AND JUNCTIONS AS INDICATED IN S412/TYP. B. AT OPENINGS AS INDICATED IN S410/TYP. 3. WELDING OF REINFORCING IS NOT PERMITTED UNLESS DETAILED ON THE DRAWINGS OR ACCEPTED IN ADVANCE BY THE ENGINEER. 4. GROUTING: A. FULLY GROUTED. STEEL, STAINLESS STEEL, AND ALUMINUM - CONNECTIONS: 1. BOLTED: A. MADE USING 3/4-INCH DIAMETER BOLTS. B. HAVING A MINIMUM OF 2 BOLTS, SPACED NOT CLOSER THAN 3 INCHES ON CENTER. C. WITH A DISTANCE OF AT LEAST 1 1/2 INCHES FROM CENTER OF BOLT TO ANY EDGE OF A PLATE OR STRUCTURAL ELEMENT. 2. WELDED: A. FILLET WELDS: PER AWS CODE BASED ON THE THICKNESS OF THE MATERIALS BEING JOINED, AND FULL LENGTH OF THE JOINT. 3. INTERFACE BETWEEN MATERIALS: A. AT BOLTED CONNECTIONS THAT INCLUDE DIFFERENT METALS (E.G.: STEEL AND STAINLESS STEEL, OR ALUMINUM AND STEEL) PROVIDE ISOLATING SLEEVES AND WASHERS AS SPECIFIED IN SECTION 05_05_24. B. WHERE ALUMINUM IS IN CONTACT WITH MASONRY OR CONCRETE, COAT ALUMINUM SURFACES AS SPECIFIED IN SECTION 09_96_01. 4. POST-INSTALLED ANCHORS IN CONCRETE AND MASONRY: A. INSTALL IN FULL COMPLIANCE WITH ACCEPTED BUILDING CODE EVALUATION REPORT AND MANUFACTURER'S INSTRUCTIONS. B. DO NOT CUT, DAMAGE, OR INTERRUPT EXISTING REINFORCEMENT TO INSTALL ANCHORS. USE NON-DESTRUCTIVE TESTING EQUIPMENT TO IDENTIFY LOCATIONS OF REINFORCEMENT IN MEMBERS BEFORE DRILLING HOLES FOR ANCHORS.			METAL FABRICATIONS: 1. HANDRAILS AND GUARDRAILS: A. ALUMINUM, EXCEPT WHERE OTHER MATERIALS ARE NOTED. 2. GRATING: A. ALUMINUM WITH TYPE 316 STAINLESS STEEL FASTENERS, UNLESS OTHERWISE NOTED. B. GRATING AND ITS SEATS OR SUPPORTS SHALL BE OF THE SAME MATERIAL. C. UNLESS INDICATED ON THE DRAWINGS AS "REMOVABLE GRATING", SECURELY FASTEN GRATING TO SUPPORTS AS INDICATED IN S559/TYP. 3. COVER PLATES: A. ALUMINUM WITH TYPE 316 STAINLESS STEEL FASTENERS, UNLESS OTHERWISE NOTED. B. COVER PLATE AND ITS SEATS OR SUPPORTS SHALL BE OF THE SAME MATERIAL. SPECIAL INSPECTION: 1. SPECIAL INSPECTION IS REQUIRED FOR THE FOLLOWING STRUCTURAL MATERIALS AND CONSTRUCTION. SEE SPECIFICATION SECTION 01_45_24 FOR DETAILS. 2. DIVISION (31) SITE CONSTRUCTION (EARTHWORK) A. EXCAVATION DEPTH. B. ADEQUACY OF EXPOSED SURFACE TO PROVIDE REQUIRED SUPPORT. C. PREPARATION OF SOILS/SURFACES SUPPORTING CONSTRUCTION. D. FILL AND BACKFILL. 3. DIVISION (03) CONCRETE: A. LOCATIONS. B. FORMWORK AND MEMBER SIZES. C. REINFORCING STEEL. D. ANCHORS: CAST-IN AND POST-INSTALLED. E. CONCRETE MIX AND PLACEMENT. F. PROTECTION AND CURING PROCEDURES. 4. DIVISION (05) METALS A. GENERAL. ALL METALS: 1) MEMBER LOCATIONS. 2) MEMBER SIZES/TYPES. 3) ANCHORS - CAST-IN AND BUILT-IN ANCHOR BOLTS. 4) ANCHORS - POST-INSTALLED MECHANICAL AND ADHESIVE. B. STRUCTURAL STEEL (CARBON AND STAINLESS). 1) HIGH-STRENGTH BOLTING. 2) WELDING. C. STRUCTURAL ALUMINUM. 1) BOLTING. 2) WELDING. 5. DIVISION (06) WOOD, PLASTICS AND COMPOSITES. STRUCTURAL OBSERVATION: 1. STRUCTURAL OBSERVATION IS REQUIRED DURING AND AT SPECIFIC STAGES OF CONSTRUCTION. SEE SPECIFICATION SECTION 01_45_24 FOR DETAILS.			STRUCTURAL SYMBOLS: 1. SEE DRAWING 00G05 FOR KEY TO DRAWING TITLES AND SECTION CUTS, AND FOR DEFINITION OF MATERIALS SHADING PATTERNS. 2. WELDING: SYMBOLS: IN ACCORDANCE WITH AMERICAN WELDING SOCIETY (AWS) A2.4. STRUCTURAL ABBREVIATIONS: 1. SEE DRAWING 00G06 FOR GENERAL LIST OF ABBREVIATIONS USED ON DRAWINGS. 2. ABBREVIATIONS FOR NAMES OF TECHNICAL GROUPS MAY BE FOUND IN THE PROJECT SPECIFICATIONS. 3. STRUCTURAL MEMBERS: A. STEEL: ABBREVIATIONS AND DESIGNATIONS ARE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION'S STEEL CONSTRUCTION MANUAL, CURRENT EDITION. B. ALUMINUM: ABBREVIATIONS AND DESIGNATIONS ARE IN ACCORDANCE WITH THE ALUMINUM ASSOCIATION'S ALUMINUM DESIGN MANUAL, CURRENT EDITION. 4. ABBREVIATIONS FOR STRUCTURAL DRAWINGS: WHEN USED ON THE STRUCTURAL DRAWINGS, THE FOLLOWING ABBREVIATIONS HAVE THE MEANINGS LISTED. REINFORCEMENT: OTHER: BO BOTTOM OF L ANGLE EF EACH FACE PL PLATE I.F. INSIDE FACE O.F. OUTSIDE FACE T.O. TOP OF # NUMBER (REINFORCING BAR SIZE) DEFERRED DESIGN SUBMITTALS AS DEFINED IN THE BUILDING CODE, DEFERRED DESIGN SUBMITTALS ARE PORTIONS OF THE DESIGN THAT ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION, AND THAT ARE TO BE REVIEWED BY THE REGISTERED DESIGN PROFESSIONAL AND SUBSEQUENTLY SUBMITTED TO THE BUILDING OFFICIAL. DEFERRED DESIGN SUBMITTALS FOR THIS PROJECT INCLUDE: 1. DIVISION 31 SITE CONSTRUCTION (EARTHWORK). A. 31_00_00 2. DIVISION 03 CONCRETE. A. 03_30_00 3. DIVISION 05 METALS. A. 05_50_00 HANDRAILS AND GUARDRAILS. 05_50_00 GRATING			
	B															
	C															
D																
E																
F																
G																

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

DESIGNED
CE

DRAWN
CE

CHECKED
MAK

DATE
OCTOBER 2022

1

2

3

4

5

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12

13

carollo

CITY OF
ARVADA

VERIFICATION SCALES

JOB NO.
201351

DRAWING NO.
00GS01

SHEET NO.
OF

CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

GENERAL

STRUCTURAL NOTES

0

1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PROJECT NO. 201351-100000 FILE NAME: 20135100GS01.dgn

Plot Date: 28-SEP-2022 1:54:29 PM

User: svcPW

Model: Layout1

ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: trea

PIPING SYMBOLS													MECHANICAL SYMBOLS													IDENTIFICATION SYMBOLS																									
DOUBLE LINE SINGLE LINE DESCRIPTION DOUBLE LINE SINGLE LINE DESCRIPTION													SINGLE LINE DESCRIPTION SINGLE LINE DESCRIPTION SINGLE LINE DESCRIPTION													CHEMICAL INJECTION POINT PIPE DESIGNATOR CONTINUATION TAG EQUIPMENT / VALVE TAG KEY TAG																									
WELDED JOINT GROOVED END JOINT FLANGED JOINT HUB & SPIGOT JOINT (RUBBER GASKET) PUSH-ON JOINT (RESTRAINED) ADAPTER SIDE GROOVED END ADAPTER FLANGE FLANGED COUPLING ADAPTER FLANGED COUPLING ADAPTER WITH THRUST TIES FLEXIBLE COUPLING FLEXIBLE COUPLING WITH THRUST TIES METAL BELLOWS EXP JOINT FLEXIBLE COUPLING ADAPTER DISMANTLING JOINT EXPANSION COMPENSATOR ELBOW UP ELBOW DOWN TEE UP TEE DOWN LATERAL UP LATERAL DOWN CONCENTRIC REDUCER ECCENTRIC REDUCER (FOT, FOB) UNION CAP ANCHOR ELBOW, 90 DEGREE CROSS TEE ELBOW, 45 DEGREE ELBOW, 22.5 DEGREE ELBOW, 11.25 DEGREE LATERAL													GATE VALVE KNIFE GATE VALVE BUTTERFLY VALVE CHARACTERIZED BALL CONTROL VALVE BALL VALVE GLOBE VALVE 3-WAY VALVE 3-WAY GLOBE TYPE MIXING VALVE 4-WAY VALVE DIAPHRAGM VALVE PLUG VALVE LUBRICATED PLUG VALVE CONCENTRIC PLUG VALVE LUBRICATED CONCENTRIC PLUG VALVE SWING CHECK VALVE WAFER CHECK VALVE PINCH VALVE BALL CHECK VALVE DUAL CHECK VALVE SILENT CHECK VALVE MUD VALVE (PLAN VIEW) NEEDLE VALVE CHECK BACKFLOW PREVENTER PIPE MATERIAL CHANGE FLOAT VALVE 3-WAY PLUG VALVE BALL V-NOTCH VALVE PUMP DISCHARGE													AIR OR CHEMICAL DIFFUSER QUICK DISCONNECT HIGH PRESSURE AIR OR FLUSHING BATCHMETER AIR VENT BASKET STRAINER BLOWER CALIBRATION COLUMN COMPRESSOR/TURBINE COMPRESSOR: RECIPROCATING DIAPHRAGM SEAL DRAIN EJECTOR OR EDUCTOR ELECTRIC MOTOR EQUIPMENT DRAIN EXPANSION JOINT, FLEXIBLE VIBRATION JOINT FAN: EXHAUST/SUPPLY FILTER FIRE HYDRANT FLAME ARRESTER FLAME ARRESTER WITH THERMALLY OPERATED VALVE FLOOR DRAIN FLOW SWITCH GAUGE: PRESSURE GAUGE: DIFFERENTIAL PRESSURE WEIR MIXER OIL OR MOISTURE TRAP PRIMARY LEVEL ELEMENT: BUBBLER PRIMARY LEVEL ELEMENT: ELECTRODE PRIMARY LEVEL ELEMENT: FLOAT SWITCH PRIMARY LEVEL ELEMENT: FLUID PRIMARY LEVEL ELEMENT: INVERTED COLUMN PRIMARY LEVEL ELEMENT: RADAR PRIMARY LEVEL ELEMENT: ULTRASONIC PRIMARY FLOW ELEMENT: FLUME PRIMARY FLOW ELEMENT: X = C - CORIOLIS X = M - MAGNETIC X = P - PROPELLER X = PT - PITOT TUBE X = R - ROTAMETER X = T - TURBINE X = TH - THERMAL X = U - ULTRASONIC X = D - DENSITY PRIMARY FLOW ELEMENT: ORIFICE PLATE PRIMARY FLOW ELEMENT: VENTURI TUBE PRIMARY FLOW ELEMENT: WEIR PULSATION DAMPENER PUMP: CENTRIFUGAL PUMP: DIAPHRAGM PUMP: METERING PUMP: PLUNGER PUMP: PERISTALTIC TUBE METERING PUMP: PROGRESSIVE CAVITY PUMP: RECIPROCATING PUMP: ROTARY PUMP: SCREW PUMP: SUBMERSIBLE PUMP: VERTICAL LIFT PIPE REDUCER: CONCENTRIC PIPE REDUCER: ECCENTRIC (FOT, FOB) ROTARY CHEMICAL FEEDER RUPTURE DISK SAMPLE PORT SIGHT GLASS SLIDE GATE SLUICE GATE STRAINER: WYE TYPE STRAINER: WYE TYPE WITH BLOWOFF THERMOMETER VALVE: ANGLE VALVE: AIR RELIEF VALVE: CONE VALVE: FLAPPER CHECK VALVE: FOUR WAY VALVE: HOSE VALVE: PLUG CONCENTRIC VALVE: PRESSURE RELIEF PRESSURE-REDUCING REGULATOR VALVE: TELESOPING VALVE: THREE WAY AIR OPERATED VALVE: THREE WAY MOTOR OPERATED VALVE: THREE WAY SOLENOID OPERATED VALVE: VACUUM BACKPRESSURE REGULATOR SELF-CONTAINED BACKPRESSURE REGULATOR W/ EXTERNAL PRESSURE TAP PRESSURE-REDUCING REGULATOR: SELF-CONTAINED PRESSURE-REDUCING REGULATOR W/EXTERNAL PRESSURE TAP													CHEMICAL DWG NO. PIPE SIZE X" XXX FLOW STREAM CONTINUATION FROM DWG NO. CONTINUATION TO DWG NO. UNIQUE IDENTIFIER A B C XXX-XX-XXXX X												
																										LINE SYMBOLS																									
																										PIPE ABOVE OR BELOW GROUND PIPE UNDERNEATH SLAB OR STRUCTURE FUTURE EXISTING DEMO																									
																										PROCESS LINE SYMBOLS																									
																										PRIMARY PROCESS FLOW IN PIPE SECONDARY PROCESS FLOW IN PIPE PRIMARY PROCESS FLOW IN CHANNEL SECONDARY PROCESS FLOW IN CHANNEL																									

Plot Date: 12-OCT-2022 10:04:04 AM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: trea

VALVE SCHEDULE (4-INCH AND LARGER)								
PROCESS UNIT #	TAG ID	LOCATION	SERVICE	TYPE	SIZE (IN.)	OPEN/CLOSE TIME (SEC)	OPERATOR	REMARKS
00	00MV1000	YARD	BWW	BUTTERFLY (V500)	24	-	VB	BYPASS TO DETENTION BASIN, BURIED
30	30FV0101	PRETREATMENT BUILDING	SBS	PLUG (V405)	4	30	ED	REMOTE CONTROL STATION
30	30FV0201	PRETREATMENT BUILDING	SBS	PLUG (V405)	4	30	ED	REMOTE CONTROL STATION
30	30FV0301	PRETREATMENT BUILDING	SBS	PLUG (V405)	4	30	ED	REMOTE CONTROL STATION
30	30FV0401	PRETREATMENT BUILDING	SBS	PLUG (V405)	4	30	ED	REMOTE CONTROL STATION
30	30MV1001	PRETREATMENT BUILDING	SBS	PLUG (V405)	6	-	HW	SOLIDS PUMP 1
30	30CV1002	PRETREATMENT BUILDING	SBS	SWING CHECK (V608)	4	-	-	SOLIDS PUMP 1
30	30MV1003	PRETREATMENT BUILDING	SBS	PLUG (V405)	4	-	HC	SOLIDS PUMP 1
30	30MV1004	PRETREATMENT BUILDING	SBS	PLUG (V405)	6	-	HW	SOLIDS PUMP 1
30	30MV2001	PRETREATMENT BUILDING	SBS	PLUG (V405)	6	-	HW	SOLIDS PUMP 2
30	30CV2002	PRETREATMENT BUILDING	SBS	SWING CHECK (V608)	4	-	-	SOLIDS PUMP 2
30	30MV2003	PRETREATMENT BUILDING	SBS	PLUG (V405)	4	-	HC	SOLIDS PUMP 2
30	30MV2004	PRETREATMENT BUILDING	SBS	PLUG (V405)	6	-	HW	SOLIDS PUMP 2
70	70MV0111	LAGOON 1 AND 2 INTERCONNECT	D	PLUG (V405)	12	-	VB	BURIED
70	70MV0103	SOLIDS HANDLING LAGOON 1	U	PLUG (V405)	4	-	HW	EXTENSION BONNET
70	70MV0104	SOLIDS HANDLING LAGOON 1	BWR	BUTTERFLY (V500)	12	-	HW	EXTENSION BONNET
70	70MV0203	SOLIDS HANDLING LAGOON 2	U	PLUG (V405)	4	-	HW	EXTENSION BONNET
70	70MV0204	SOLIDS HANDLING LAGOON 2	BWR	BUTTERFLY (V500)	12	-	HW	EXTENSION BONNET
70	70MV0310	SOLIDS HANDLING LAGOON 3	BWW	BUTTERFLY (V500)	24	-	VB	BURIED
70	70MV0303	SOLIDS HANDLING LAGOON 3	U	PLUG (V405)	4	-	HW	EXTENSION BONNET
70	70MV0304	SOLIDS HANDLING LAGOON 3	BWR	BUTTERFLY (V500)	12	-	HW	EXTENSION BONNET
70	70MV0410	SOLIDS HANDLING LAGOON 4	BWW	BUTTERFLY (V500)	24	-	VB	BURIED
70	70MV0403	SOLIDS HANDLING LAGOON 4	U	PLUG (V405)	4	-	HW	EXTENSION BONNET
70	70MV0404	SOLIDS HANDLING LAGOON 4	BWR	BUTTERFLY (V500)	12	-	HW	EXTENSION BONNET
ABBREVIATIONS: ED=ELECTRIC DISCRETE; EM=ELECTRIC MODULATING; HC=HANDCHAIN; HW=HANDWHEEL; N=2" SQUARE NUT, VB=VALVE BOX W/ 2" SQUARE NUT, BURIED								

SLIDE GATE SCHEDULE										
PROCESS UNIT #	TAG ID	LOCATION	SIZE (FEET)		HEAD (FEET)		CLOSURE TYPE	GATE TYPE	OPERATOR	REMARKS
			W	H	SEAT	UNSEAT				
70	70G0101	LAGOON 1 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0102	LAGOON 1 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
70	70G0201	LAGOON 2 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0202	LAGOON 2 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
70	70G0301	LAGOON 3 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0302	LAGOON 3 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
70	70G0401	LAGOON 4 OUTLET STRUCTURE	5	4	8	8	FM	DO	HCN	
70	70G0402	LAGOON 4 OUTLET STRUCTURE	3	3	10	10	FM	DO	HCN	TOP SEAL
NOTE: ALL GATES SHALL BE NONRISING STEM.										
ABBREVIATIONS: CLOSURE TYPE: OF = OPEN FRAME (NON-SELF CONTAINED); FM = FRAME MOUNTED (SELF CONTAINED) GATE TYPE: DO = DOWNWARD OPENING; UO = UPWARD OPENING OPERATOR TYPE: HCN = HAND CRANK W/ 2" SQUARE NUT; HW = HANDWHEEL; PED = PEDESTAL; FBN = FLOOR BOX W/ 2" SQUARE NUT; M = MOTOR OPERATOR										

PIPING SCHEDULE											
ABBR.	SERVICE	DIAMETER (INCHES)	MATERIAL	PRESSURE CL, SPECIAL THICKNESS CL, OR SCHEDULE	JOINTS/ FITTINGS	GASKET MATERIAL	TEST PRESSURE/ METHOD	LINING	COATING	PIPE SPEC SECTION	COMMENTS
BWR	BACKWASH RECYCLE										
	BURIED	3 TO 12	DIP	CL 350	RPO OR RMJ	EPDM	25 PSIG / HH	CM	DOUBLE PEN	40_05_19.01	
	EXPOSED	3 TO 12	DIP	CL 53	FL	EPDM	25 PSIG / HH	CM	EPX	40_05_19.01	
	SUBMERGED	3 TO 12	DIP	CL 53	FL	EPDM	25 PSIG / HH	CM	EPX	40_05_19.01	
BWW	BACKWASH WASTE										
	BURIED	10 TO 24	DIP	CL 350	RPO OR RMJ	EPDM	25 PSIG / HH	CM	DOUBLE PEN	40_05_19.01	
	SUBMERGED	10 TO 24	DIP	CL 53	FL	EPDM	25 PSIG / HH	CM	EPX	40_05_19.01	
D	DECANT										
	BURIED	6	DIP	CL 350	RPO OR RMJ	EPDM	25 PSIG / HH	CM	DOUBLE PEN	40_05_19.01	
	SUBMERGED	6	DIP	CL 53	FL	EPDM	25 PSIG / HH	CM	EPX	40_05_19.01	
DR	PROCESS DRAIN										
	EXPOSED	4 TO 6	DIP	CL 53	FL	EPDM	25 PSIG / HH	CM	EPX	40_05_19.01	
PEN	NONIONIC POLYMER										
	EXPOSED	ALL	PVC	SCH 80	SW	VITON	125 PSIG / HH	NONE	NONE	40_05_31.17	USE IPS TYPE 724 CEMENT
SBS	SEDIMENTATION BASIN SOLIDS										
	BURIED	4 TO 8	DIP	CL 350	RPO OR RMJ	EPDM	25 PSIG / HH	CM	DOUBLE PEN	40_05_19.01	
	EXPOSED	4 TO 8	DIP	CL 53	FL	EPDM	25 PSIG / HH	CM	EPX	40_05_19.01	
U	UNDERDRAIN										
	BURIED	3	HDPE, PERFORATED	ASTM F667	ES	EPDM	NONE	NONE	NONE	40_05_33.03	IN SOLIDS LAGOON ONLY
	BURIED	4	HDPE	ASTM F667	ES	EPDM	NONE	NONE	NONE	40_05_33.03	IN SOLIDS LAGOON ONLY
	BURIED	6	DIP	CL 350	RPO OR RMJ	EPDM	25 PSIG / HH	CM	DOUBLE PEN	40_05_19.01	YARD ONLY
	SUBMERGED	6	DIP	CL 53	FL	EPDM	25 PSIG / HH	CM	EPX	40_05_19.01	
W1	POTABLE WATER										
	BURIED	3 & SMALLER	PVC	SCH 80	SW	EPDM	150 PSIG / HH	NONE	NONE	40_05_31.17	USE IPS TYPE 724 CEMENT
	BURIED	4 TO 6	DIP	CL 350	RPO OR RMJ	EPDM	150 PSIG / HH	CM	DOUBLE PEN	40_05_19.01	
	EXPOSED	3 & SMALLER	COPPER	TYPE L	SOLDERED	NONE	150 PSIG / HH	NONE	NONE	40_05_17.05	

PIPE SCHEDULE ABBREVIATIONS	
ABBREVIATIONS TO DESIGNATE TEST PRESSURE/METHOD PER SPECIFICATION SECTION 40_05_00.09:	
AM	AIR METHOD
GR	GRAVITY METHOD
HH	HIGH HEAD METHOD
LH	LOW HEAD METHOD
SC	SPECIAL CASE
ABBREVIATIONS TO DESIGNATE PIPE MATERIAL:	
CI	CAST IRON
CUP	COPPER
DIP	DUCTILE IRON PIPING
FRP	FIBERGLASS REINFORCED PLASTIC
MDPE	MEDIUM DENSITY POLYETHYLENE
HDPE	HIGH DENSITY POLYETHYLENE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
SST	STAINLESS STEEL
VCP	VITRIFIED CLAY PIPING
ABBREVIATIONS TO DESIGNATE CLASS, SCHEDULE, OR THICKNESS:	
CL	CLASS, FOLLOWED BY THE DESIGNATION
GA	GAUGE, PRECEDED BY THE DESIGNATION
SCH	SCHEDULE, FOLLOWED BY THE DESIGNATION
SDR	STANDARD DIMENSION RATIO
ABBREVIATIONS TO DESIGNATE PIPING JOINTS/FITTINGS:	
B&SP	BELL & SPIGOT
BFW	BUTT FUSION
CF	COMPRESSION FITTINGS
ES	EXTERNAL SNAP
FL	FLANGED
GE	GROOVED END
MJ	MECHANICAL JOINT
NH	NO HUB
PO	PUSH ON
RMJ	RESTRAINED MECHANICAL JOINT
RPO	RESTRAINED PUSH ON
SCRD	SCREWED
SFW	SOCKET FUSION
SLD	SOLDERED
SW	SOLVENT WELD
WLD	WELDED
ABBREVIATIONS TO DESIGNATE GASKETS:	
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
NBR	NITRILE RUBBER (BUNA-N)
PTFE	TEFLON
ABBREVIATIONS TO DESIGNATE LINING AND COATINGS:	
CM	CEMENT MORTAR
EPU	EPOXY AND POLYURETHANE COATING SYSTEM PER SECTION 09_96_01
EPX	EPOXY COATING SYSTEM PER SECTION 09_06_01
PEN	POLYETHYLENE ENCASED
TW	TAPE WRAP IN ACCORDANCE WITH SPEC SECTION 40_05_24.09
TW-CM	SHOP-APPLIED TAPE WRAP W/ CEMENT MORTAR OVERCOAT



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
MECHANICAL
MECHANICAL SCHEDULES

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.
201351
DRAWING NO.
00GM02
SHEET NO.
OF

Plot Date: 14-SEP-2022 2:04:20 PM
User: svcPW
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1
LAST SAVED BY: lstepard

ELECTRICAL PLAN SYMBOLS							ELECTRICAL ONE-LINE SYMBOLS											
IDENTIFICATION SYMBOLS				SWITCHES/RECEPTACLES			RACEWAY			MEDIUM VOLTAGE			LOW VOLTAGE			MISCELLANEOUS		
EQUIP # EQUIPMENT AND INSTRUMENT IDENTIFICATION ■ EQUIPMENT/INSTRUMENT LOCATOR b X a c LUMINAIRE IDENTIFICATION a = CIRCUIT DESIGNATION b = DEVICE SWITCHED FROM c = MOUNTING HEIGHT IN FEET TO BOTTOM OF FIXTURE X = LUMINAIRE TYPE, REFER TO THE LUMINAIRE SCHEDULE XXXX CONDUIT IDENTIFICATION XXXX = CONDUIT NUMBER, REFER TO CONDUIT SCHEDULE UNLESS OTHERWISE NOTED, GROUPED CONDUITS ARE LABELED LEFT TO RIGHT OR TOP TO BOTTOM. X INDICATES KEYNOTE X (PERTAINS ONLY TO SHEET WHERE NOTE IS FOUND) A DISCONNECT SWITCH A = TYPE, REFER TO DISCONNECT SCHEDULE 📷 CAMERA LUMINAIRES LINEAR FIXTURE 2' X 2' LAY-IN TROFFER 2' X 4' LAY-IN TROFFER ○ ○ LUMINAIRE POLE MOUNTED R H GO/NO-GO PANEL - STROBE AND HORN R = RED LIGHT G = GREEN LIGHT H = HORN R G GO/NO-GO PANEL - SOLID R GO/NO-GO PANEL - STROBE LUMINAIRE, EMERGENCY BATTERY-POWERED LUMINAIRE, EMERGENCY/EXIT BATTERY-POWERED LUMINAIRE, EMERGENCY BATTERY-POWERED REMOTE ○ LUMINAIRE, SURFACE OR PENDANT MOUNTED ⊥ ○ LUMINAIRE, WALL MOUNTED ← ○ LUMINAIRE, FLOOD/SPOT ↖ ⊗ ↗ ⊗ LUMINAIRE, EXIT ONE OR TWO FACES AS INDICATED. ARROW POINTS IN DIRECTION OF EGRESS.																		

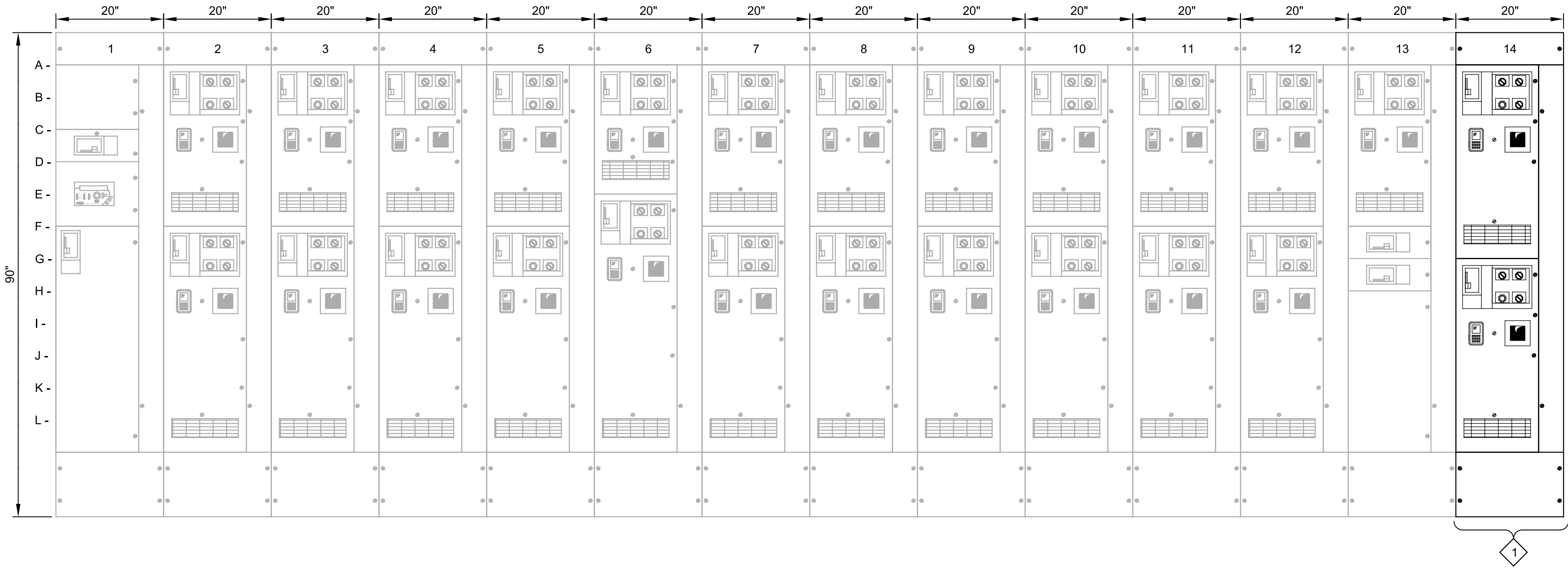
A	A	AMP	J	JUNCTION BOX	TACH	TACHOMETER	1	MASTER ELEMENT	83	AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY	A																																																																																																																																																																																																																																										
	ABS	ABSOLUTE			TB - X	TERMINAL BLOCK - UNIT X	2	TIME-DELAY STARTING OR CLOSING RELAY	84	OPERATING MECHANISM																																																																																																																																																																																																																																											
	AC	ALTERNATING CURRENT	K	KEY INTERLOCK	TC	THERMOCOUPLE / TIME CLOCK / TRAY CABLE	3	CHECKING OR INTERLOCKING RELAY	85	PILOT COMMUNICATIONS, CARRIER OR PILOT-WIRE RELAY																																																																																																																																																																																																																																											
	ACK	ACKNOWLEDGE	KA	KILOAMP	TD	TEMPERATURE DETECTOR RELAY	4	MASTER CONTACTOR	86	LOCKOUT RELAY																																																																																																																																																																																																																																											
	ACTR	ACTUATOR	KV	KILOVOLT	TE	TOTALLY ENCLOSED	5	STOPPING DEVICE	87	DIFFERENTIAL PROTECTIVE RELAY																																																																																																																																																																																																																																											
	AF	AMP FRAME	KVA	KILOVOLT AMPERE	TEFC	TOTALLY ENCLOSED FAN COOLED	6	STARTING CIRCUIT BREAKER	88	AUXILIARY MOTOR OR MOTOR GENERATOR																																																																																																																																																																																																																																											
	AFC	AUTOMATIC FREQUENCY CONTROL	KVAR	KILOVAR (REACTANCE)	TENV	TOTALLY ENCLOSED NON-VENTILATED	7	ANODE CIRCUIT BREAKER	89	LINE SWITCH																																																																																																																																																																																																																																											
	AIC	AMP INTERRUPTING CAPACITY	KW	KILOWATT	TERM	TERMINAL	8	CONTROL POWER DISCONNECTING DEVICE	90	REGULATING DEVICE																																																																																																																																																																																																																																											
	AM	AMMETER	KWD	KILOWATT DEMAND	TJB	TERMINAL JUNCTION BOX	9	REVERSING DEVICE	91	VOLTAGE DIRECTIONAL RELAY																																																																																																																																																																																																																																											
	ANN	ANNUNCIATOR	KWH	KILOWATT HOUR	TM	THERMAL MAGNETIC	10	UNIT SEQUENCE SWITCH	92	VOLTAGE AND POWER DIRECTIONAL RELAY																																																																																																																																																																																																																																											
B	ANT	ANTENNA			TP	TWISTED PAIR	11	MULTIFUNCTION DEVICE	93	FIELD-CHANGING CONTACTOR	B																																																																																																																																																																																																																																										
	APU	AUXILIARY POWER UNIT	L	LONG-TIME	TS	TEMPERATURE SWITCH	12	OVER-SPEED DEVICE	94	TRIPPING OR TRIP-FREE RELAY																																																																																																																																																																																																																																											
	ARM	ARMORED CABLE	L-B	LINE-BUS	TS1W	TWO SPEED CONSEQUENT POLE, ONE WINDING	13	SYNCHRONOUS-SPEED DEVICE	COMMONLY USED SUFFIX LETTERS APPLIED TO POWER DEVICE FUNCTION NUMBERS																																																																																																																																																																																																																																												
	AS	AMMETER SWITCH	L-G	LINE-GROUND	TS2W	TWO SPEED SEPARATE WINDING	14	UNDER-SPEED DEVICE																																																																																																																																																																																																																																													
	ASYM	ASYMMETRICAL	LA	LIGHTNING ARRESTOR	TSAT	THERMOSTAT	15	SPEED OR FREQUENCY MATCHING DEVICE	B	A ALARM ONLY B BUS PROTECTION G GROUND FAULT PROTECTION (RELAY CT IN A SYSTEM NEUTRAL CIRCUIT OR GENERATOR PROTECTION) GS GROUND FAULT PROTECTION (RELAY CT IN TOROIDAL OR GROUND SENSOR TYPE) L LINE PROTECTION M MOTOR PROTECTION N GROUND FAULT PROTECTION (RELAY COIL CONNECTED IN RESIDUAL CT CIRCUIT) T TRANSFORMER PROTECTION V VOLTAGE P PHASE PROTECTION																																																																																																																																																																																																																																											
	AT	AMP TRIP	LBL	LABEL			16	DATA COMMUNICATIONS DEVICE																																																																																																																																																																																																																																													
	ATO	AUTOMATIC THROW OVER	LC	LIGHTING CONTACT OR	UHF	ULTRA HIGH FREQUENCY	17	SHUNTING OR DISCHARGE SWITCH																																																																																																																																																																																																																																													
	ATP	AMMETER TEST POINT	LCP- X	LOCAL CONTROL PANEL NO. X	UNG	UNGROUND	18	ACCELERATING OR DECELERATING DEVICE																																																																																																																																																																																																																																													
	ATS	AUTOMATIC TRANSFER SWITCH	LL	LEAD-LAG LOAD REACTOR	UPS	UNINTERRUPTIBLE POWER SUPPLY	19	STARTING-TO-RUNNING TRANSITION CONTACTOR																																																																																																																																																																																																																																													
	AUTO XFMR	AUTOMATIC TRANSFORMER	LP	LIGHT POLE	UVR	UNDER VOLTAGE RELAY	20	ELECTRICALLY OPERATED VALVE																																																																																																																																																																																																																																													
AUX	AUXILIARY	LP - X	LIGHTING PANEL NO. X			21	DISTANCE RELAY																																																																																																																																																																																																																																														
AWG	AMERICAN WIRE GAGE	LTG	LIGHTING	V	VOLT	22	EQUALIZER CIRCUIT BREAKER																																																																																																																																																																																																																																														
		LV	LOW VOLTAGE	VA	VOLT AMPERE	23	TEMPERATURE CONTROL DEVICE																																																																																																																																																																																																																																														
C	B	BELL	LVL	LEVEL	VAR	VARMETER	24	VOLTS PER HERTZ RELAY				C	ABBREVIATIONS AFD - ARC FLASH DETECTOR CLK - CLOCK OR TIMING SOURCE DDR - DYNAMIC DISTURBANCE RECORDER DFR - DIGITAL FAULT RECORDER ENV - ENVIRONMENTAL DATA HIZ - HIGH IMPEDANCE FAULT DETECTOR HMI - HUMAN MACHINE INTERFACE HST - HISTORIAN LGC - SCHEME LOGIC MET - SUBSTATION METERING PDC - PHASOR DATA CONCENTRATOR PMU - PHASOR MEASUREMENT UNIT PQM - POWER QUALITY MONITOR RIO - REMOTE I/O DEVICE RTU - REMOTE TELEMETRY UNIT/REMOTE TERMINAL UNIT SER - SEQUENCE OF EVENTS RECORDER TCM - TRIP CIRCUIT MONITOR																																																																																																																																																																																																																																								
	BAT	BATTERY			VCP	VENDOR CONTROL PANEL	25	SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE																																																																																																																																																																																																																																													
	BFG	BELOW FINISHED GRADE	M-X	MOTOR CONTROLLER NO. X	VFD	VARIABLE FREQUENCY DRIVE	26	APPARATUS THERMAL DEVICE																																																																																																																																																																																																																																													
	BHP	BRAKE HORSEPOWER	MA	MILLIAMPERE	VHF	VERY HIGH FREQUENCY	27	UNDERVOLTAGE RELAY																																																																																																																																																																																																																																													
	BKR	BREAKER	MCA	MOTOR CIRCUIT AMPS	VM	VOLTMETER	27N	GROUND FAULT UNDERVOLTAGE RELAY																																																																																																																																																																																																																																													
	BRF	BELOW RAISED FLOOR	MCC - X	MOTOR CONTROL CENTER NO. X	VP	VAPORPROOF	28	FLAME DETECTOR																																																																																																																																																																																																																																													
			MCP	MOTOR CIRCUIT PROTECTOR	VR	VOLTAGE REGULATOR	29	ISOLATING CONTACTOR																																																																																																																																																																																																																																													
	C	CONDUIT / CONTINUOUS LOAD	MH	MANHOLE / MOUNTING HEIGHT	VS	VOLTAGE SWITCH	30	ANNUNCIATOR RELAY																																																																																																																																																																																																																																													
	CB	CIRCUIT BREAKER	MLO	MAIN LUGS ONLY	VT	VOLTAGE TRANSFORMER	31	SEPARATE EXCITATION DEVICE																																																																																																																																																																																																																																													
	CCTV	CLOSED CIRCUIT TELEVISION	MOD	MOTOR OPERATED DAMPER	VTP	VOLTAGE TEST POINT	32	DIRECTIONAL POWER RELAY																																																																																																																																																																																																																																													
D	CCW	COUNTER CLOCKWISE	MOV	METAL OXIDE VARISTOR			33	POSITION SWITCH	D																																																																																																																																																																																																																																												
	CKT	CIRCUIT	MPR	MOTOR PROTECTION RELAY	W	WATT / WEST	34	MASTER SEQUENCE DEVICE																																																																																																																																																																																																																																													
	COAX	COAXIAL CABLE	MS-X	MOTOR STARTER NO. X	WT	WATER TIGHT	35	BRUSH-OPERATING OR SLIP-RING SHORT-CIRCUITING DEVICE																																																																																																																																																																																																																																													
	COM	COMMON	MSP	MOTOR STARTING PANEL	WP	WEATHER PROOF	36	POLARITY DEVICE																																																																																																																																																																																																																																													
	COMM	COMMUNICATION	MTO	MANUAL THROW OVER			37	UNDERCURRENT OR UNDERPOWER RELAY																																																																																																																																																																																																																																													
	CPT	CONTROL POWER TRANSFORMER	MTR-X	MOTOR NO. X	XFMR	TRANSFORMER	38	BEARING PROTECTIVE DEVICE																																																																																																																																																																																																																																													
	CR	CONTROLLED RECEPTACLE	MTS	MANUAL TRANSFER SWITCH			39	MECHANICAL CONDITION MONITOR																																																																																																																																																																																																																																													
	CS	CONTROL SWITCH	MV	MEGAVOLT			40	FIELD RELAY																																																																																																																																																																																																																																													
	CT	CURRENT TRANSFORMER	MVA	MEGAVOLT-AMPERES			41	FIELD CIRCUIT BREAKER																																																																																																																																																																																																																																													
	CV	CONTROL VALVE	MVS	MEDIUM VOLTAGE SWITCH			42	RUNNING CIRCUIT BREAKER																																																																																																																																																																																																																																													
E	CW	CLOCKWISE / COOL WHITE	MW	MEGAWATT			43	MANUAL TRANSFER OR SELECTOR DEVICE	E																																																																																																																																																																																																																																												
	DC	DIRECT CURRENT	N	NEUTRAL			44	UNIT SEQUENCE STARTING RELAY																																																																																																																																																																																																																																													
	DCS	DISTRIBUTED CONTROL SYSTEM	NC	NORMALLY CLOSED			45	ABNORMAL ATMOSPHERIC CONDITION MONITOR																																																																																																																																																																																																																																													
	DCU - X	DISTRIBUTED CONTROL UNIT NO. X	NEC	NATIONAL ELECTRICAL CODE			46	REVERSE-PHASE OR BALANCE CURRENT RELAY																																																																																																																																																																																																																																													
	DEMO	DEMOLITION	NFC	NONMETALLIC FLEXIBLE CONDUIT			47	PHASE-BALANCE OR PHASE-SEQUENCE VOLTAGE RELAY																																																																																																																																																																																																																																													
	DISC	DISCONNECT SWITCH	NL	NIGHT LIGHT			48	INCOMPLETE SEQUENCE RELAY																																																																																																																																																																																																																																													
	DM	DEMAND METER	NO	NORMALLY OPEN			49	MACHINE OR TRANSFORMER THERMAL RELAY																																																																																																																																																																																																																																													
	DPDT	DOUBLE POLE DOUBLE THROW	NP	NAMEPLATE			50	INSTANTANEOUS OVERCURRENT RELAY																																																																																																																																																																																																																																													
	DPST	DOUBLE POLE SINGLE THROW					51	AC TIME OVERCURRENT RELAY																																																																																																																																																																																																																																													
	DS	DOOR SWITCH	O	OPEN OR OPENED			52	AC CIRCUIT BREAKER																																																																																																																																																																																																																																													
F			OH	OVERHEAD			53	FIELD EXCITATION RELAY	F																																																																																																																																																																																																																																												
	E/G	EMERGENCY GENERATOR	OL	OVERLOAD RELAY			54	TURNING GEAR ENGAGING DEVICE																																																																																																																																																																																																																																													
	EM	EMERGENCY					55	POWER FACTOR RELAY																																																																																																																																																																																																																																													
	EMT	ELECTRICAL METALLIC TUBING	P	POLE			56	FIELD APPLICATION RELAY																																																																																																																																																																																																																																													
	ENCL	ENCLOSURE	PA	PUBLIC ADDRESS			57	SHORT-CIRCUITING OR GROUNDING DEVICE																																																																																																																																																																																																																																													
	ENG	ENGINE	PB	PUSHBUTTON / PULL BOX			58	RECTIFICATION FAILURE RELAY																																																																																																																																																																																																																																													
	ENT	ELECTRICAL NON-METALLIC TUBING	PCS	PVC COATED GALVANIZED STEEL CONDUIT			59	OVERVOLTAGE RELAY																																																																																																																																																																																																																																													
	EP	EXPLOSION PROOF	PCM	PROCESS CONTROL MODULE			60	VOLTAGE OR CURRENT BALANCE RELAY																																																																																																																																																																																																																																													
	ETM	ELAPSED TIME METER	PE	PHOTOCELL			61	DENSITY SWITCH OR SENSOR																																																																																																																																																																																																																																													
			PF	POWER FACTOR			62	TIME-DELAY STOPPING OR OPENING RELAY																																																																																																																																																																																																																																													
G	F	SUB-FED	PFCC	POWER FACTOR CORRECTION CAPACITOR			63	PRESSURE SWITCH	G	VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY																																																																																																																																																																																																																																											
	FA	FIRE ALARM	PFR	PHASE FAILURE RELAY			64	GROUND DETECTOR RELAY																																																																																																																																																																																																																																													
	FACP	FIRE ALARM CONTROL PANEL	PH	PHASE			65	GOVERNOR																																																																																																																																																																																																																																													
	FDR	FEEDER	PNL	PANEL			66	NOTCHING OR JOGGING DEVICE																																																																																																																																																																																																																																													
	FLA	FULL LOAD AMPS	PPX	POWER PANEL NO. X			67	AC DIRECTIONAL OVERCURRENT RELAY																																																																																																																																																																																																																																													
	FLX	FLEXIBLE CONDUIT	PRI	PRIMARY			68	BLOCKING OR OUT OF STEP RELAY																																																																																																																																																																																																																																													
	FO	FIBER OPTIC	PT	POTENTIAL TRANSFORMER			69	PERMISSIVE CONTROL DEVICE																																																																																																																																																																																																																																													
	FRC	FIBERGLASS RIGID CONDUIT	PVC	POLYVINYL CHLORIDE RIGID PLASTIC CONDUIT			70	RHEOSTAT																																																																																																																																																																																																																																													
	FREQ	FREQUENCY	PWR	POWER			71	LIQUID LEVEL SWITCH																																																																																																																																																																																																																																													
	FU	FUSE					72	DC CIRCUIT BREAKER																																																																																																																																																																																																																																													
H	FU	SW FUSED SWITCH	RAC	RIGID ALUMINUM CONDUIT			73	LOAD-RESISTOR CONTACTOR	H	CITY OF ARVADA, COLORADO RALSTON WTP SOLIDS IMPROVEMENTS ELECTRICAL ELECTRICAL ABBREVIATIONS																																																																																																																																																																																																																																											
	FVNR	FULL VOLTAGE NON-REVERSING	RECPT	RECEPTACLE			74	ALARM RELAY																																																																																																																																																																																																																																													
	FVR	FULL VOLTAGE REVERSING	REV	REVERSE			75	POSITION CHANGING MECHANISM																																																																																																																																																																																																																																													
	FWD	FORWARD	RF	RADIO FREQUENCY			76	DC OVERCURRENT RELAY																																																																																																																																																																																																																																													
			RMS	ROOT MEAN SQUARED			77	TELEMETERING DEVICE																																																																																																																																																																																																																																													
	G	GROUND / EQUIPMENT GROUND / GROUND FAULT	RVAT	REDUCED VOLTAGE AUTO TRANSFORMER			78	PHASE-ANGLE MEASURING RELAY																																																																																																																																																																																																																																													
	GEN	GENERATOR	RVNR	REDUCED VOLTAGE NON-REVERSING			79	AC RECLOSING RELAY																																																																																																																																																																																																																																													
	GRC	GALVANIZED STEEL RIGID CONDUIT	RVSS	REDUCED VOLTAGE SOLID STATE			80	FLOW SWITCH																																																																																																																																																																																																																																													
	GFCI	GROUND FAULT CIRCUIT INTERRUPTER (RECEPTACLE)					81	FREQUENCY RELAY																																																																																																																																																																																																																																													
	GFI	GROUND FAULT INTERRUPTER (BREAKER)	S	SHIELD / SHORT-TIME			82	DC LOAD MEASURING RECLOSING RELAY																																																																																																																																																																																																																																													
I	GFR	GROUND FAULT RELAY	SA	SURGE ARRESTER					I	JOB NO. 201351 DRAWING NO. 00GE02 SHEET NO. OF																																																																																																																																																																																																																																											
			SC	SHORT CIRCUIT																																																																																																																																																																																																																																																	
	H	HOT-LEG	SDBC	SOFT DRAWN BARE COPPER																																																																																																																																																																																																																																																	
	HF	HIGH FREQUENCY	SFL	SUB FEED LUGS																																																																																																																																																																																																																																																	
	HP	HORSEPOWER	SLT	SEALTIGHT LIQUIDTIGHT FLEXIBLE CONDUIT																																																																																																																																																																																																																																																	
	HPS	HIGH PRESSURE SODIUM	SM	SURFACE MOUNTED																																																																																																																																																																																																																																																	
	HR	HOUR	SP	SINGLE POLE																																																																																																																																																																																																																																																	
	HSTAT	HUMIDISTAT	SPD	SURGE PROTECTIVE DEVICE																																																																																																																																																																																																																																																	
	HV	HIGH VOLTAGE	SPDT	SINGLE POLE DOUBLE THROW																																																																																																																																																																																																																																																	
	HVAC	HEATING/VENTILATION/AIR CONDITIONING	SPST	SINGLE POLE SINGLE THROW																																																																																																																																																																																																																																																	
J	HZ	HERTZ	SPKR	SPEAKER					J																																																																																																																																																																																																																																												
			SS	SOLID STATE																																																																																																																																																																																																																																																	
	I	INSTANTANEOUS / INTERMITTENT LOAD	STB	SHORTING TERMINAL BLOCK																																																																																																																																																																																																																																																	
	IC	INTERRUPTING CAPACITY	SW	SWITCH																																																																																																																																																																																																																																																	
	IJB	INSTRUMENT JUNCTION BOX	SWBD	SWITCHBOARD																																																																																																																																																																																																																																																	
	IMC	INTERMEDIATE METAL CONDUIT	SWGR	SWITCHGEAR																																																																																																																																																																																																																																																	
	INST	INSTANTANEOUS	SYM	SYMMETRICAL																																																																																																																																																																																																																																																	
	INT	INTERLOCK																																																																																																																																																																																																																																																			
	INTERCOM	INTERCOMMUNICATION																																																																																																																																																																																																																																																			
	NOTES: 1. REFER TO SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL ABBREVIATIONS.																																																																																																																																																																																																																																																				
G				DESIGNED CE																																																																																																																																																																																																																																																	

Plot Date: 13-OCT-2022 4:37:57 PM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1

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GENERAL NOTES:

1. THE EXISTING INFORMATION SHOWN IS BASED ON AS-BUILTS AND SHALL BE FIELD VERIFIED.
2. REFER TO SPECIFICATION 01_14_00 FOR CONSTRUCTION SEQUENCING.

KEY NOTES:

1. INSTALL NEW VERTICAL SECTION, EQUIPPED AS SHOWN MATCHING THE RATINGS OF THE EXISTING SQUARE D MODEL 6 MOTOR CONTROL CENTER F.O. 13541945-014. 480V, 3-PHASE, 4W, 60HZ.

FRONT VIEW

SCALE: 3/4"=1'-0"
FILE: 2013510003E621

SIDE VIEW

SCALE: 3/4"=1'-0"
FILE: 2013510003E621

1A- SPACE	2A- M-1-3 FLOCCULATORS	3A- M-2-3 FLOCCULATORS	4A- M-1-4 FLOCCULATORS	5A- M-2-4 FLOCCULATORS	6A- M-1-2 FLOCCULATORS	7A- M-4-2 FLOCCULATORS	8A- M-2-1 FLOCCULATORS	9A- M-3-1 FLOCCULATORS	10A- M-3-3 FLOCCULATORS	11A- M-4-3 FLOCCULATORS	12A- M-3-4 FLOCCULATORS	13A- M-4-4 FLOCCULATORS	14A- 30P-1000 SOLIDS PUMP NO. 1
1C- SPD	2F- RM-2A RAPID MIXER	3F- RM-2B RAPID MIXER	4F- RM-3A RAPID MIXER	5F- RM-3B RAPID MIXER	6E- M-2-2 FLOCCULATORS	7F- M-1-1 FLOCCULATORS	8F- RM-2C RAPID MIXER	9F- RM-2D RAPID MIXER	10F- RM-3C RAPID MIXER	11F- RM-3D RAPID MIXER	12F- M-4-1 FLOCCULATORS	13F- PNL-PP1	14G 30P-2000 SOLIDS PUMP NO. 2
1D- POWER METER					6I- M-3-2 FLOCCULATORS	7J- PNL-PP2	8K- SPACE	9K- SPACE			12K- SPACE	13G TLP1 PNL- LP1	
1F- MAIN BREAKER												13H SPACE	



60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			
DESIGNED CGR			
DRAWN TLM			
CHECKED			
DATE OCTOBER 2022			
REV	DATE	BY	DESCRIPTION

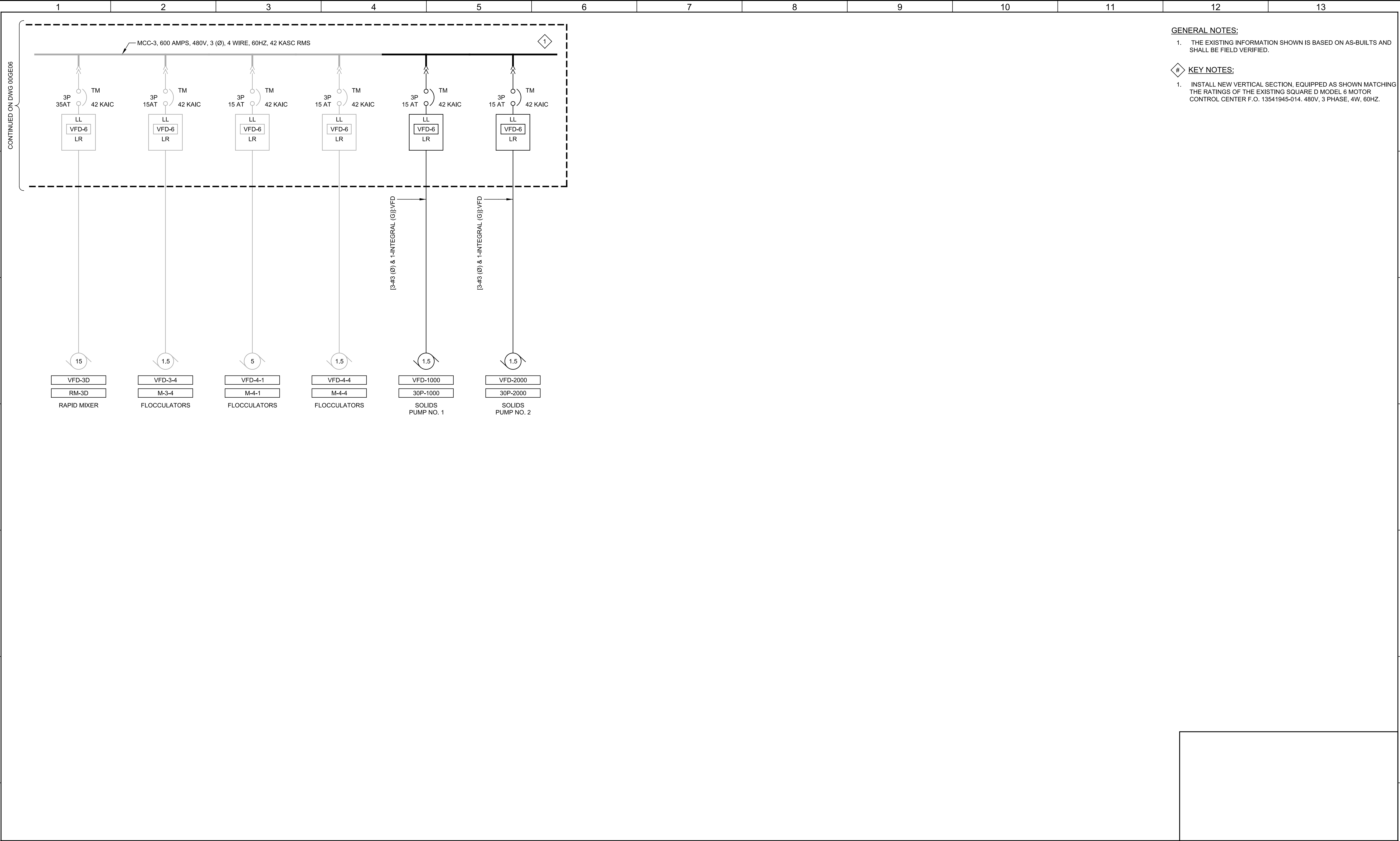
CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
ELECTRICAL
MCC-3 ELEVATION

VERIFY SCALES
BAR IS ONE INCH ON
ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

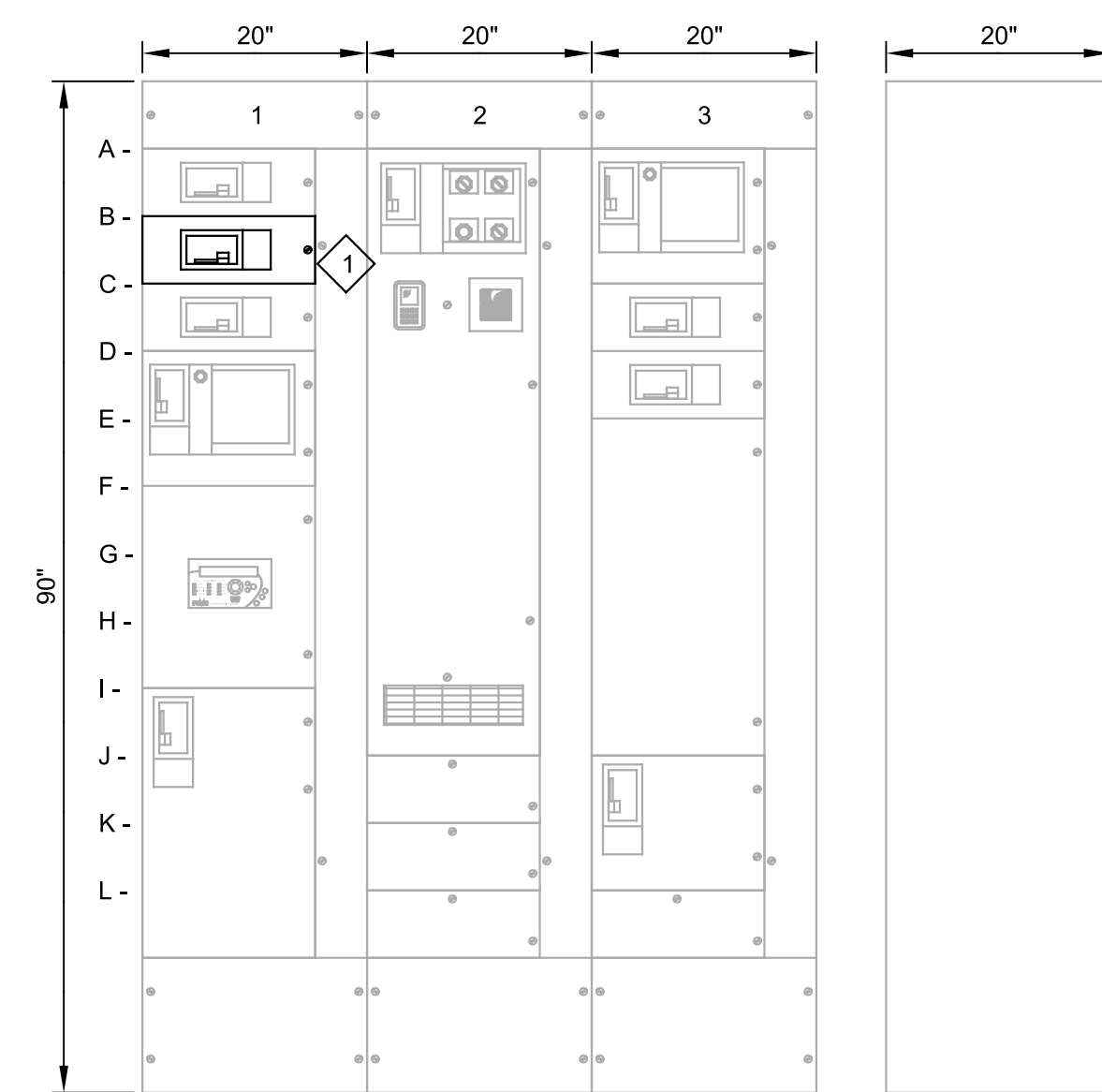
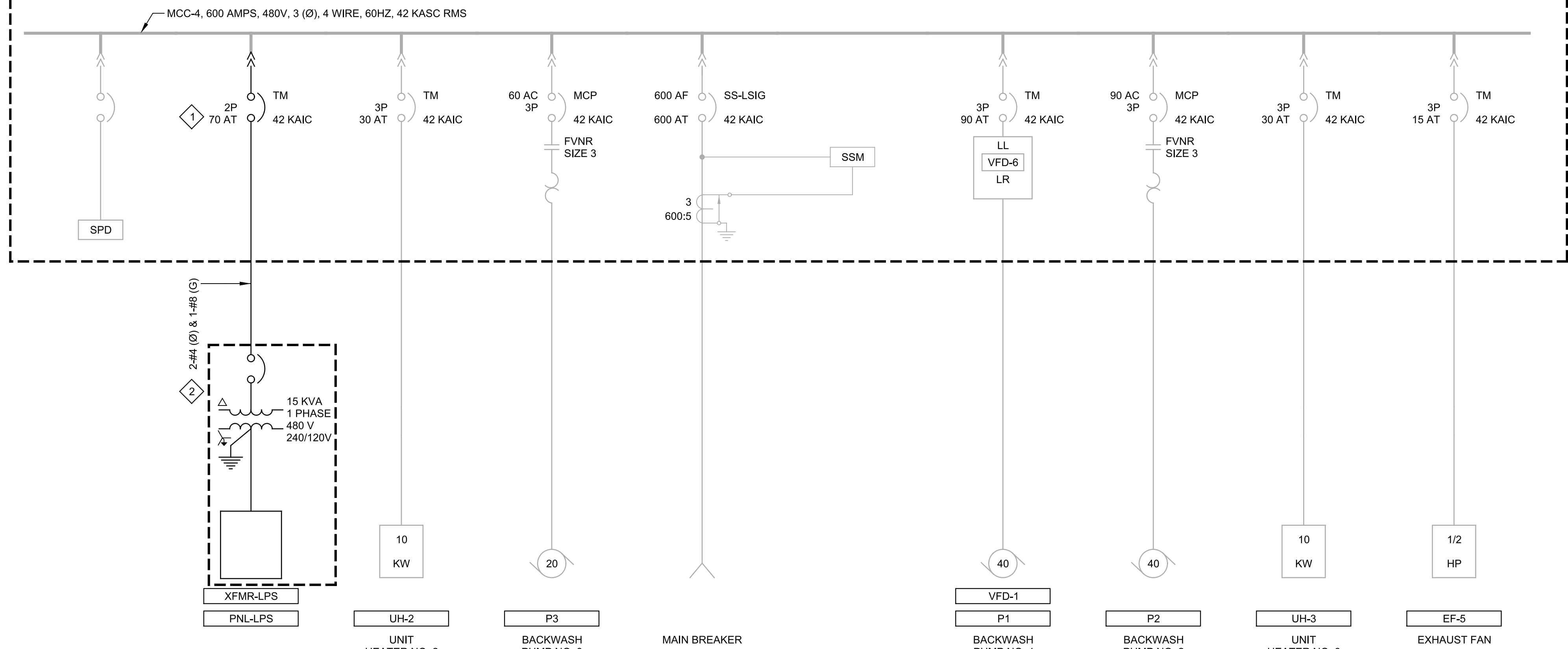
JOB NO.
201351
DRAWING NO.
00GE03
SHEET NO.
OF



Plot Date: 13-OCT-2022 4:43:09 PM User: svcPW Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1 LAST SAVED BY: jsandoval



				60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED CGR						CITY OF ARVADA, COLORADO			VERIFY SCALES	JOB NO. 201351
					DRAWN TLM						RALSTON WTP SOLIDS IMPROVEMENTS	BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.		
					CHECKED						ELECTRICAL	0  1"	00GE05		
					DATE OCTOBER 2022						MCC-3 ONE-LINE DIAGRAM 2	IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO.		
REV	DATE	BY		DESCRIPTION										OF	



FRONT VIEW

SCALE: 3/4"=1'-0"
FILE: 2013510003E622

SIDE VIEW

SCALE: 3/4"=1'-0"
FILE: 2013510003E622

GENERAL NOTES:

1. EXISTING MOTOR CONTROL
CENTER IS SQUARE D MODEL 6 MOTOR CONTROL
CENTER F.O. 13541945-015. 480V, 3 PHASE, 4W,
60HZ.

KEY NOTES:

1. DEMOLISH THE EXISTING CIRCUIT BREAKER TO ACCOMMODATE THE NEW CIRCUIT BREAKER.
2. DEMOLISH THE EXISTING POWER CONDUCTORS AND EXISTING MINI POWER CENTER.

1A- SPD	2A- P1 BACKWASH PUMP NO. 1	3A- P2 BACKWASH PUMP NO. 2
1B- XFMR-LPS PNL-LPS	2J- SPACE	3C- UH-3 UNIT HEATER NO. 3
1C- UH-2 UNIT HEATER NO. 2	2K- SPACE	3D- EF-5 EXHAUST FAN
1D- P3 BACKWASH PUMP NO. 3	2L- SPACE	3J- SPACE
1F- POWER METER		3L- SPACE
1I- MAIN BREAKER		

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Plot Date: 13-OCT-2022 4:37:21 PM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: jsandoval

12345678910111213													
A	PANEL PNL-LPS 110/13/2022												
	LOCATION: SOLIDS HANDLING LAGOONS												
	VOLTS: 240/120												
	PHASE & WIRE: 1 PH 3W												
	INTERRUPT: 10 KAIC												
	OPTIONS: SPD												
	NEMA: 1												
	FEED: TOP												
	MTG: SURFACE												
	BUS RATING: 100												
	MAIN: CB												
	MAIN RATING: 100 AF 70 AT												
	EQUIP SIZING VA 3720												
	PANEL AMPS 15.5												
	B	I/C/S DESCRIPTION LOAD (VA) BKR CIR Ø CIR BKR LOAD (VA) DESCRIPTION I/C/S											
LIGHTING (EXISTING) 20A-1P 1 A 2 20A-1P I/O PNL-LU-6 (EXISTING)													
SLUDGE POND OUTLET (EXISTING) 20A-1P 3 B 4 20A-1P I/O PNL-LS-8 (EXISTING)													
SIREN 20A-1P 5 A 6 20A-1P MILTRONICS PNL (EXISTING)													
C 70HTU-0111 - HEAT TRACE UNIT NO. 1 600 15A-1P 7 B 8 20A-1P STROBE LIGHT (EXISTING)													
C 70HTU-0211 - HEAT TRACE UNIT NO. 2 600 15A-1P 9 A 10 20A-1P LAGOON NO. 1 RECEPTACLE I													
C 70HTU-0311 - HEAT TRACE UNIT NO. 3 600 15A-1P 11 B 12 20A-1P LAGOON NO. 2 RECEPTACLE I													
C 70HTU-0411 - HEAT TRACE UNIT NO. 4 600 15A-1P 13 A 14 20A-1P LAGOON NO. 3 RECEPTACLE I													
SPARE 20A-1P 15 B 16 20A-1P LAGOON NO. 4 RECEPTACLE I													
SPARE 20A-1P 17 A 18 20A-1P SPARE													
SPARE 20A-1P 19 B 20 20A-1P SPARE													
SPARE 20A-1P 21 A 22 20A-1P SPARE													
SPARE 20A-1P 23 B 24 20A-1P SPARE													
C		PANEL PNL-PP110/13/2022											
		LOCATION: PRETREATMENT BUILDING ELECTRICAL ROOM											
	VOLTS: 480												
	PHASE & WIRE: 3 PH 3W												
	INTERRUPT: 22 KAIC												
	OPTIONS: SPD												
	NEMA: 100												
	FEED: TOP												
	MTG: SURFACE												
	BUS RATING: 100												
	MAIN: CB												
	MAIN RATING: 100 AF 70 AT												
	EQUIP SIZING VA 4575												
	PANEL AMPS 5.5												
	D	I/C/S DESCRIPTION LOAD (VA) BKR CIR Ø CIR BKR LOAD (VA) DESCRIPTION I/C/S											
LTG - CHEM STORAGE 20A-1P 1 A 2 20A-1P LTG - FLOC BASIN 1 & 2													
LTG - PIPE CHASE 20A-1P 3 B 4 20A-1P LTG - FLOC BASIN 3 & 4													
LTG - STORAGE, ELEC & COAG FEED 20A-1P 5 C 6 20A-1P LTG - SEDIMENTATION BASIN 1 & 2													
LTG - ELEC/STORAGE ROOM 20A-1P 7 A 8 20A-1P LTG - SEDIMENTATION BASIN 3 & 4													
BASIN 1, 2, 3, & 4 FLOC LIGHTING 20A-1P 9 B 10 20A-1P EXTERIOR LIGHT													
SPARE 20A-1P 11 C 12 20A-1P SPARE													
SPARE 20A-1P 13 A 14 20A-1P SPARE													
SPARE 20A-1P 15 B 16 20A-1P SPARE													
SPARE 20A-1P 17 C 18 20A-1P SPARE													
C 305 19 A 20 305 C													
C 30EDR-0101 - SED BASIN NO. 1 SOLIDS VALVE 305 15A-3P 21 B 22 15A-3P 305 30EDR-0301 - SED BASIN NO. 3 SOLIDS VALVE C													
C 305 23 C 24 305 C													
E		DISCONNECT SCHEDULE10/13/2022											
		TAG VOLTAGE POLES AMPS NEMA TYPE TYPE HORSEPOWER FUSE SIZE BREAKER AF/AT ACCESSORIES											
	A 600 VAC 3P 30A 4 NON-FUSED												
	Q 120 VAC 1P 30A 4 NON-FUSED 1												
	ACCESSORIES 1= "B" TYPE ELECTRICAL INTERLOCK FOR POSITION INDICATION												
	2= INSULATED GROUNDABLE NEUTRAL KIT												
	3= DRAIN AND BREATHER KIT WHEN OUTDOORS												
	4= EARLY BREAK AUXILIARY CONTACT												
	F												
G		60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION											
		DESIGNED CGR											
	DRAWN TLM												
	CHECKED												
	DATE OCTOBER 2022												
	REV DATE BY DESCRIPTION												
	12345678910111213												

[illegible]

Plot Date: 13-OCT-2022 9:55:24 AM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Sld_Pen_v0905.pen PlotScale: 1:1

sshepard

INSTRUMENT TAG IDENTIFICATION LETTERS

MEASURED VARIABLE \ INSTRUMENT FUNCTION		ELEMENT	TRANSMITTER	INDICATING TRANSMITTER	CONVERTER TRANSDUCER, RELAY SPECIAL DEVICES	INDICATOR	RECORDER	CONTROL/COMMAND	INDICATING CONTROLLER	RECORDING CONTROLLER	SWITCH	SWITCH LOW LOW	SWITCH LOW	SWITCH HIGH	SWITCH HIGH HIGH	SWITCH COMBINATION HIGH LOW	ACTION	ALARM LOW LOW	ALARM LOW	ALARM HIGH	ALARM HIGH HIGH	TOTALIZE INDICATOR TRANSMITTER	VALVE	GAUGE	LIGHT	SPEED SETTING
A	ANALYSIS	AE	AT	AIT	AY	AI	AR	AC	AIC	ARC	AS	ASLL	ASL	ASH	ASHH	ASHL		AALL	AAL	AAH	AAHH				AL	
B	BURNER FLAME	BE	BT	BIT	BY	BI	BR	BC	BIC	BRC	BS	BSLL	BSL	BSH	BSHH			BALL	BAL	BAH	BAHH				BL	
C	CONDUCTIVITY	CE	CT	CIT	CY	CI	CR	CC	CIC	CRC	CS	CSLL	CSL	CSH	CSHH	CSHL		CALL	CAL	CAH	CAHH				CL	
D	DENSITY	DE	DT	DIT	DY	DI	DR	DC	DIC	DRC	DS	DSLL	DSL	DSH	DSHH	DSHL		DALL	DAL	DAH	DAHH				DL	
E	VOLTAGE												ESL													
F	FLOW	FE	FT	FIT	FY	FI	FR	FC	FIC	FRC	FS	FSL	FSL	FSH	FSHH	FSHL		FALL	FAL	FAH	FAHH	FQI	FCV	FG	FL	
FF	FLOW RATIO				FFY	FFI		FFC	FFIC		FFS														FFL	
H	HAND (MANUAL)*							HC			HS*						HA*						HV		HL	HSS
I	CURRENT		IT	IIT	IY	II	IR	IC	IIC	IRC	IS	ISLL	ISL	ISH	ISHH			IALL	IAL	IAH	IAHH				IL	
J	POWER																									
K	TIME				KY	KI	KR	KC	KIC	KRC	KS	KSLL	KSL	KSH	KSHH			KALL	KAL	KAH	KAHH		KV		KL	
L	LEVEL	LE	LT	LIT	LY	LI	LR	LC	LIC	LRC	LS	LSLL	LSL	LSH	LSHH	LSHL		LALL	LAL	LAH	LAHH		LCV	LG	LL	
M	MOISTURE OR HUMIDITY	ME	MT	MIT	MY	MI	MR	MC	MIC	MRC	MS	MSLL	MSL	MSH	MSHH			MALL	MAL	MAH	MAHH				ML	
N	USER'S CHOICE																									
P	PRESSURE OR VACUUM	PE	PT	PIT	PY	PI	PR	PC	PIC	PRC	PS	PSLL	PSL	PSH	PSHH	PSHL		PALL	PAL	PAH	PAHH		PCV		PL	
PD	DIFFERENTIAL PRESSURE		PDT	PDIT	PDY	POI	PDR	PDC	PDIC	PDRC	PDS	PDSLL	PDSL	PDSH	PDSHH			PDALL	PDAL	PDAH	PDAHH		PDCV		PDL	
Q	QUANTITY	QE	QT	QIT	QY	QI	QR				QS	QSLL	QSL	QSH	QSHH			QALL	QAL	QAH	QAAH					
R	RADIATION																									
S	SPEED	SE	ST	SIT	SY	SI	SR	SC	SIC	SRC	SS	SSLL	SSL	SSH	SSHH			SALL	SAL	SAH	SAHH					
T	TEMPERATURE	TE	TT	TIT	TY	TI	TR	TC	TIC	TRC	TS	TSLL	TSL	TSH	TSHH	TSHL		TALL	TAL	TAH	TAHH		TCV		TL	
TD	DIFFERENTIAL TEMPERATURE		TDT	TDIT	TDY	TDI	TDR	TDC	TDIC	TDRC	TDS	TDSLL	TDSL	TDSH	TDSHH			TDALL	TDAL	TDAH	TDAHH		TDCV		TDL	
U	MULTIVARIABLE					UI	UR	UC	UIC	URC	US														UL	
V	VISCOSITY	VE	VT	VIT	VY	VI	VR	VC	VIC	VRC	VS	VSLL	VSL	VSH	VSHH			VALL	VAL	VAH	VAHH				VL	
W	WEIGHT	WE	WT	WIT	WY	WI	WR				WS	WSLL	WSL	WSH	WSHH			WALL	WAL	WAH	WAHH					
X	UNCLASSIFIED	XE	XT	XIT	XY	XI	XR	XC	XIC	XRC	XS	XSLL	XSL	XSH	XSHH			XALL	XAL	XAH	XAAH		XCV	XG	XL	
XV	VIBRATION	XVE	XVT		XVY	XVI	XVR				XVS			XVSH	XVSHH					XVAH	XVAHH				XVL	
Y	STATUS***					YI																			YL	
Z	POSITION	ZE	ZT	ZIT	ZY	ZI		ZC**			ZS**											ZV			ZL**	

* REFER TO OPERATOR PILOT DEVICE LEGEND

** LETTER INDICATES POSITION (O=OPEN, C=CLOSED, R=RAISE, L=LOWER, ETC)

OPERATOR PILOT DEVICE LEGEND

Operator Pilot Device Legend																											
Device Type	Pilot Device Function																										
	Local-Off-Remote (LOR) OR Local-Stop-Remote (LSR)	STOP (SP)	START (ST)	Hand-Off-Auto (HOA)	Off-On (OO)	SELECT (SEL)	Open-Stop-Close (OSC)	JOG Open-Hold-Close (JOHC)	Semiauto-Auto-Manual (SAAM)	Lead-Lag-Standby (LLGS)	JOG Open-JOG Close (JOJC)	Online-Offline (OLOF)	Auto-Manual (AM)	Fixed Rate-Level Rate (FRLR)	Open-Close (OC)	No Offline-Offline Transition (NOOT)	Low-High (LH)	RESET (RST)	SPEED (SPD)	START-STOP (STSP)	E-STOP (E-SP)	BYPASS (BYP)			SILENCE	POSITION (POS)	
Pilot Device Tag (Hand Switches)	HAS*	HSB	HSC	HSD	HSE	HSF	HSG	HSJ	HIS	HSJ	HSK	HSL	HSM	HSN	HSO	HSP	HSQ	HSR	HSS	HST	HSU	HSV	HSW	HSX	HSY	HSZ	

I/O TYPE DESIGNATIONS

RNG	RUNNING	SPDC	SPEED COMMAND
FAIL	FAILED/FAULT	SPDF	SPEED FEEDBACK
FWD	RUNNING FORWARD	REM	LOR IN REMOTE
FAST	RUNNING HIGH	LOC	LOR IN LOCAL
SLOW	RUNNING LOW	AUTO	HOA IN AUTO
REV	RUNNING REVERSE	HAND	HOA IN HAND
SVC	SOLENOID VALVE CLOSE	RST	RESET
SVO	SOLENOID VALVE OPEN		
RUN	RUN		
SLWC	MOTOR START LOW		
REVC	MOTOR START REVERSE		

INSTRUMENT TYPE DESIGNATIONS

CGD	COMBUSTIBLE GAS DETECTOR	RTD	RESISTANCE TEMP DETECTOR
COND	CONDUCTIVITY	SB	SLUDGE BLANKET
DO	DISSOLVED OXYGEN	SC	STREAMING CURRENT
FMCW	FREQ. MODULATED CONT. WAVE	SD	SLUDGE DEPTH
IS	INTRINSIC SAFETY BARRIER	SH	SODIUM HYPOCHLORITE
LEL	LOWER EXPLOSIVE LIMIT	SO2	SULFUR DIOXIDE
MLSS	MIXED LIQUOR SUSPENDED SOLIDS	TDR	TIME DOMAIN REFLECTOMETRY
ORP	OXIDATION REDUCTION POTENTIAL	TOC	TOTAL ORGANIC CARBON
P-SUB	PRESSURE SUBMERSIBLE	TSS	TOTAL SUSPENDED SOLIDS
PC	PARTICLE COUNTER	UVI	UV INTENSITY
PTOF	PULSE TIME OF FLIGHT	UVT	UV TRANSMITTANCE

SPECIFIC ABBREVIATIONS

HTR	HEATER
HTU	HEAT TRACE UNIT
MWH	MOTOR WINDING HEATER
SV	SOLENOID VALVE
SPD	SURGE PROTECTIVE DEVICE
UPS	UNINTERRUPTIBLE POWER SUPPLY
YA	STATUS AUTO
YR	STATUS REMOTE
Y1	STATE RUNNING
Y2	ALARM FAILED/FAULT

P&ID LINE SYMBOLS

INSTRUMENT OR CONNECTION TO PROCESS	_____
PNEUMATIC SIGNAL	— # — # — # — # — # — # —
ELECTRIC SIGNAL	-----
HYDRAULIC SIGNAL	- L - L - L - L - L - L - L - L - L -
CAPILLARY TUBE	— x — x — x — x — x —
ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)	— s — s — s — s — s —
ELECTROMAGNETIC OR SONIC SIGNAL (NOT GUIDED)	— s — s — s — s — s —
INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)	— o — o — o — o — o — o — o — o — o — o —

PROCESS LINE SYMBOLS

PRIMARY PROCESS FLOW IN PIPE	=====
SECONDARY PROCESS FLOW IN PIPE	=====
PRIMARY PROCESS FLOW IN CHANNEL	-----
SECONDARY PROCESS FLOW IN CHANNEL	-----

DESIGNATIONS

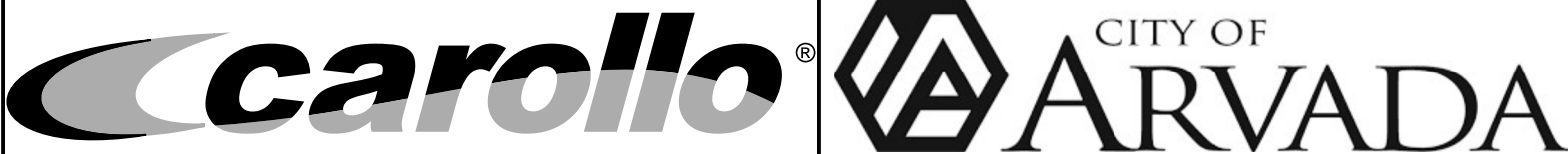
EQUIPMENT ENCLOSURE	-----
EXISTING	_____
FUTURE	----- FUTURE

MISCELLANEOUS P&ID SYMBOLS

PROCESS CONTINUATION	DESC2_# DWG NO. CONTINUATION SHEET
SIGNAL CONTINUATION	DESC2_# DWG NO. CONTINUATION SHEET
PIPE CALLOUT	PIPE SIZE
SCHEMATIC DETAIL	? -
TYPICAL DETAIL	* TYP TYPNUM TYPNUM2 TYPNUM3 TYPNUM4 TYPNUM5 TYPNUM6

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED CE
DRAWN CE
CHECKED
DATE OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
INSTRUMENTATION
SYMBOLS AND ABBREVIATIONS 2

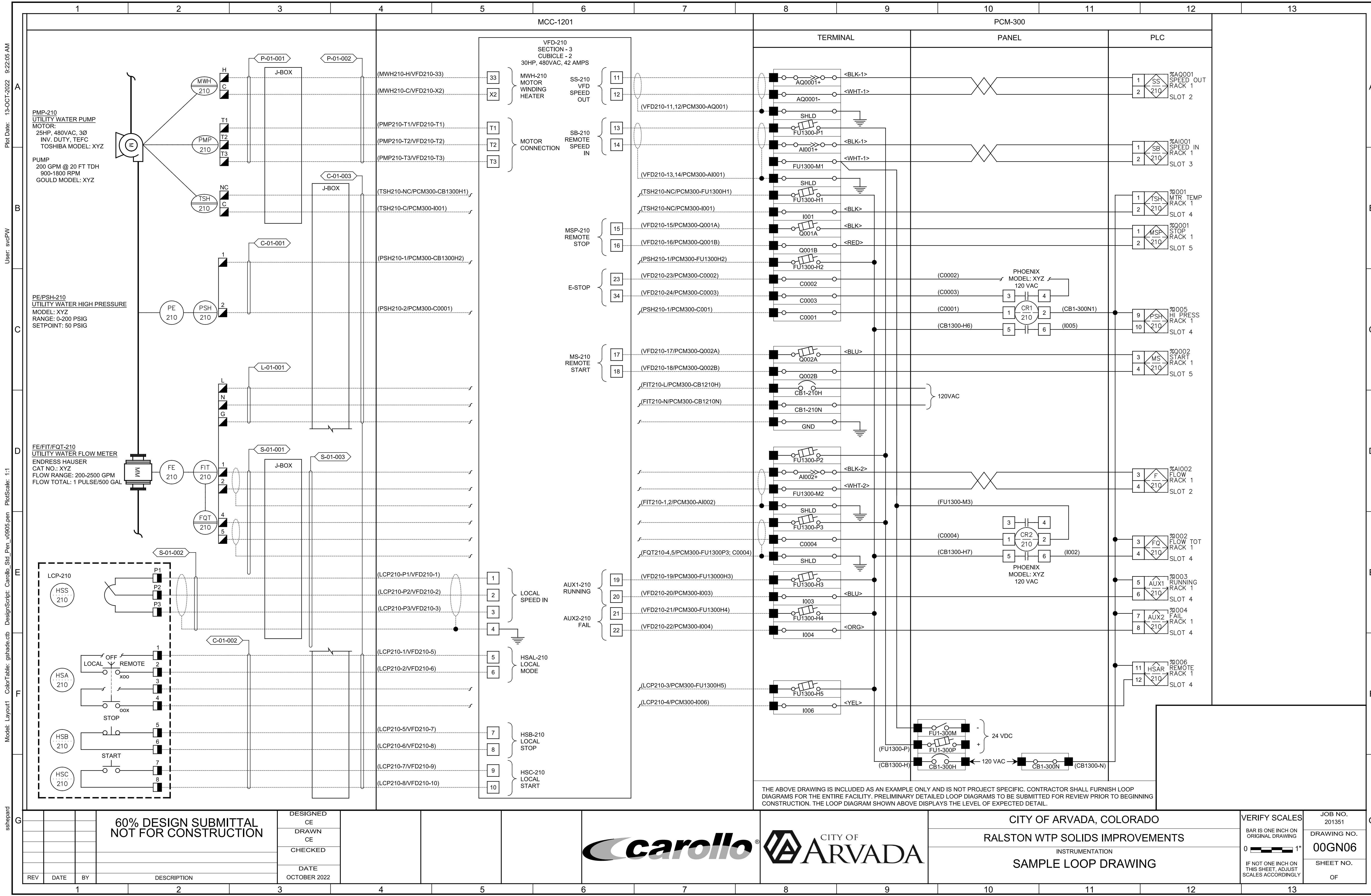
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201351
DRAWING NO. 00GN02
SHEET NO. OF

PROJECT NO. 201351-100000 FILE NAME: 20135100GN003.dwg

Plot Date: 13-OCT-2022 9:21:57 AM User: svcpw Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1
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PROJECT NO. 201351-100000 FILE NAME: 20135100GN005.dwg

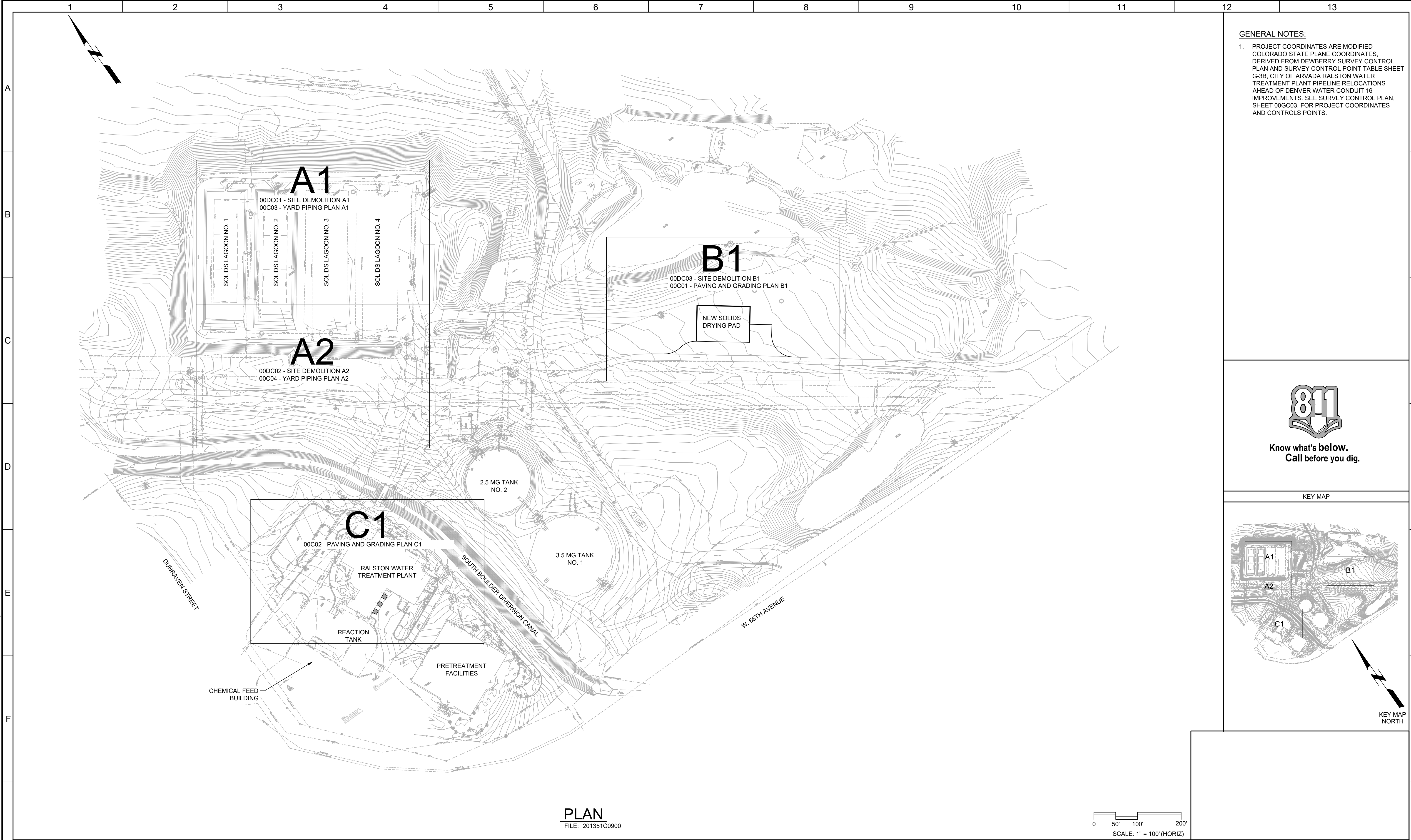


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FILE NAME: 20135100C000.dwg

PROJECT NO. 201351

LAST SAVED BY: jpecyna



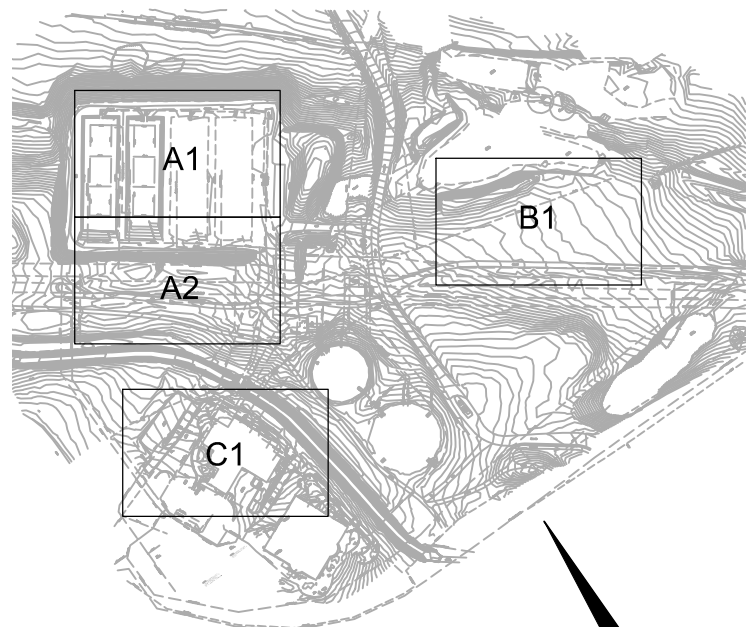
GENERAL NOTES:

1. PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE COORDINATES, DERIVED FROM DEWBERRY SURVEY CONTROL PLAN AND SURVEY CONTROL POINT TABLE SHEET G-3B, CITY OF ARVADA RALSTON WATER TREATMENT PLANT PIPELINE RELOCATIONS AHEAD OF DENVER WATER CONDUIT 16 IMPROVEMENTS. SEE SURVEY CONTROL PLAN, SHEET 00GC03, FOR PROJECT COORDINATES AND CONTROLS POINTS.



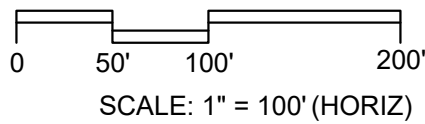
Know what's below.
Call before you dig.

KEY MAP



KEY MAP
NORTH

PLAN
FILE: 201351C0900



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REV	DATE	BY	DESCRIPTION

DESIGNED RJF
DRAWN JJP
CHECKED BLG
DATE OCTOBER 2022



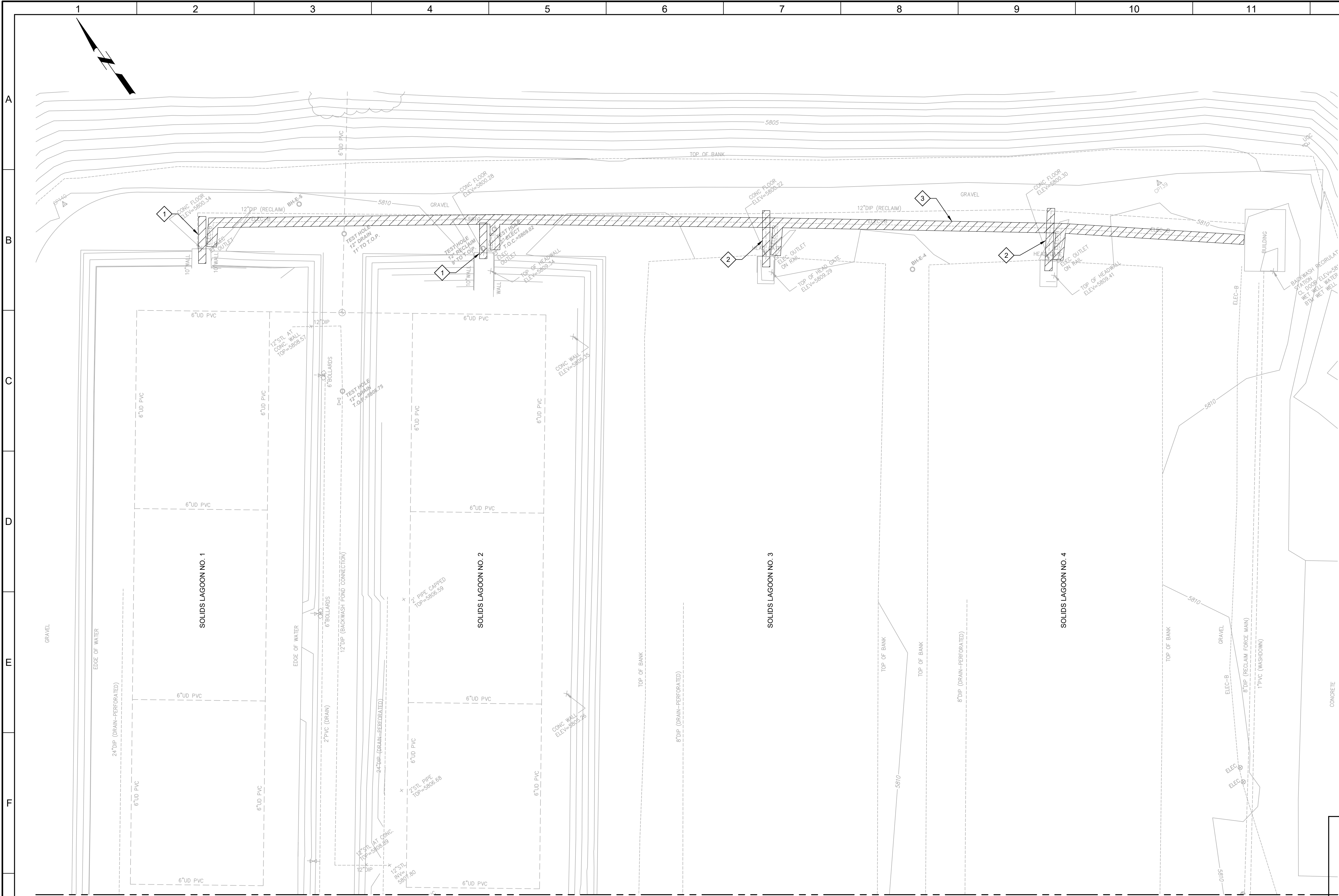
CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
CIVIL
CIVIL DRAWING KEY PLAN

VERIFY SCALES
BAR IS ONE INCH ON
ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

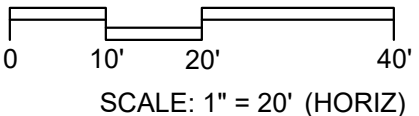
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DRAWING NO. 00C00
SHEET NO. SHT OF

Plot Date: 10/10/2022 4:06:56 PM

LAST SAVED BY: jpecyna



MATCH LINE SEE DWG 00DC02
PLAN
FILE: 201351C0900



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DESIGNED RJF DRAWN JJP			
CHECKED BLG			
DATE OCTOBER 2022			
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DESIGNED RJF DRAWN JJP
CHECKED BLG
DATE OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
CIVIL
**SITE DEMOLITION
PLAN A1**

VERIFY SCALES
BAR IS ONE INCH ON
ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

JOB NO.
201351
DRAWING NO.
00DC01
SHEET NO.
X OF

GENERAL NOTES:

- PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE COORDINATES, DERIVED FROM DEWBERRY SURVEY CONTROL PLAN AND SURVEY CONTROL POINT TABLE SHEET G-3B, CITY OF ARVADA RALSTON WATER TREATMENT PLANT PIPELINE RELOCATIONS AHEAD OF DENVER WATER CONDUIT 16 IMPROVEMENTS. SEE SURVEY CONTROL PLAN, SHEET 00GC03, FOR PROJECT COORDINATES AND CONTROLS POINTS.

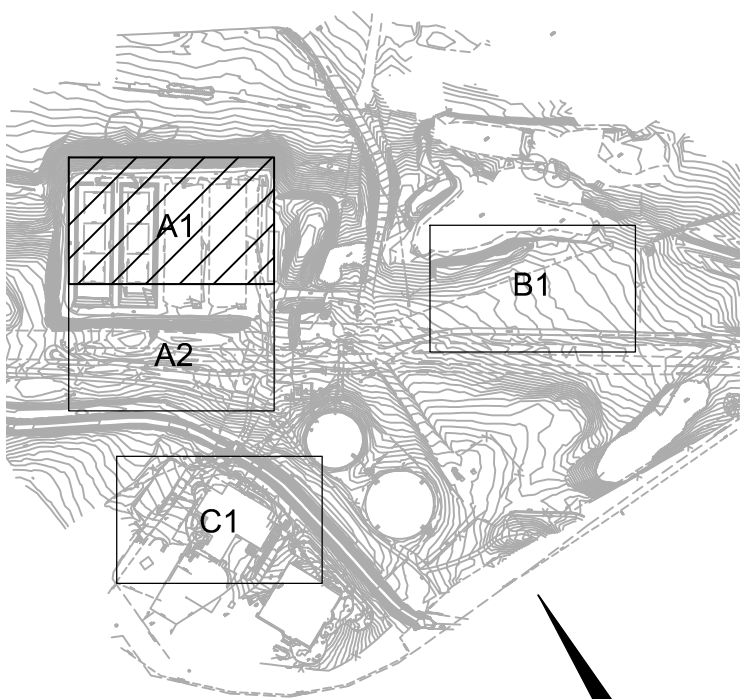
KEY NOTES:

- DEMOLISH EXISTING 12" BWR, SEE SHEET 70M02 FOR CONTINUATION.
- DEMOLISH EXISTING 8" BWR AND 12"x12"x8" TEE.
- DEMOLISH EXISTING BURIED ELECTRICAL CONDUIT.



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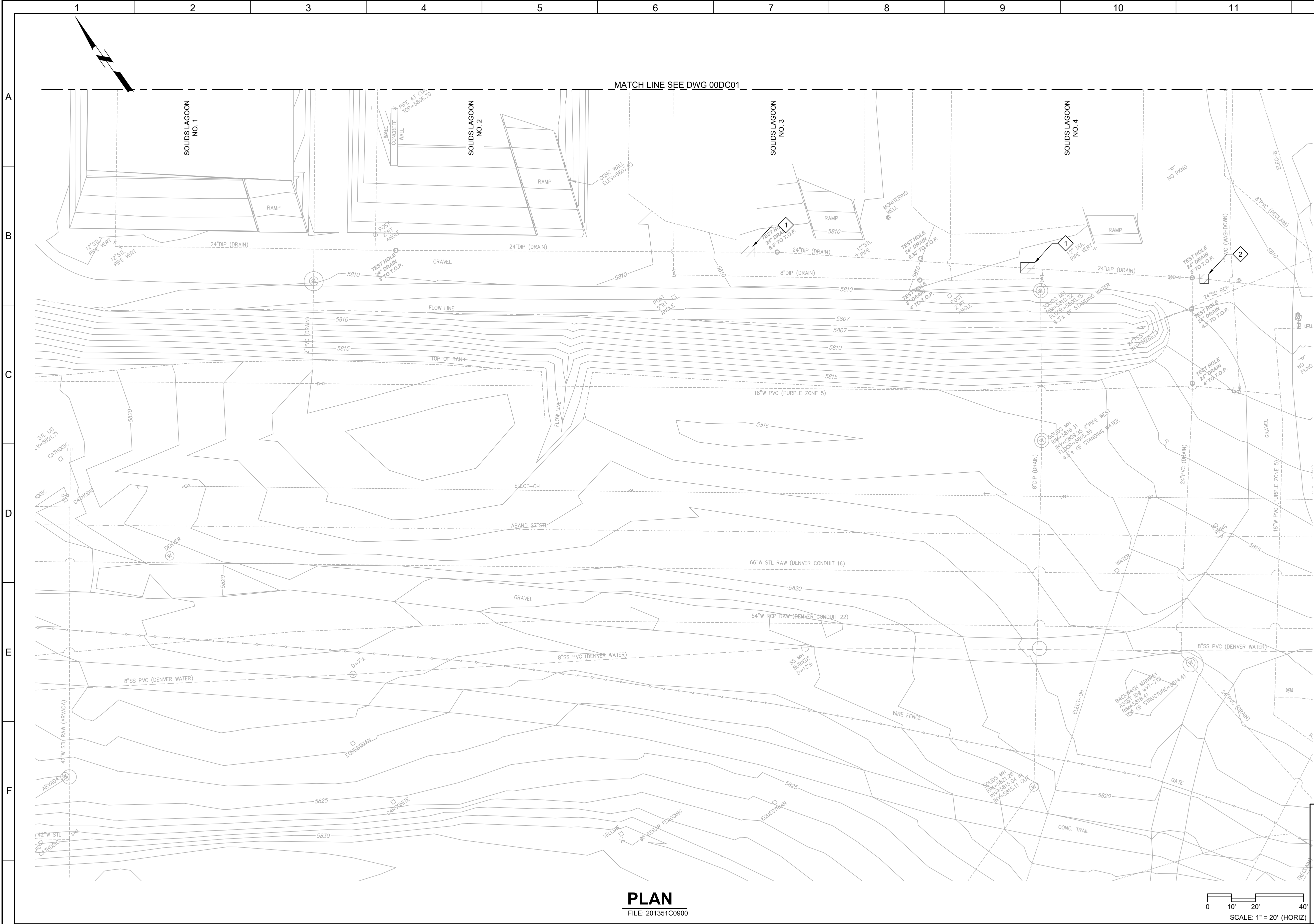
KEY MAP



KEY MAP
NORTH

Plot Date: 10/10/2022 4:10:07 PM

LAST SAVED BY: jpecyna



GENERAL NOTES:

- PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE COORDINATES, DERIVED FROM DEWBERRY SURVEY CONTROL PLAN AND SURVEY CONTROL POINT TABLE SHEET G-3B, CITY OF ARVADA RALSTON WATER TREATMENT PLANT PIPELINE RELOCATIONS AHEAD OF DENVER WATER CONDUIT 16 IMPROVEMENTS. SEE SURVEY CONTROL PLAN, SHEET 00GC03, FOR PROJECT COORDINATES AND CONTROLS POINTS.

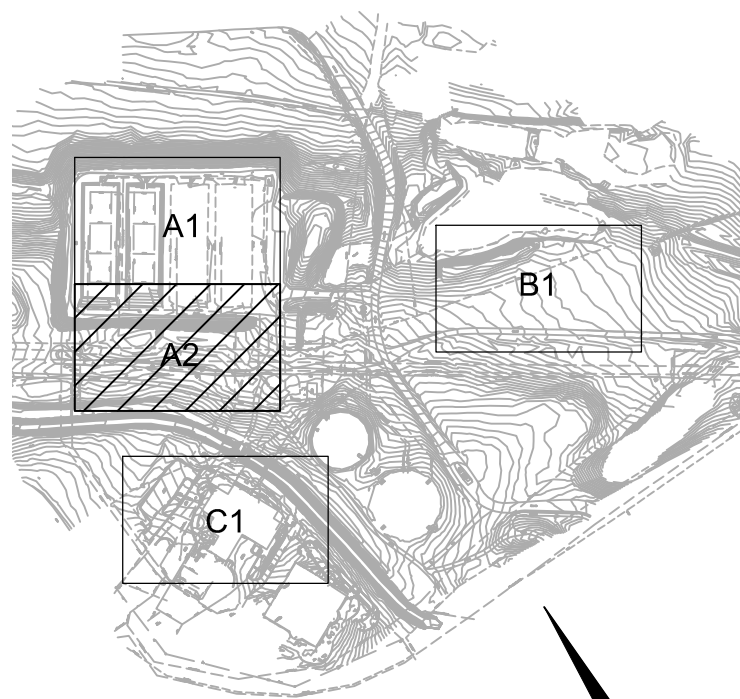
X KEY NOTES:

- DEMOLISH PORTION OF EXISTING 24\"/>
- DEMOLISH PORTION OF EXISTING 24\"/>



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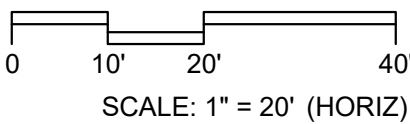
KEY MAP



KEY MAP
NORTH

PLAN

FILE: 201351C0900



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JJF
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BLG
DATE
OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS

CIVIL
SITE DEMOLITION
PLAN A2

VERIFY SCALES

BAR IS ONE INCH ON
ORIGINAL DRAWING
0 1"

IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

JOB NO.
201351

DRAWING NO.
00DC02

SHEET NO.
X OF

Plot Date: 10/10/2022 4:12:26 PM

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GENERAL NOTES:

- PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE COORDINATES, DERIVED FROM DEWBERRY SURVEY CONTROL PLAN AND SURVEY CONTROL POINT TABLE SHEET G-3B, CITY OF ARVADA RALSTON WATER TREATMENT PLANT PIPELINE RELOCATIONS AHEAD OF DENVER WATER CONDUIT 16 IMPROVEMENTS. SEE SURVEY CONTROL PLAN, SHEET 00GC03, FOR PROJECT COORDINATES AND CONTROLS POINTS.



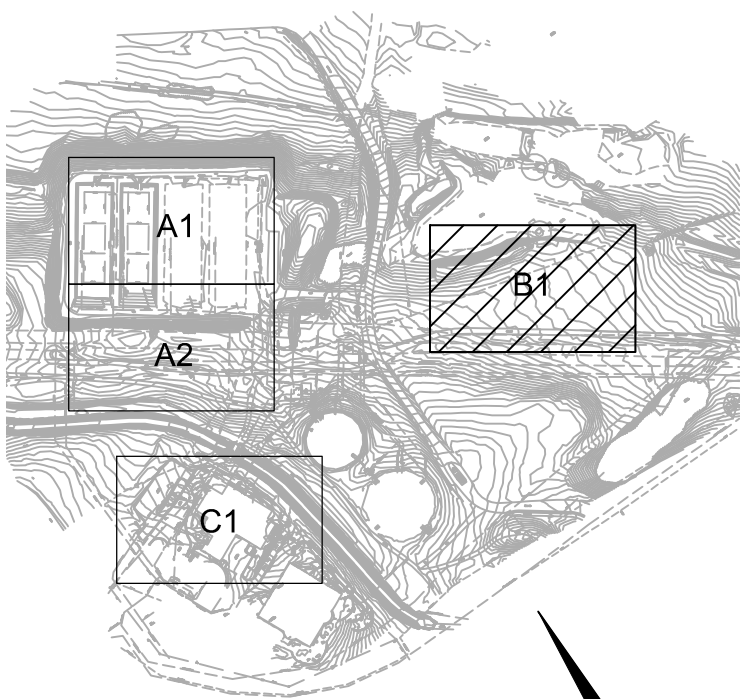
KEY NOTES:

- CLEAR AND GRUB EXISTING VEGETATION TO LIMITS SHOWN.
- PROTECT IN PLACE EXISTING POWER POLE.



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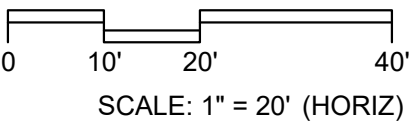
KEY MAP



KEY MAP
NORTH

PLAN

FILE: 201351C0900



60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			
DESIGNED RJF			
DRAWN JJP			
CHECKED BLG			
DATE OCTOBER 2022			
REV	DATE	BY	DESCRIPTION
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DESIGNED RJF	
DRAWN JJP	
CHECKED BLG	
DATE OCTOBER 2022	



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
CIVIL
SITE DEMOLITION
PLAN B1

VERIFY SCALES

BAR IS ONE INCH ON
ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

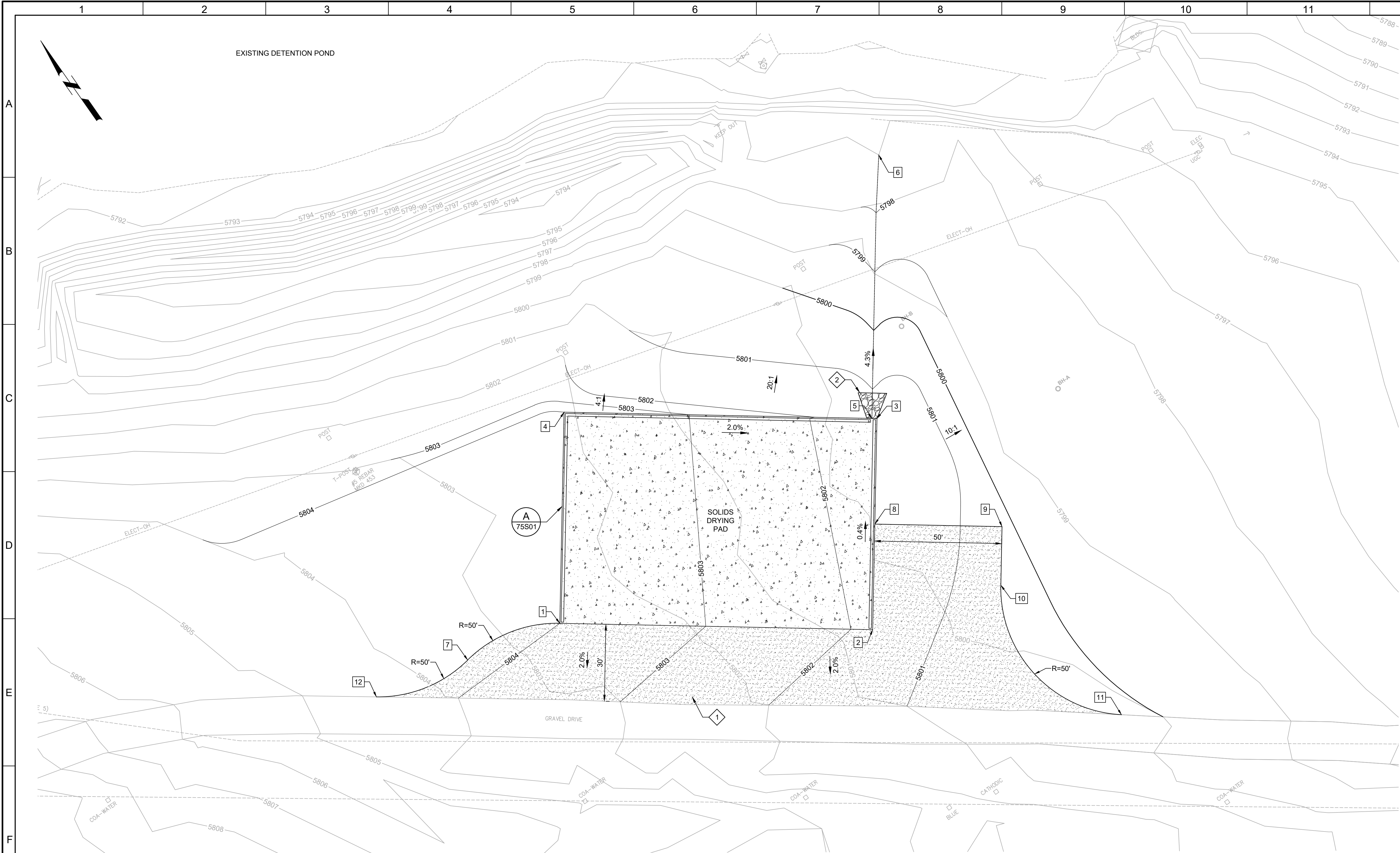
JOB NO.
201351

DRAWING NO.
00DC03

SHEET NO.
X OF

Plot Date: 10/10/2022 4:14:41 PM

LAST SAVED BY: jpecyna

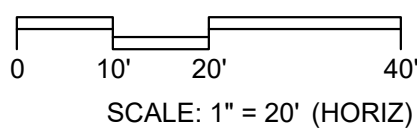


PLAN

FILE: 201351C0101

X COORDINATE CONTROL POINTS					X COORDINATE CONTROL POINTS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	122960.50	80938.58	5804.00	FTG TOC	5	122956.13	81085.24	5801.50	FL
2	122887.93	81037.89	5801.85	FTG TOC	6	123039.41	81146.85	5797.00	FL
3	122954.95	81086.86	5801.50	FTG TOC	7	122969.41	80900.64	5804.02	ROAD
4	123027.52	80987.55	5804.00	FTG TOC	8	122921.44	81062.37	5801.67	ROAD

X COORDINATE CONTROL POINTS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
9	122891.94	81102.74	5800.67	ROAD
10	122873.38	81089.19	5800.56	ROAD
11	122804.47	81098.79	5800.18	ROAD
12	122978.14	80862.94	5804.52	ROAD



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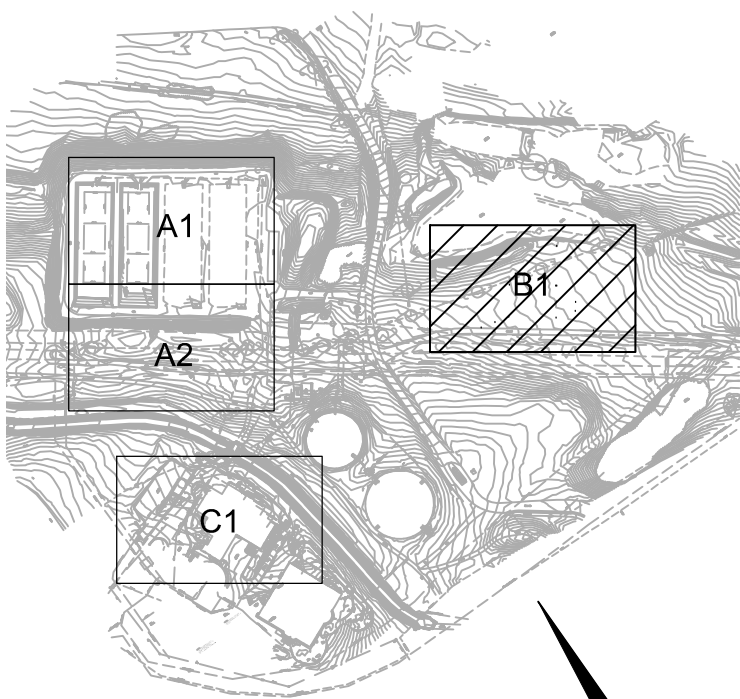
X KEY NOTES:

- 6" CLASS 6 AGGREGATE BASE COURSE (RECYCLED CONCRETE) ACCESS ROAD ALONG SOUTH EDGE OF SOLIDS DRYING PAD.
- INSTALL TYPE VL RIPRAP WITH FILTER FABRIC AT SOLIDS DRYING PAD OUTLET.



Know what's below.
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KEY MAP



KEY MAP
NORTH

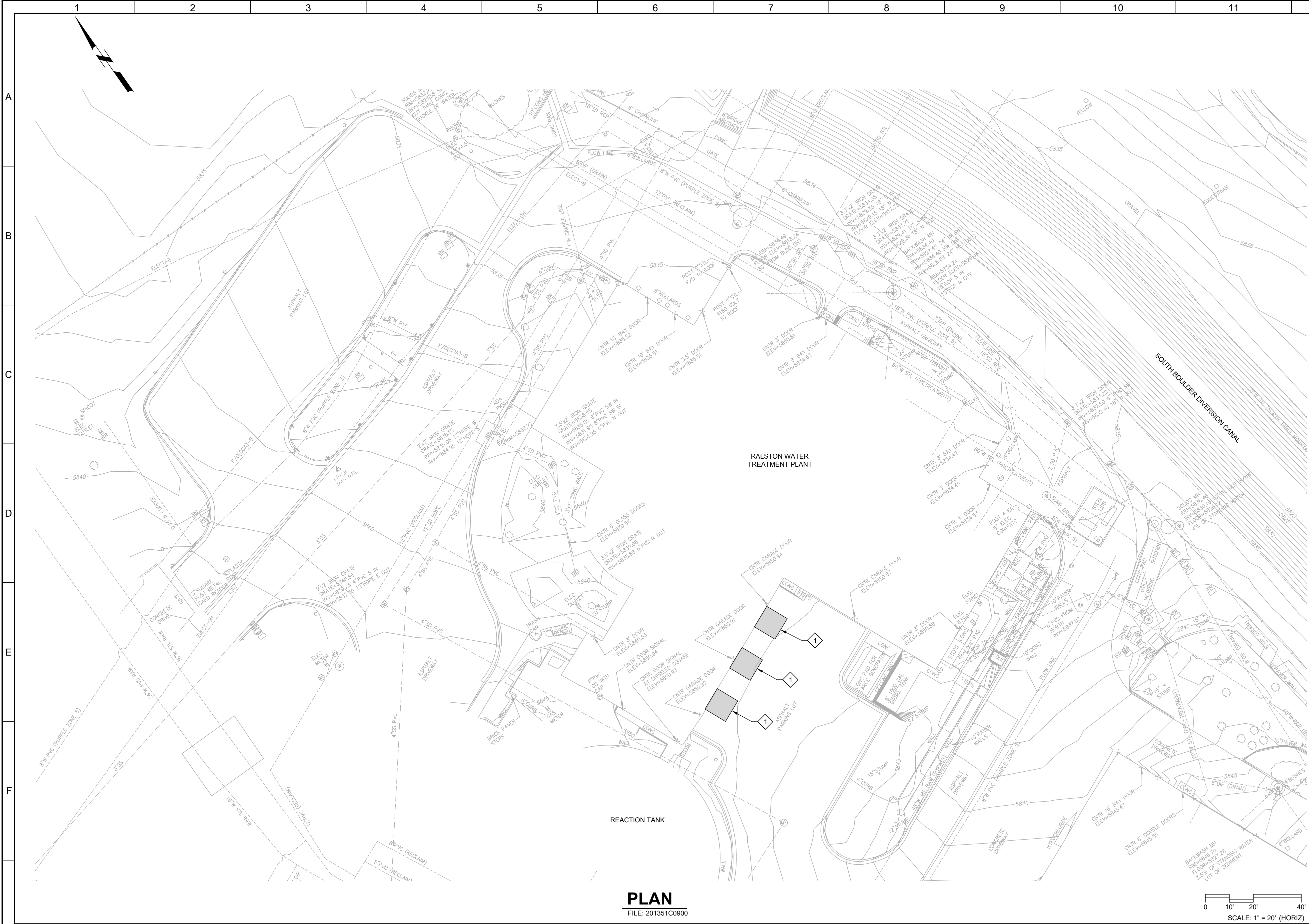
60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			
DESIGNED RJF			
DRAWN JJP			
CHECKED BLG			
DATE OCTOBER 2022			
REV	DATE	BY	DESCRIPTION
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CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
CIVIL
PAVING AND GRADING
PLAN B1

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201351 DRAWING NO. 00C01 SHEET NO. X OF
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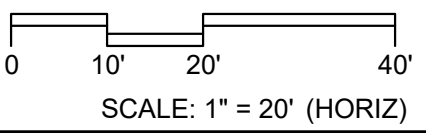
Plot Date: 10/10/2022 4:19:28 PM

LAST SAVED BY: jpecyna



PLAN

FILE: 201351C0900



GENERAL NOTES:

- PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE COORDINATES, DERIVED FROM DEWBERRY SURVEY CONTROL PLAN AND SURVEY CONTROL POINT TABLE SHEET G-3B, CITY OF ARVADA RALSTON WATER TREATMENT PLANT PIPELINE RELOCATIONS AHEAD OF DENVER WATER CONDUIT 16 IMPROVEMENTS. SEE SURVEY CONTROL PLAN, SHEET 00GC03, FOR PROJECT COORDINATES AND CONTROLS POINTS.

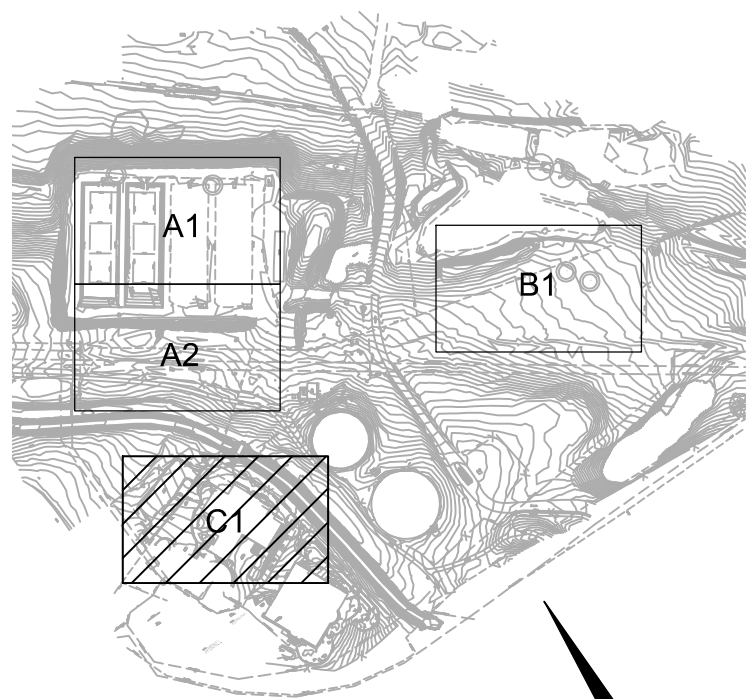
KEY NOTES:

- REPAIR ASPHALT PAVING FOLLOWING INSTALLATION OF FILTER IMPROVEMENTS TO BE PERFORMED BY CMAR UNDER SEPARATE CONTRACT. MATCH EXISTING ASPHALT THICKNESS, INSTALL TO EXISTING LINE AND GRADE.



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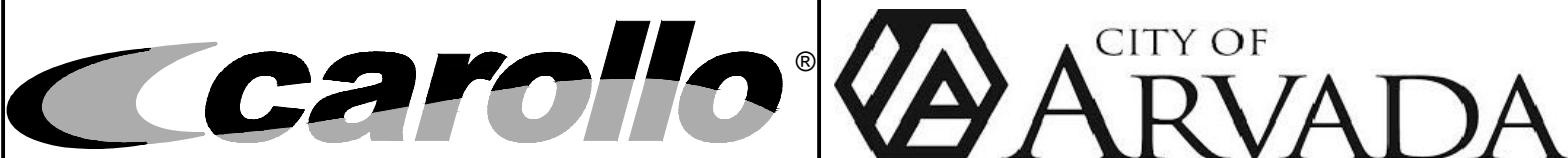
KEY MAP



KEY MAP NORTH

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

DESIGNED
RJF
DRAWN
JJP
CHECKED
BLG
DATE
OCTOBER 2022



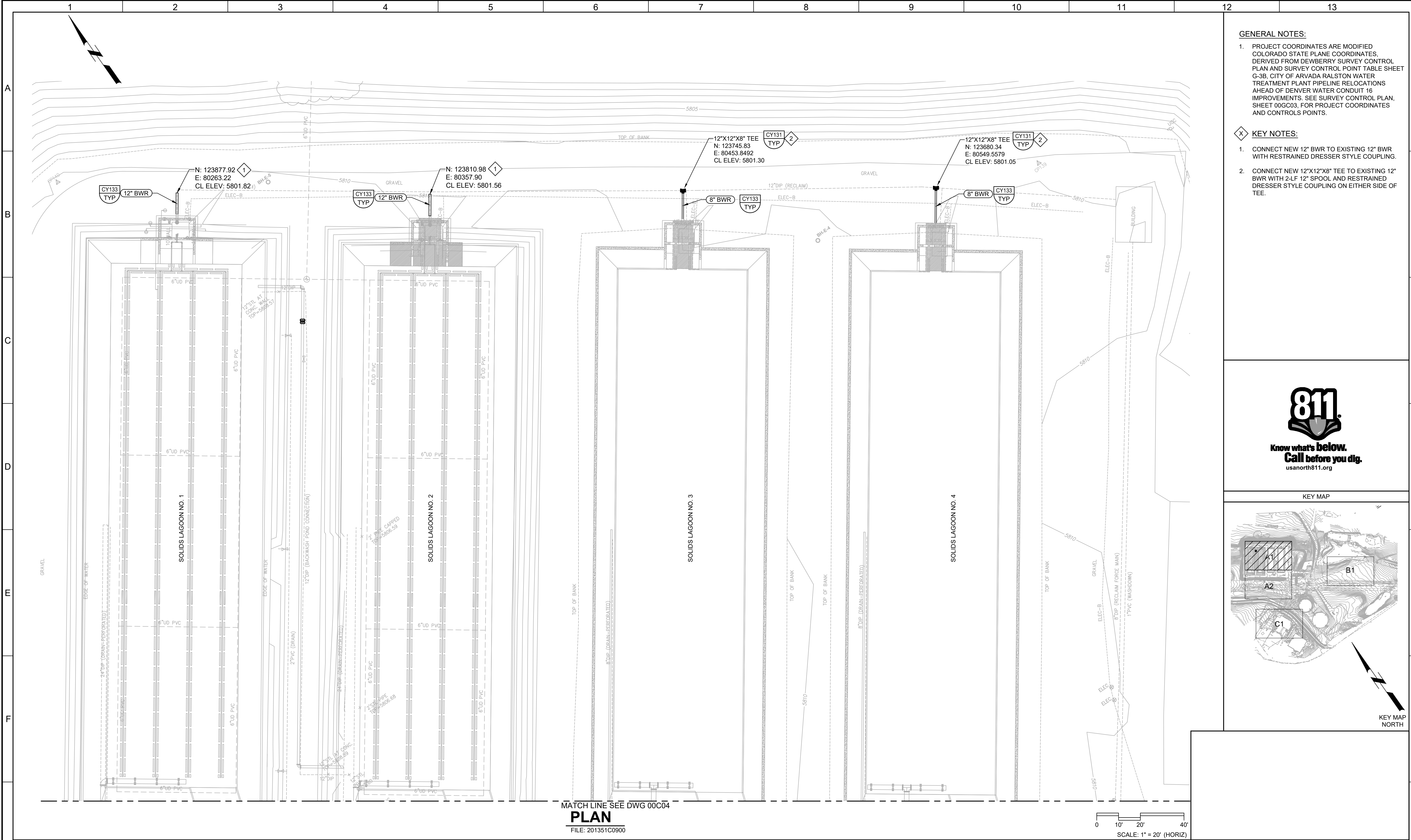
CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
CIVIL
PAVING AND GRADING
PLAN C1

VERIFY SCALES
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0 1"
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JOB NO.
201351
DRAWING NO.
00C02
SHEET NO.
X OF

Plot Date: 10/10/2022 4:50:20 PM

LAST SAVED BY: jpecyna

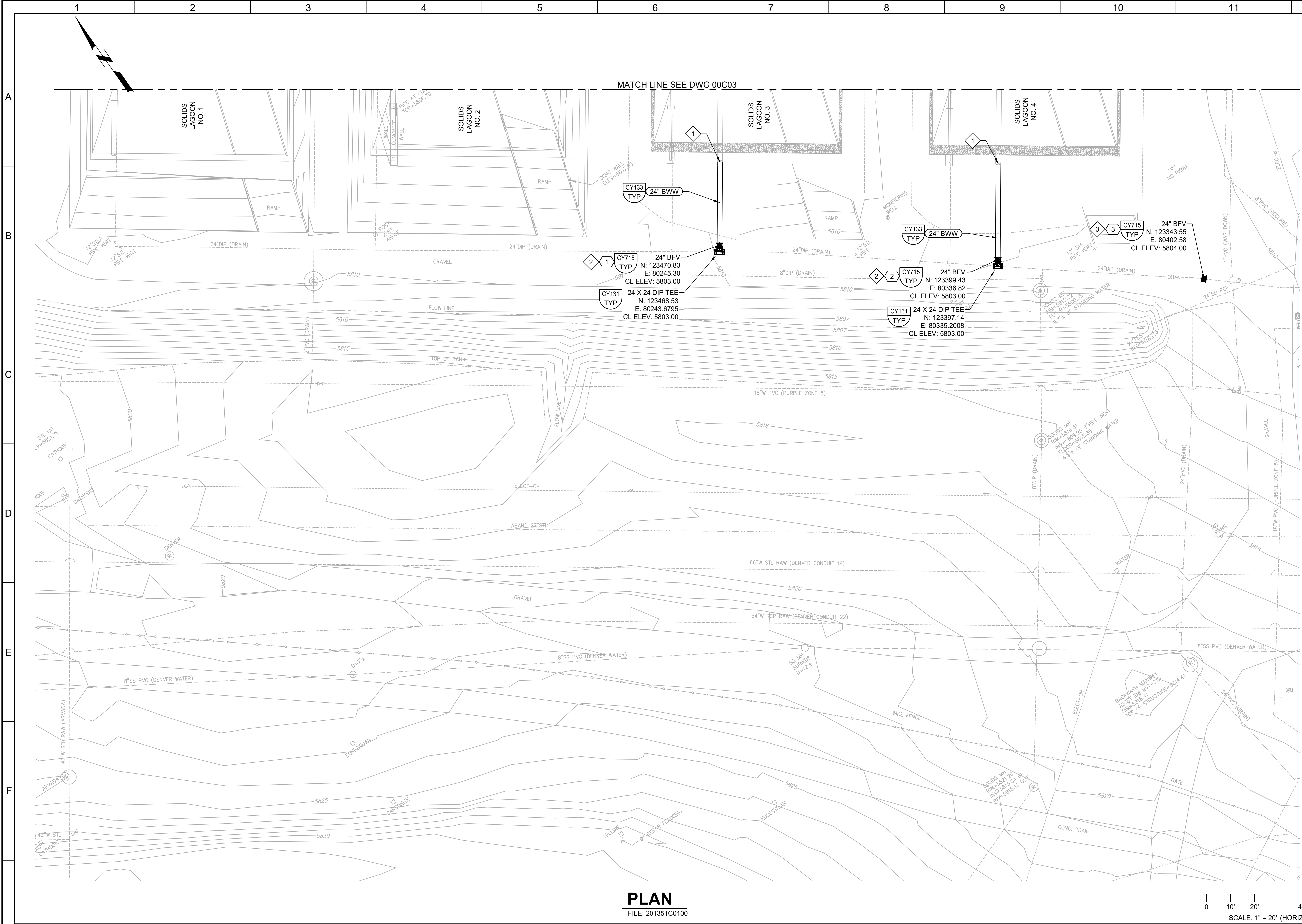


MATCH LINE SEE DWG 00C04
PLAN
FILE: 201351C0900

0 10' 20' 40'
SCALE: 1" = 20' (HORIZ)

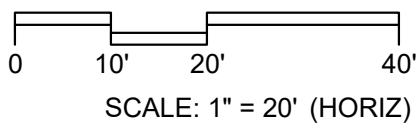
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LAST SAVED BY: jpecyna



PLAN

FILE: 201351C0100



GENERAL NOTES:

- PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE COORDINATES, DERIVED FROM DEWBERRY SURVEY CONTROL PLAN AND SURVEY CONTROL POINT TABLE SHEET G-3B, CITY OF ARVADA RALSTON WATER TREATMENT PLANT PIPELINE RELOCATIONS AHEAD OF DENVER WATER CONDUIT 16 IMPROVEMENTS. SEE SURVEY CONTROL PLAN, SHEET 00GC03, FOR PROJECT COORDINATES AND CONTROLS POINTS.
- REFER TO SPECIFICATION 01_14_00 FOR CONSTRUCTION SEQUENCING.

KEY NOTES:

- SEE MECHANICAL DRAWINGS FOR CONTINUATION.
- CUT EXISTING 24" DIP, CONNECT NEW 24" TEE WITH 2-LF 24" SPOOL AND RESTRAINED DRESSER STYLE COUPLING ON EITHER SIDE OF TEE.
- CUT EXISTING 24" DIP, CONNECT NEW 24" BFV WITH 2-LF 24" SPOOL AND RESTRAINED DRESSER STYLE COUPLING ON EITHER SIDE OF VALVE.

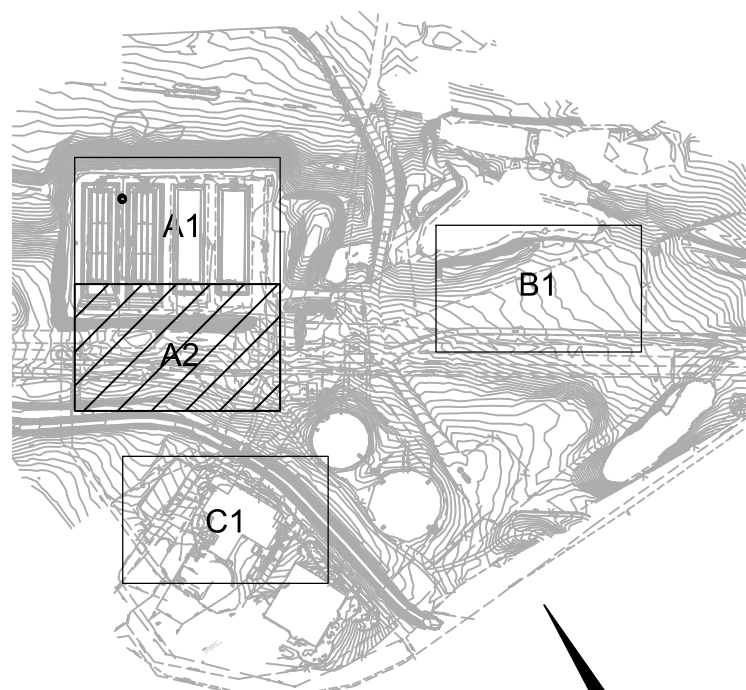
KEY TAGS:

- | | | |
|---|----------|----------------|
| 1 | 70MV0310 | 24" BURIED BFV |
| 2 | 70MV0410 | 24" BURIED BFV |
| 3 | 00MV1000 | 24" BURIED BFV |



Know what's below.
Call before you dig.
usanorth811.org

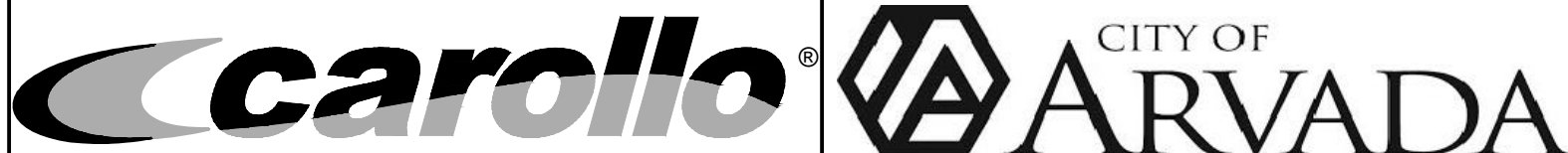
KEY MAP



KEY MAP
NORTH

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

DESIGNED
RJF
DRAWN
JJP
CHECKED
BLG
DATE
OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
CIVIL
YARD PIPING
PLAN A2

VERIFY SCALES
BAR IS ONE INCH ON
ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

JOB NO.
201351
DRAWING NO.
00C04
SHEET NO.
X OF

FIGURE: 10122022-11-03-17-FM

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CITY OF ARVADA STORMWATER MANAGEMENT PLAN GENERAL NOTES:

- THE PERMITTEE SHALL BE RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, STORM SEWERS, STORM SEWER APPURTENANCES, OTHER PROPERTIES, ETC., RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
- ADDITIONAL EROSION AND SEDIMENT CONTROL BMPs MAY BE REQUIRED DURING AND AFTER CONSTRUCTION AND SHALL BE EXECUTED AND COMPLETED BY THE PERMITTEE. THE PERMITTEE SHALL PLAN, INSTALL, AND MAINTAIN ALL EROSION, AND SEDIMENT CONTROL MEASURES, INCLUDING DRAINAGE AND WATER QUALITY BMPs AS INDICATED ON THIS PLAN AND AS NECESSARY TO REDUCE THE DISCHARGE OF POLLUTANTS TO THE MAXIMUM EXTENT PRACTICABLE ADVERSE IMPACTS. EROSION AND SEDIMENT DEPOSITION ONTO PAVED SECTIONS, INTO STORM SEWERS, STORM SEWER APPURTENANCES, RECEIVING WATERS, OR OFF THE PROJECT SITE.
- THE PERMITTEE SHALL TAKE APPROPRIATE PREVENTATIVE MEASURES TO MINIMIZE TO THE MAXIMUM EXTENT PRACTICABLE DIRT AND MUD FROM BEING TRACKED OR DEPOSITED ONTO PAVED SECTIONS VIA MULTIPLE BMPs. SEDIMENT, MUD, AND CONSTRUCTION DEBRIS THAT MAY BE TRACKED, DEPOSITED, OR ACCUMULATED ON PAVED SECTIONS, IN THE FLOW LINES, PRIVATE PROPERTY, AND/OR PUBLIC RIGHTS-OF-WAY OF THE CITY AS A RESULT OF THIS CONSTRUCTION PROJECT SHALL BE CLEANED UP.
- AREAS REACHING SUBSTANTIAL COMPLETION OF GRADING AND TOPSOIL PLACEMENT OPERATIONS MUST BE DRILL SEEDED AND CRIMP MULCHED WITHIN 14 DAYS OF SUBSTANTIAL COMPLETION OF GRADING AND TOPSOIL OPERATIONS. IF AN INCOMPLETE AREA IS TO REMAIN INACTIVE FOR LONGER THAN 30 DAYS, IT MUST BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE LANDSCAPED WITHIN 14 DAYS FROM THE SUSPENSION OR COMPLETION OF LAND DISTURBANCE ACTIVITIES.
- THIS APPROVED SWMP DESIGN DRAWING, THE ASSOCIATED APPROVED SWMP NARRATIVE, A COPY OF THE STORMWATER QUALITY DISCHARGE PERMIT, AND THE RULES AND REGULATIONS REGARDING STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES MANUAL SHALL BE KEPT ON SITE AT ALL TIMES.
- ACCUMULATED SEDIMENT AND DEBRIS SHALL BE REMOVED FROM A BMP (MAINTENANCE) WHEN THE SEDIMENT LEVEL OR DEBRIS ADVERSELY IMPACTS THE FUNCTIONING OF THE BMP OR AS DEFINED WITHIN THE RULES AND REGULATIONS REGARDING STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES MANUAL, WHICHEVER IS MORE RESTRICTIVE. IF MAINTENANCE OF THE BMP DOES NOT RESTORE THE INTENDED FUNCTION, THEN THE BMP MUST BE REPLACED.
- THE DISCHARGING OF CEMENT, CONCRETE, OR MORTAR FROM READY MIX DELIVERY TRUCKS, PUMP TRUCKS, BATCH PLANTS OR SMALL MECHANICAL MIXERS DIRECTLY ONTO PAVED SURFACES OR DISTURBED GROUND HAVING NO CONTAINMENT IS PROHIBITED. THE DISPOSAL OF ANY LIQUID WASTES OR WASH WATER FROM ANY OPERATIONS SUCH AS PAINTING, DRYWALL, OR TILE INSTALLATIONS DIRECTLY ONTO PAVED SURFACES OR THE GROUND WITHOUT CONTAINMENT IS PROHIBITED. THE PERMITTEE SHALL PROTECT ALL CURB FLOW LINES, ADJACENT WATERWAYS, WETLANDS, STORM SEWERS, STORM SEWER APPURTENANCES, OTHER PROPERTIES, ETC., ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE.
- IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO RESOLVE CONSTRUCTION PROBLEMS DUE TO CHANGING CONDITIONS OR DESIGN ERRORS THEY MAY ENCOUNTER DURING THE PROGRESS OF ANY PORTION OF THE WORK. IF CONDITIONS IN THE FIELD REQUIRE CHANGES AND THE PROPOSED MODIFICATIONS TO THE APPROVED PLANS INVOLVE SIGNIFICANT CHANGES TO THE CHARACTER OF THE WORK OR TO FUTURE CONTIGUOUS PUBLIC OR PRIVATE IMPROVEMENTS, THE CONTRACTOR, THROUGH THE ENGINEER OF RECORD, SHALL BE RESPONSIBLE TO REVISE PLANS AND SUBMIT THEM TO THE CITY OF ARVADA FOR APPROVAL PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE WORK. ANY CONTROLS, FEATURES OR IMPROVEMENTS NOT CONSTRUCTED IN ACCORDANCE WITH THE APPROVED SWMP, CITY OF ARVADA STANDARD DETAIL DESIGNS, CITY OF ARVADA APPROVED VARIANCES, OR AN APPROVED DESIGN DRAWING AMENDMENT SHALL BE REMOVED AND THE CONTROLS, FEATURES AND/OR IMPROVEMENTS SHALL BE RECONSTRUCTED.
- SECONDARY CONTAINMENT FEATURES SHALL BE IN PLACE FOR ANY BULK FUEL STORAGE, MIXERS, GENERATORS, OR ANY OTHER SPILL OR LEAK SOURCE THAT REMAINS ONSITE FOR A PERIOD LONGER THAN 7 CALENDAR DAYS. A RECOVERY OR SALVAGE DRUM SHALL BE KEPT ON-SITE FOR STORAGE OF CONTAMINATED SOILS.
- STRAW BALES AND RECYCLED ASPHALT OR CONCRETE ARE NOT ACCEPTABLE FOR THE CONSTRUCTION OF BMPs WITHIN THE CITY OF ARVADA AND MAY NOT BE USED.
- CONTRACTOR TO PROVIDE A COPY OF THEIR DEWATERING PLAN TO THE COA WATER DEPARTMENT EROSION CONTROL STAFF PRIOR TO BEGINNING DEWATERING OPERATIONS. ONLY DEWATERING OF STORMWATER IS ALLOWED UNDER THE CITY'S STORMWATER QUALITY DISCHARGE PERMIT. ALL OTHER DEWATERING OPERATIONS REQUIRE AN ADDITIONAL PERMIT FROM CDPs.

GENERAL NOTES:

- DIMENSIONS OF CONCRETE WASHOUT TO BE DETERMINED BY CONTRACTOR BASED ON PROJECT REQUIREMENTS.

PROJECT OWNER/ DEVELOPER SIGNATURE BLOCK

I HAVE REVIEWED THE INFORMATION CONTAINED WITHIN THE STORMWATER MANAGEMENT PLAN AND ACCEPT RESPONSIBILITY FOR THE REQUIREMENTS SET FORTH

OWNER: _____ DATE _____

PLAN PREPARER SIGNATURE BLOCK

I ACKNOWLEDGE MY RESPONSIBILITY FOR THE PREPARATION OF THE STORMWATER MANAGEMENT PLAN.

ENGINEER: REBECCA J. FALK
PE NUMBER: CO 56929 _____ DATE _____

DESIGNED
R/JF
DRAWN
JJP
CHECKED
JJK
DATE
OCTOBER 2022

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV DATE BY DESCRIPTION

1 2 3 4 5 6 7 8 9 10 11 12 13

CITY OF ARVADA BMP LEGEND:

CD	CHECK DAM	IPA	AREA INLET PROTECTION	OP	TEMPORARY OUTLET PROTECTION	SM	SEEDING AND MULCHING
CF	CONSTRUCTION FENCE	IPC	CULVERT INLET PROTECTION	RCD	REINFORCED CHECK DAM	SR	SURFACE ROUGHENING
CFB	COMPOST FILTER BERM / COMPOST BLANKET	IPI	INTERIM INLET PROTECTION	RCS	ROUGH CUT STREET CONTROL	SSA	STABILIZED STAGING AREA
CS	CURB SOCK	IPO	ON-GRADE INLET PROTECTION	RS	ROCK SOCKS/ WATTLES	ST	SEDIMENT TRAP
CW	CONCRETE WASHOUT/ LIQUID WASTE WASHOUT	IPS	SUMP INLET PROTECTION	SB	SEDIMENT BASIN	TSC	TEMPORARY STREAM CROSSING
DC	DIVERSION CHANNELS	LC	SINGLE FAMILY LOT EROSION CONTROL BMPs	SCL	SEDIMENT CONTROL LOG	TSD	TEMPROARY SLOPE DRAIN
DD	TEMPOARY DIVERSION DIKE/ DITCH/ BERM	LOC	LIMITS OF CONSTRUCTION	SF	SILT FENCE	VTC	VEHICLE TRACKING CONTROL
DW	DEWATERING	MR	MATERIAL STAGING IN ROADWAY	SF-R	SILT FENCE REINFORCED	VW	VTC WITH WHEEL WASH
ECB	EROSION CONTROL BLANKET						

EROSION CONTROL PLAN

SCALE: 1" = 100'

0 50' 100' 400'

SCALE: 1" = 100' (HORIZ)

CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

CIVIL

EROSION CONTROL NOTES, LEGEND, AND PLAN

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

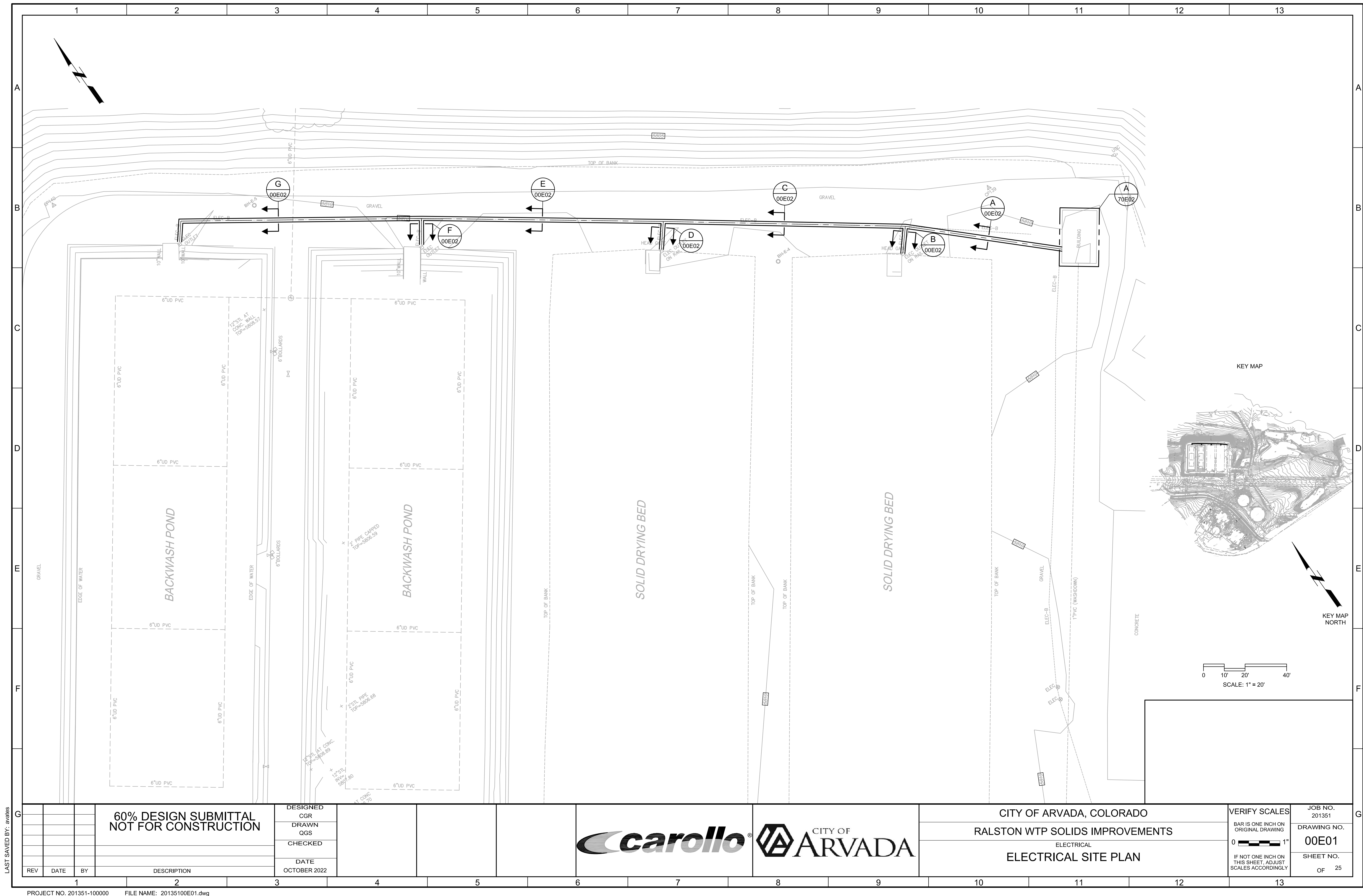
JOB NO. 201351

DRAWING NO. EC01

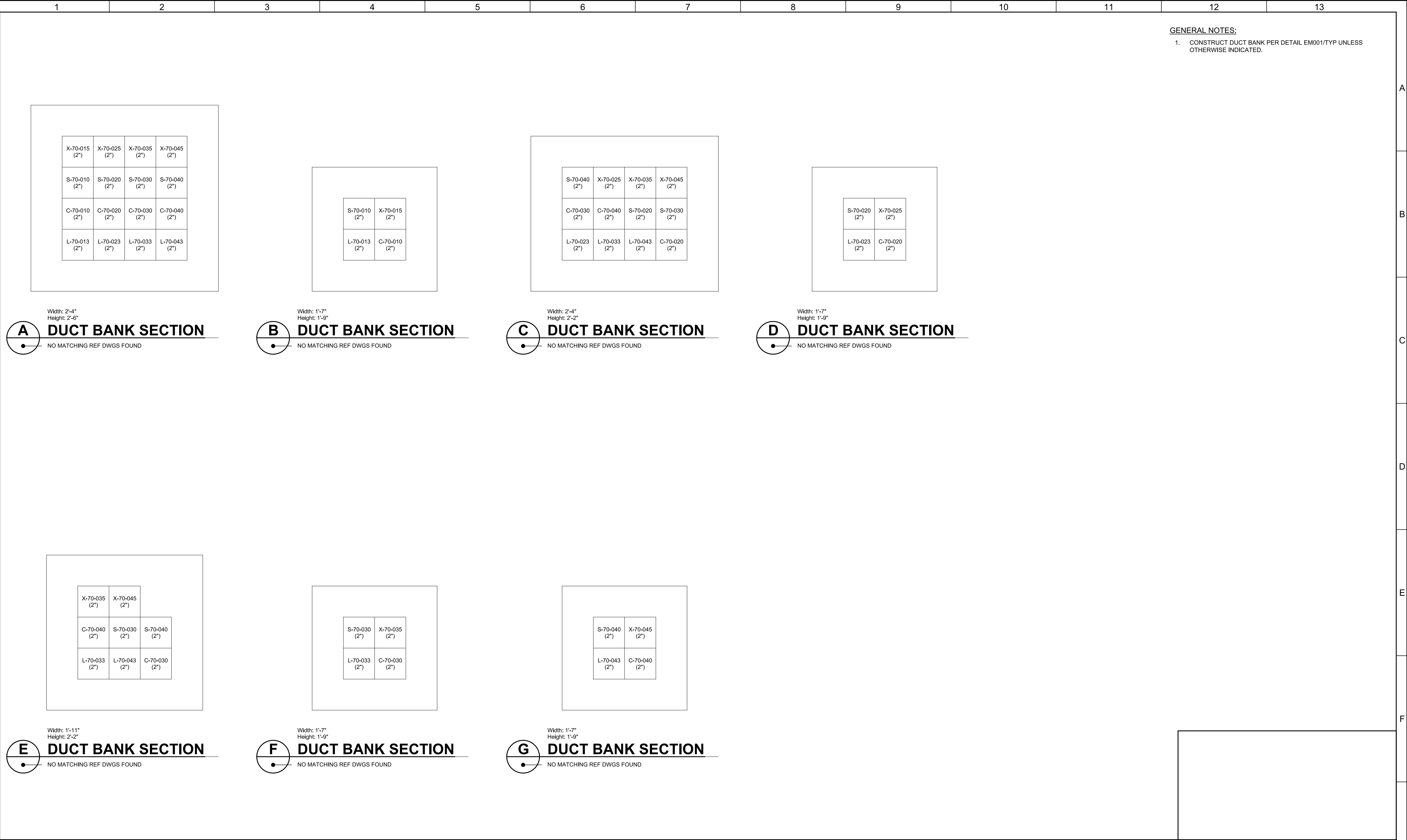
SHEET NO. SHT OF

carollo

CITY OF ARVADA



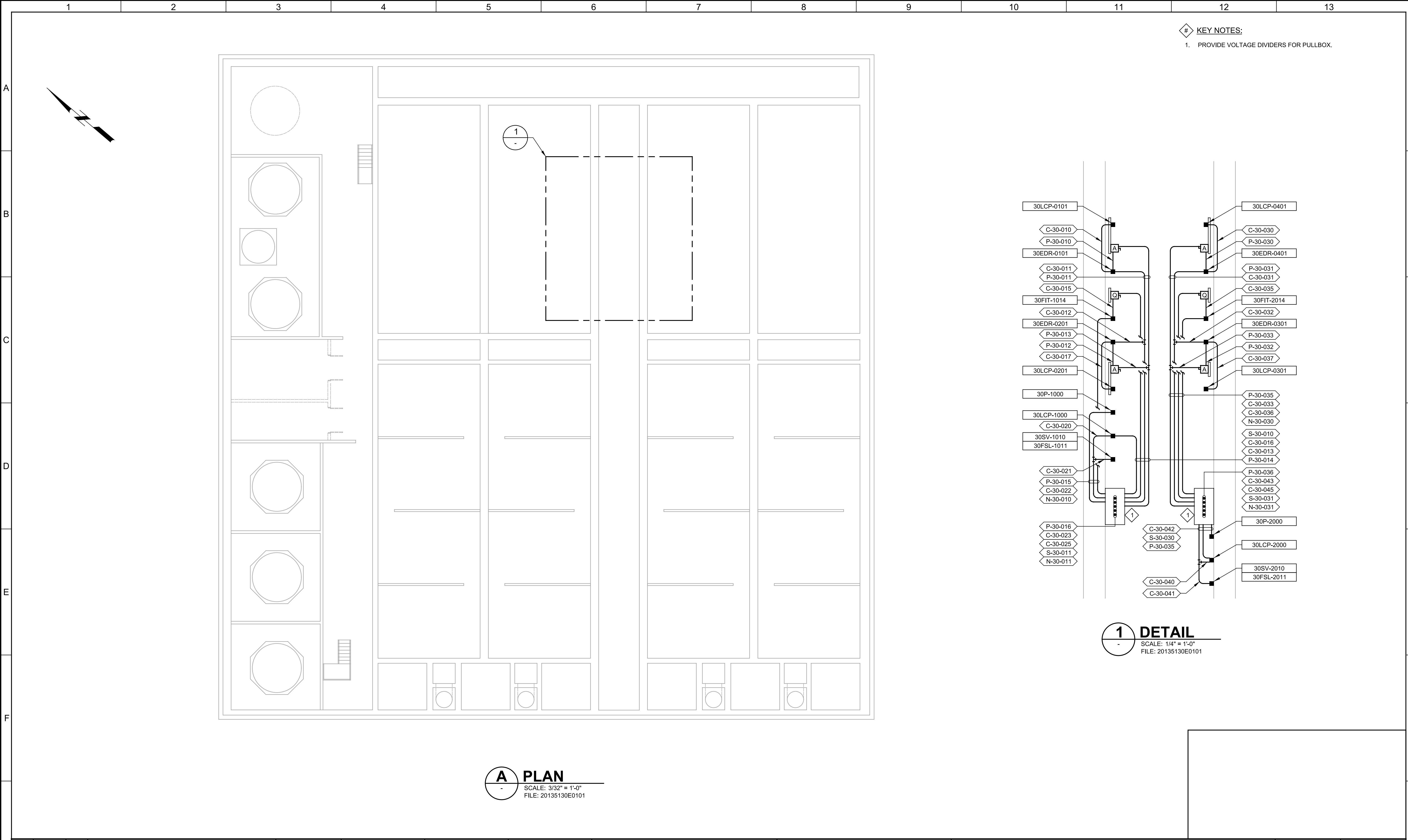
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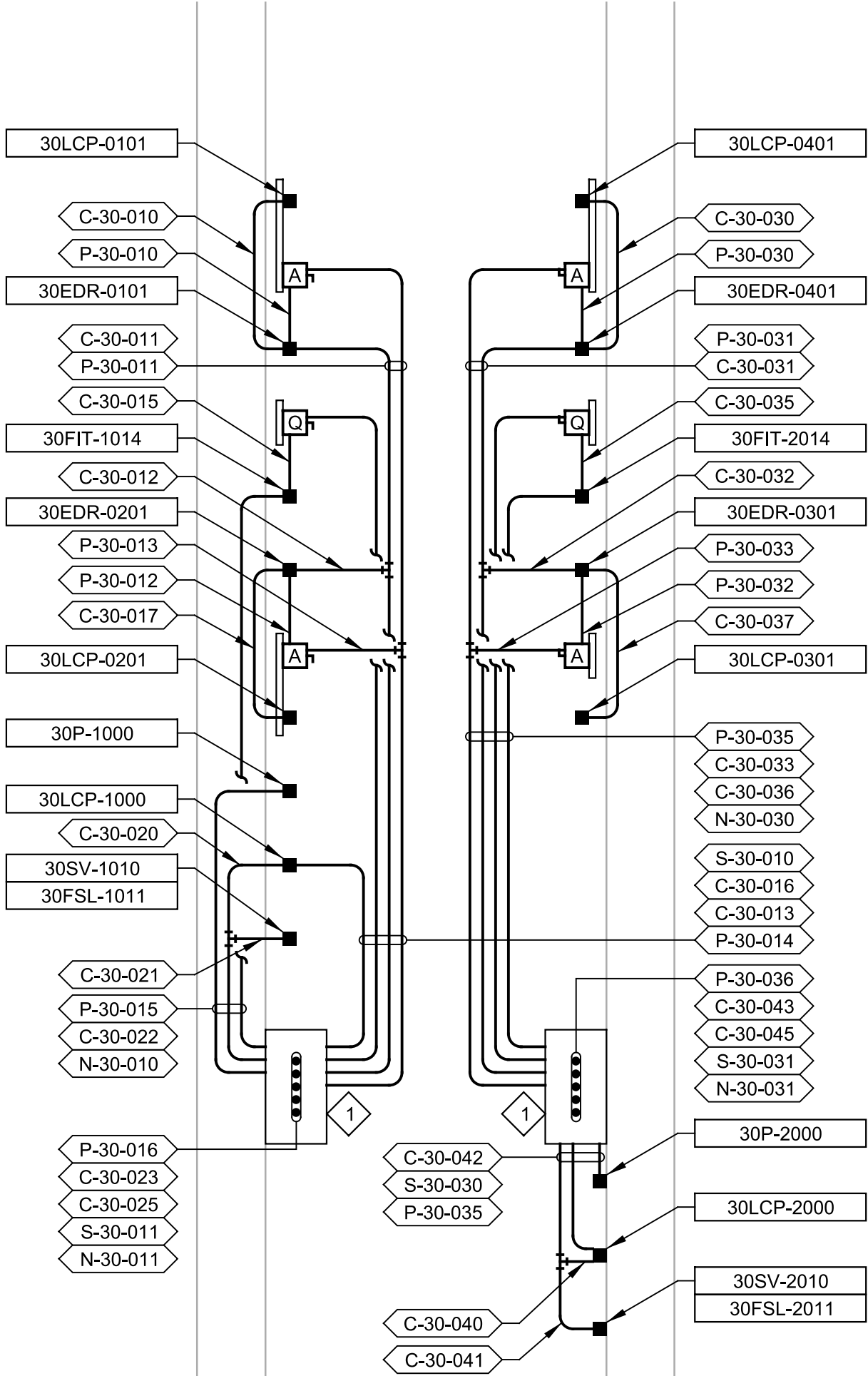
- GENERAL NOTES:
- CONSTRUCT DUCT BANK PER DETAIL EM001/TYP UNLESS OTHERWISE INDICATED.

			60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED CGR							CITY OF ARVADA, COLORADO		VERIFY SCALES	JOB NO. 201351	G
				DRAWN QGS							RALSTON WTP SOLIDS IMPROVEMENTS	BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.		
				CHECKED							ELECTRICAL	0  1"	00E02		
				DATE OCTOBER 2022							DUCT BANK SECTIONS 1	IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO.		
REV	DATE	BY		DESCRIPTION										OF	

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DesignScript: Carollo Std Pen_v0905.pen
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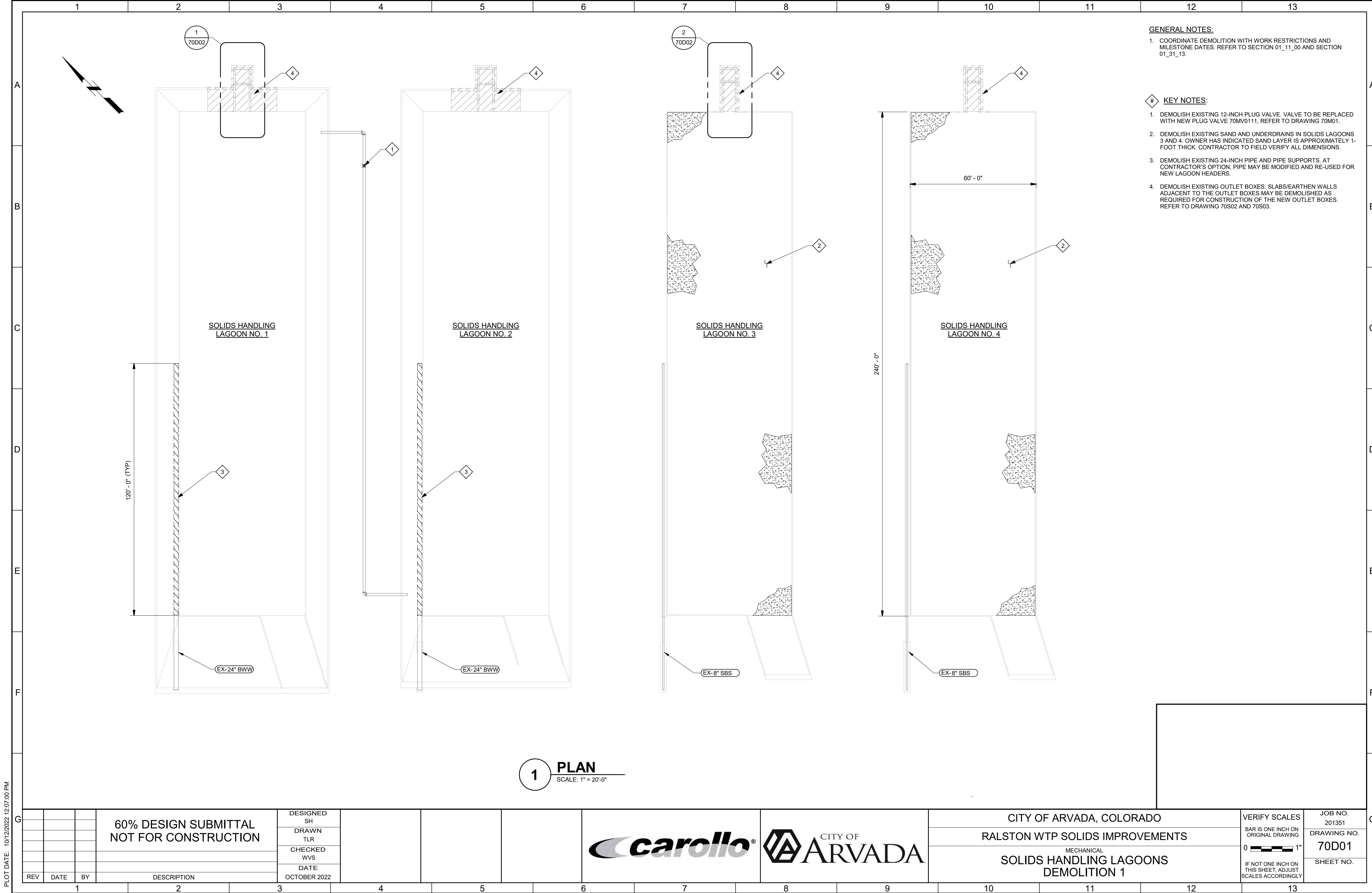
- # KEY NOTES:
1. PROVIDE VOLTAGE DIVIDERS FOR PULLBOX.



1 DETAIL
SCALE: 1/4" = 1'-0"
FILE: 20135130E0101

A PLAN
SCALE: 3/32" = 1'-0"
FILE: 20135130E0101

				60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED CGR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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- GENERAL NOTES:**
- COORDINATE DEMOLITION WITH WORK RESTRICTIONS AND MILESTONE DATES. REFER TO SECTION 01_11_00 AND SECTION 01_31_13.
- KEY NOTES:**
- DEMOLISH EXISTING 12-INCH PLUG VALVE. VALVE TO BE REPLACED WITH NEW PLUG VALVE 70MV0111, REFER TO DRAWING 70M01.
 - DEMOLISH EXISTING SAND AND UNDERDRAINS IN SOLIDS LAGOONS 3 AND 4. OWNER HAS INDICATED SAND LAYER IS APPROXIMATELY 1-FOOT THICK. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS.
 - DEMOLISH EXISTING 24-INCH PIPE AND PIPE SUPPORTS. AT CONTRACTOR'S OPTION, PIPE MAY BE MODIFIED AND RE-USED FOR NEW LAGOON HEADERS.
 - DEMOLISH EXISTING OUTLET BOXES. SLABS/EARTHEN WALLS ADJACENT TO THE OUTLET BOXES MAY BE DEMOLISHED AS REQUIRED FOR CONSTRUCTION OF THE NEW OUTLET BOXES. REFER TO DRAWING 70S02 AND 70S03.

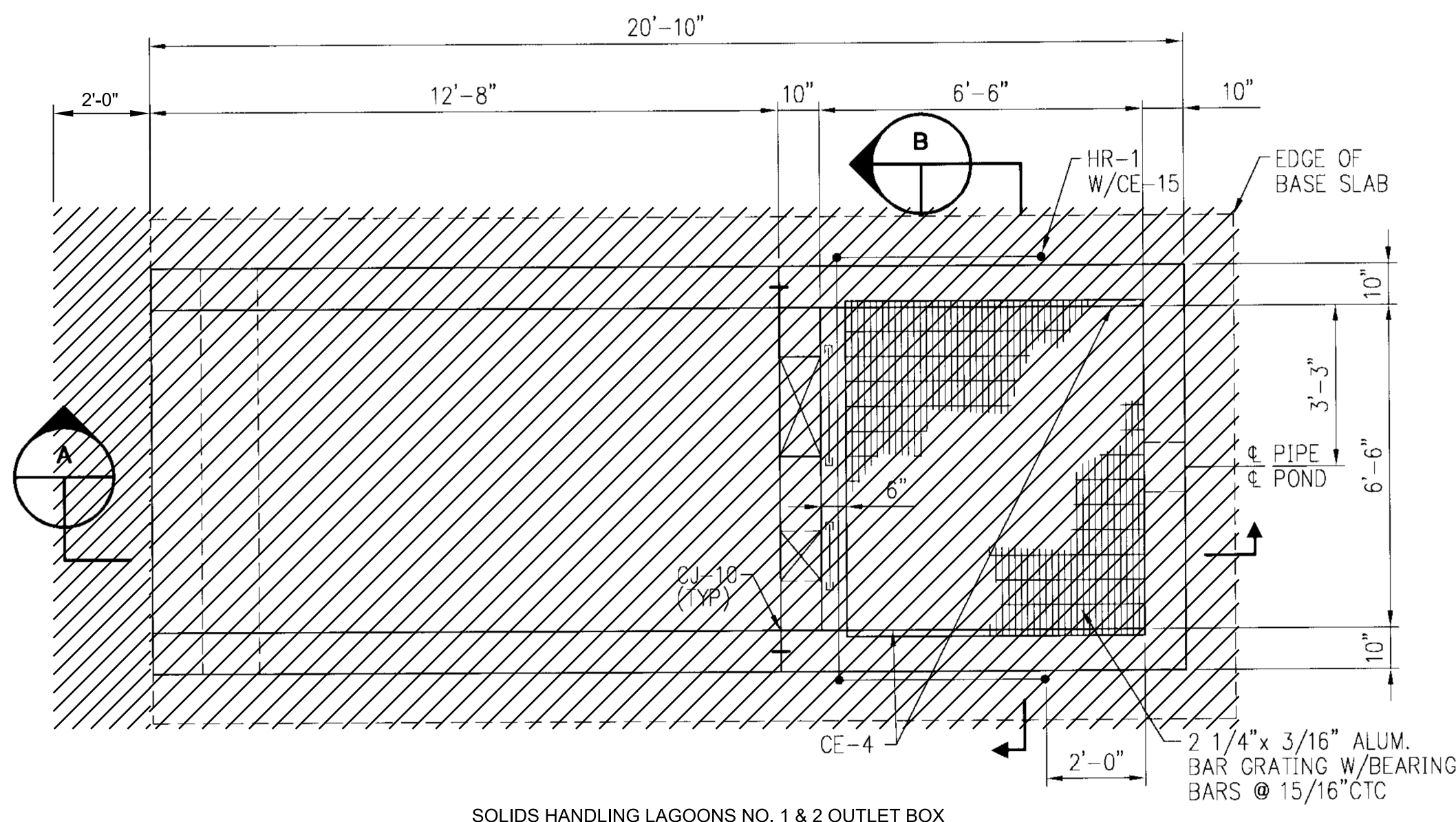
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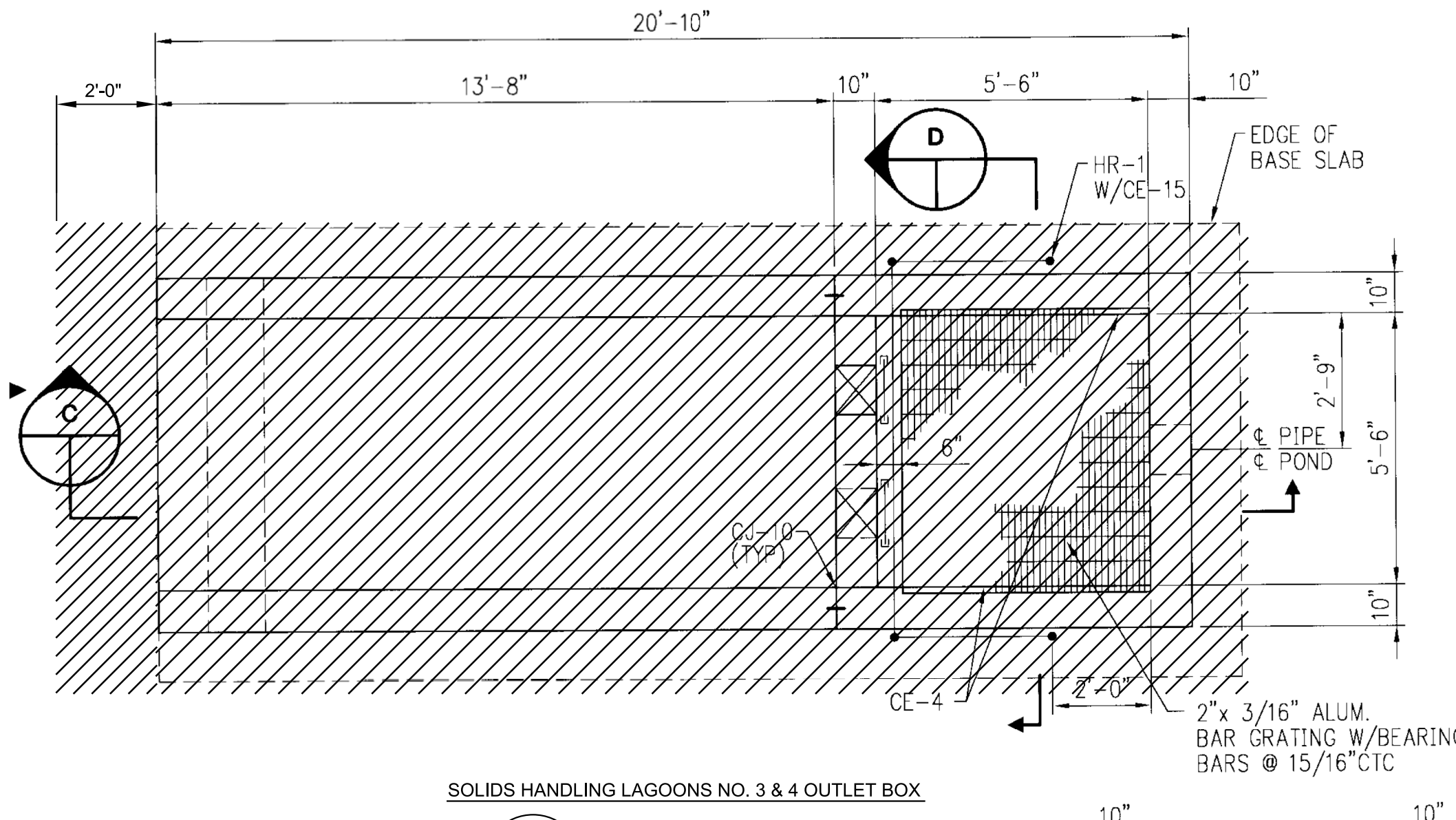
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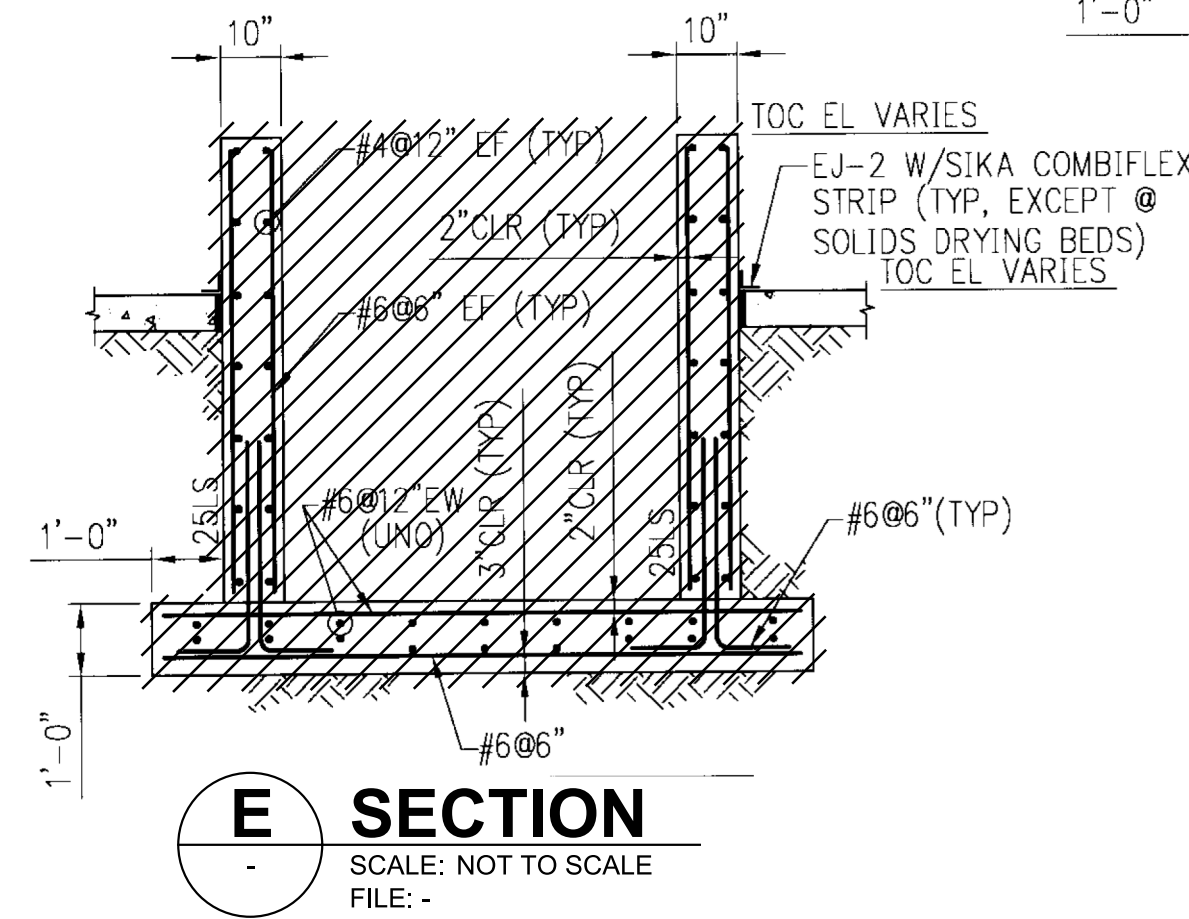
SOLIDS HANDLING LAGOONS NO. 1 & 2 OUTLET BOX

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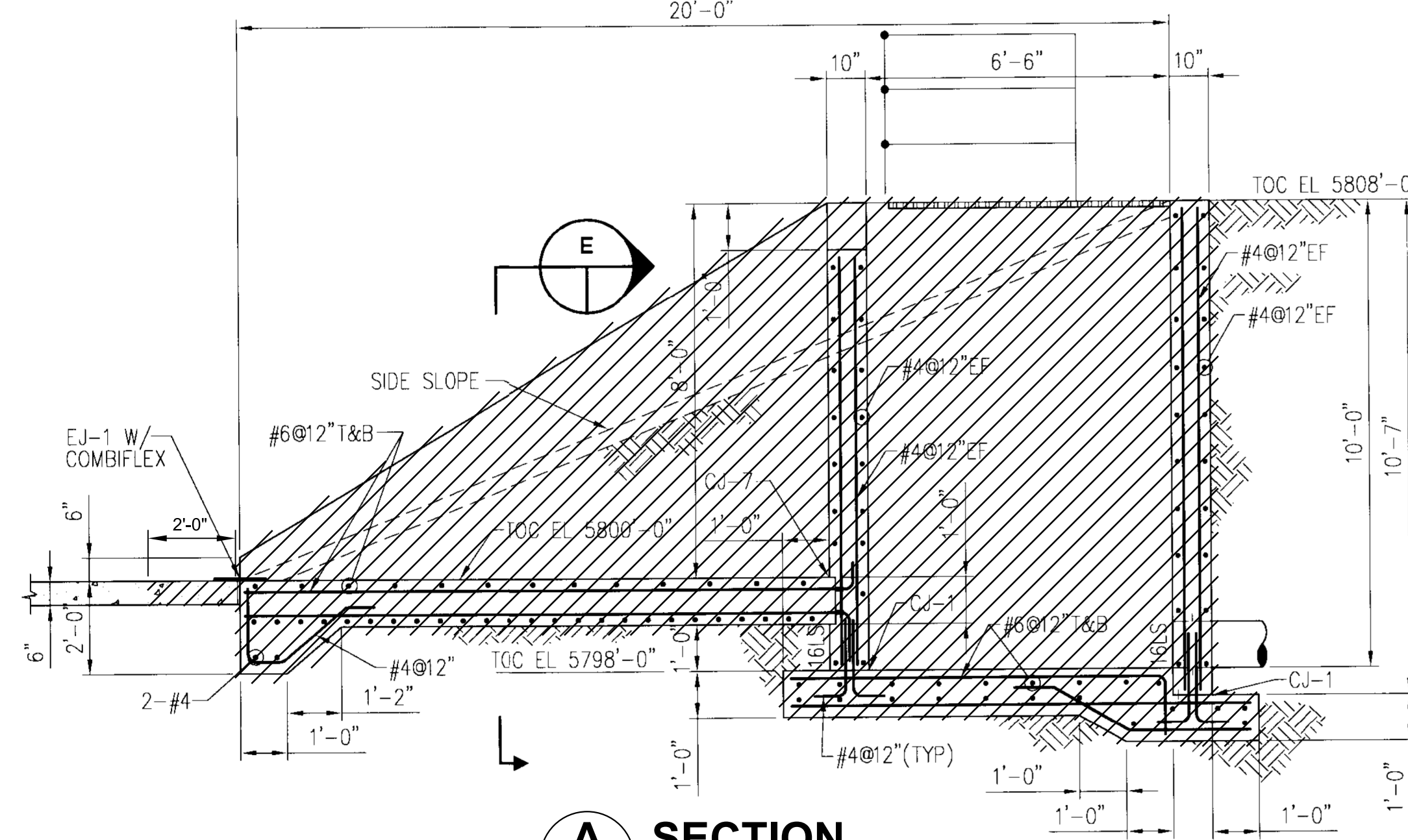


SOLIDS HANDLING LAGOONS NO. 3 & 4 OUTLET BOX

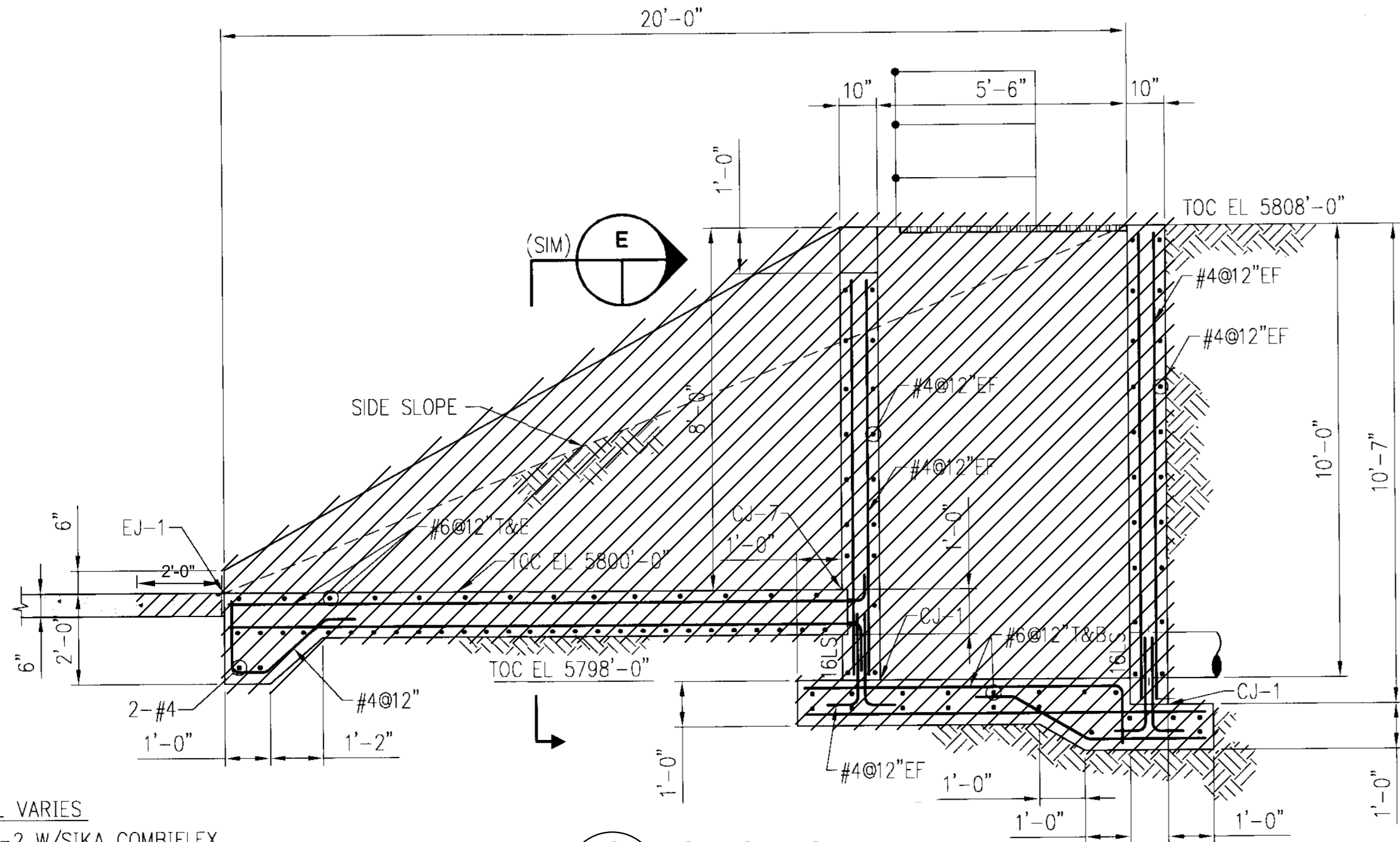
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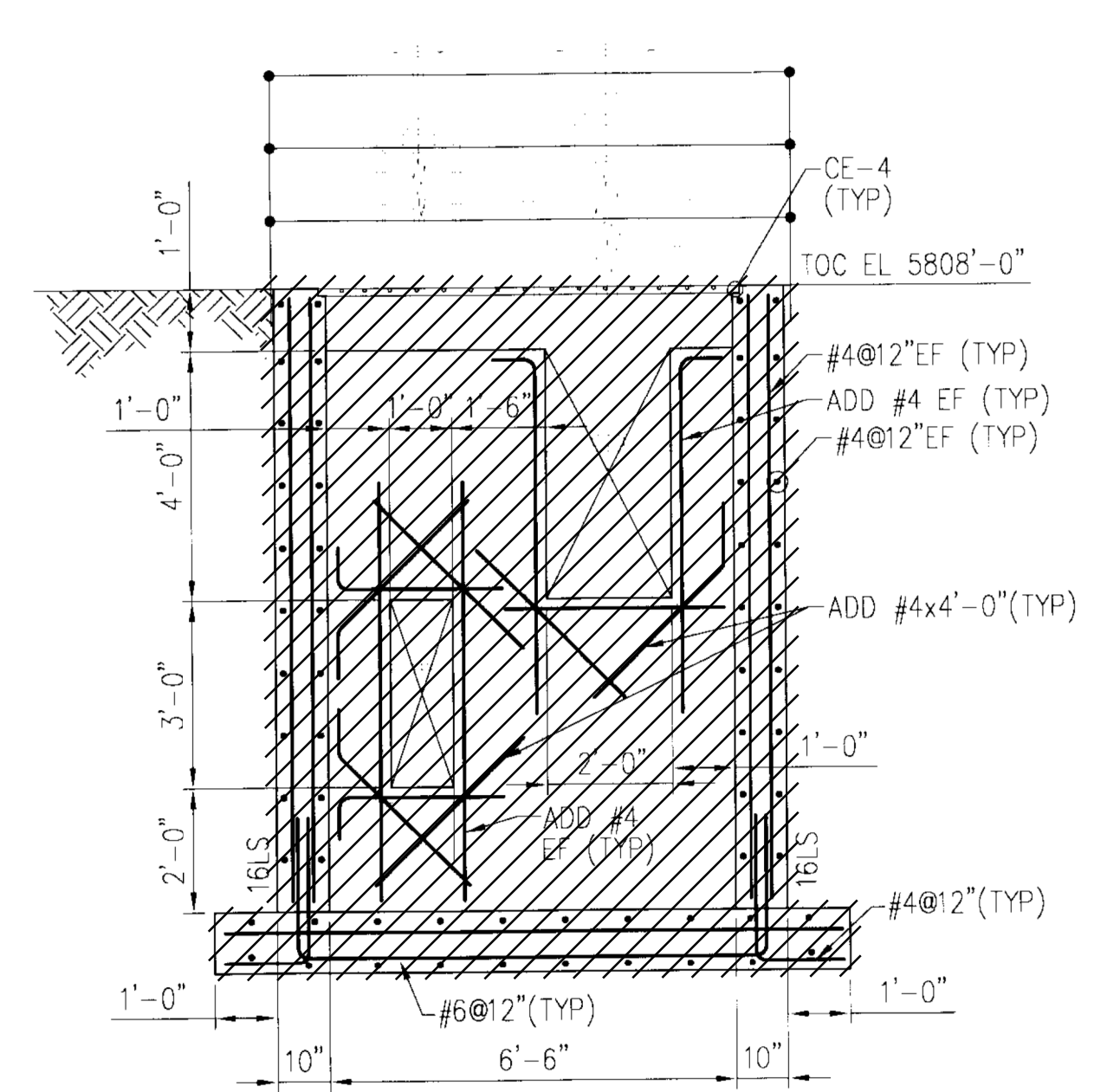
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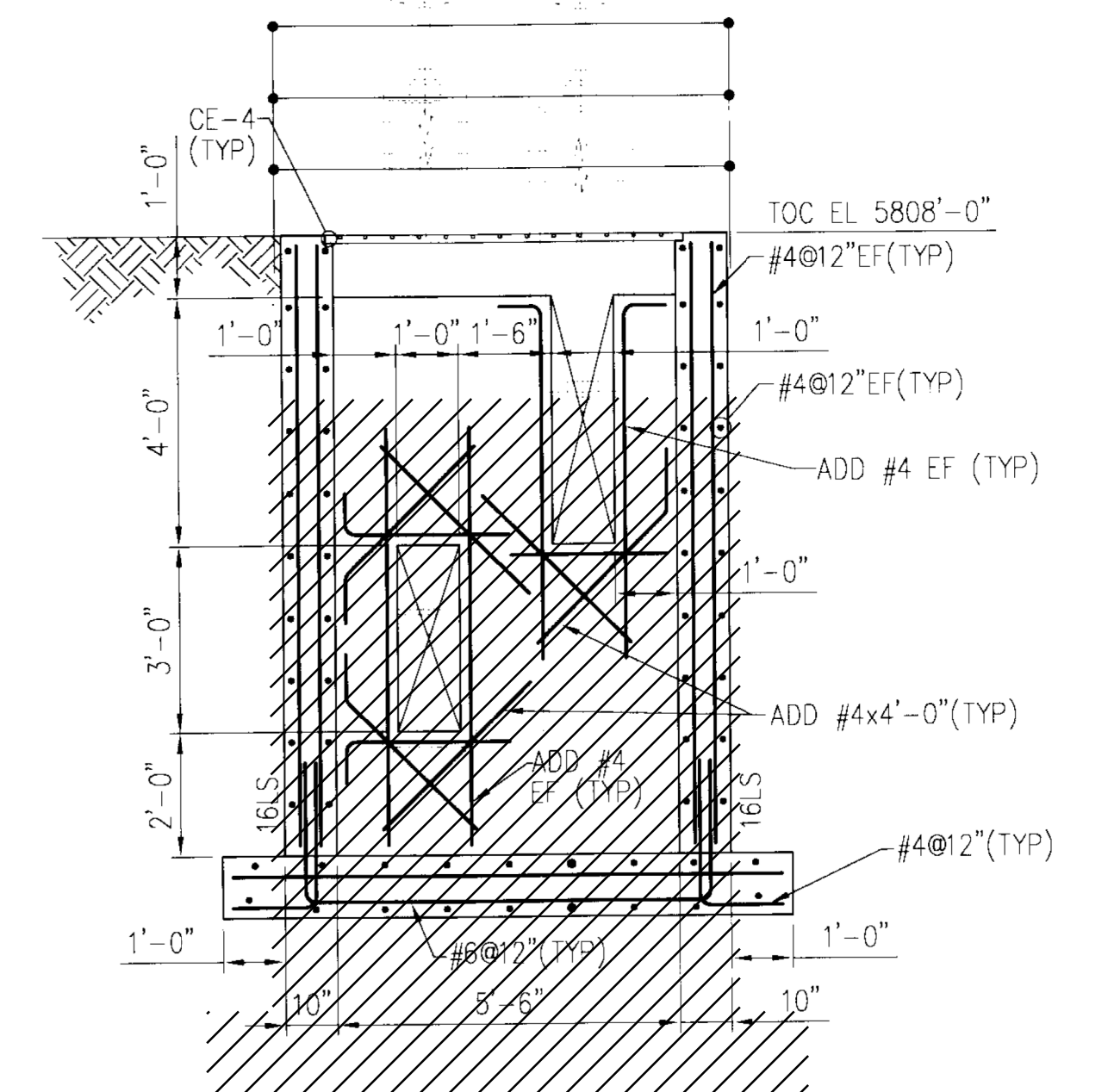
A SECTION
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C SECTION
SCALE: NOT TO SCALE
FILE: -



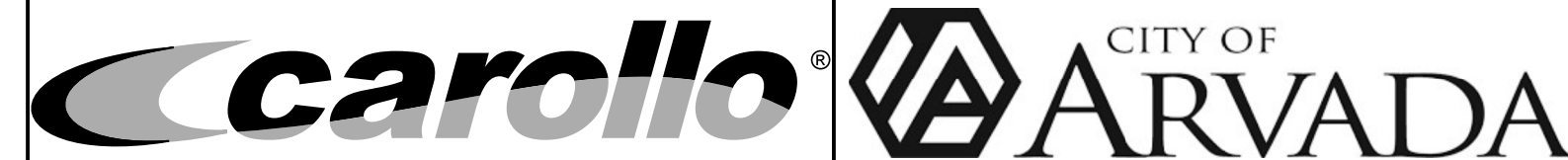
B SECTION
SCALE: NOT TO SCALE
FILE: -



D SECTION
SCALE: NOT TO SCALE
FILE: -

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

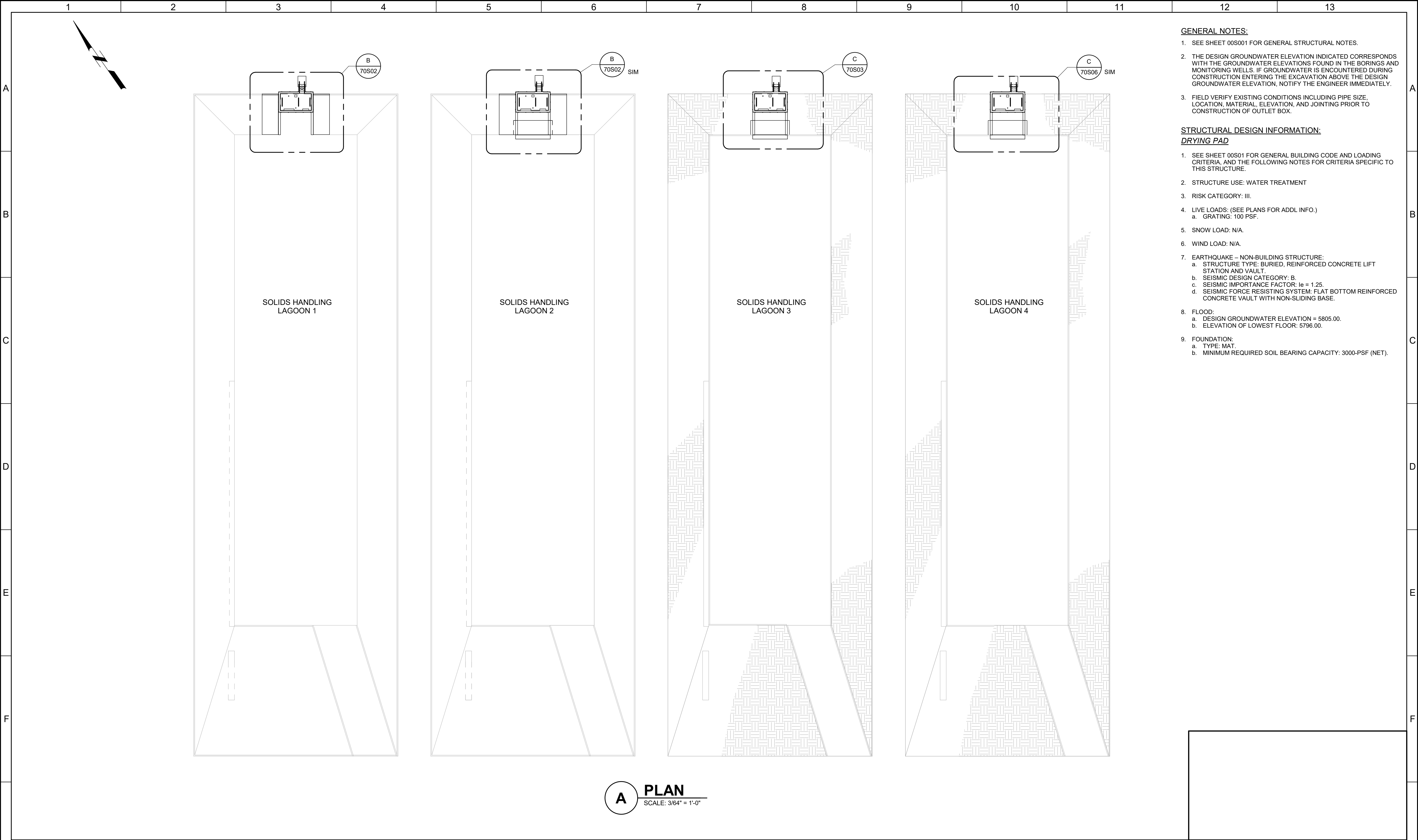
DESIGNED
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CHECKED
WWS
DATE
OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
DEMOLITION
SOLIDS HANDLING LAGOONS
DEMOLITION 2

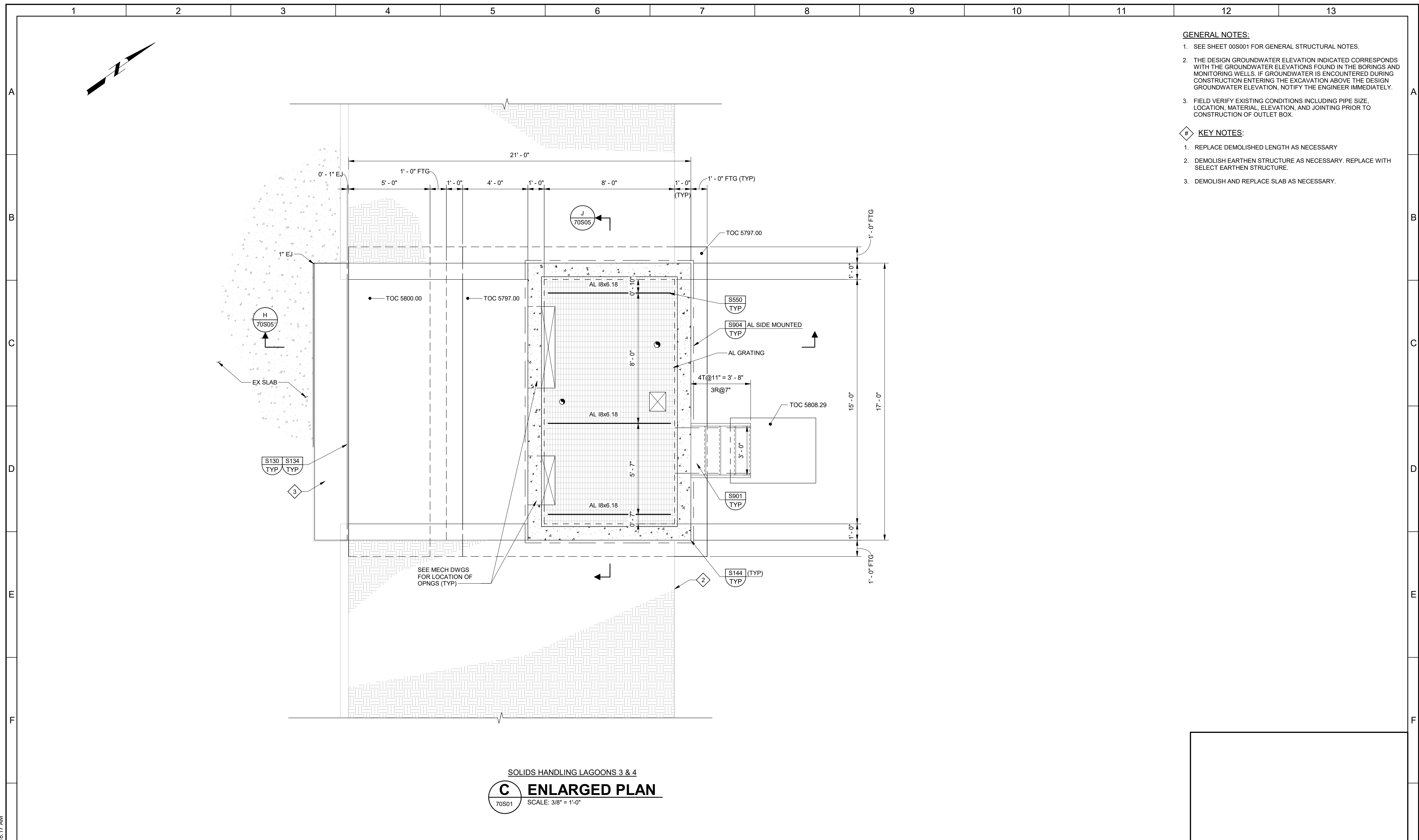
VERIFY SCALES
BAR IS ONE INCH ON
ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

JOB NO.
201351
DRAWING NO.
70D02
SHEET NO.
OF



- GENERAL NOTES:**
- SEE SHEET 00S001 FOR GENERAL STRUCTURAL NOTES.
 - THE DESIGN GROUNDWATER ELEVATION INDICATED CORRESPONDS WITH THE GROUNDWATER ELEVATIONS FOUND IN THE BORINGS AND MONITORING WELLS. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION ENTERING THE EXCAVATION ABOVE THE DESIGN GROUNDWATER ELEVATION, NOTIFY THE ENGINEER IMMEDIATELY.
 - FIELD VERIFY EXISTING CONDITIONS INCLUDING PIPE SIZE, LOCATION, MATERIAL, ELEVATION, AND JOINTING PRIOR TO CONSTRUCTION OF OUTLET BOX.
- STRUCTURAL DESIGN INFORMATION:**
- DRYING PAD**
- SEE SHEET 00S01 FOR GENERAL BUILDING CODE AND LOADING CRITERIA, AND THE FOLLOWING NOTES FOR CRITERIA SPECIFIC TO THIS STRUCTURE.
 - STRUCTURE USE: WATER TREATMENT
 - RISK CATEGORY: III.
 - LIVE LOADS: (SEE PLANS FOR ADDL INFO.)
 - GRATING: 100 PSF.
 - SNOW LOAD: N/A.
 - WIND LOAD: N/A.
 - EARTHQUAKE – NON-BUILDING STRUCTURE:
 - STRUCTURE TYPE: BURIED, REINFORCED CONCRETE LIFT STATION AND VAULT.
 - SEISMIC DESIGN CATEGORY: B.
 - SEISMIC IMPORTANCE FACTOR: $I_e = 1.25$.
 - SEISMIC FORCE RESISTING SYSTEM: FLAT BOTTOM REINFORCED CONCRETE VAULT WITH NON-SLIDING BASE.
 - FLOOD:
 - DESIGN GROUNDWATER ELEVATION = 5805.00.
 - ELEVATION OF LOWEST FLOOR: 5796.00.
 - FOUNDATION:
 - TYPE: MAT.
 - MINIMUM REQUIRED SOIL BEARING CAPACITY: 3000-PSF (NET).

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION				DESIGNED MKF				CITY OF ARVADA, COLORADO RALSTON WTP SOLIDS IMPROVEMENTS STRUCTURAL SOLIDS HANDLING LAGOONS OVERALL PLAN			VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY		JOB NO. 201351
				DRAWN KA									DRAWING NO.
				CHECKED MAK									70S01
				DATE OCTOBER 2022									SHEET NO.
REV	DATE	BY	DESCRIPTION										
1													
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GENERAL NOTES:

1. SEE SHEET 00S001 FOR GENERAL STRUCTURAL NOTES.
2. THE DESIGN GROUNDWATER ELEVATION INDICATED CORRESPONDS TO THE DESIGN GROUNDWATER ELEVATIONS FOUND IN THE BORINGS AND MONITORING WELLS. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION ENTERING THE EXCAVATION ABOVE THE DESIGN GROUNDWATER ELEVATION, NOTIFY THE ENGINEER IMMEDIATELY.
3. FIELD VERIFY EXISTING CONDITIONS INCLUDING PIPE SIZE, LOCATION, MATERIAL, ELEVATION, AND JOINTING PRIOR TO CONSTRUCTION OF OUTLET BOX.

KEY NOTES:

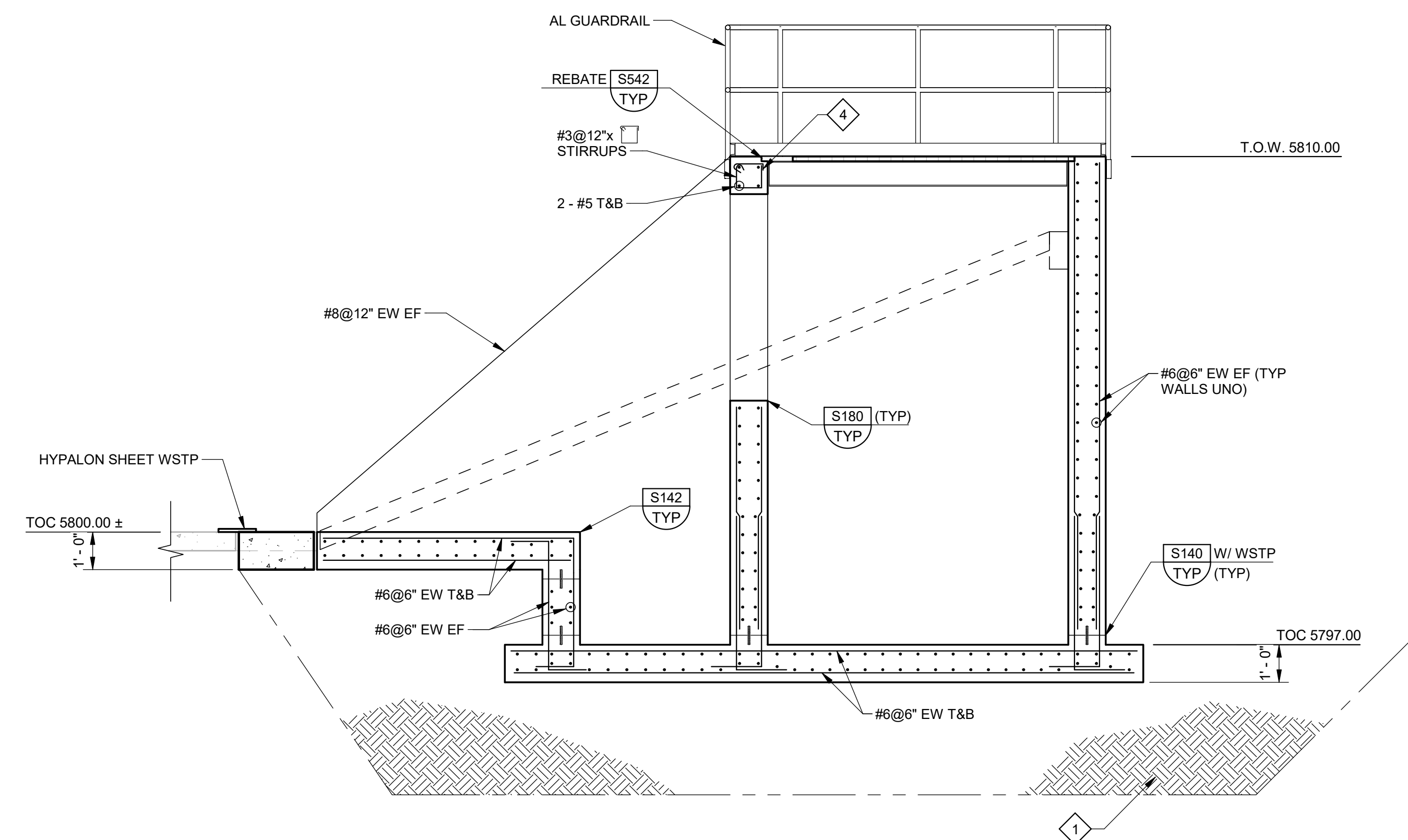
1. REPLACE DEMOLISHED LENGTH AS NECESSARY
2. DEMOLISH EARTHEN STRUCTURE AS NECESSARY. REPLACE WITH SELECT EARTHEN STRUCTURE.
3. DEMOLISH AND REPLACE SLAB AS NECESSARY.

SOLIDS HANDLING LAGOONS 3 & 4

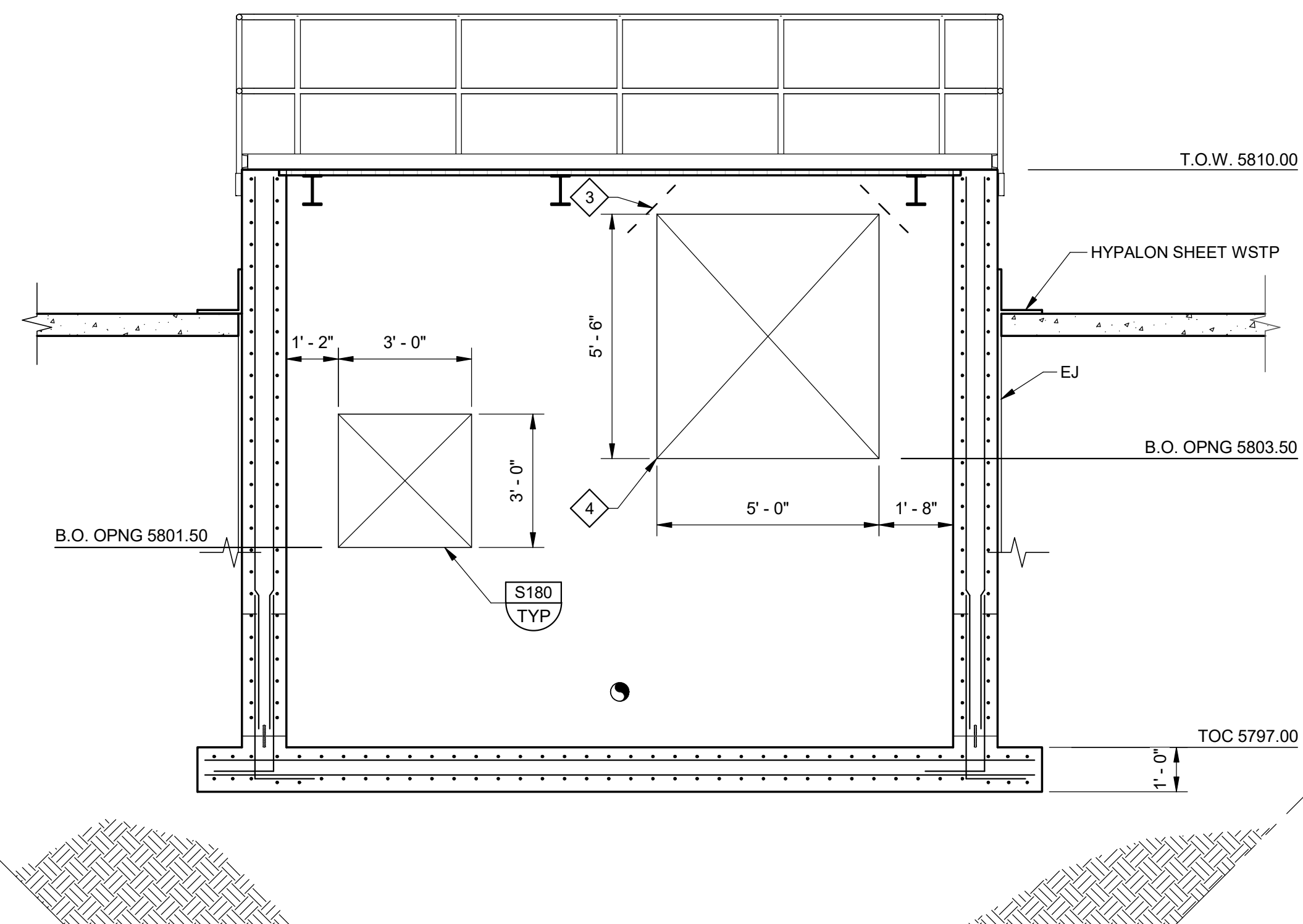
C **ENLARGED PLAN**

70S01 SCALE: 3/8" = 1'-0"

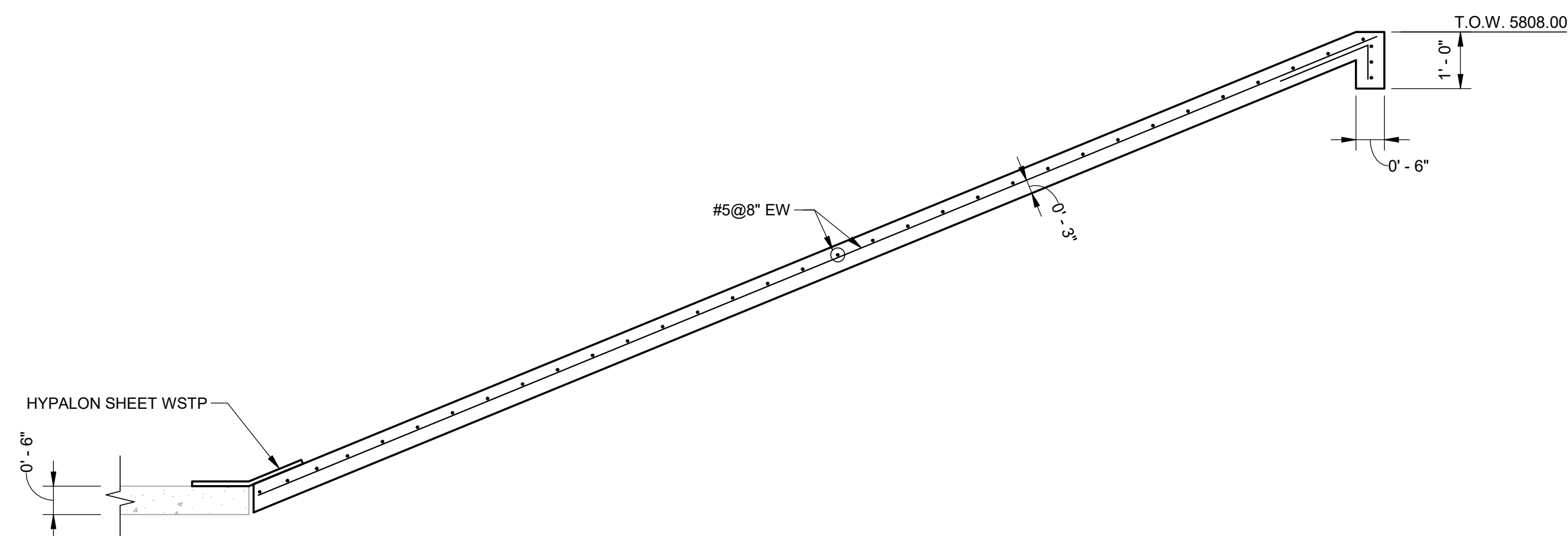
[illegible]



D SECTION
70S02 SCALE: 3/8" = 1'-0"



E SECTION
70S02 SCALE: 3/8" = 1'-0"



F **SECTION**
70S02 SCALE: 1/2" = 1'-0"

G				60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			DESIGNED MKF						CITY OF ARVADA, COLORADO			VERIFY SCALES	JOB NO. 201351
							DRAWN KA						RALSTON WTP SOLIDS IMPROVEMENTS			BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.
							CHECKED MAK						STRUCTURAL				70S04
							DATE OCTOBER 2022						SOLIDS HANDLING LAGOONS LAGOONS 1 & 2 SECTIONS			IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO.
	REV	DATE	BY	DESCRIPTION													
			1	2	3	4	5	6	7	8	9	10	11	12	13		

PLOT DATE: 10/17/2022 8:07:39 AM

FILE NAME: R:\d1355757\20135170S9801.rvt

GENERAL NOTES:

1. SEE SHEET 00S001 FOR GENERAL STRUCTURAL NOTES.
2. THE DESIGN GROUNDWATER ELEVATION INDICATED CORRESPONDS WITH THE GROUNDWATER ELEVATIONS FOUND IN THE BORINGS AND MONITORING WELLS. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION ENTERING THE EXCAVATION ABOVE THE DESIGN GROUNDWATER ELEVATION, NOTIFY THE ENGINEER IMMEDIATELY.
3. FIELD VERIFY EXISTING CONDITIONS INCLUDING PIPE SIZE, LOCATION, MATERIAL, ELEVATION, AND JOINTING PRIOR TO CONSTRUCTION OF OUTLET BOX.

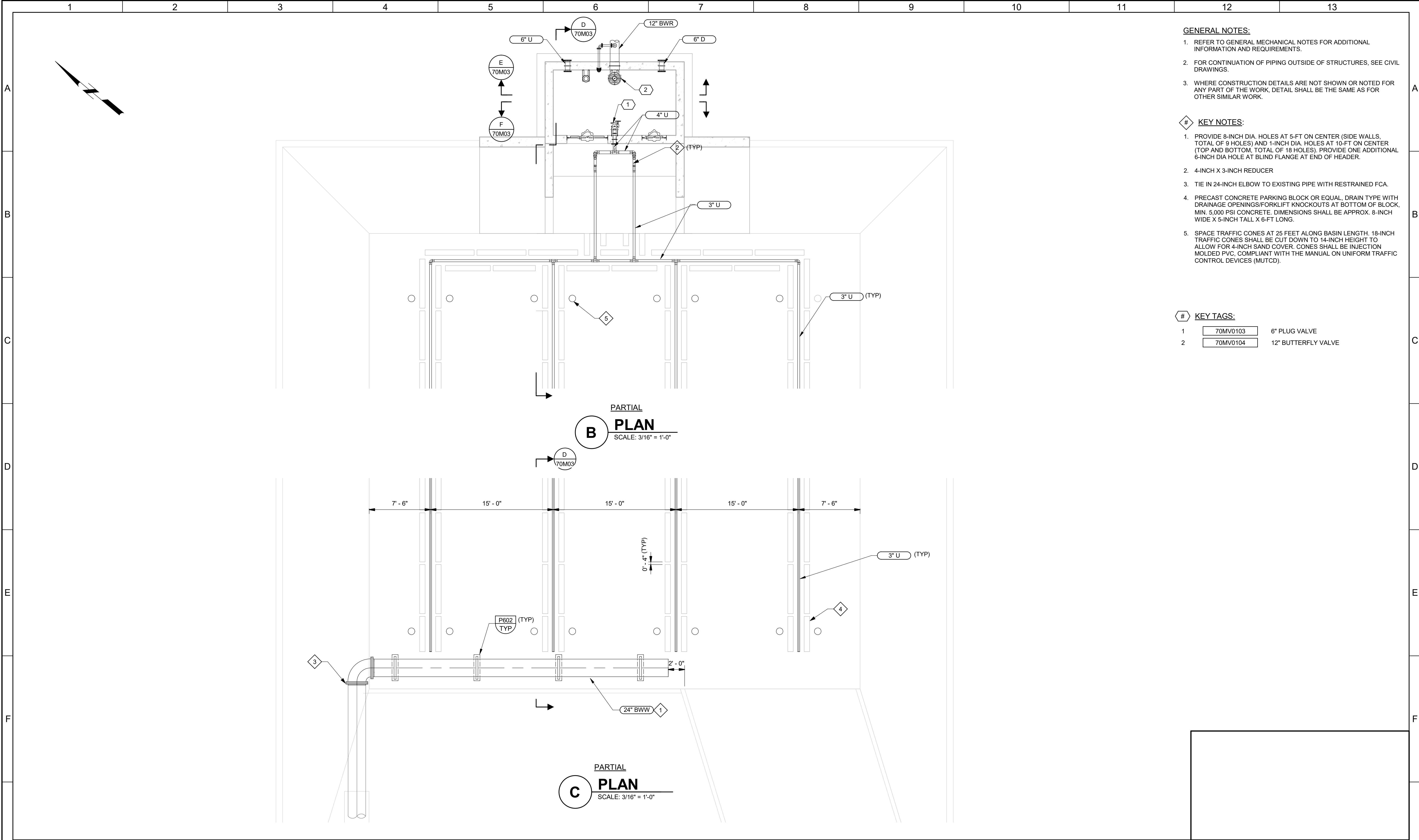
KEY NOTES:

1. OVEREXCAVATE 3'-0" TO REMOVE BEDROCK. BACKFILL WITH CDOT CLASS 1 BACKFILL. SEE SECTION 31_00_00 - EARTHWORK.
2. MAINTAIN 1" CLEAR FROM REBATE TO STIRRUP.
3. PROVIDE 1 - #5x5'-0" DIAGONAL CORNER BAR PER CORNER AT TOP OF OPENING.
4. PROVIDE REINFORCEMENT AS SHOWN IN DETAIL S180/TYP AROUND OPENING EXCEPT AS NOTED.



1. OVEREXCAVATE 3'-0" TO REMOVE BEDROCK. BACKFILL WITH CDOT CLASS 1 BACKFILL. SEE SECTION 31.00.00 - EARTHWORK.
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3. PROVIDE 1 - #5x5'-0" DIAGONAL CORNER BAR PER CORNER AT TOP OF OPENING.
4. PROVIDE REINFORCEMENT AS DEPICTED IN DETAIL S180/TYP AROUND OPENING EXCEPT AS SHOWN.

G				90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED MKF					 	CITY OF ARVADA, COLORADO			VERIFY SCALES	JOB NO. 201351
					DRAWN KA						RALSTON WTP SOLIDS IMPROVEMENTS			BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.
					CHECKED MAK						STRUCTURAL			0  1"	70S05
					DATE OCTOBER 2022						SOLIDS HANDLING LAGOONS			IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO.
	REV	DATE	BY		DESCRIPTION						LAGOONS 3 & 4 SECTIONS				
	1		2	3	4	5	6	7	8	9	10	11	12	13	

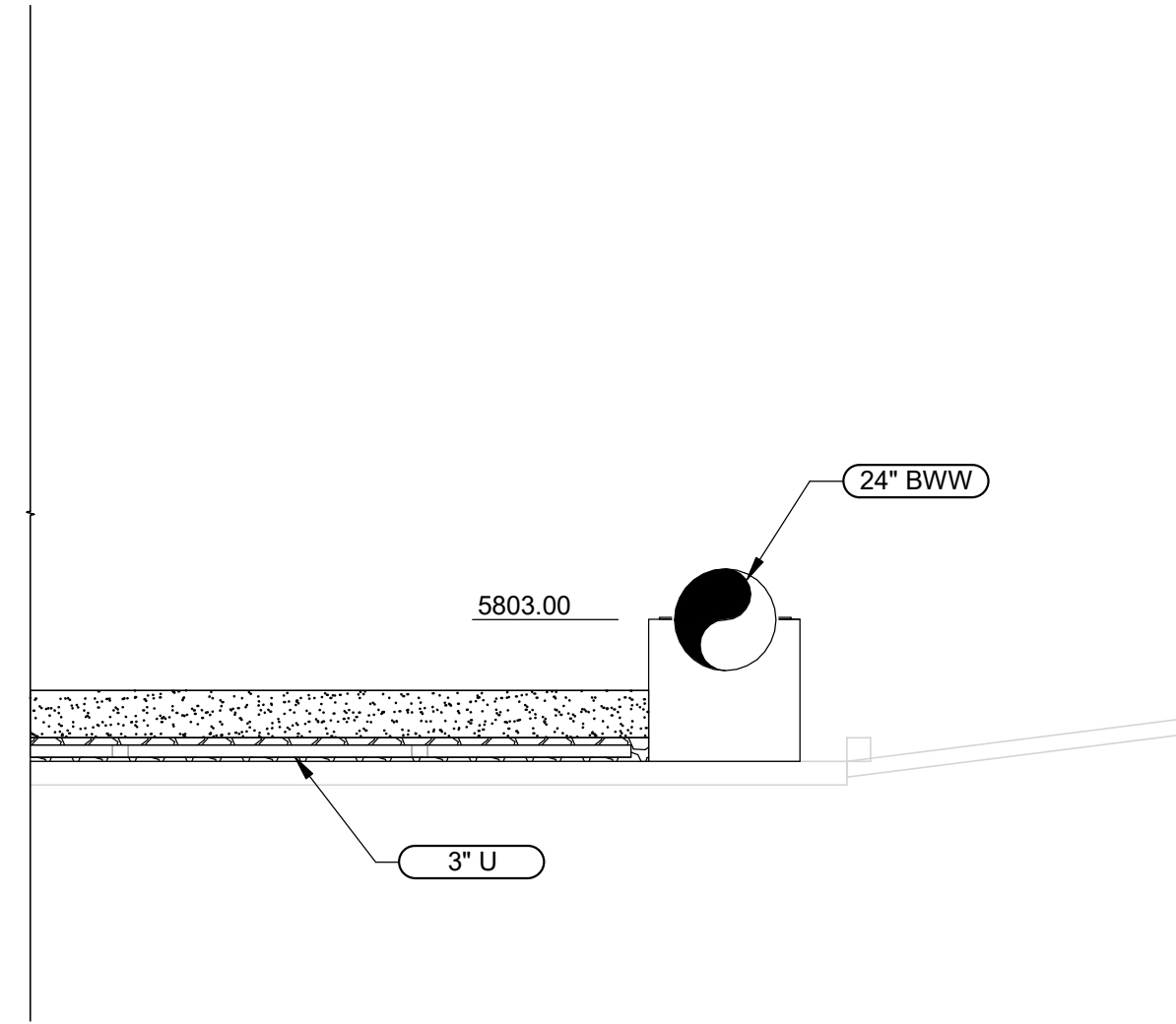


- GENERAL NOTES:**
1. REFER TO GENERAL MECHANICAL NOTES FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
 2. FOR CONTINUATION OF PIPING OUTSIDE OF STRUCTURES, SEE CIVIL DRAWINGS.
 3. WHERE CONSTRUCTION DETAILS ARE NOT SHOWN OR NOTED FOR ANY PART OF THE WORK, DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
- KEY NOTES:**
1. PROVIDE 8-INCH DIA. HOLES AT 5-FT ON CENTER (SIDE WALLS, TOTAL OF 9 HOLES) AND 1-INCH DIA. HOLES AT 10-FT ON CENTER (TOP AND BOTTOM, TOTAL OF 18 HOLES). PROVIDE ONE ADDITIONAL 6-INCH DIA HOLE AT BLIND FLANGE AT END OF HEADER.
 2. 4-INCH X 3-INCH REDUCER
 3. TIE IN 24-INCH ELBOW TO EXISTING PIPE WITH RESTRAINED FCA.
 4. PRECAST CONCRETE PARKING BLOCK OR EQUAL, DRAIN TYPE WITH DRAINAGE OPENINGS/FORKLIFT KNOCKOUTS AT BOTTOM OF BLOCK, MIN. 5,000 PSI CONCRETE. DIMENSIONS SHALL BE APPROX. 8-INCH WIDE X 5-INCH TALL X 6-FT LONG.
 5. SPACE TRAFFIC CONES AT 25 FEET ALONG BASIN LENGTH. 18-INCH TRAFFIC CONES SHALL BE CUT DOWN TO 14-INCH HEIGHT TO ALLOW FOR 4-INCH SAND COVER. CONES SHALL BE INJECTION MOLDED PVC, COMPLIANT WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

#	KEY TAGS:
1	70MV0103 6" PLUG VALVE
2	70MV0104 12" BUTTERFLY VALVE

G				60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED SH							CITY OF ARVADA, COLORADO			VERIFY SCALES	JOB NO. 201351	G										
					DRAWN TLR							RALSTON WTP SOLIDS IMPROVEMENTS	BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.													
					CHECKED WVS							MECHANICAL	0  1"	70M02													
					DATE OCTOBER 2022							SOLIDS HANDLING LAGOONS PARTIAL PLANS	IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO.													
	REV	DATE	BY	DESCRIPTION																							
	1			2		3		4		5		6		7		8		9		10		11		12		13	

PLOT DATE: 10/12/2022 4:18:45 PM



Technical drawing of a two-bay industrial structure, likely a water treatment or storage facility. The drawing shows two vertical shafts, each equipped with a motorized drive at the top and a float valve at the bottom. The structure is supported by a concrete base. Key features include:

- B.O. OPENING 5801.50**: Located on the left side of the structure.
- B.O. OPENING 5803.50**: Located on the right side of the structure.
- 5798.25**: A dimension or elevation mark located between the two shafts.
- 4**: A callout number pointing to the bottom of the left shaft.
- 3**: A callout number pointing to the bottom of the right shaft.

6

2" BWR

5

P656 (TYP)

12" BWR

5801.75

6" U

5798.00

6" D

5799.50

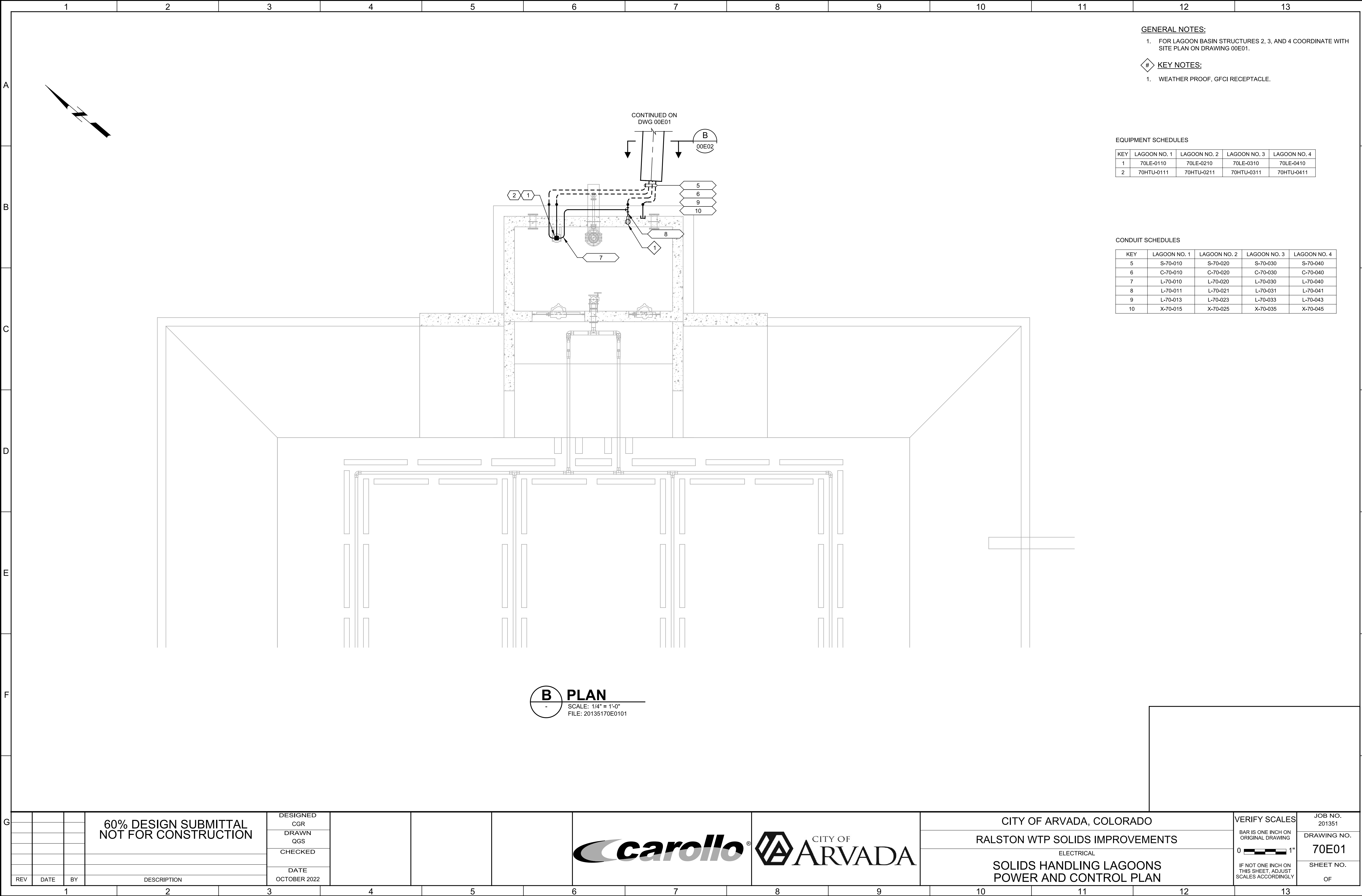
- | | | |
|---|----------|-----------------------------|
| 1 | 70MV0103 | 6" PLUG VALVE |
| 2 | 70MV0104 | 12" BUTTERFLY VALVE |
| 3 | 70G0101 | BACKWASH RECYCLE GATE NO. 1 |
| 4 | 70G0102 | DECANT GATE NO. 1 |

Plot Date: 12-OCT-2022 10:51:03 AM

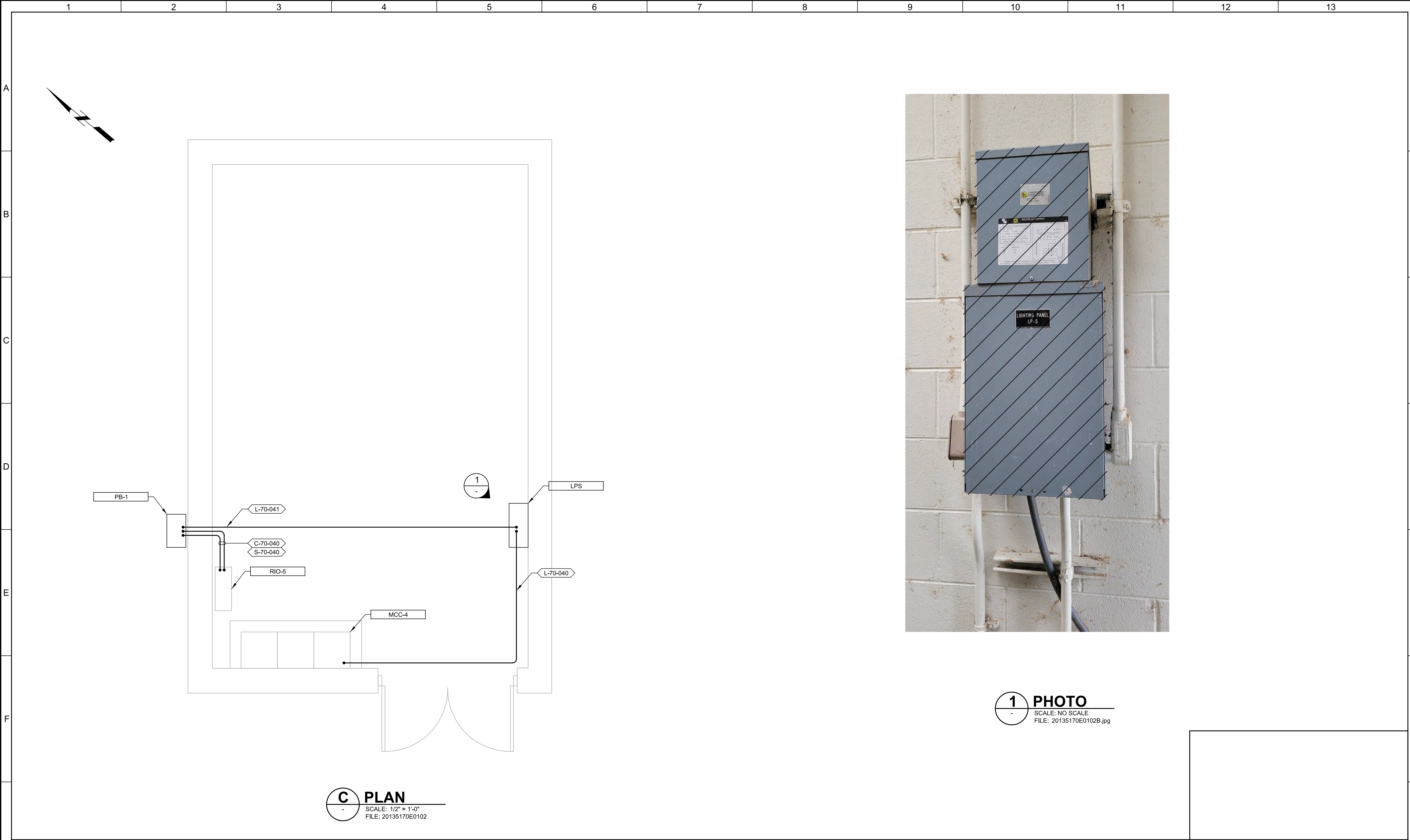
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Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: qsandoval



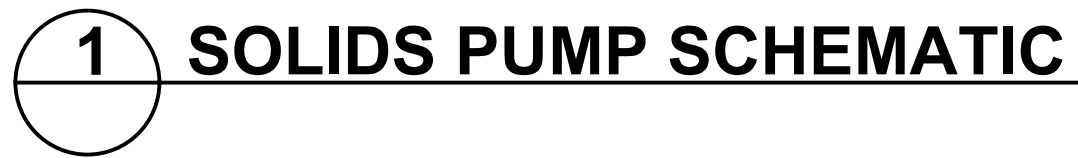
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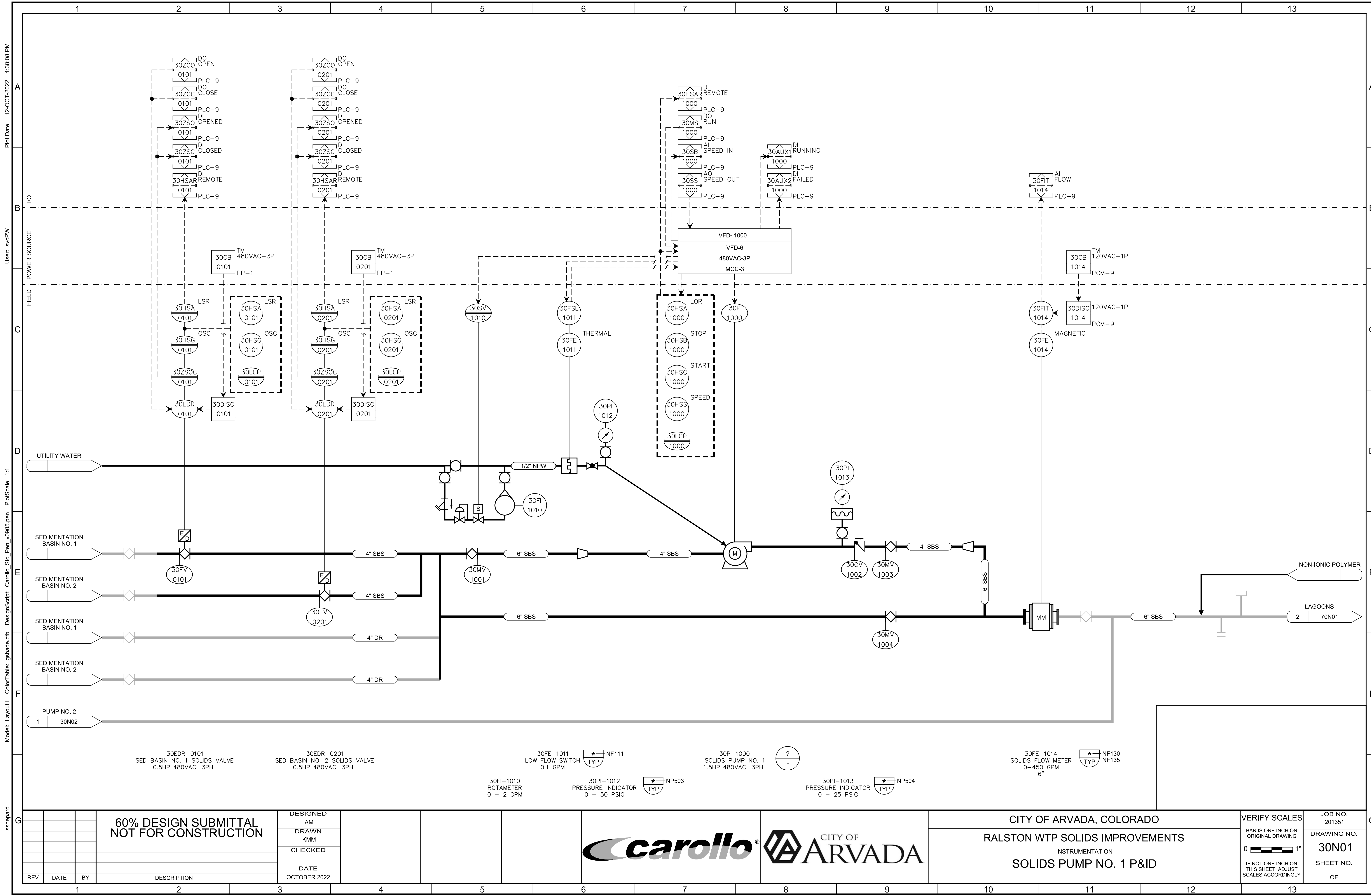
1 PHOTO
SCALE: NO SCALE
FILE: 20135170E0102B.jpg

C PLAN
SCALE: 1/2" = 1'-0"
FILE: 20135170E0102

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION				DESIGNED CGR										CITY OF ARVADA, COLORADO			VERIFY SCALES	JOB NO. 201351
				DRAWN QGS										RALSTON WTP SOLIDS IMPROVEMENTS			BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.
				CHECKED										ELECTRICAL			0 1"	70E02
				DATE OCTOBER 2022										BACKWASH RECYCLE PUMP STATION POWER AND CONTROL PLAN			IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. OF
REV	DATE	BY	DESCRIPTION															



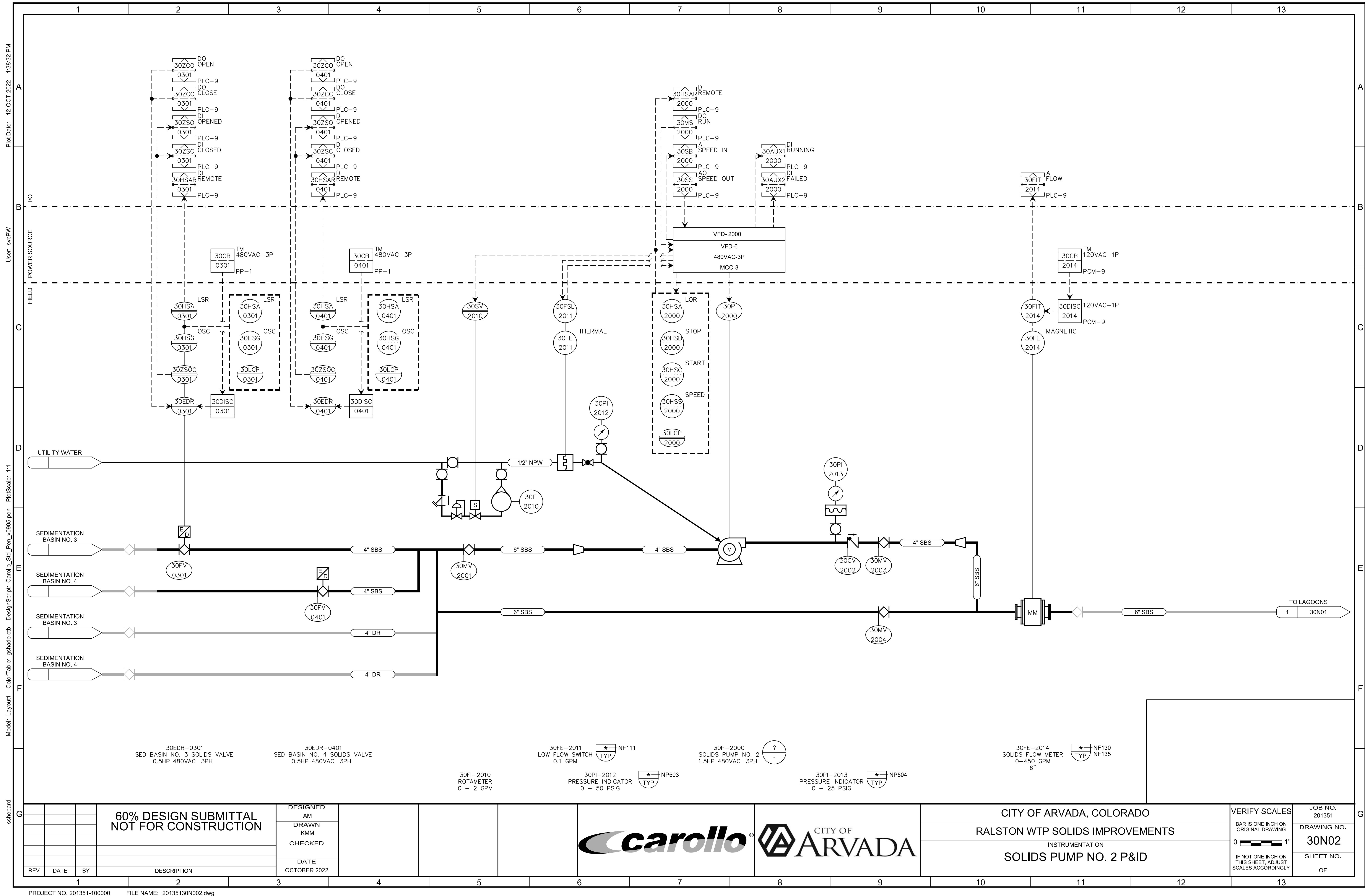
PROJECT NO. 201351-100000 FILE NAME: 20135100N001.dwg



Plot Date: 12-OCT-2022 1:38:08 PM
User: svcFW
Model: Layout1
DesignScript: Carollo_Sld_Pen_v0905.pen
PlotScale: 1:1
ColorTable: gshade.ctb
sshepard

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			DESIGNED AM							CITY OF ARVADA		CITY OF ARVADA, COLORADO		VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"	JOB NO. 201351
			DRAWN KMM							CAROLLO		RALSTON WTP SOLIDS IMPROVEMENTS			DRAWING NO. 30N01
			CHECKED									INSTRUMENTATION			
			DATE OCTOBER 2022									SOLIDS PUMP NO. 1 P&ID			SHEET NO. OF
REV	DATE	BY	DESCRIPTION												
1															

PROJECT NO. 201351-100000 FILE NAME: 20135130N001.dwg

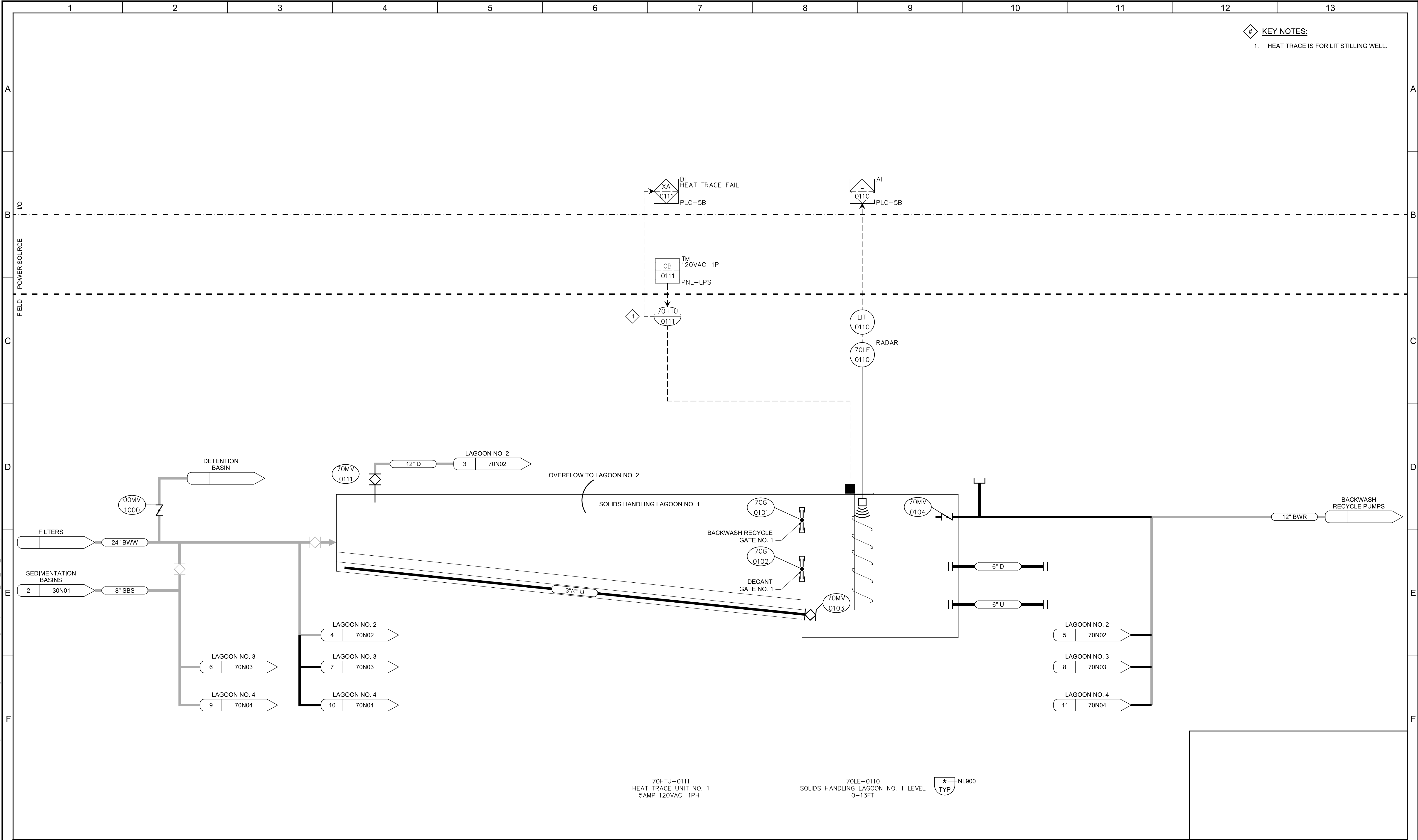


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sshepard

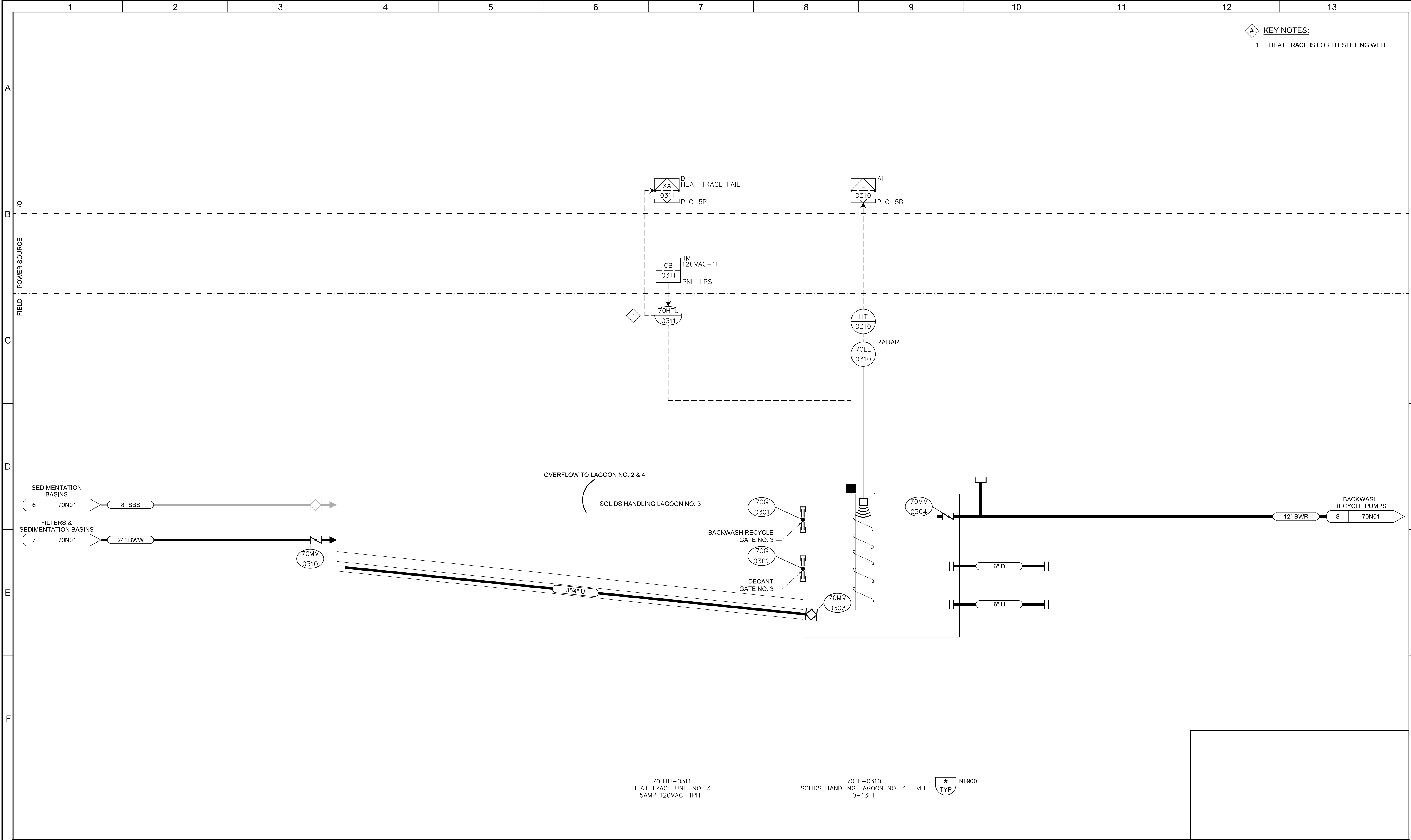


G				60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED AM					CITY OF ARVADA, COLORADO	VERIFY SCALES	JOB NO. 201351	G																																																																																	
					DRAWN LMB											CHECKED	DRAWING NO.					70N01					SHEET NO.	REV	DATE	BY	DESCRIPTION	DATE OCTOBER 2022						RALSTON WTP SOLIDS IMPROVEMENTS	BAR IS ONE INCH ON ORIGINAL DRAWING												INSTRUMENTATION	0 1"												SOLIDS HANDLING LAGOON NO. 1 P&ID	IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	OF	1				2		3		4		5		6		7		8		9		10		11		12		13	
					CHECKED							DRAWING NO.																																																																																		
												70N01																																																																																		
												SHEET NO.																																																																																		
REV	DATE	BY	DESCRIPTION	DATE OCTOBER 2022						RALSTON WTP SOLIDS IMPROVEMENTS	BAR IS ONE INCH ON ORIGINAL DRAWING																																																																																			
										INSTRUMENTATION	0 1"																																																																																			
										SOLIDS HANDLING LAGOON NO. 1 P&ID	IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	OF																																																																																		
1				2		3		4		5		6		7		8		9		10		11		12		13																																																																				



IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

Plot Date: 12-OCT-2022 11:17:20 AM
User: svcPW
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Sld_Pen_v0905.pen PlotScale: 1:1
sshepard



- # KEY NOTES:
- HEAT TRACE IS FOR LIT STILLING WELL.

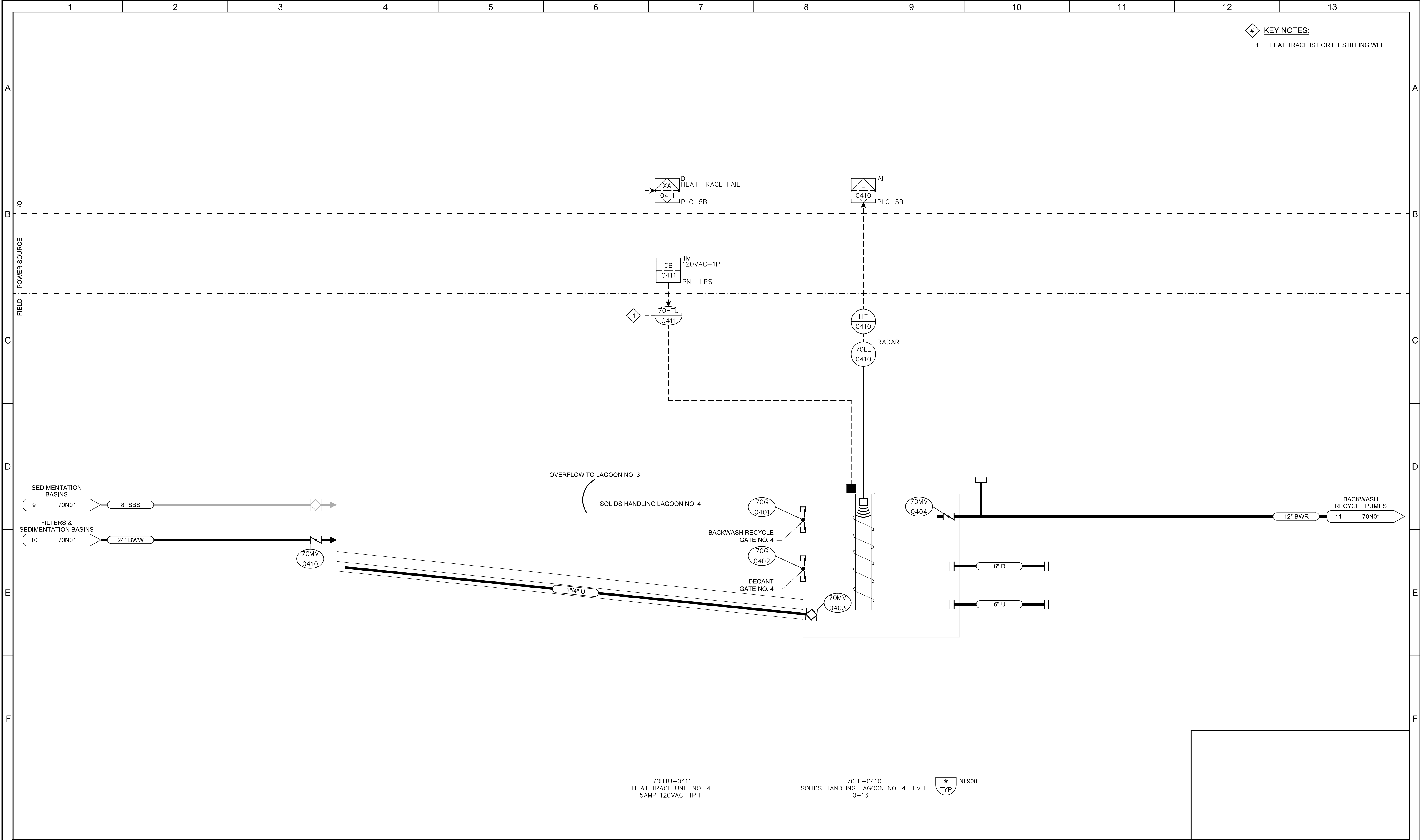
				60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED AM						CITY OF ARVADA, COLORADO	VERIFY SCALES	JOB NO. 201351
					DRAWN LMB							BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.
					CHECKED							0 1"	70N03
					DATE OCTOBER 2022							IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. OF
REV	DATE	BY		DESCRIPTION							RALSTON WTP SOLIDS IMPROVEMENTS		
											INSTRUMENTATION		
											SOLIDS HANDLING LAGOON NO. 3 P&ID		

Plot Date: 12-OCT-2022 11:17:20 AM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Sld_Pen_v0905.pen PlotScale: 1:1

sshepard



70HTU-0411
HEAT TRACE UNIT NO. 4
5AMP 120VAC 1PH

70LE-0410
SOLIDS HANDLING LAGOON NO. 4 LEVEL
0-13FT

NL900
TYP



60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			
DESIGNED AM			
DRAWN LMB			
CHECKED			
DATE OCTOBER 2022			
REV	DATE	BY	DESCRIPTION
1			

DESIGNED AM
DRAWN LMB
CHECKED
DATE OCTOBER 2022



CITY OF ARVADA, COLORADO	
RALSTON WTP SOLIDS IMPROVEMENTS	
INSTRUMENTATION	
SOLIDS HANDLING LAGOON NO. 4 P&ID	

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

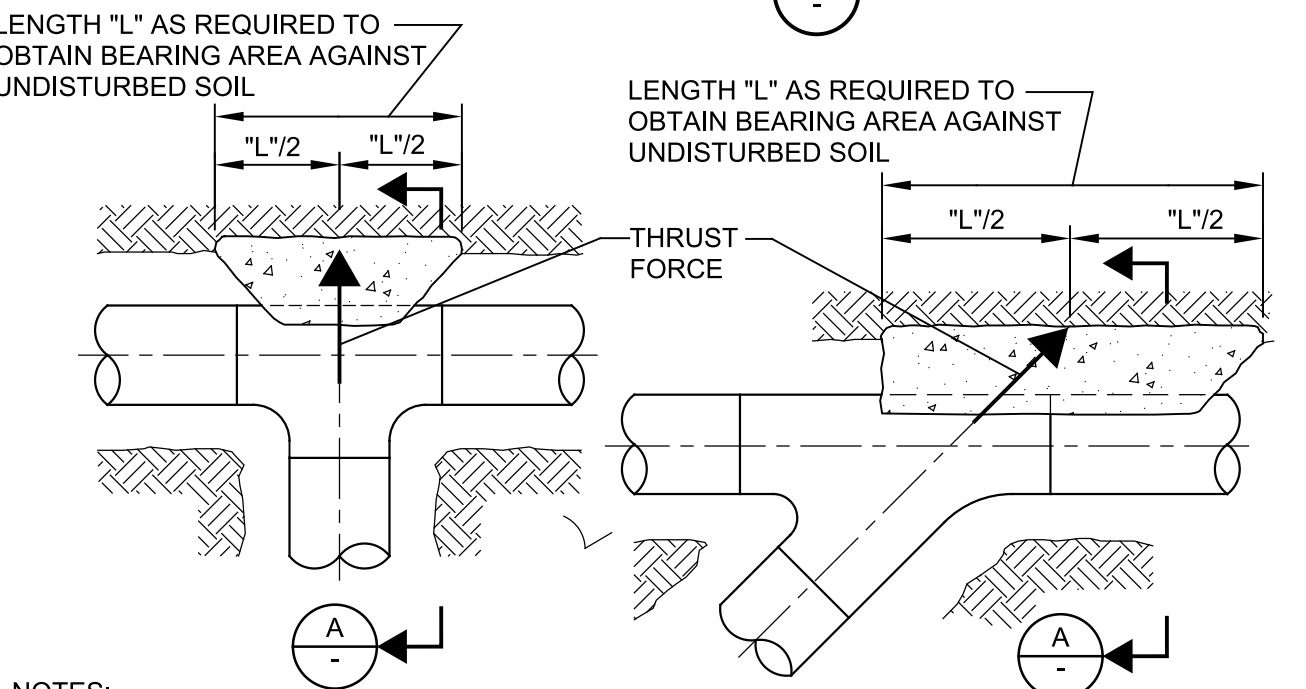
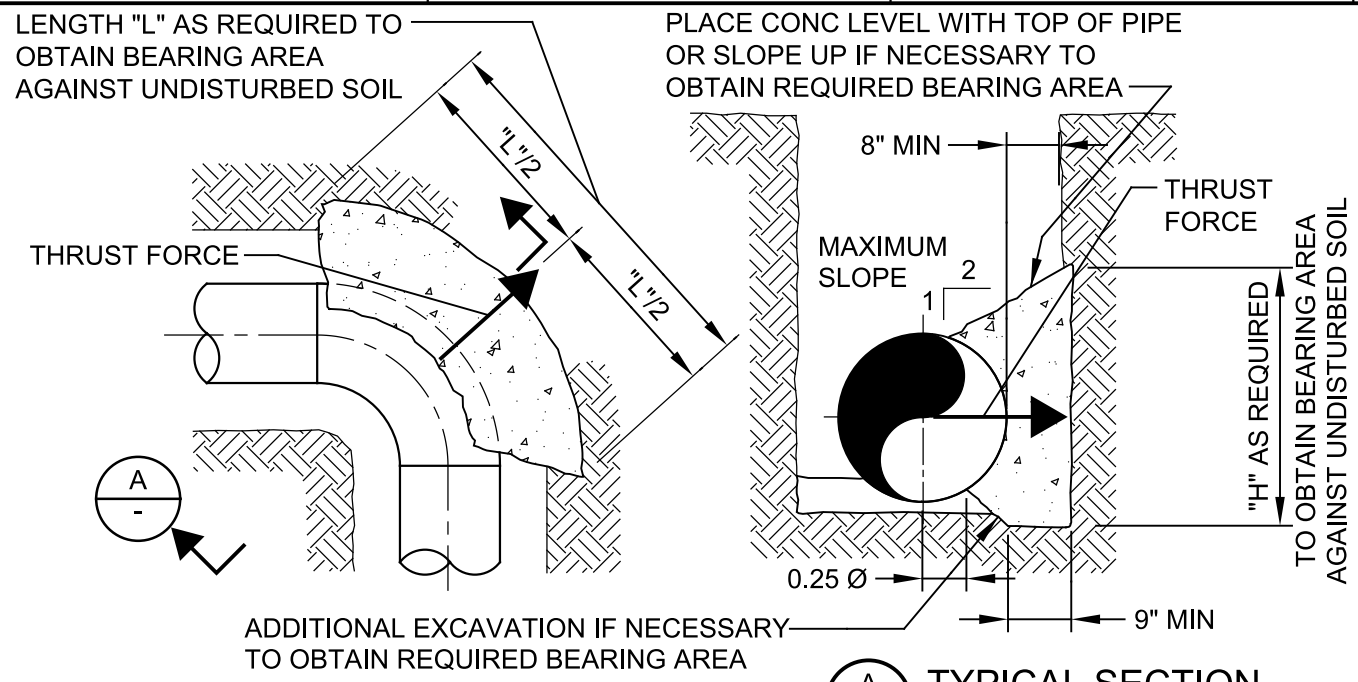
JOB NO. 201351
DRAWING NO. 70N04
SHEET NO. OF

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Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: irea



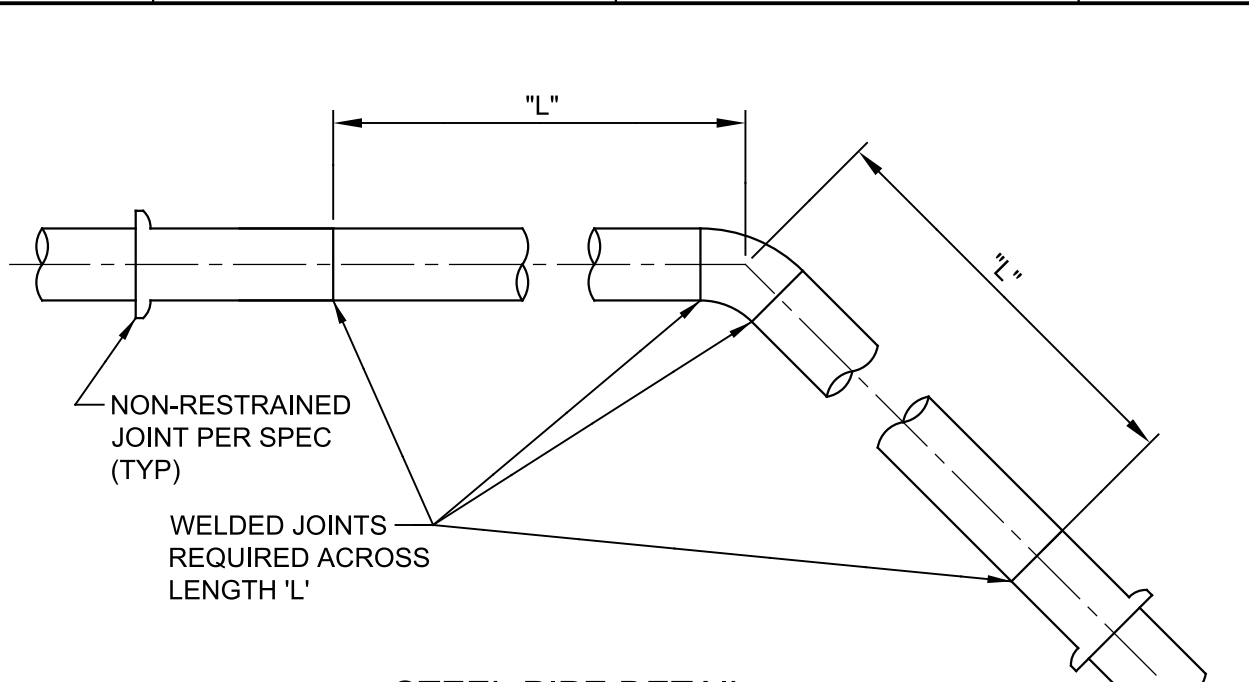
- NOTES:
- BEARING AREA IS THE AREA REQUIRED TO OBTAIN A MAXIMUM PRESSURE NOT GREATER THAN 1500 PSF AT THE TOP OF THRUST BLOCK WHEN THE PIPE IS SUBJECTED TO ITS TEST PRESSURE, OR BEARING AREA INDICATED ON THE DRAWINGS USING A PASSIVE RESISTANCE OF 200 PSF/FT DEPTH.
 - CONCRETE SHALL BE CLASS "A" OR "C".
 - THRUST BLOCK SHALL BEAR ON UNDISTURBED SOIL.

CY131 THRUST RESTRAINT - BURIED THRUST BLOCK

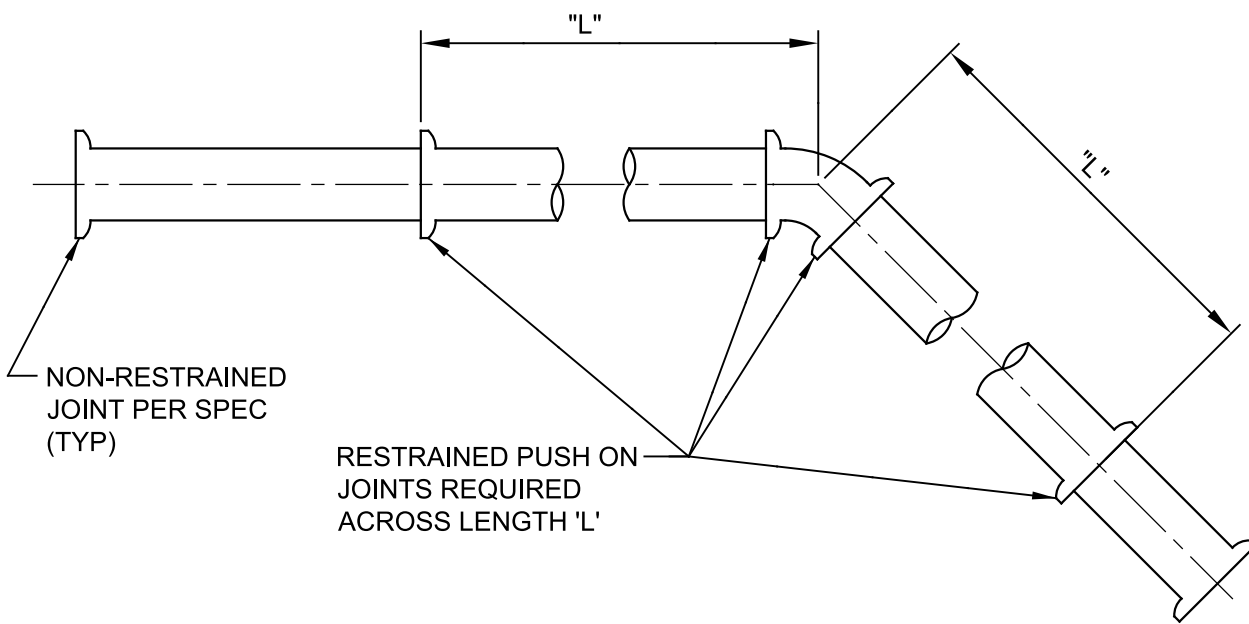
TYP

SN

08/19/22



STEEL PIPE DETAIL



DUCTILE IRON OR PVC PIPE

CY134 THRUST RESTRAINT - BURIED RESTRAINED LENGTH

TYP

SN

SHEET 1 OF 2

08/19/22

PIPE DIAMETER: 		PIPE PRESSURE: 			
PIPE RESTRAINT LENGTHS (4 FEET OF COVER)		PIPE RESTRAINT LENGTHS (5 FEET OF COVER)		PIPE RESTRAINT LENGTHS (6+ FEET OF COVER)	
HORIZONTAL BEND ANGLE	FULLY RESTRAINED LENGTH "L" (FT)	HORIZONTAL BEND ANGLE	FULLY RESTRAINED LENGTH "L" (FT)	HORIZONTAL BEND ANGLE	FULLY RESTRAINED LENGTH "L" (FT)
LESS THAN 5°	 	LESS THAN 5°	 	LESS THAN 5°	
5° - 25°	 	5° - 25°	 	5° - 25°	
26° - 45°	 	26° - 45°	 	26° - 45°	
46° - 70°	 	46° - 70°	 	46° - 70°	
71° - 90°	 	71° - 90°	 	71° - 90°	
DEAD ENDS, VALVES, TEES & WYES	 	DEAD ENDS, VALVES, TEES & WYES	 	DEAD ENDS, VALVES, TEES & WYES	
VERTICAL BEND ANGLE	FULLY RESTRAINED LENGTH "L" (FT)	VERTICAL BEND ANGLE	FULLY RESTRAINED LENGTH "L" (FT)	VERTICAL BEND ANGLE	FULLY RESTRAINED LENGTH "L" (FT)
LESS THAN 5°	 	LESS THAN 5°	 	LESS THAN 5°	
5° - 25°	 	5° - 25°	 	5° - 25°	
26° - 45°	 	26° - 45°	 	26° - 45°	
46° - 70°	 	46° - 70°	 	46° - 70°	
71° - 90°	 	71° - 90°	 	71° - 90°	

NOTES:

- LENGTHS SHALL APPLY EACH WAY FROM HORIZONTAL OR VERTICAL BEND, VALVE, OR DEAD END. FOR A TEE OR WYE, THE RESTRAINED LENGTH SHALL APPLY ALONG THE BRANCH OF THE FITTING. ALSO RESTRAIN ONE STANDARD JOINT LENGTH OF PIPE EACH WAY ALONG THE RUN SIDE OF THE TEE OR WYE.
- EXTEND ALL LENGTHS TO THE NEXT PIPE JOINT PAST REQUIRED LENGTH.
- THE LENGTH OF CARRIER PIPE WITHIN A CASING PIPE WILL NOT BE CONSIDERED AS PART OF THE REQUIRED RESTRAINED LENGTH.
- ALL CLOSURE PIECES SHALL BE RESTRAINED PIPE.

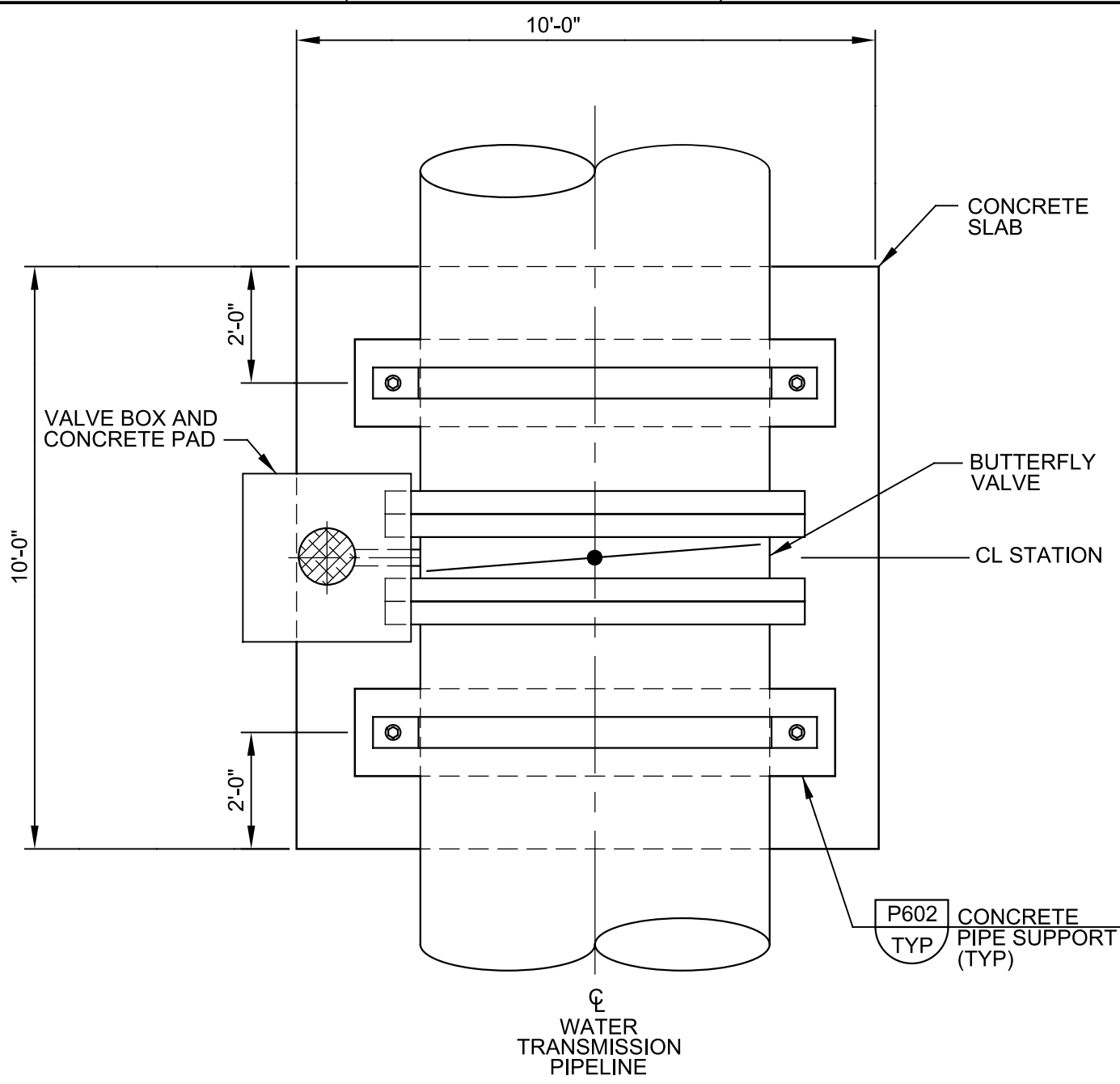
CY134 THRUST RESTRAINT - BURIED RESTRAINED LENGTH

TYP

SN

SHEET 2 OF 2

08/19/22



NOTES:

- ALL BURIED VALVES SHALL BE PROVIDED WITH EXTENSION STEM OPERATOR WITH 2" SQUARE AWWA NUT WITHIN 36" OF VALVE BOX COVER. INDICATE ON NUT DIRECTION OF ROTATION TO OPEN VALVE.
- COAT BURIED PIPE AND VALVE BOX PER SPECIFICATIONS.
- CLEAN VALVE BOX OF ALL DEBRIS AND SOIL.

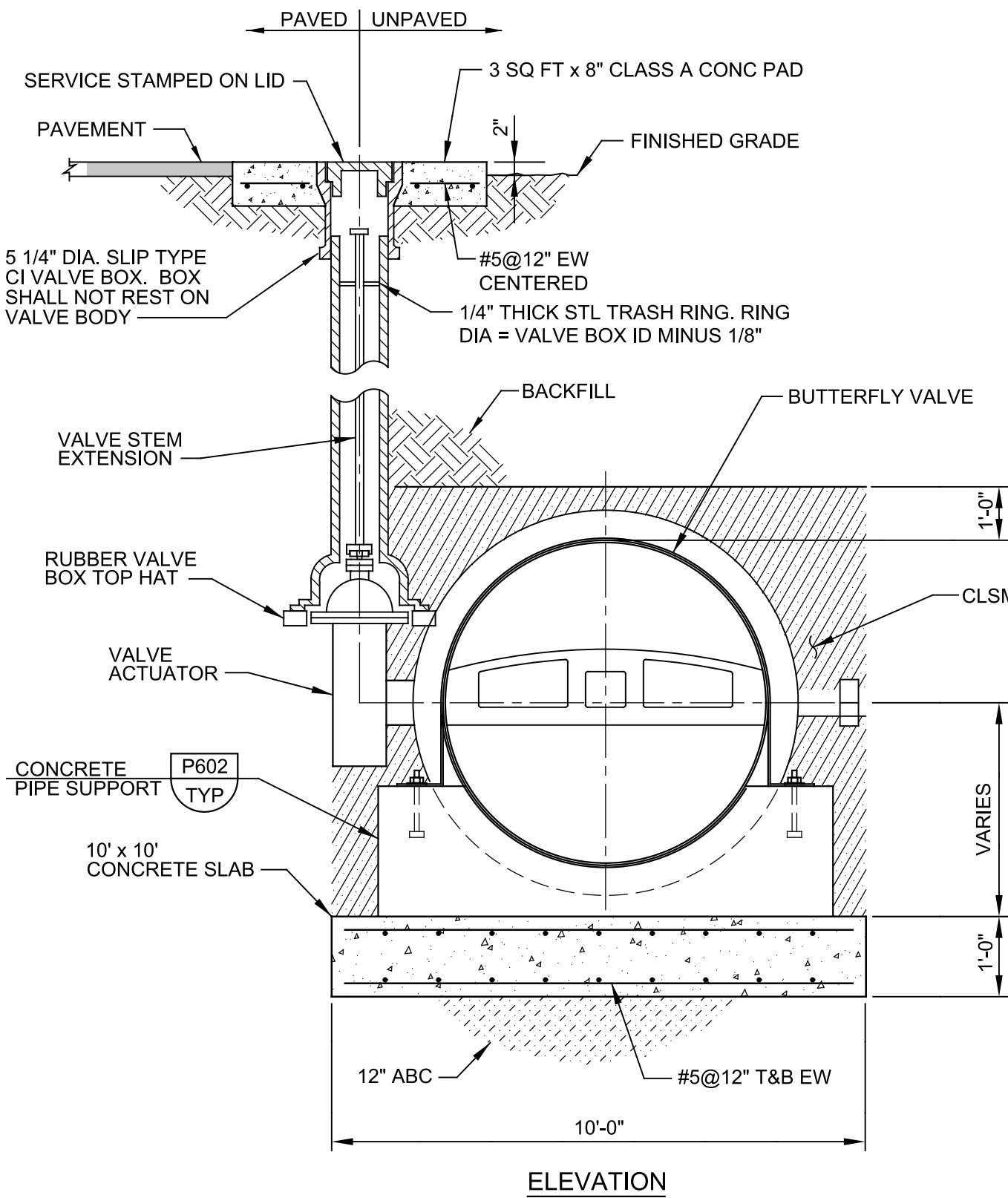
CY715 BUTTERFLY VALVE - DIRECT BURY

TYP

S

SHEET 1 OF 2

5/21/19



CY715 BUTTERFLY VALVE - DIRECT BURY

TYP

S

SHEET 2 OF 2

5/21/19

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

DESIGNED
BF
DRAWN
TLR
CHECKED
-
DATE
OCTOBER 2022

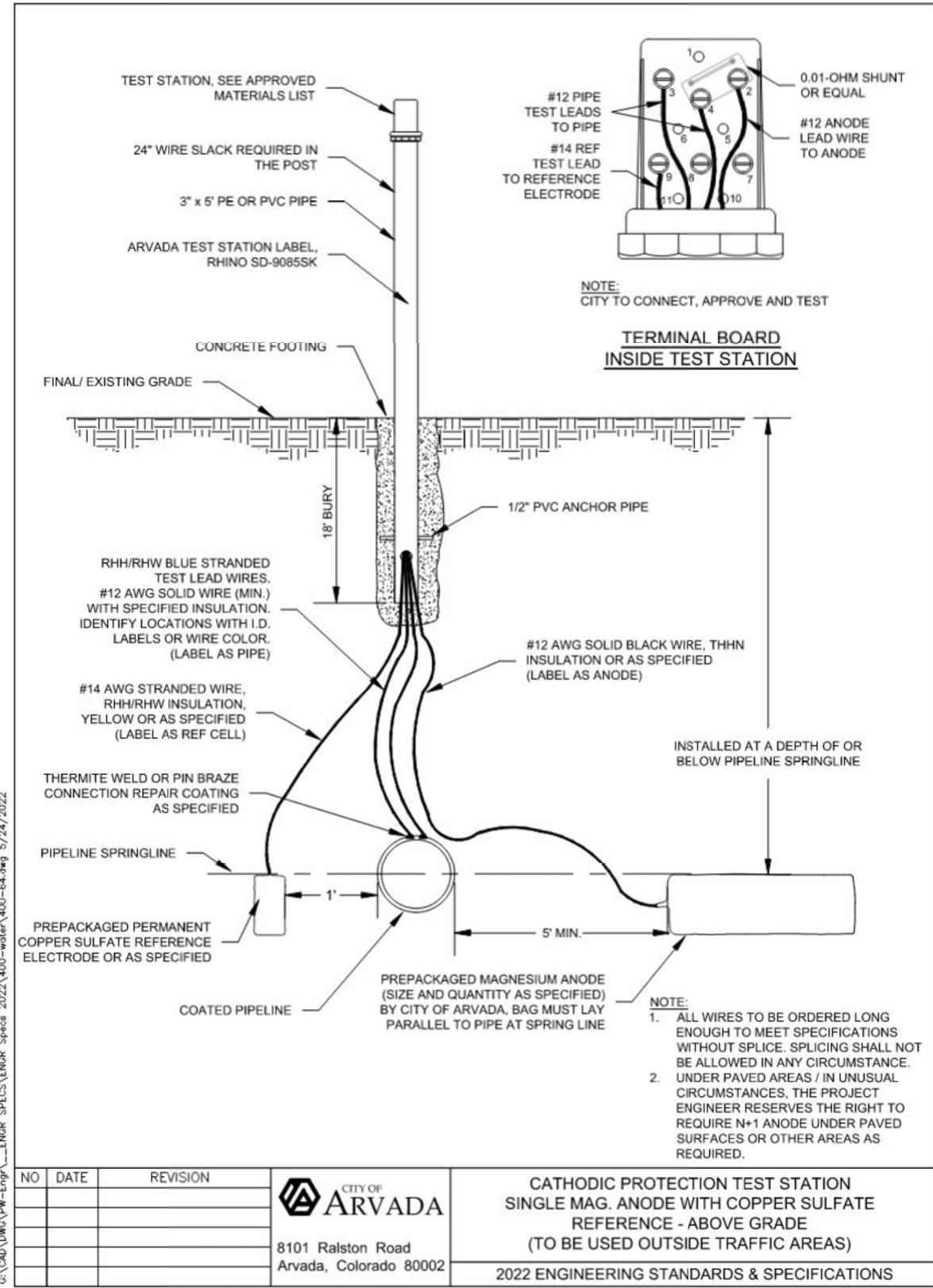
carollo CITY OF ARVADA

CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
CIVIL TYPICAL DETAILS 1

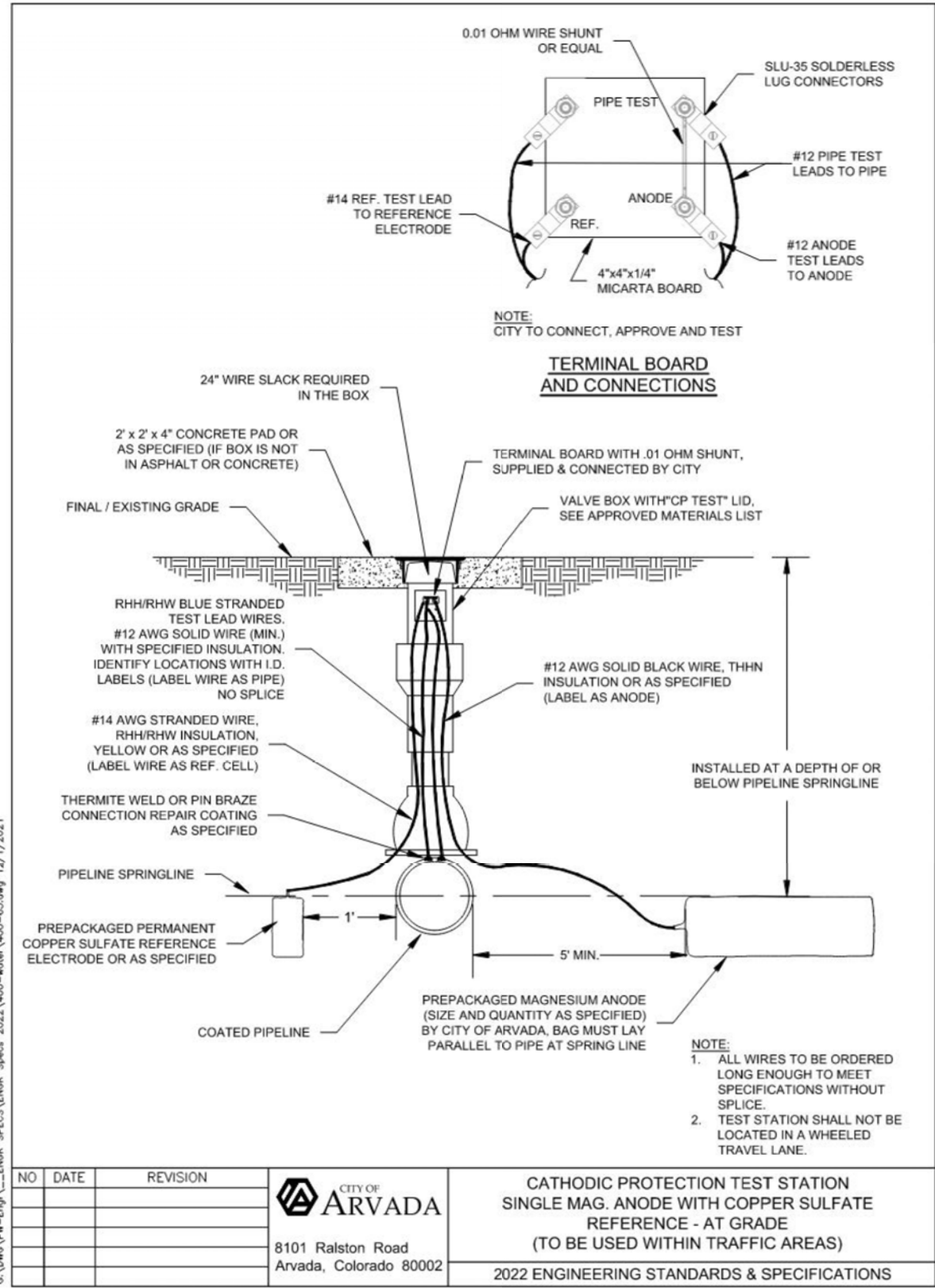
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.
201351
DRAWING NO.
00TC01
SHEET NO.
OF

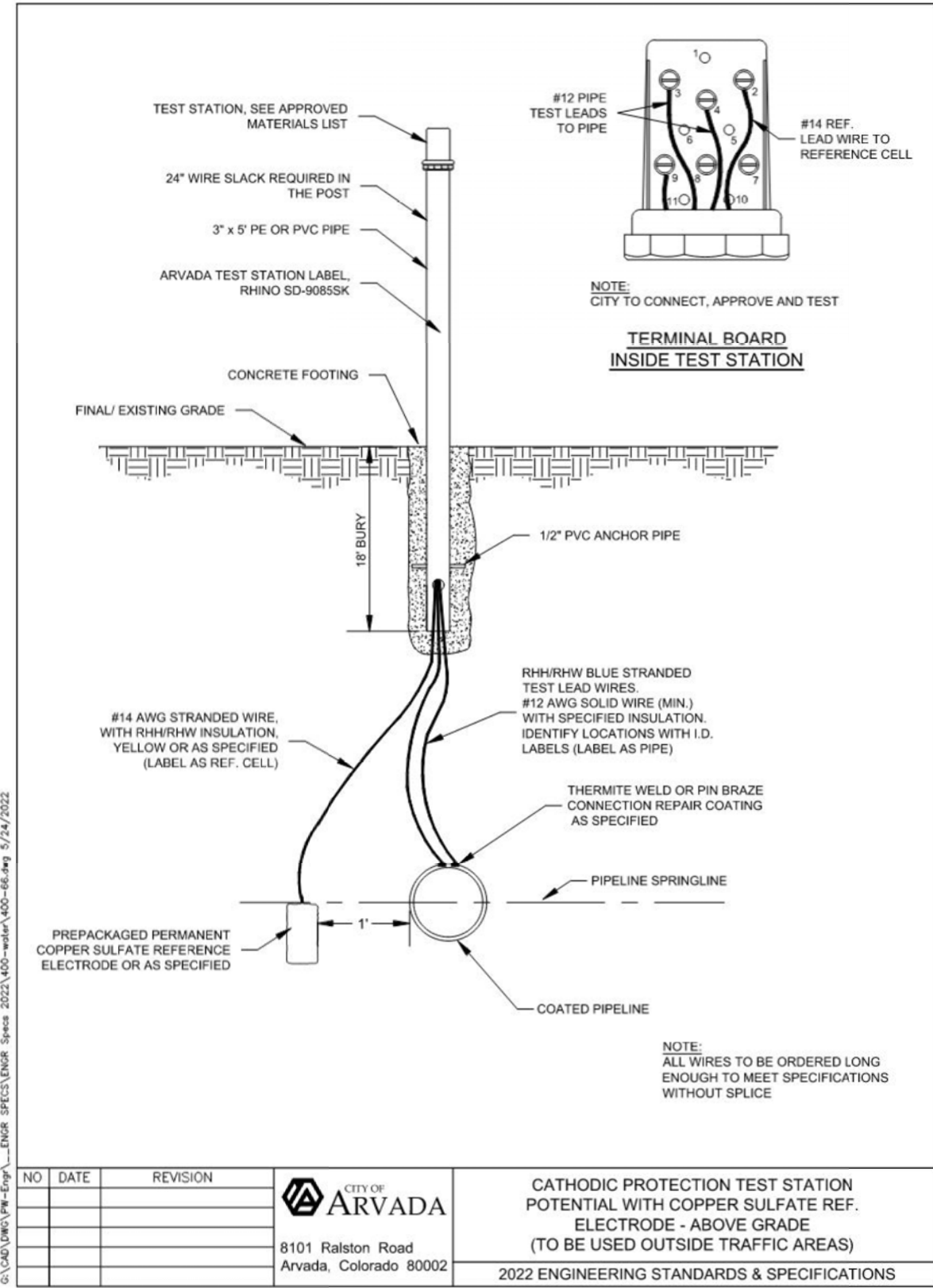
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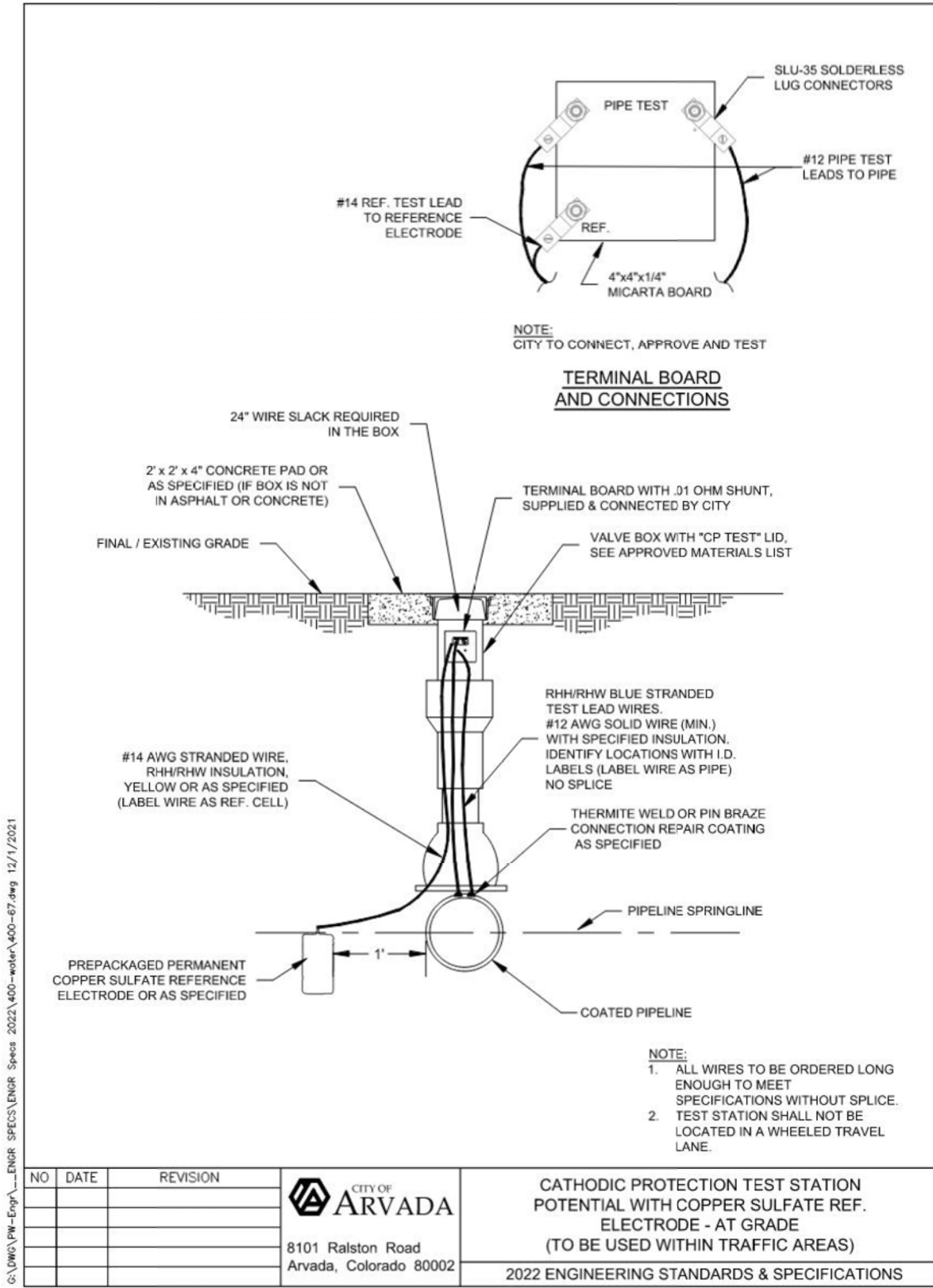
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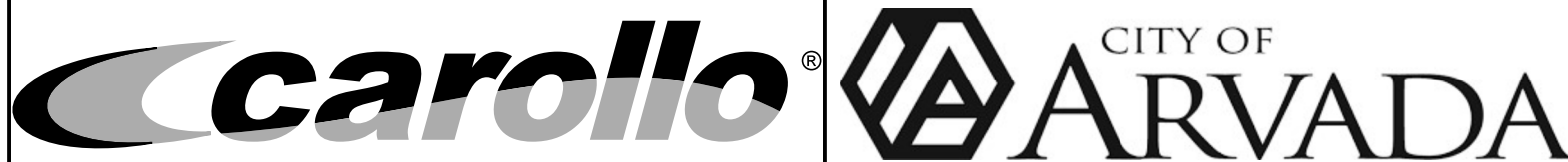
400-65



400-66



400-67



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
CIVIL TYPICAL DETAILS 2

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.
201351
DRAWING NO.
00TC02
SHEET NO.
OF

Plot Date: 13-OCT-2022 2:51:31 PM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: KAtkin

- SEE DIVISION 03 SPECIFICATION FOR REQUIREMENTS FOR CONCRETE CONSTRUCTION.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, MINIMUM REINFORCEMENT OF CONCRETE WALLS OR SLABS SHALL BE AS FOLLOWS. CONTACT ENGINEER FOR LOCATIONS INSIDE CONCRETE.
10" THICK OR LESS:#5 @ 12" EACH WAY.
MORE THAN 10" THICK:#5 @ 12" EACH WAY, EACH FACE.
- WALL REINFORCEMENT AT CORNERS OR JUNCTIONS OF WALLS SHALL BE CONTINUOUS. LAP SPliced, OR TERMINATED IN AN ACI STANDARD 90 DEGREE HOOK. SEE DETAIL **S144**/TYP.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, DOWELS BETWEEN ADJACENT CONCRETE PLACEMENTS SHALL BE THE SAME SIZE AND SPACING AS THE REINFORCEMENT WHICH IS SPliced TO THE DOWELS.
- SLAB, BEAM AND COLUMN REINFORCING BARS SHALL HAVE A MINIMUM EXTENSION OR ANCHORAGE INTO SUPPORTS IN ACCORDANCE WITH ACI 318 AND ACI 350.
- PROVIDE STIRRUP SUPPORT BARS SHALL BE TO SECURE TOP BARS AGAINST DISPLACEMENT AS REQUIRED.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, CONCRETE COVER OVER #11 AND SMALLER REINFORCING BARS SHALL BE AS FOLLOWS:
A. SLABS AND JOISTS:
FORMED CONCRETE SURFACES AND UNFORMED TOP SURFACES FOR DRY CONDITIONS
#7 BARS AND SMALLER:.....1"
#8 BARS AND LARGER:.....1 1/2"
FORMED CONCRETE SURFACES AND UNFORMED TOP SURFACES EXPOSED TO WEATHER, IN CONTACT WITH SOIL OR FLUIDS, OR LOCATED OVER FLUIDS:.....2"
B. BEAMS AND COLUMNS:
FORMED CONCRETE SURFACES FOR DRY CONDITIONS:
STIRRUPS, SPIRALS, AND TIES:.....1 1/2"
PRINCIPAL REINFORCEMENT:.....2"
FORMED CONCRETE SURFACES EXPOSED TO WEATHER, IN CONTACT WITH SOIL OR FLUIDS, OR IN BEAMS LOCATED OVER FLUIDS:
STIRRUPS AND TIES:.....2"
PRINCIPAL REINFORCEMENT:.....2 1/2"
C. WALLS:
FORMED CONCRETE SURFACES FOR DRY CONDITIONS:
#7 BARS AND SMALLER:.....1"
#8 BARS AND LARGER:.....1 1/2"
FORMED CONCRETE SURFACES EXPOSED TO WEATHER, OR IN CONTACT WITH SOIL OR FLUIDS:.....2"

S101 REINFORCED CONCRETE NOTES
TYP

SHEET 1 OF 3 03/12/19

- FOOTINGS AND SLABS ON GRADE:
FORMED VERTICAL CONCRETE SURFACES:.....2"
AT UNFORMED CONCRETE SURFACES CAST AGAINST SOIL, ROCK, OR CONCRETE WORK MATS:.....3"
TOP SURFACE OF FOOTINGS AND SLABS:.....SAME AS SLABS
- WATERSTOPS:
A. PROVIDE WATERSTOPS AT JOINTS IN SLABS AND WALLS OF LIQUID-CONTAINING STRUCTURES, AND PORTIONS OF STRUCTURES BELOW THE DESIGN GROUNDWATER LEVEL. MAKE WATERSTOPS CONTINUOUS THROUGH STRUCTURE, SPlicing WATERSTOPS IN SLABS WITH WATERSTOPS IN WALLS.
B. END WATERSTOPS 3" BELOW TOP OF WALLS, WHERE TOP OF WALL IS COVERED BY A SLAB WITHOUT WATERSTOPS, CONTINUE WATERSTOP TO WALL/SLAB JOINT, WHERE TOP OF WALL IS COVERED BY A SLAB WITH WATERSTOP, MAKE WATERSTOPS CONTINUOUS, SPlicing WATERSTOPS IN WALLS WITH WATERSTOPS IN SLAB.
- CURE CONCRETE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. WHERE WATER CURING IS SPECIFIED, MEMBRANE CURING IS NOT ALLOWED.
A. THE CONTRACTOR IS WARNED THAT WATER CURING IS DIFFICULT AT TIMES DUE TO WIND AND DRY CONDITIONS. STUDY SPECIFICATION REQUIREMENTS AND FURNISH ADEQUATE SYSTEMS TO PROVIDE WATER CURING WHERE REQUIRED.
B. KEEP WATER CURED SURFACES VISIBLY MOIST AT ALL TIMES. FLOOD TOPS OF WALLS NOT LESS THEN 3 TIMES DAILY.
- DO NOT PLACE BACKFILL AGAINST WALLS UNTIL:
A. WALLS HAVE BEEN CAST TO FULL HEIGHT OF STRUCTURE AND CONCRETE HAS REACHED THE MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f_c).
B. CONNECTING SLABS AND BEAMS HAVE BEEN CAST AND CONCRETE IN THOSE ELEMENTS HAS REACHED THE MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f_c).
- LAP SPLICES:
A. SEE TABLE 1 OF THIS DETAIL FOR LAP SPlice LENGTHS.
B. WHEN MULTIPLE BARS ARE SPliced AT THE SAME SECTION, THE "CLEAR BAR SPACING" IS DEFINED AS THE MINIMUM CLEAR DISTANCE BETWEEN THE BARS OUTSIDE THE SPlice LENGTH MINUS ONE BAR DIAMETER.
C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, BARS AT A LAP SPlice SHALL BE IN CONTACT WITH EACH OTHER.
D. "TOP BARS" ARE HORIZONTAL REINFORCEMENT AT LOCATIONS WHERE MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
- FORM EXPOSED CONCRETE CORNERS AND EDGES WITH 3/4" CHAMFER UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

S101 REINFORCED CONCRETE NOTES
TYP

SHEET 2 OF 3 03/12/19

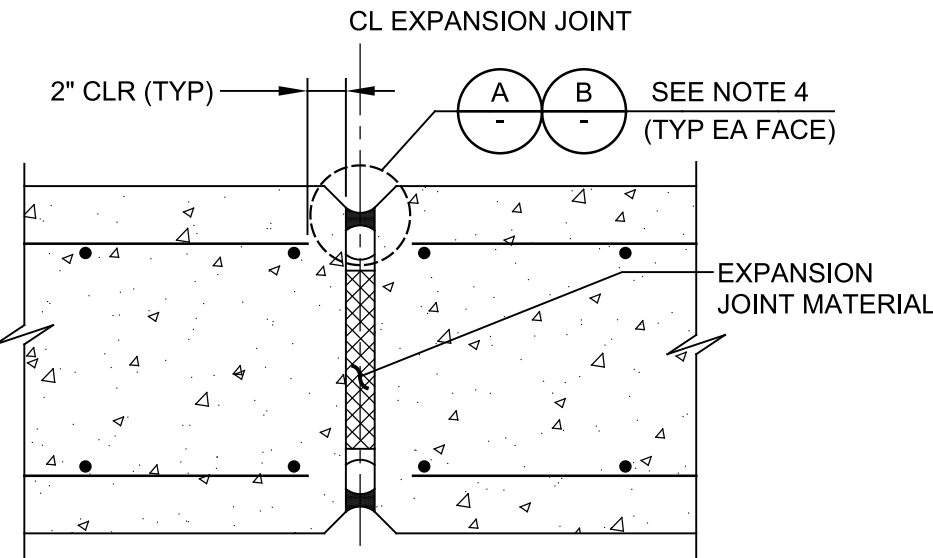
BAR SIZE	MINIMUM COVER (BAR DIA)	MINIMUM CLEAR BAR SPACING (BAR DIA)	LAP SPlice LENGTH (INCHES)	
			TOP BARS	OTHER BARS
#4	MORE THAN 1	MORE THAN 2	32 *	25 *
	MORE THAN 2	MORE THAN 4	20	16
#5	MORE THAN 1	MORE THAN 2	40 *	31 *
	MORE THAN 2	MORE THAN 4	26	20
#6	MORE THAN 1	MORE THAN 2	48 *	37 *
	MORE THAN 2	MORE THAN 4	30	24
#7	MORE THAN 1	MORE THAN 2	70 *	54 *
	MORE THAN 2	MORE THAN 4	43	33
#8	MORE THAN 1	MORE THAN 2	81 *	62 *
	MORE THAN 2	MORE THAN 4	50	38
#9	MORE THAN 1	MORE THAN 2	90 *	70 *
	MORE THAN 2	MORE THAN 4	56	42
#10	MORE THAN 1	MORE THAN 2	104 *	81 *
	MORE THAN 2	MORE THAN 4	62	48
#11	MORE THAN 1	MORE THAN 2	114 *	88 *
	MORE THAN 2	MORE THAN 4	69	54

REINFORCING BAR LAP SPlice TABLE NOTES:

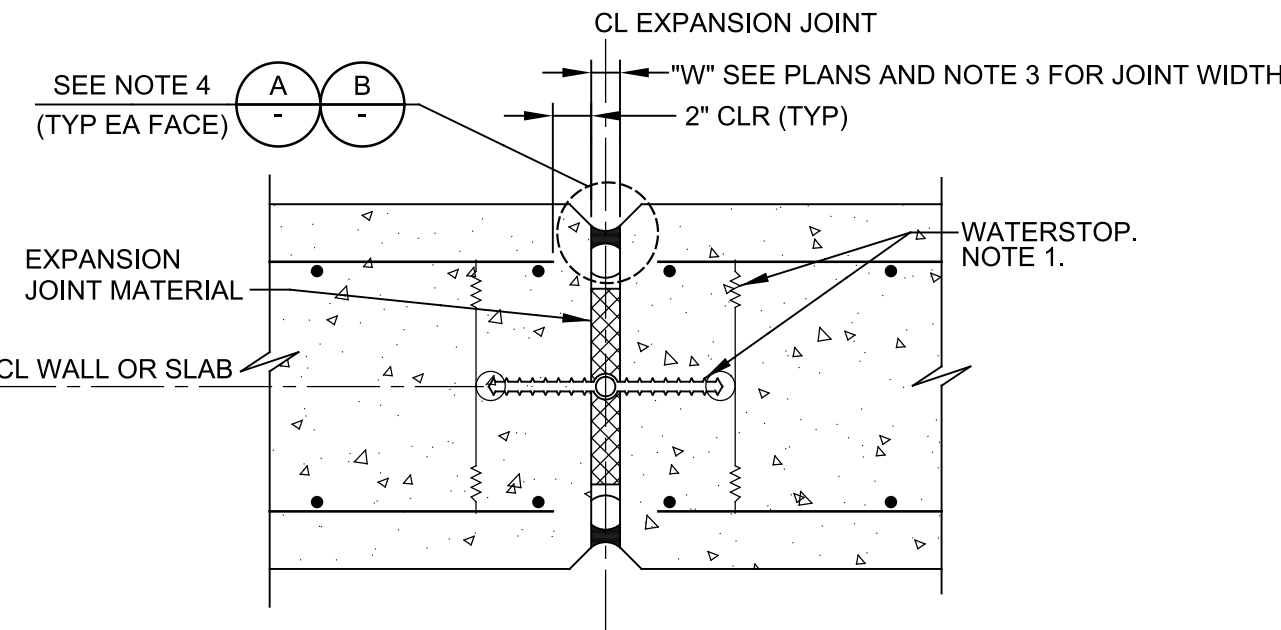
- TABULATED SPlice LENGTHS ARE APPLICABLE ONLY WHEN BOTH REQUIREMENTS FOR MINIMUM COVER AND FOR MINIMUM CLEAR BAR SPACING ARE SATISFIED.
- * = IF THE CLEAR BAR SPACING IS LESS THAN OR EQUAL TO TWO BAR DIAMETERS, OR THE COVER IS LESS THAN OR EQUAL TO ONE BAR DIAMETER, THE LAP SPlice LENGTH SHALL BE INCREASED BY 50 PERCENT.

S101 REINFORCED CONCRETE NOTES
TYP

SHEET 3 OF 3 03/12/19



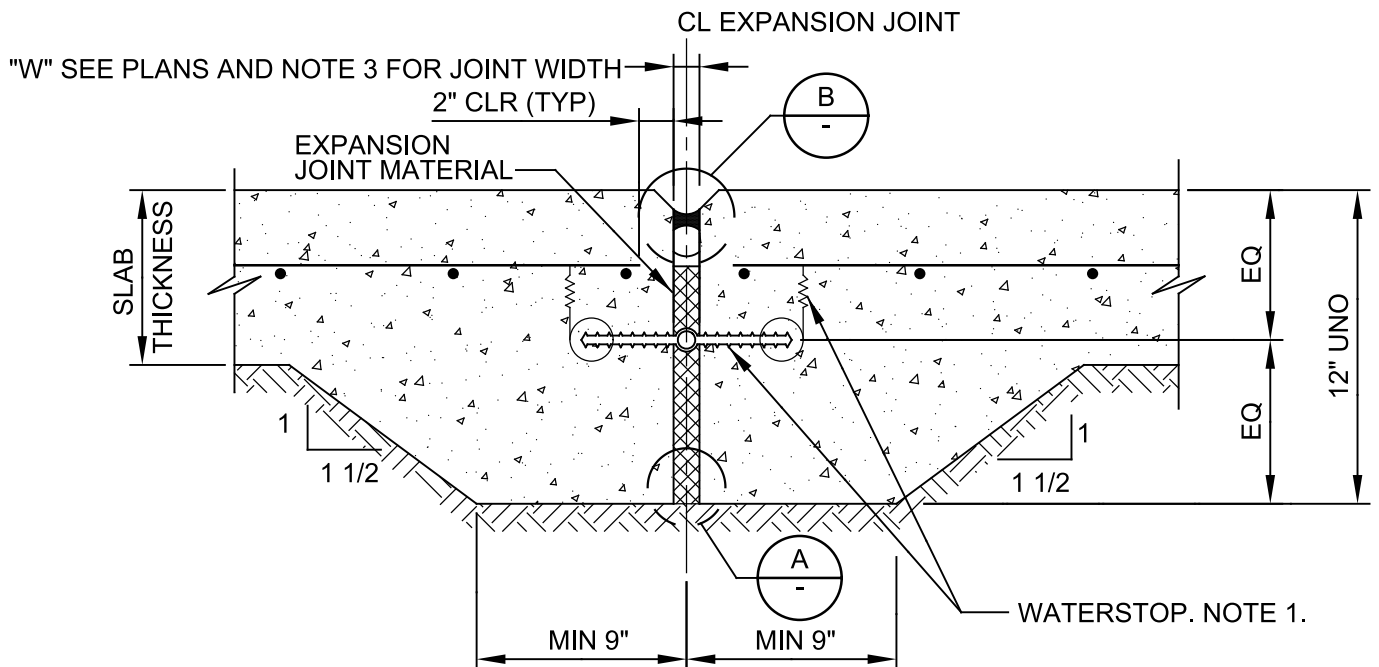
NON-WATER BEARING SLAB OR WALL



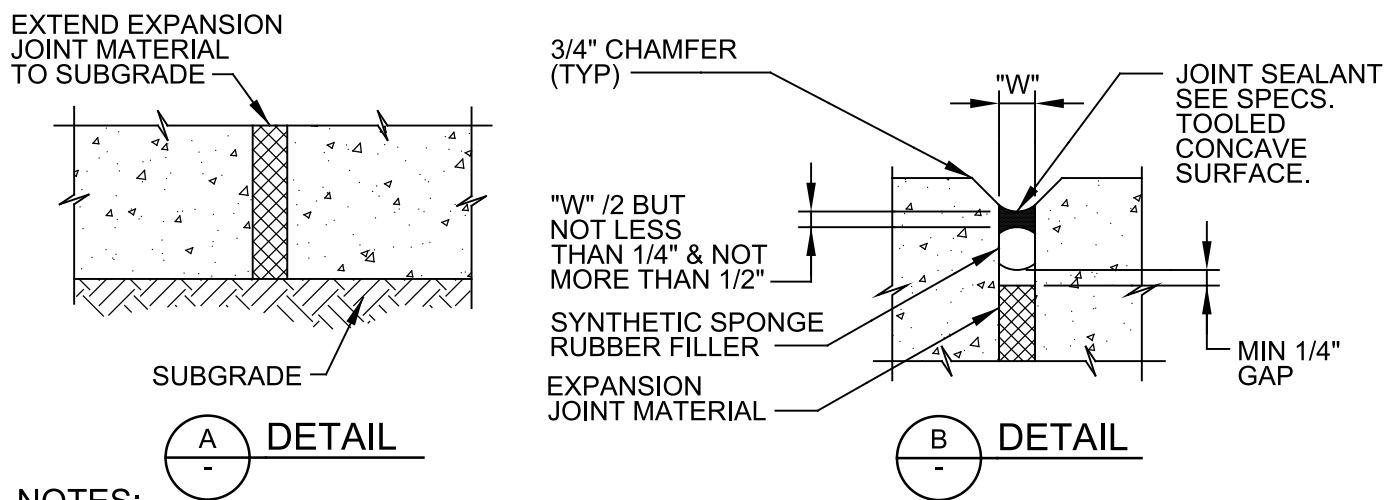
WATER BEARING SLAB OR WALL

S130 EXPANSION JOINT
TYP

SHEET 1 OF 2 07/22/16



WATER BEARING SLAB LESS THAN 12" THICK



NOTES:

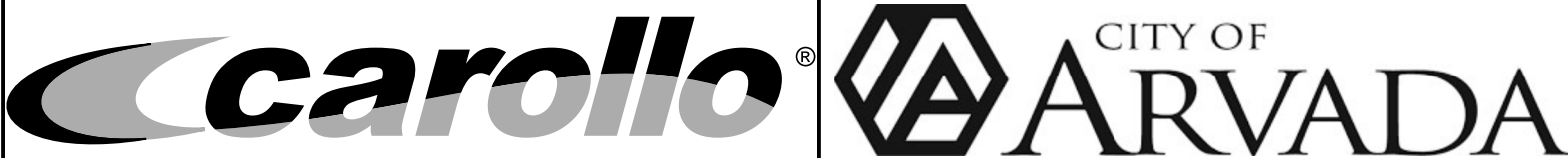
- 9" WATERSTOP WITH CENTER BULB CENTERED ON JOINT - SEE DETAIL **S106**/TYP. PROVIDE WIRE TIES MAX 2'-0" OC. HOG RINGS MAY BE USED IN LIEU OF WIRE LOOPS. THOROUGHLY CLEAN WATERSTOP BEFORE PLACING CONCRETE IN SECOND POUR.
- JOINT EDGES:
A. FOR WALLS AND BOTTOM OF EXPOSED SLABS: FORM EDGES WITH 3/4" CHAMFER.
B. FOR SLABS: EDGE TOP AND ENDS WITH 1/4" RADIUS.
- "W"=1" UNLESS OTHERWISE INDICATED ON PLANS. (MIN JOINT WIDTH = 3/8". MAX JOINT WIDTH = 2")
- USE DETAIL A ONLY AT SOIL SIDE OF SLABS ON GRADE. USE DETAIL B AT ALL OTHER LOCATIONS.

S130 EXPANSION JOINT
TYP

SHEET 2 OF 2 07/22/16

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

DESIGNED
MKF
DRAWN
KA
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MAK
DATE
OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
STRUCTURAL TYPICAL DETAILS 1

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

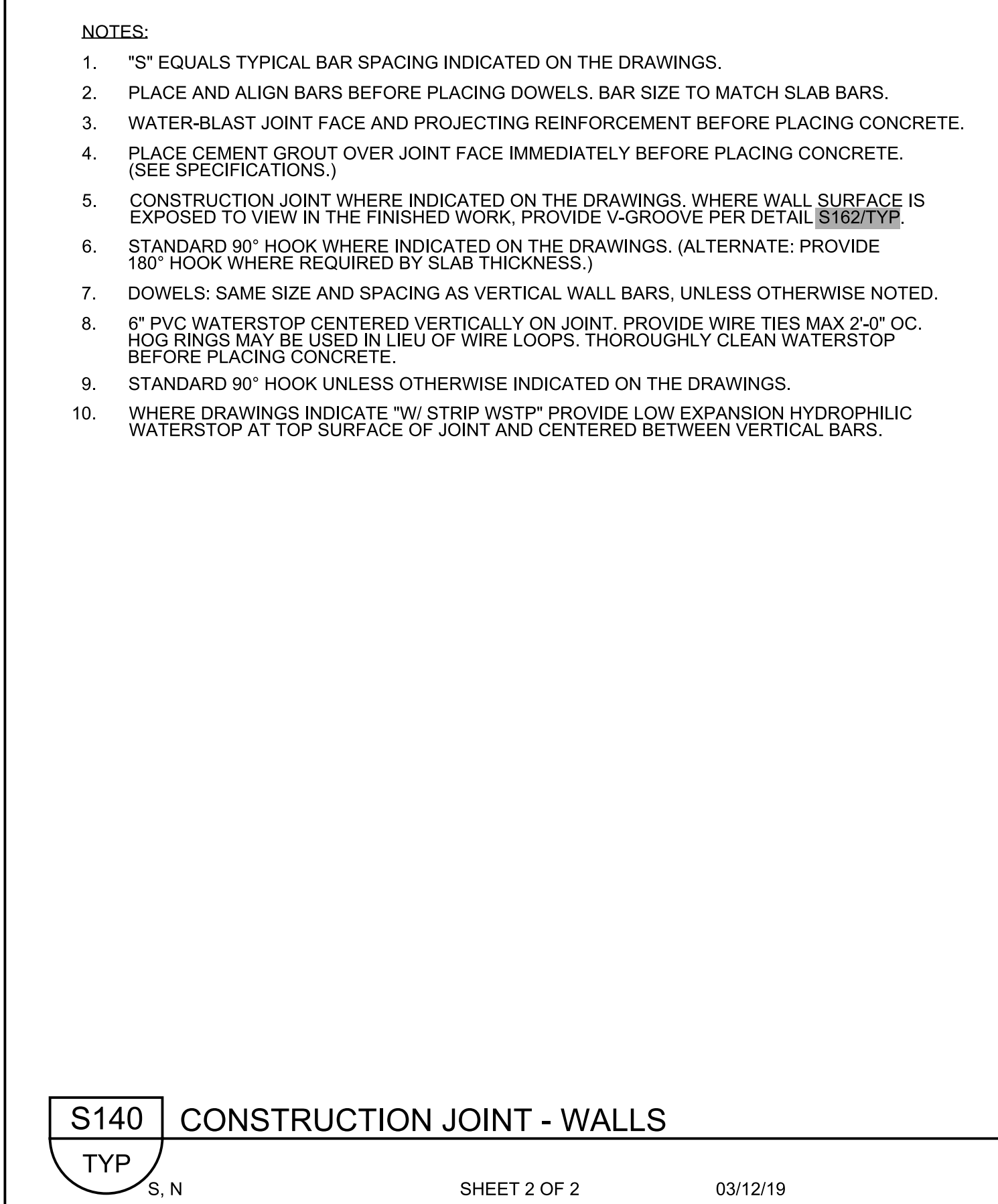
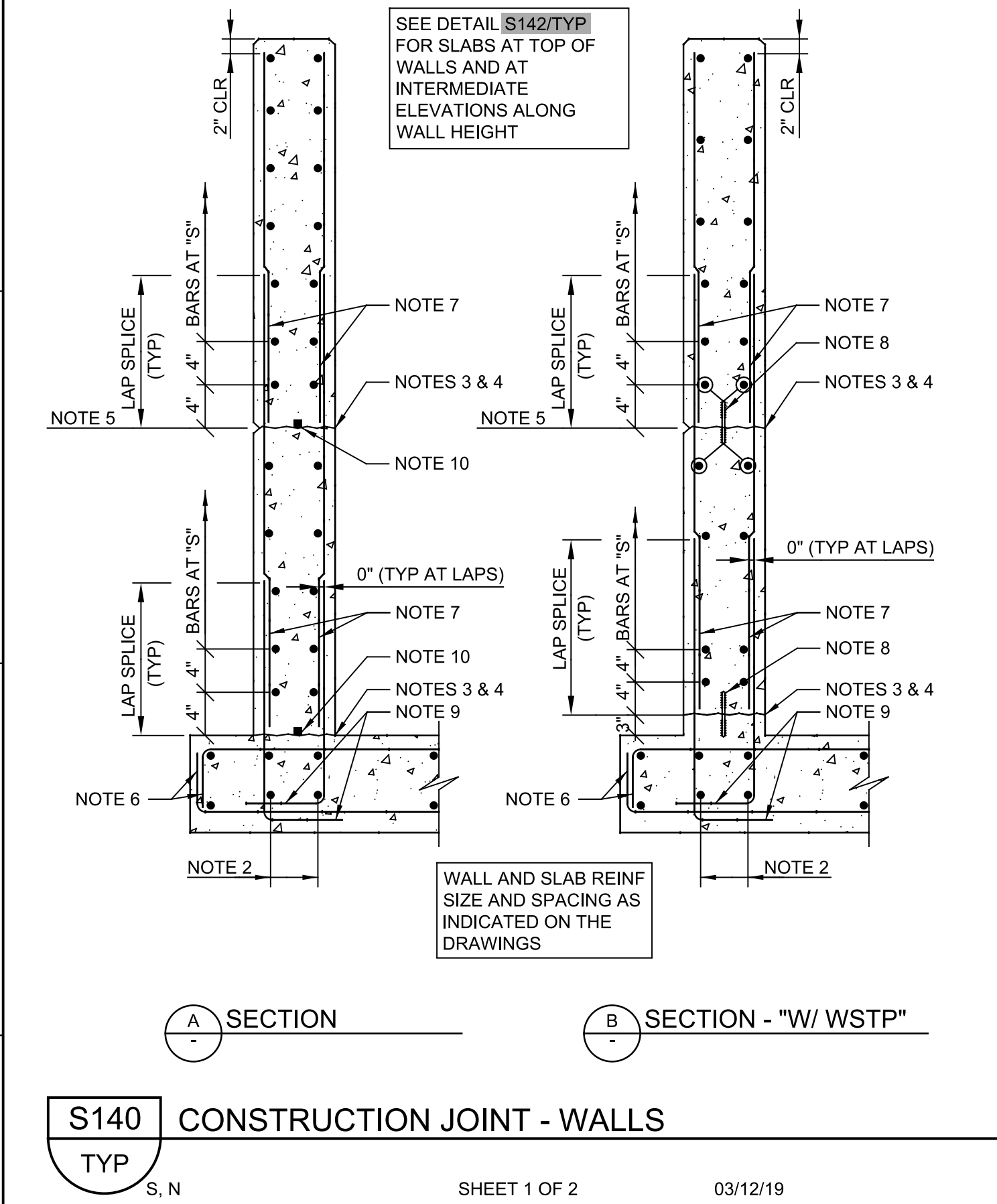
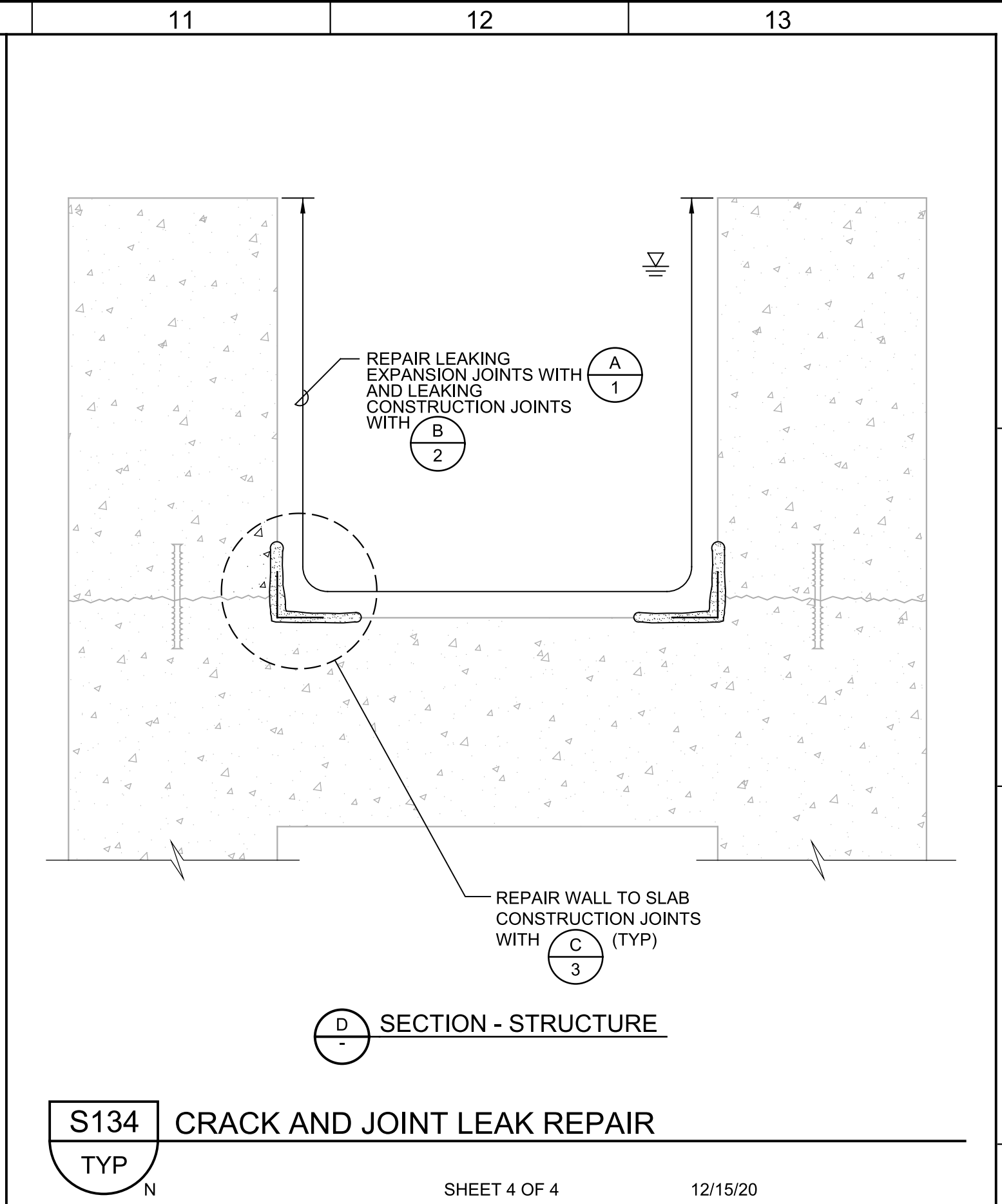
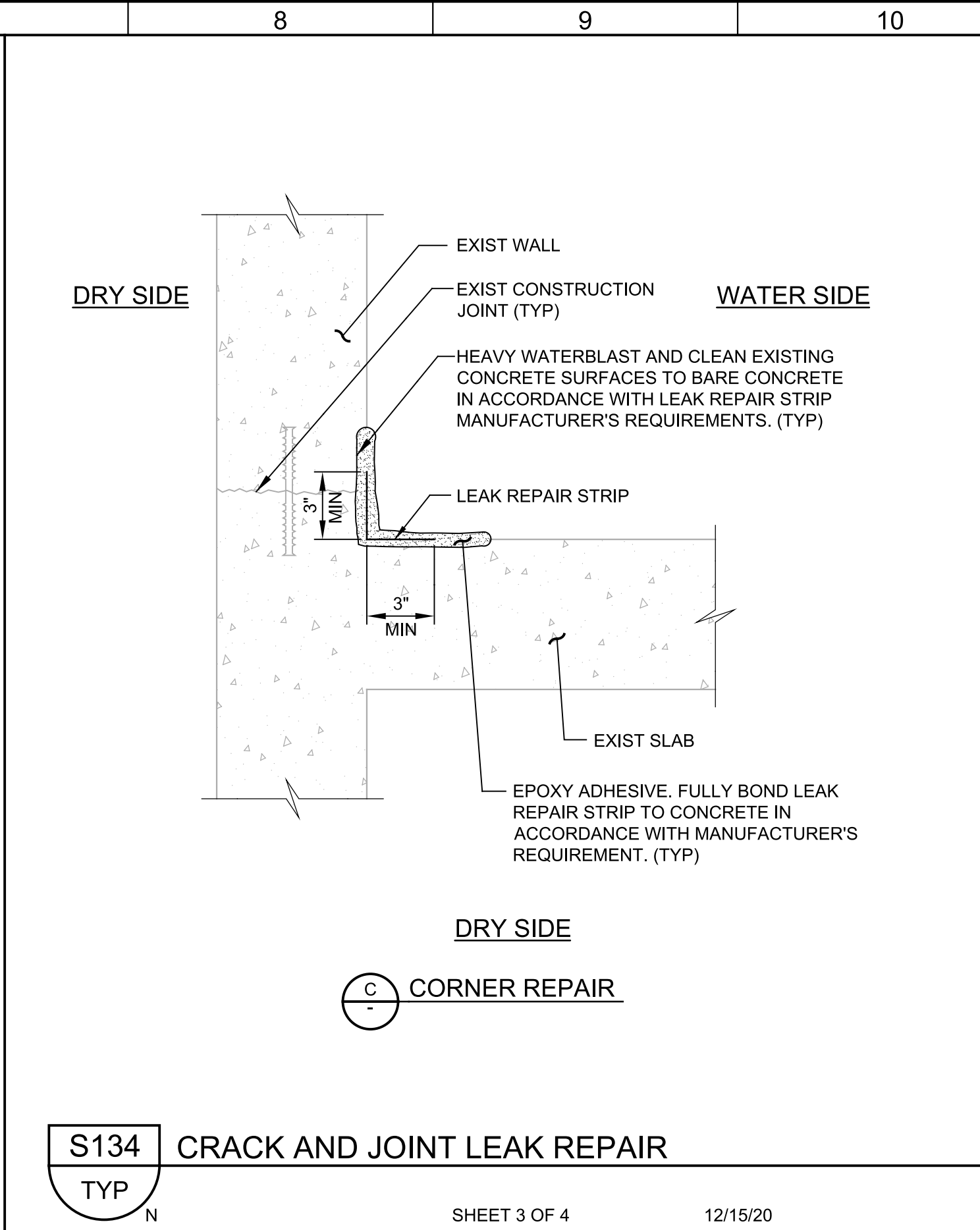
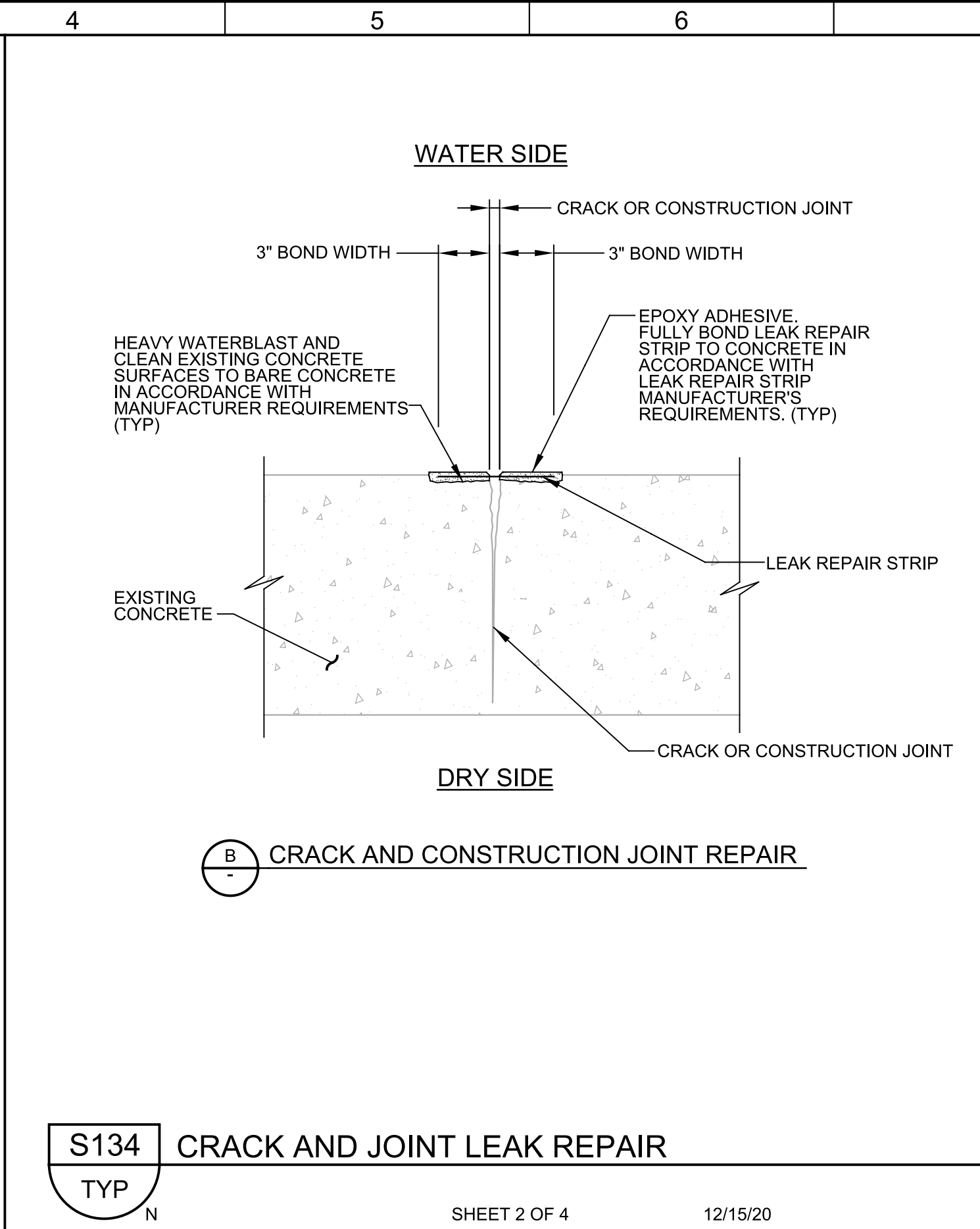
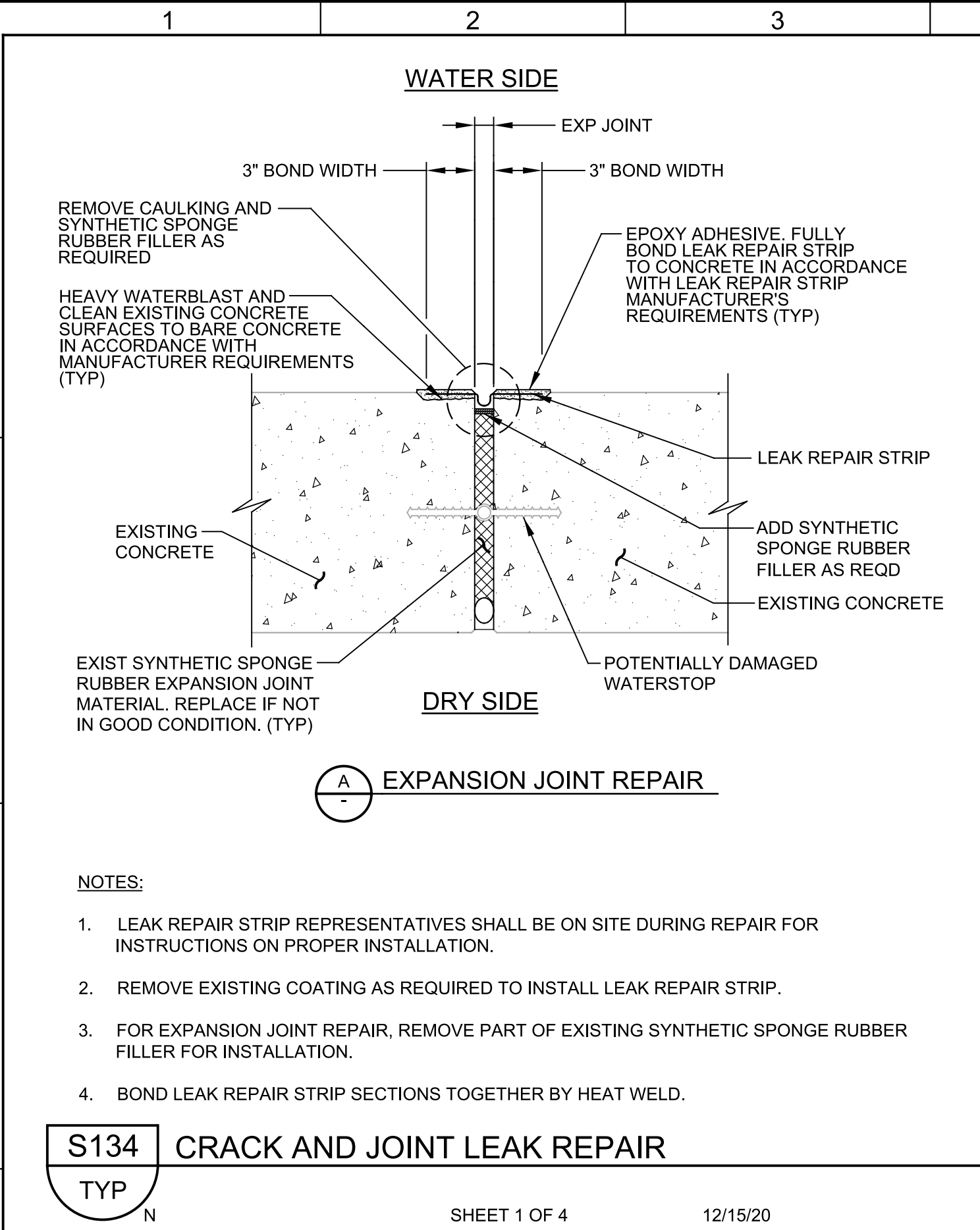
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201351
DRAWING NO.
00TS01
SHEET NO.
OF

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User: svcPW

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LAST SAVED BY: KAtkin



			60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED MKF
				DRAWN KA
				CHECKED MAK
				DATE OCTOBER 2022
REV	DATE	BY		DESCRIPTION

				DESIGNED MKF			
				DRAWN KA			
				CHECKED MAK			
				DATE OCTOBER 2022			
REV	DATE	BY	DESCRIPTION				
1				4	5	6	7



CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

TYPICAL DETAILS

STRUCTURAL TYPICAL DETAILS 2

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

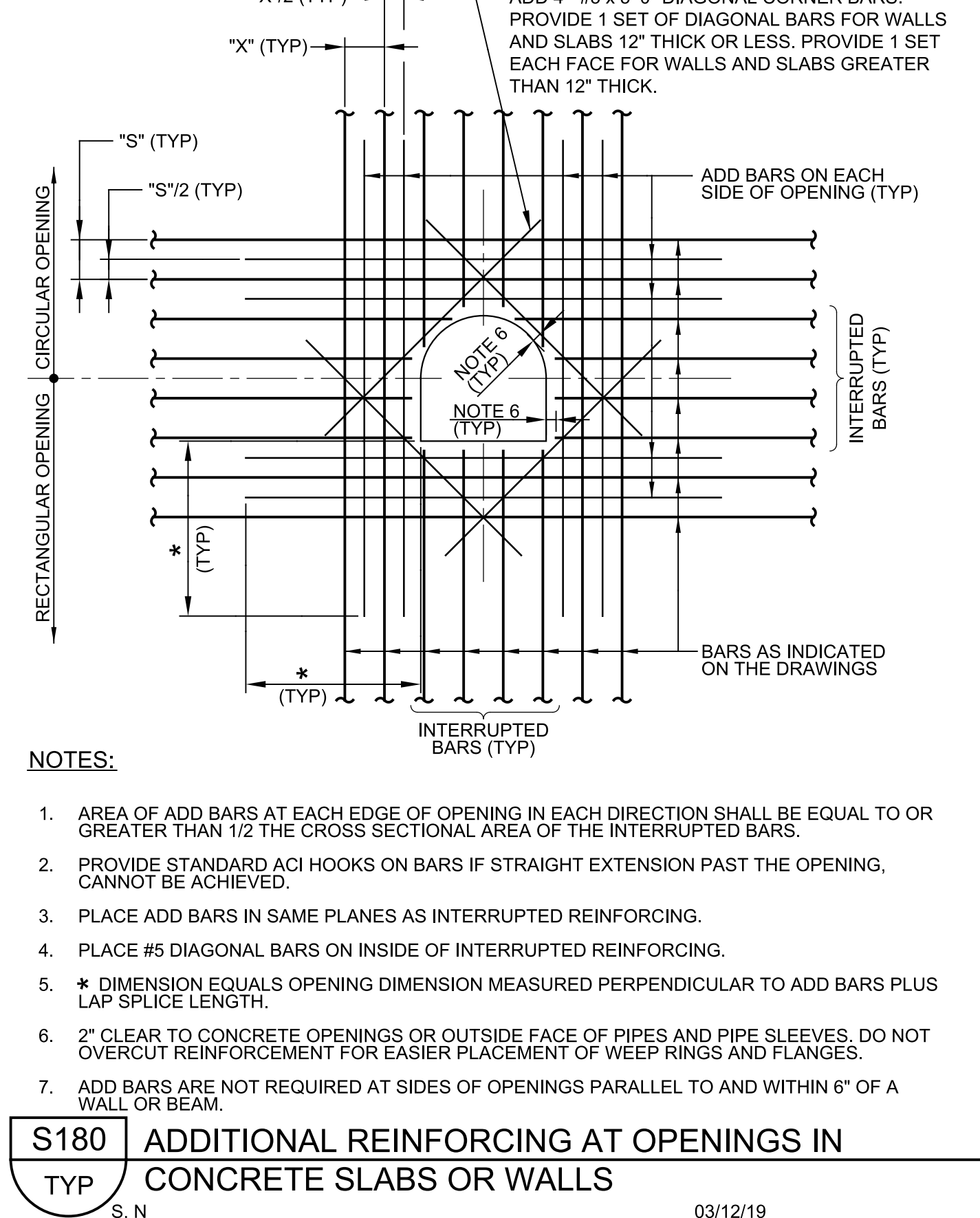
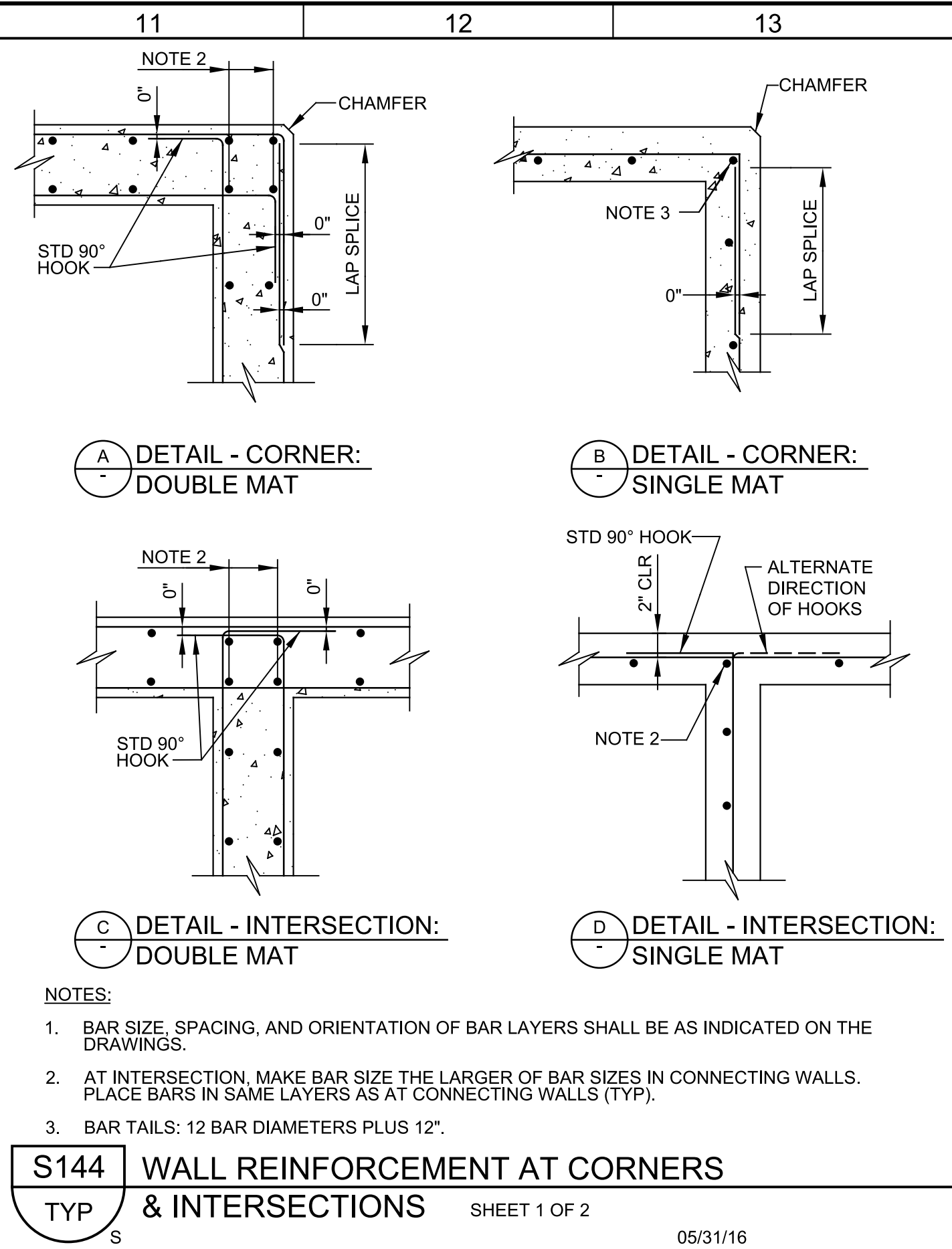
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

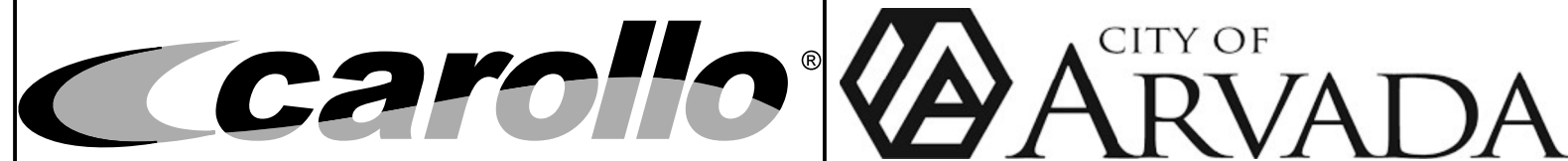
JOB NO.
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DRAWING NO.
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SHEET NO.
OF



				
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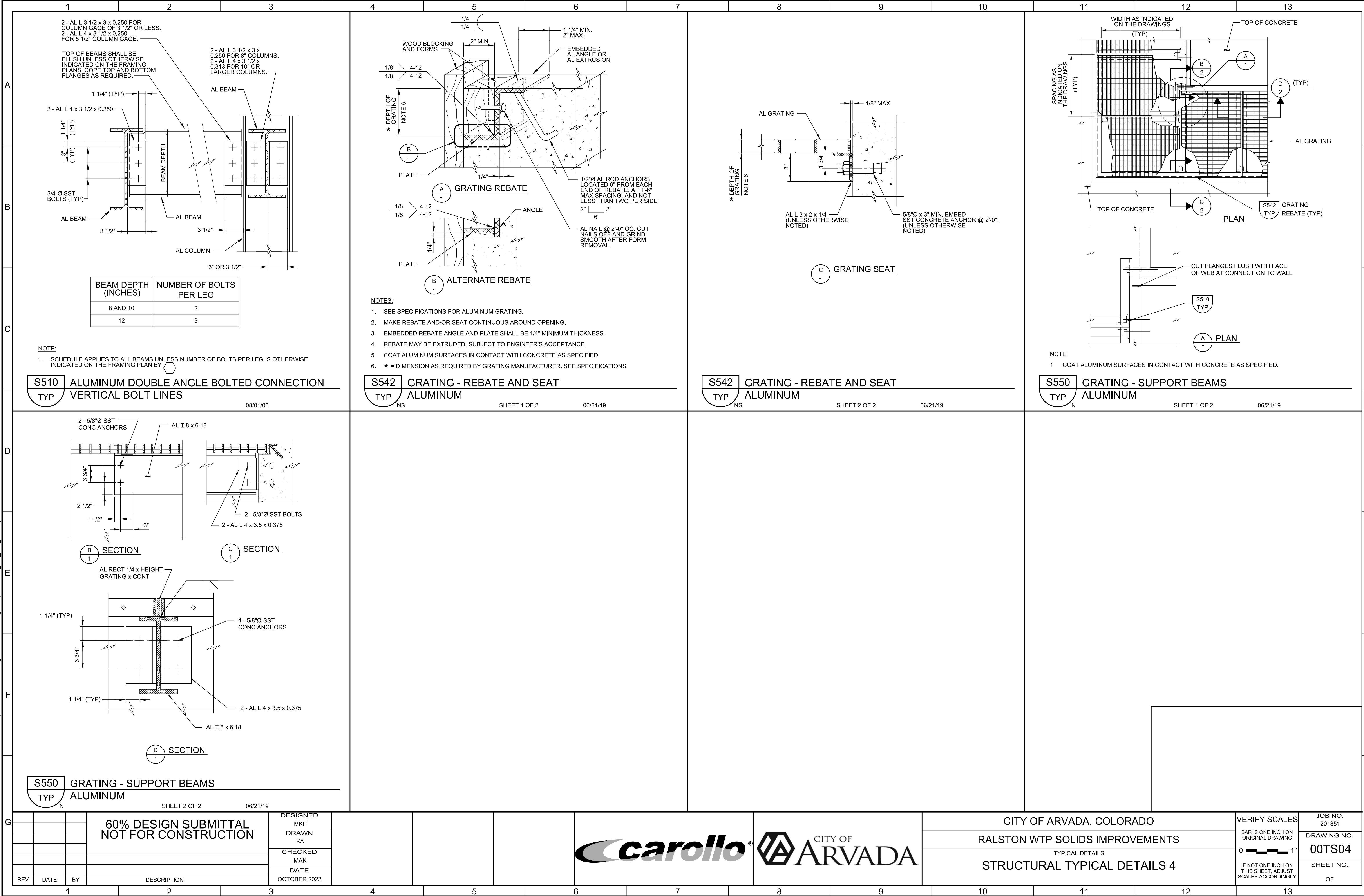
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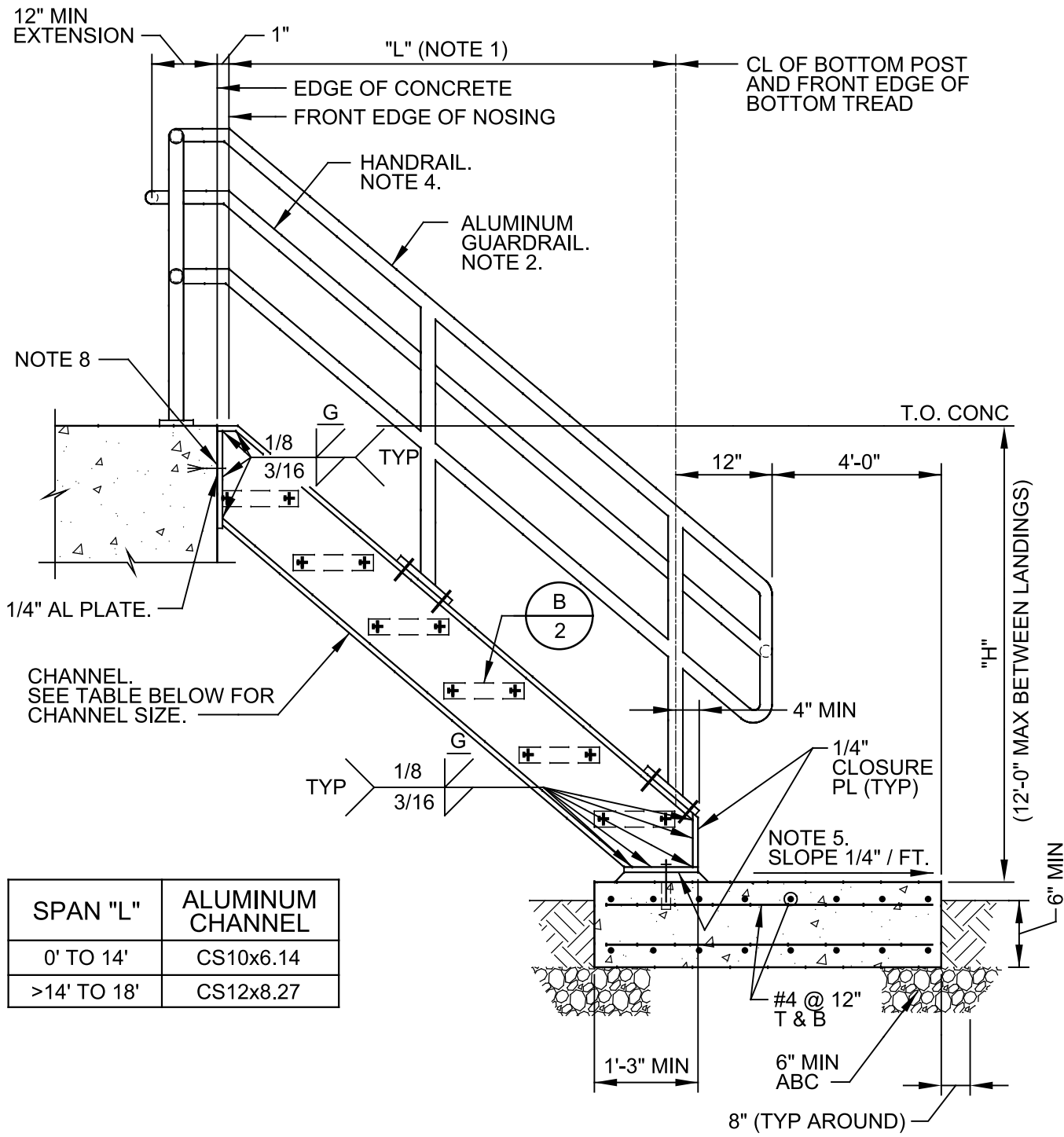
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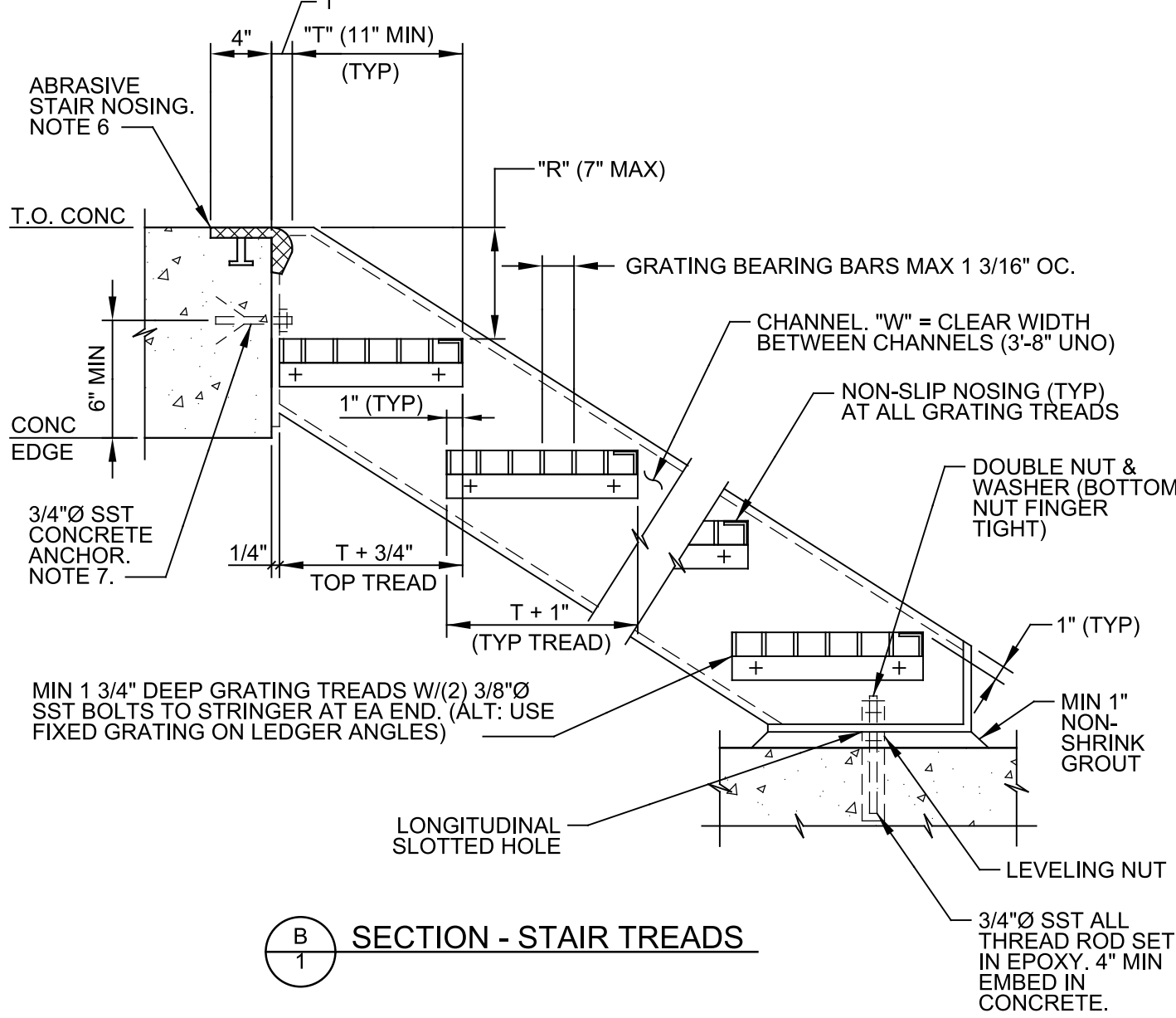
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LAST SAVED BY: jbaumgaier



A ELEVATION - STAIRS

S901 STAIRS - ALUMINUM - TWO RAIL
TYP R

SHEET 1 OF 3 10/13/22



B 1 SECTION - STAIR TREADS

S901 STAIRS - ALUMINUM - TWO RAIL
TYP NS

SHEET 2 OF 3 06/10/22

- NOTES:
- SEE DRAWINGS FOR DIMENSIONS "H", "L", "R", "T" AND "W".
 - SEE **DETAIL S906/TYP** FOR ALUMINUM GUARDRAIL NOTES AND **DETAIL S907/TYP** FOR ALUMINUM GUARDRAIL DETAILS.
 - COAT ALUMINUM SURFACES IN CONTACT WITH CONCRETE, AND INSTALL ISOLATION SLEEVES AND WASHERS BETWEEN DISSIMILAR METALS AS SPECIFIED.
 - PROVIDE HANDRAIL EXTENSIONS AS SHOWN AT BOTH SIDES OF STAIR, UNLESS HANDRAIL IS CONTINUOUS (AS AT SWITCHBACK STAIR).
 - AT EXTERIOR STAIRS, PROVIDE CONCRETE SLAB ON GRADE UNLESS OTHERWISE INDICATED ON THE DRAWINGS. MINIMUM CONCRETE SLAB WIDTH = STAIR CLEAR WIDTH ("W") PLUS 2'-0" (12" EACH SIDE). EDGE TOP CORNERS OF SLAB TO 1/4" RADIUS.
 - ABRASIVE STAIR NOSING: PROVIDE 2" CLEAR BETWEEN END OF STAIR NOSING AND VERTICAL/INSIDE FACE OF STAIR STRINGER. TOOL A GROOVE, 1/8" WIDE BY FULL WIDTH AND THICKNESS OF NOSING AT EACH END OF NOSING. CONTINUE JOINT DOWN VERTICAL FACE AT RISER. FILL GROOVE WITH SYNTHETIC RUBBER SEALING COMPOUND.
 - INSTALL CONCRETE ANCHORS MIN 6" FROM BOTTOM AND 6" FROM SIDES/EDGES OF CONCRETE.
 - CONNECTION TO CONCRETE SHOWN. SEE **DETAIL S908/TYP** FOR CONNECTION AT METAL FRAMING.

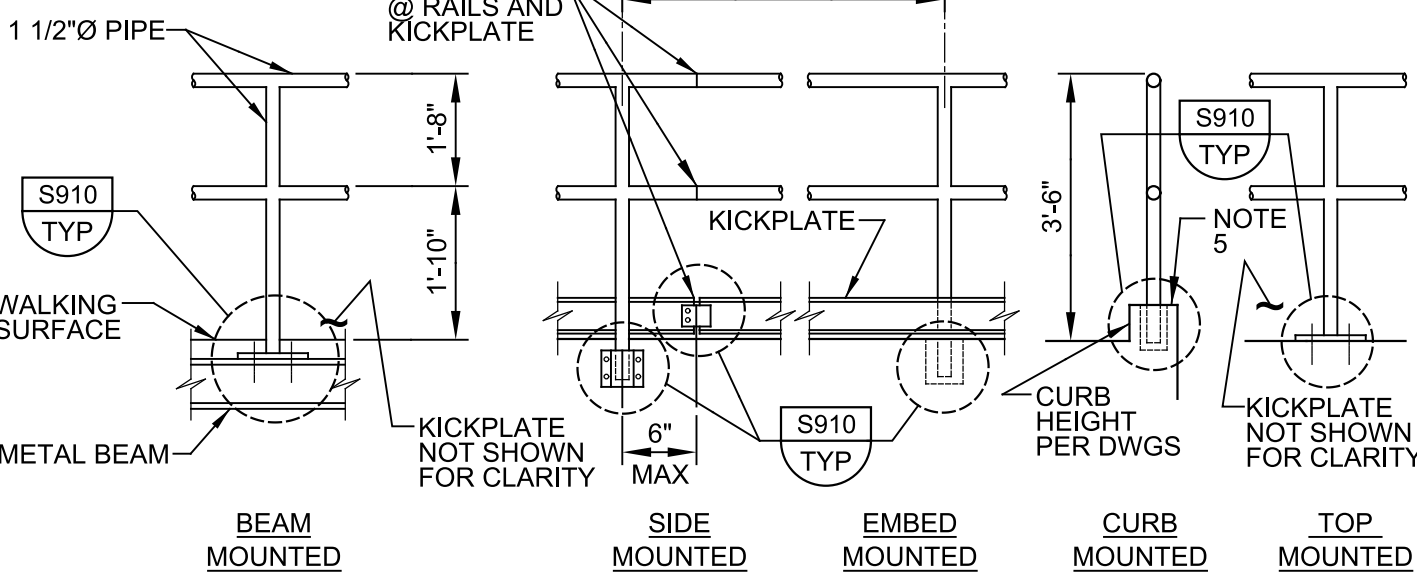
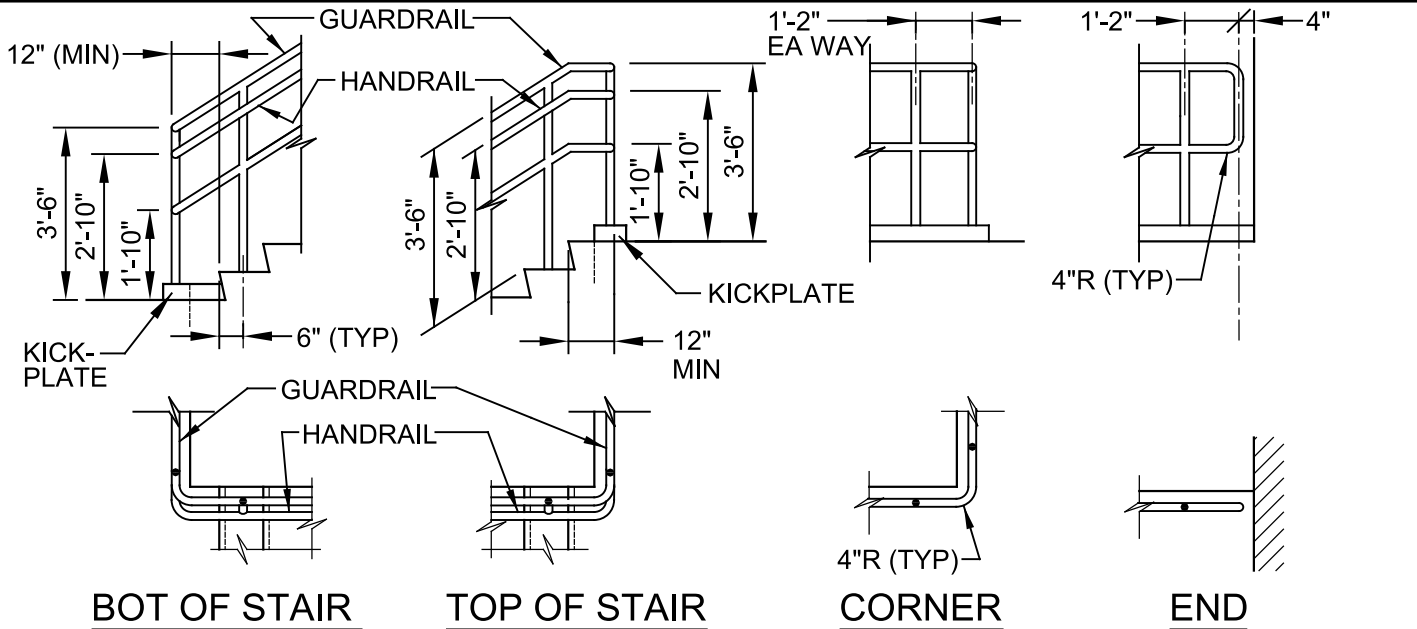
S901 STAIRS - ALUMINUM - TWO RAIL
TYP NS

SHEET 3 OF 3 06/10/22

- NOTES:
- PROVIDE GUARDRAILS AT STAIRS AND AT OPEN SIDED WALKING SURFACES THAT ARE ELEVATED MORE THAN 30" ABOVE GRADE OR ADJACENT CONSTRUCTION.
 - WHERE EQUIPMENT IS LOCATED LESS THAN 10' FROM EDGE OF ROOF AND ELEVATED MORE THAN 30" ABOVE GRADE OR ADJACENT CONSTRUCTION, PROVIDE 42" HIGH GUARDRAIL FORMING A PROTECTIVE BARRIER. PARAPET WALL 42" OR MORE IN HEIGHT MAY BE THE GUARDRAIL AT ROOF LOCATIONS.
 - SEE DRAWINGS AND SPECIFICATIONS FOR GUARDRAIL MATERIAL TYPE(S).
 - PROVIDE HANDRAIL AT BOTH SIDES OF EVERY STAIR HAVING 2 OR MORE RISERS.
 - PROVIDE CONTINUOUS HANDRAIL GRIPPING SURFACES FOR THE FULL LENGTH OF THE STAIR.
 - PROVIDE HANDRAIL EXTENSIONS AT BOTH SIDES OF STAIRS AT TOP AND BOTTOM. HANDRAIL EXTENSION ON STAIR MOUNTED GUARDRAIL MAY BE OMITTED WHERE IT IS PERPENDICULAR TO AND IMPEDES EXIT FLOW.
 - MAKE INSIDE HANDRAIL ON SWITCHBACK STAIRS CONTINUOUS.
 - FOR WALL MOUNTED HANDRAILS, PROVIDE SINGLE RAIL WITH TOP OF RAIL AT 2'-10" HEIGHT ABOVE LANDINGS OR TREAD NOSINGS. PROVIDE MATCHING HANDRAIL ON OPPOSITE SIDE.
 - GUARDRAIL SHALL BE FIXED UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
 - PLACE CENTER OF EMBEDDED POSTS 6" FROM EDGE OF CONCRETE AND 6" FROM FRONT EDGE OF CONCRETE STAIR NOSINGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
 - PLACE GUARDRAIL POSTS OPPOSITE EACH OTHER WHERE RAILINGS ARE PARALLEL.
 - FOR GUARDRAIL POSTS MOUNTED TO BEAM OR STAIR CHANNEL, PROVIDE MANUFACTURERS REINFORCED CONNECTION FROM POST TO PLATE. PLATE AND REINFORCED INSERTS SHALL BE ALUMINUM OR STAINLESS STEEL.
 - PROVIDE SLIDING JOINTS AT 24" MAX SPACING FOR EXPANSION OF RAIL AND KICKPLATE. LOCATE SLIDING JOINTS NEAR FACE OF POST. GAP AT TIME OF INSTALLATION SHALL BE BASED ON TEMPERATURE OF GUARDRAIL. PROVIDE 1/4" GAP AT 100°F AND 5/8" GAP AT 0°F. INTERPOLATE GAP FOR OTHER INSTALLATION TEMPERATURES. AT CONCRETE EXPANSION JOINTS, PROVIDE MINIMUM 1" GAP IN SLIDING JOINTS BUT NOT LESS THAN WIDTH OF CONCRETE EXPANSION JOINT. MAKE INSERT SLEEVES IN RAILS LONG ENOUGH TO ALLOW FOR THE FULL RANGE OF MOVEMENT.
 - MATERIAL FOR KICKPLATE CHANNEL SLIDING JOINT PLATES, SHALL BE OF THE SAME MATERIAL AS THE GUARDRAIL.
 - JOINTS FOR STAINLESS STEEL GUARDRAIL AND HANDRAIL SHALL BE COPED, WELDED, AND GROUND SMOOTH.
 - PROVIDE KICKPLATE AT ALL LOCATIONS EXCEPT AT SLOPING GUARDRAIL ON STAIRS AND WHERE GUARDRAIL IS MOUNTED ON A 4" MIN CURB. KICKPLATE MAY BE EXTRUDED OR BENT PLATE AND SHALL BE ATTACHED WITH SST BOLTS IN 5/16" x 3/4" SLOTTED HOLES. BOLT KICKPLATE TO POST WITH BOTTOM 1/4" CLEAR ABOVE FLOOR. FOR SIDE MOUNTED GUARDRAIL, PROVIDE STANDARD SPACER BLOCK BETWEEN POST AND KICKPLATE TO MAINTAIN 1/4" MAX CLEAR SPACING. HAND TIGHTEN AND CENTER PUNCH BOLT THREADS TO LOCK.
 - COAT SURFACES OF ALUMINUM IN CONTACT WITH CONCRETE AS SPECIFIED, PROVIDE NEOPRENE GASKET BETWEEN ALUMINUM AND STEEL.

S903 GUARDRAIL - HANDRAIL - NOTES
TYP J

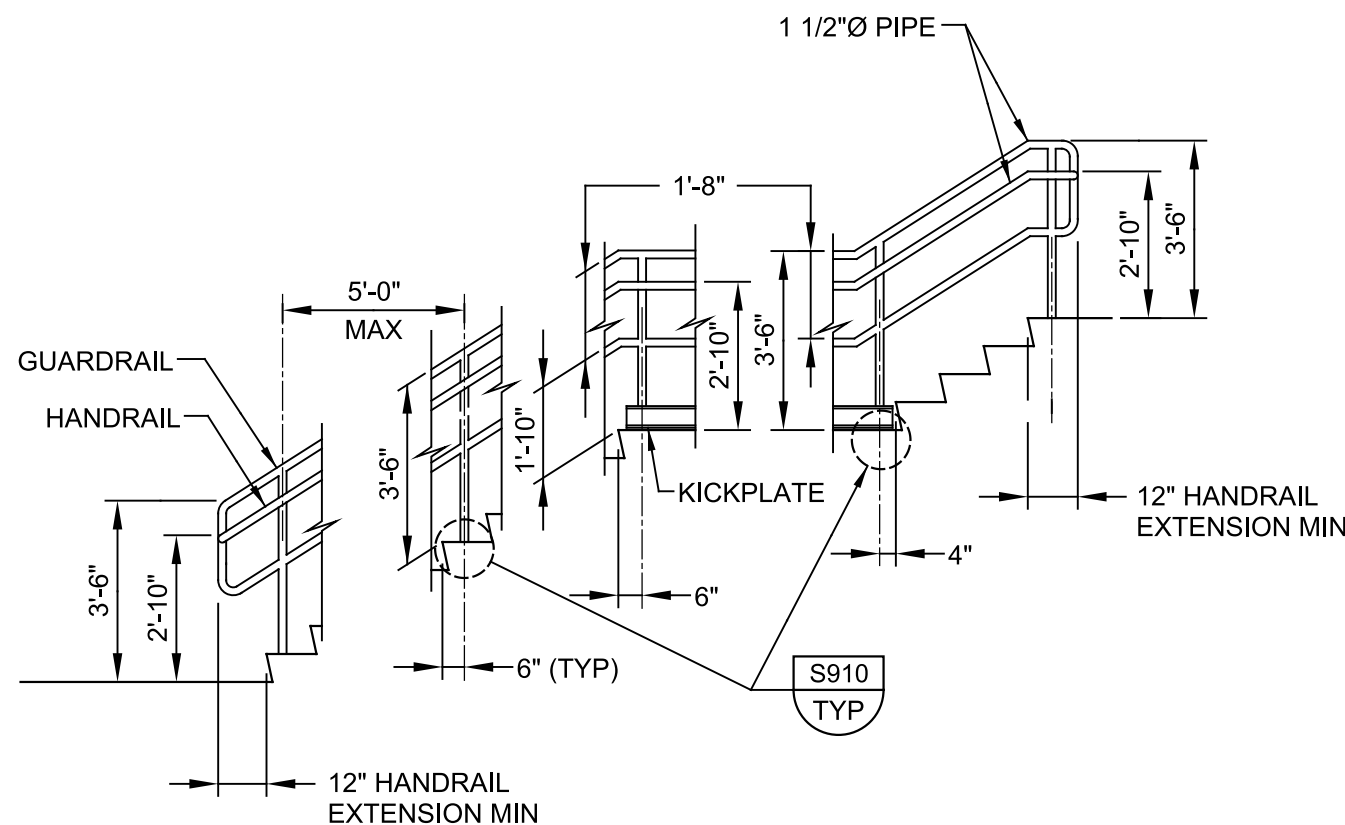
09/23/22



GUARDRAIL ELEVATION

S904 GUARDRAIL - TWO RAIL
TYP R

SHEET 1 OF 3 10/13/22



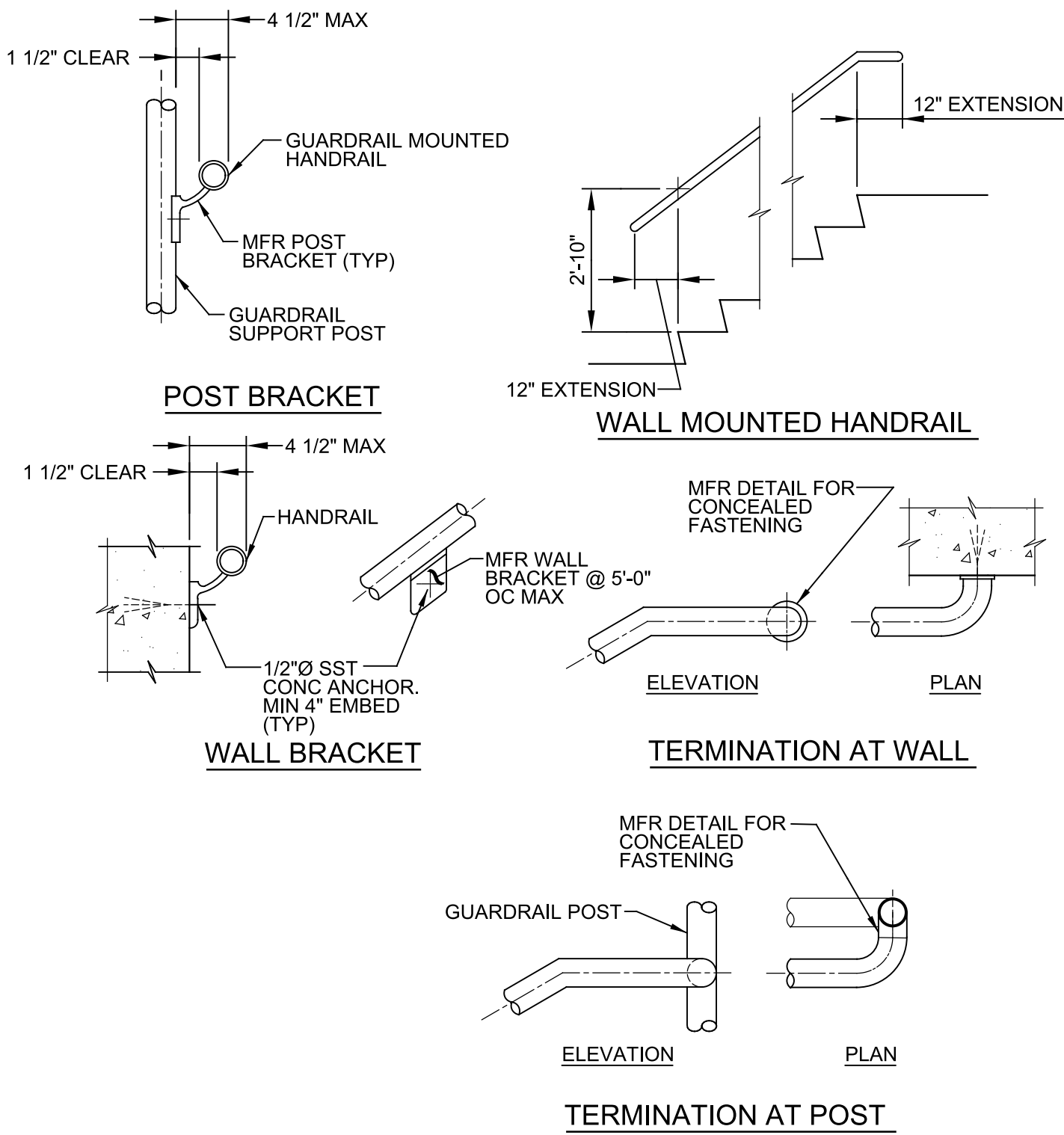
STAIR GUARDRAIL/HANDRAIL ELEVATION

NOTES:

- THIS DETAIL IS APPLICABLE AT PRIVATE STAIRS IN F, H, AND S OCCUPANCIES WHERE OPERATOR ONLY ACCESSIBILITY IS REQUIRED. DETAILS AND INSTALLATION SHALL COMPLY WITH THE BUILDING CODE.
- SEE SPECIFICATIONS AND **DETAIL S906/TYP** FOR ADDITIONAL REQUIREMENTS.
- VARIOUS POST MOUNTING DETAILS ARE ILLUSTRATED. SEE DRAWINGS AND **DETAIL S910/TYP** FOR SPECIFIC MOUNTING REQUIREMENTS.
- HANDRAIL EXTENSIONS ARE REQUIRED AT BOTH SIDES OF STAIR, EXCEPT WHERE INSIDE HANDRAIL IS CONTINUOUS AT SWITCHBACK STAIR.
- AT CURB, USE EMBEDDED OR TOP MOUNTED POST AS INDICATED ON THE DRAWINGS.

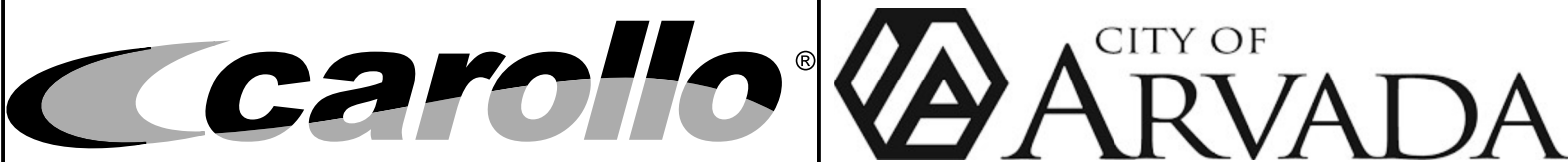
S904 GUARDRAIL - TWO RAIL
TYP R

SHEET 2 OF 3 10/13/22



S904 GUARDRAIL - TWO RAIL
TYP R

SHEET 3 OF 3 10/13/22



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
STRUCTURAL TYPICAL DETAILS 5

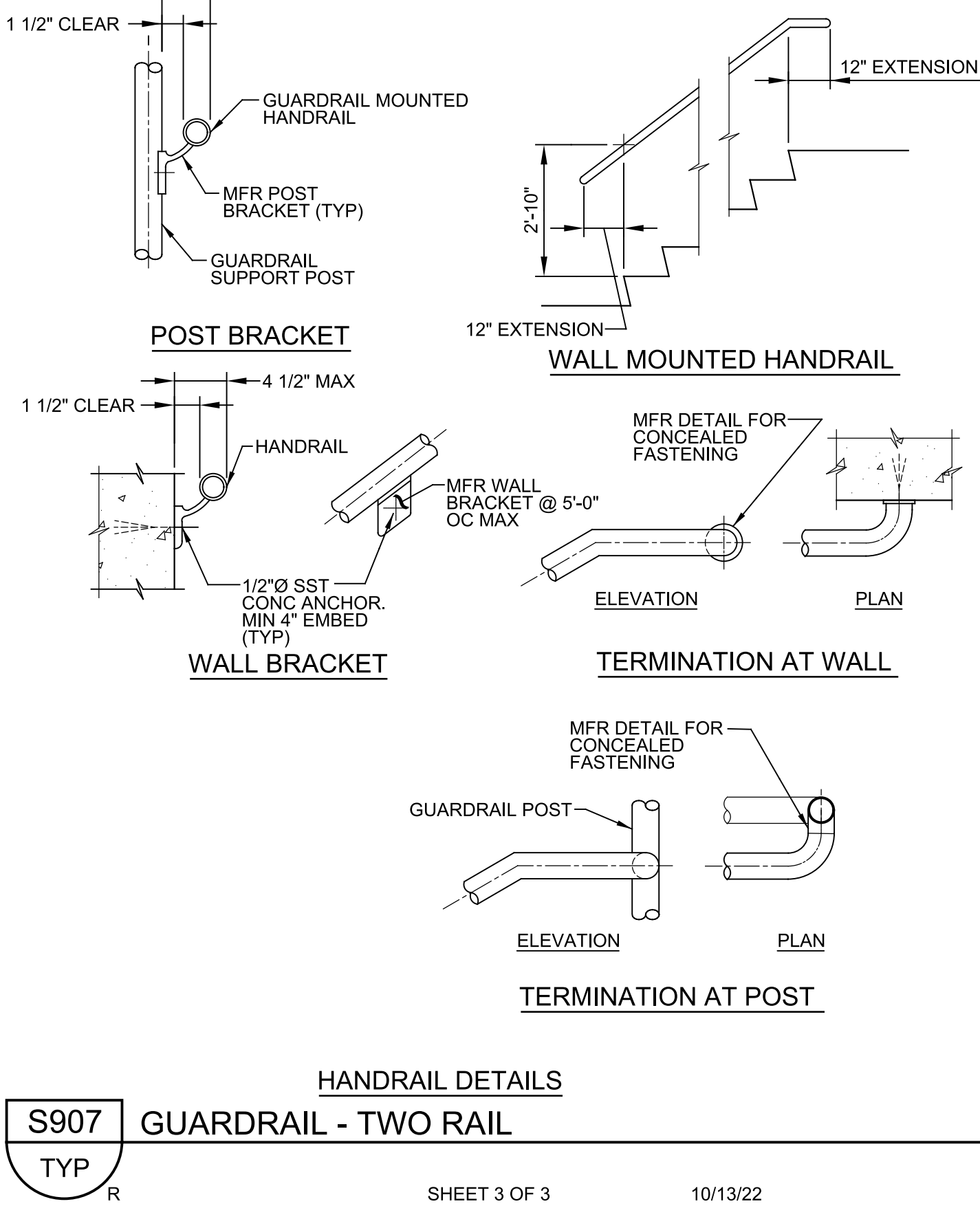
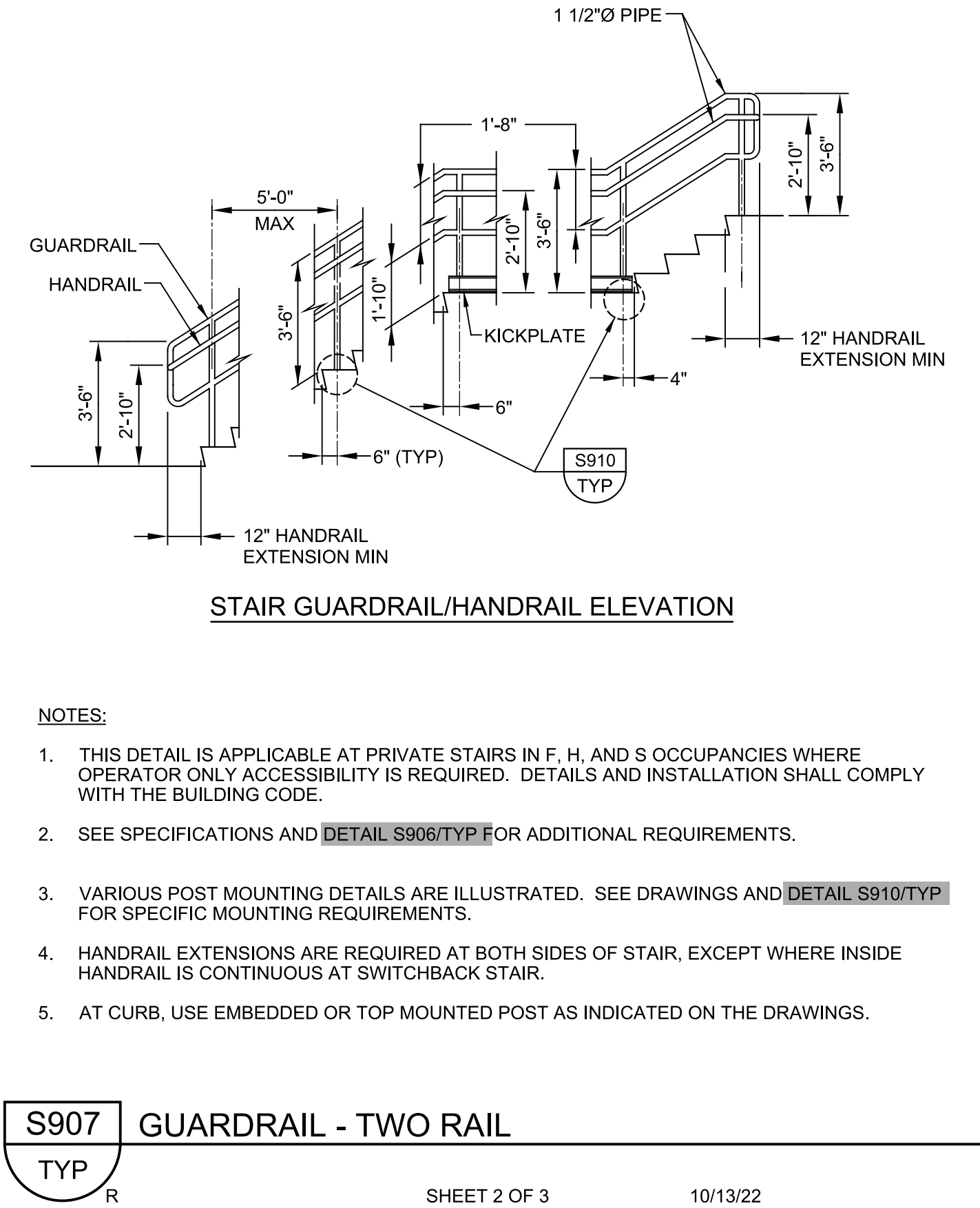
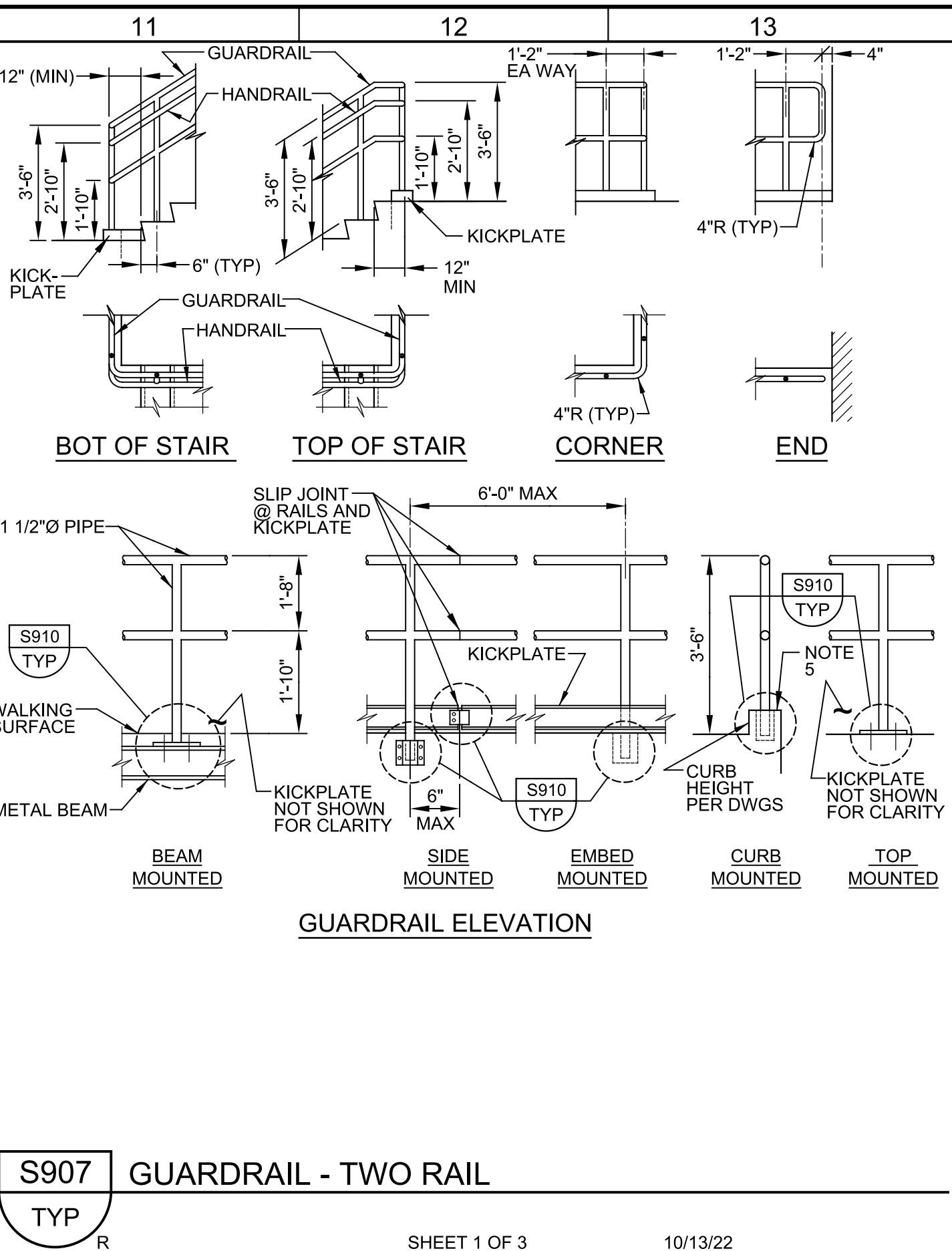
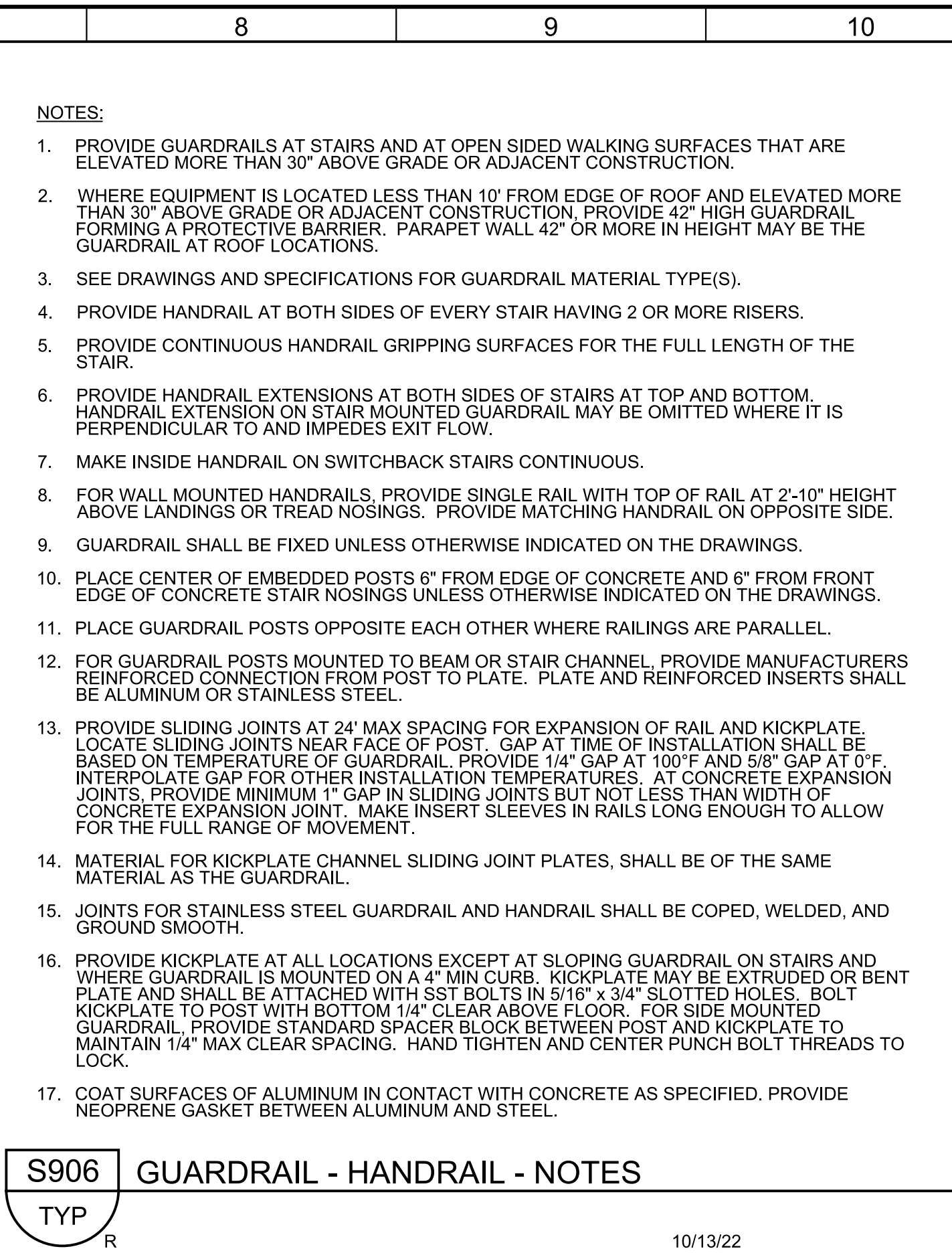
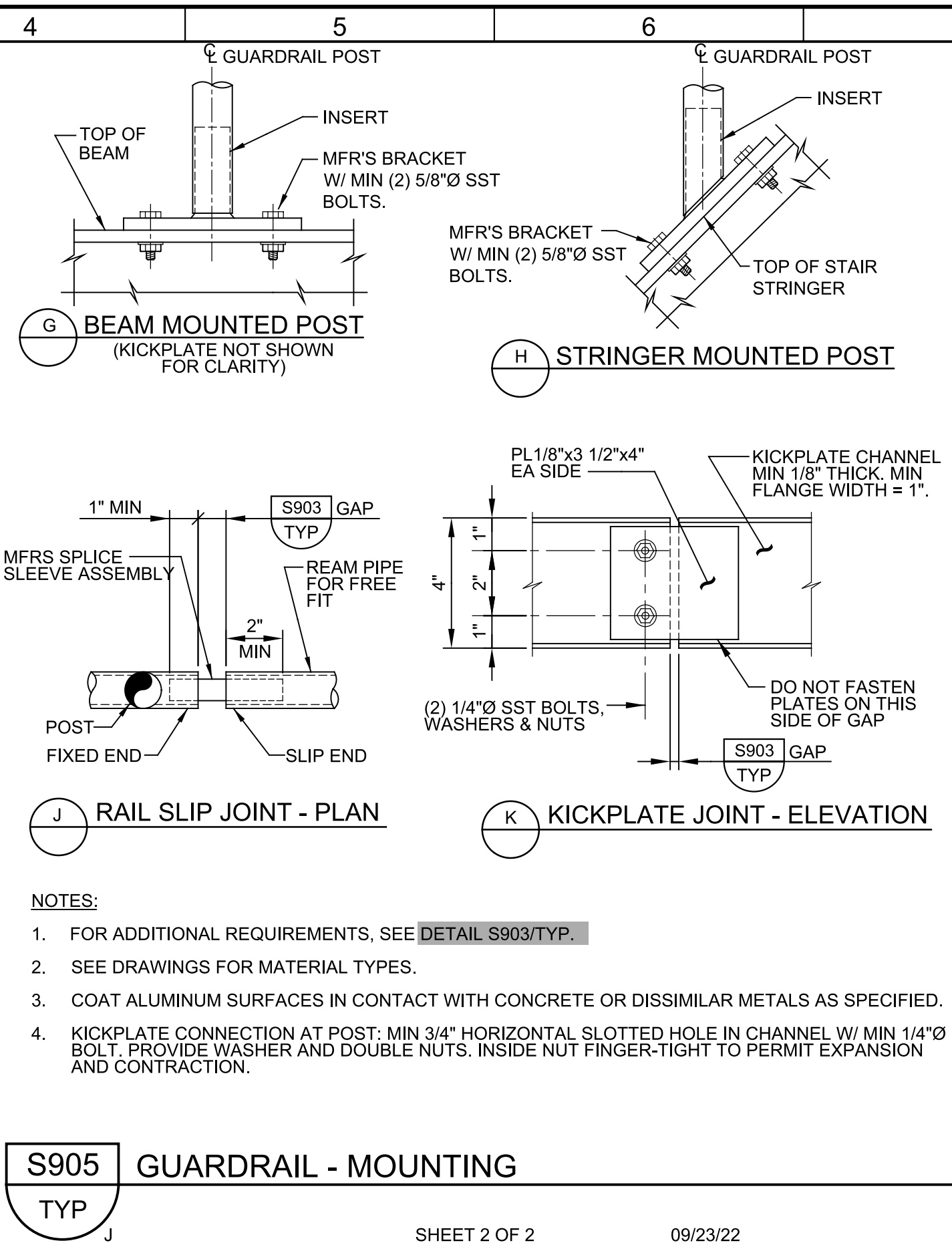
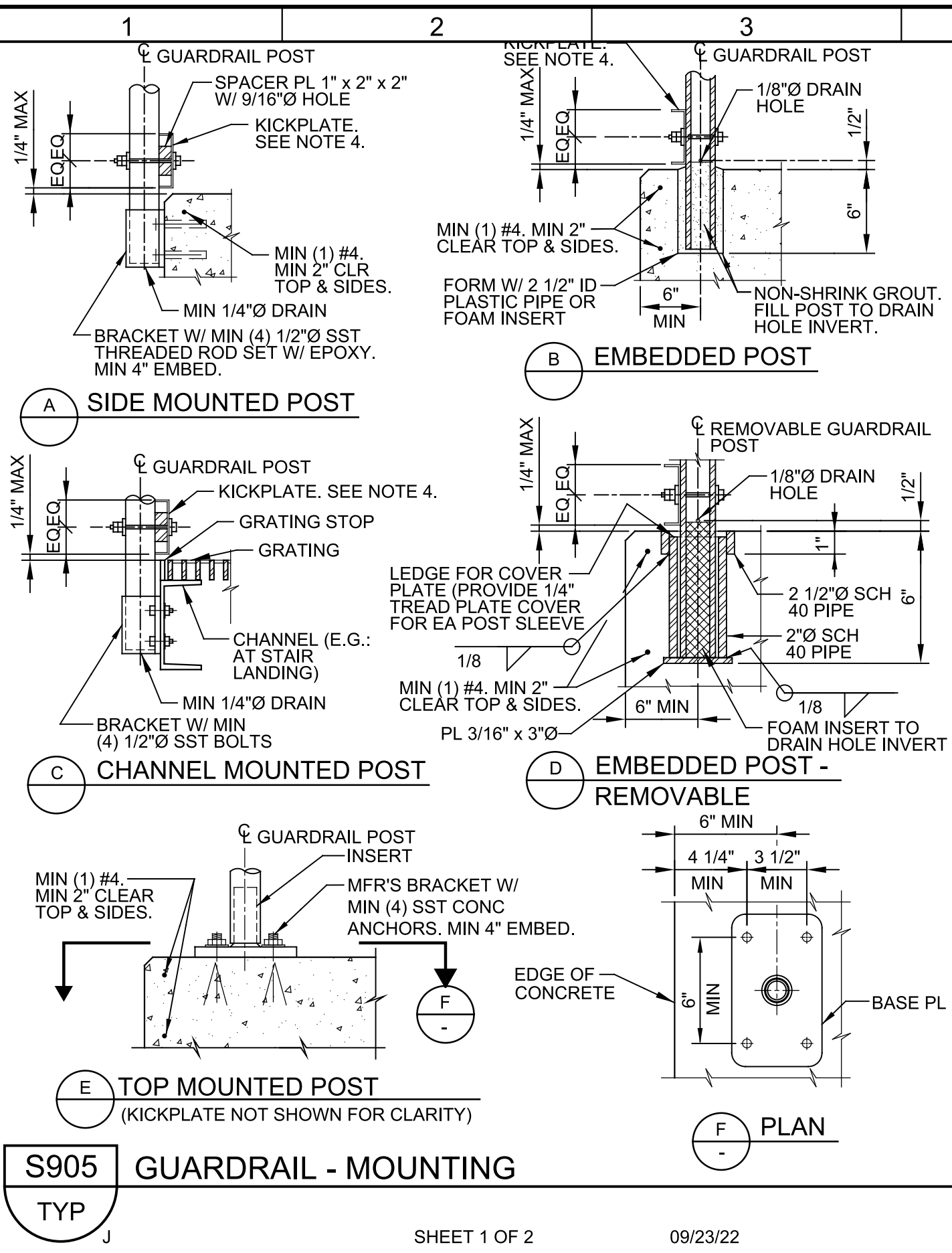
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SHEET NO. OF

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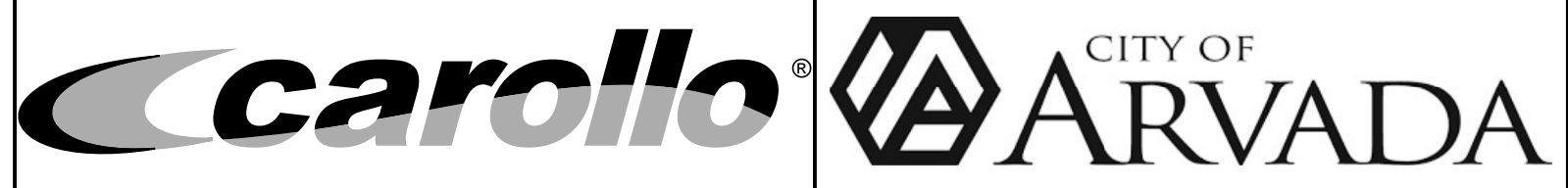
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LAST SAVED BY: jbaumgaer



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DRAWN	KA/JBB		
CHECKED	MAK		
DATE	OCTOBER 2022		
REV	DATE	BY	DESCRIPTION
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2			
3			

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DATE	OCTOBER 2022		
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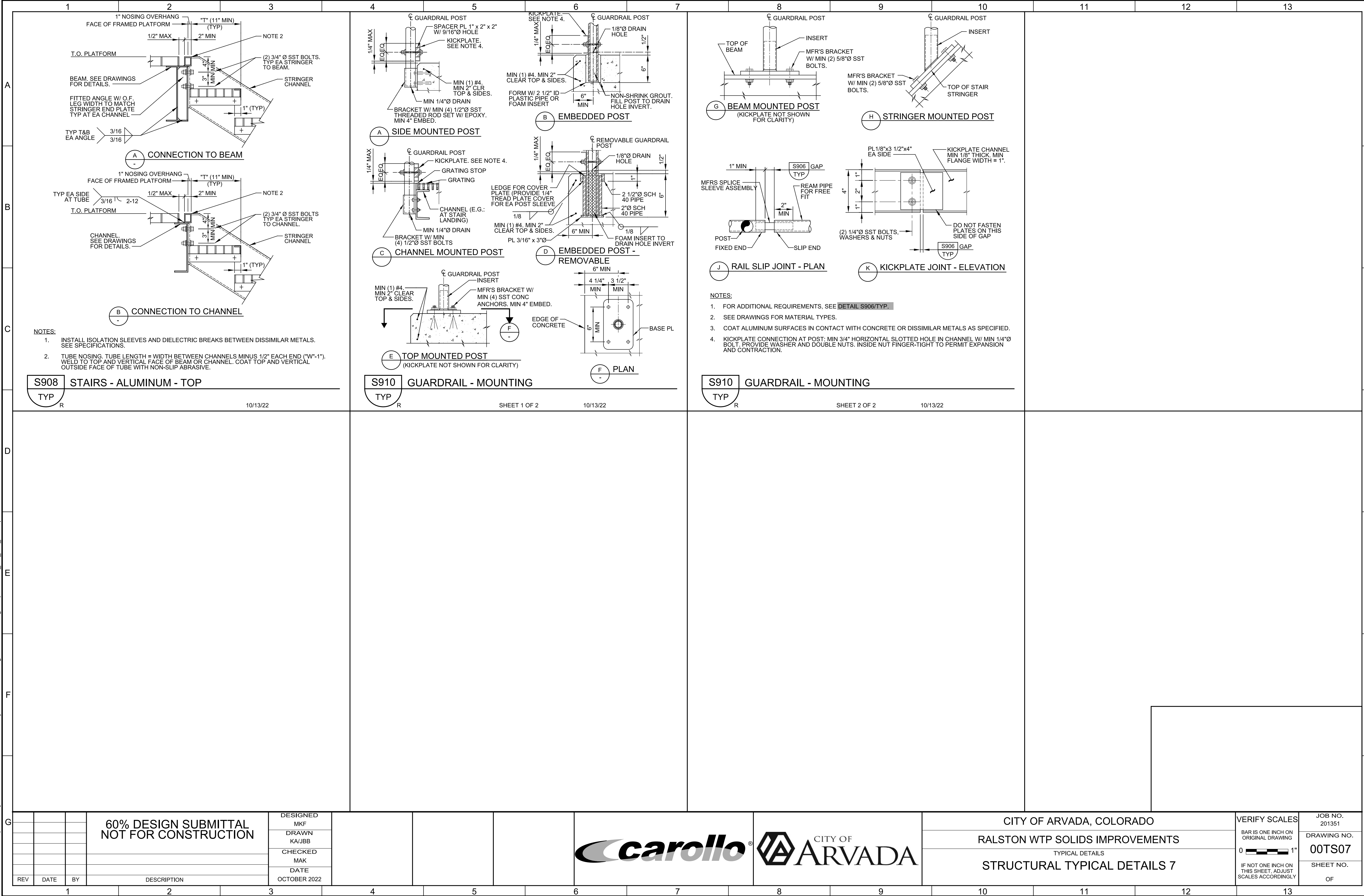
CITY OF ARVADA, COLORADO			
RALSTON WTP SOLIDS IMPROVEMENTS			
STRUCTURAL TYPICAL DETAILS 6			
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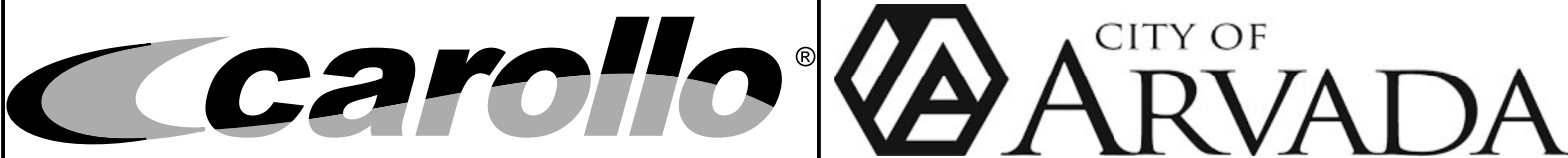
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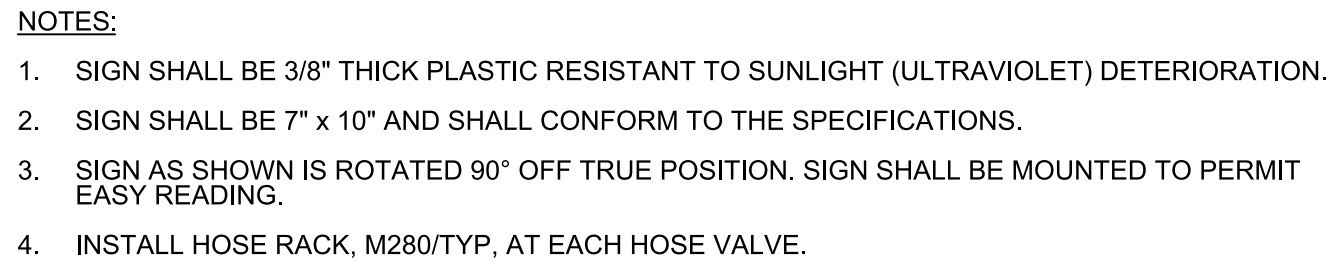
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MAK
DATE
OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
STRUCTURAL TYPICAL DETAILS 7

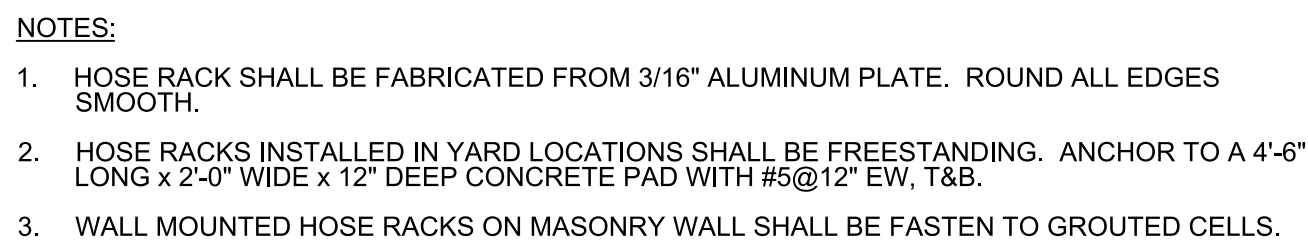
VERIFY SCALES
BAR IS ONE INCH ON
ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

JOB NO.
201351
DRAWING NO.
00TS07
SHEET NO.
OF



TYP

08/01/05



TYP

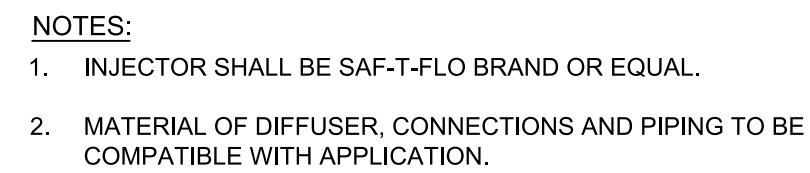
SHEET 1 OF 2

10/28/13



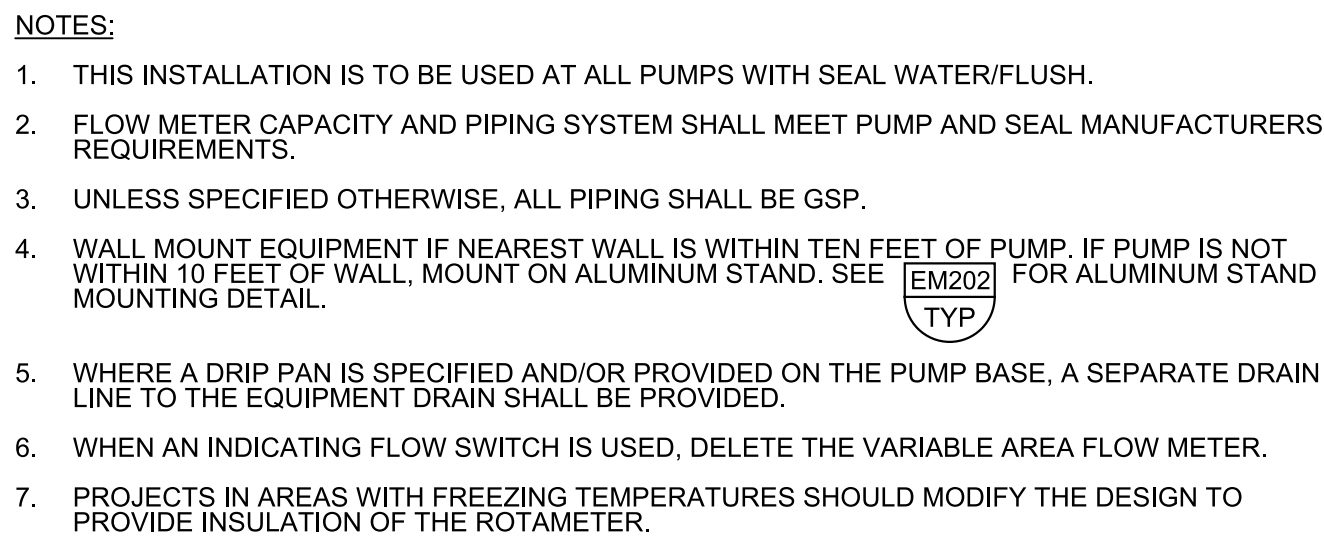
SHEET 2 OF 2

10/28/13



TYP

04/18/13

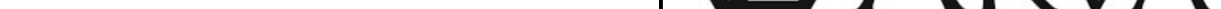


TYP

10/22/21

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DATE
OCTOBER 2022

REV	DATE	BY	DESCRIPTION
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carollo® CITY OF ARVADA

CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

TYPICAL DETAILS

MECHANICAL TYPICAL DETAILS 1

VERIFY SCALES

BAR IS ONE INCH ON
ORIGINAL DRAWING

JOB NO.
201351

DRAWING NO.

SHEET NO.

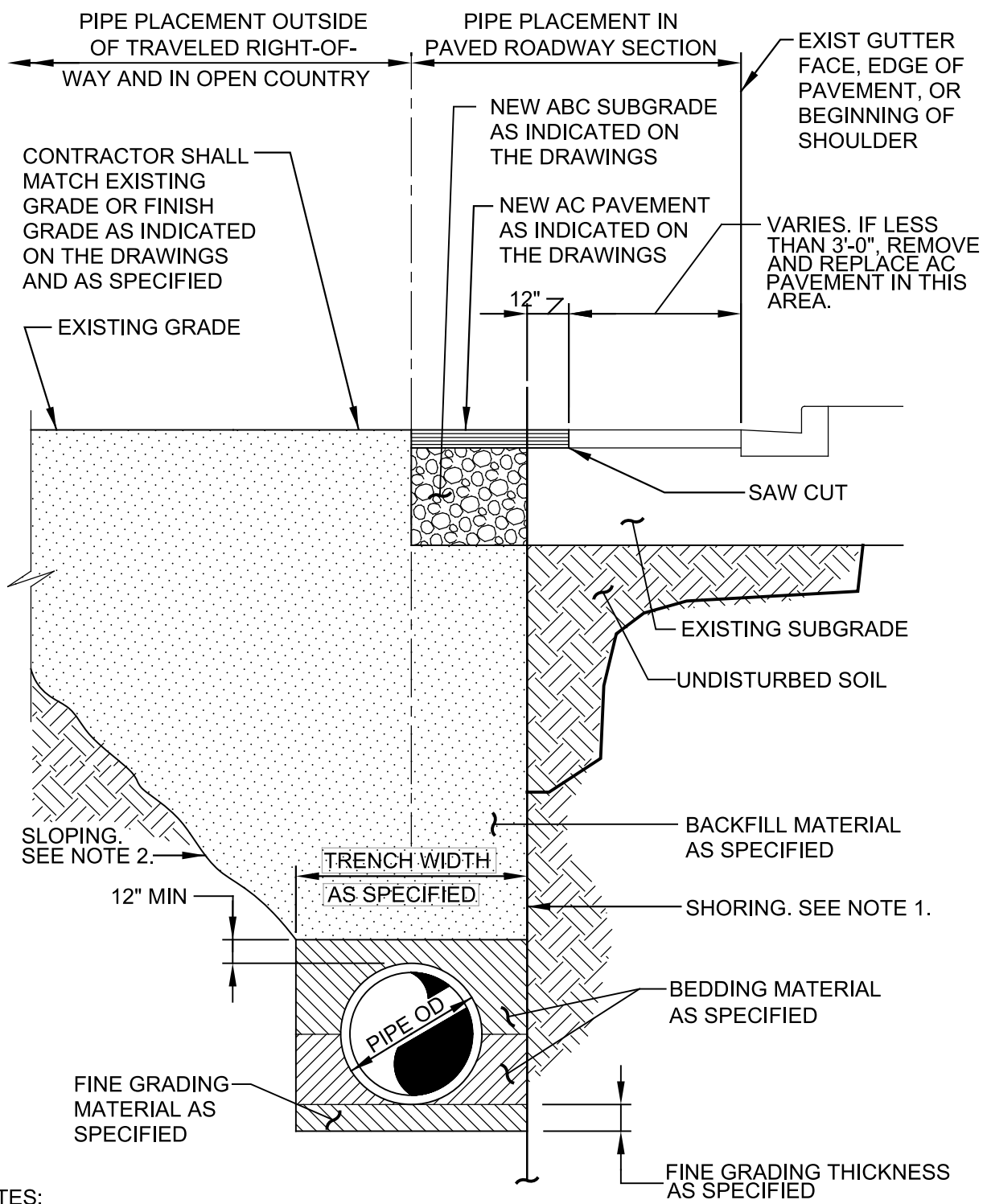
OF

Plot Date: 12-SEP-2022 7:51:37 AM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: irea



- NOTES:
- SEE SPECIFICATIONS FOR SHORING REQUIREMENTS.
 - SEE SPECIFICATIONS FOR SLOPING REQUIREMENTS.

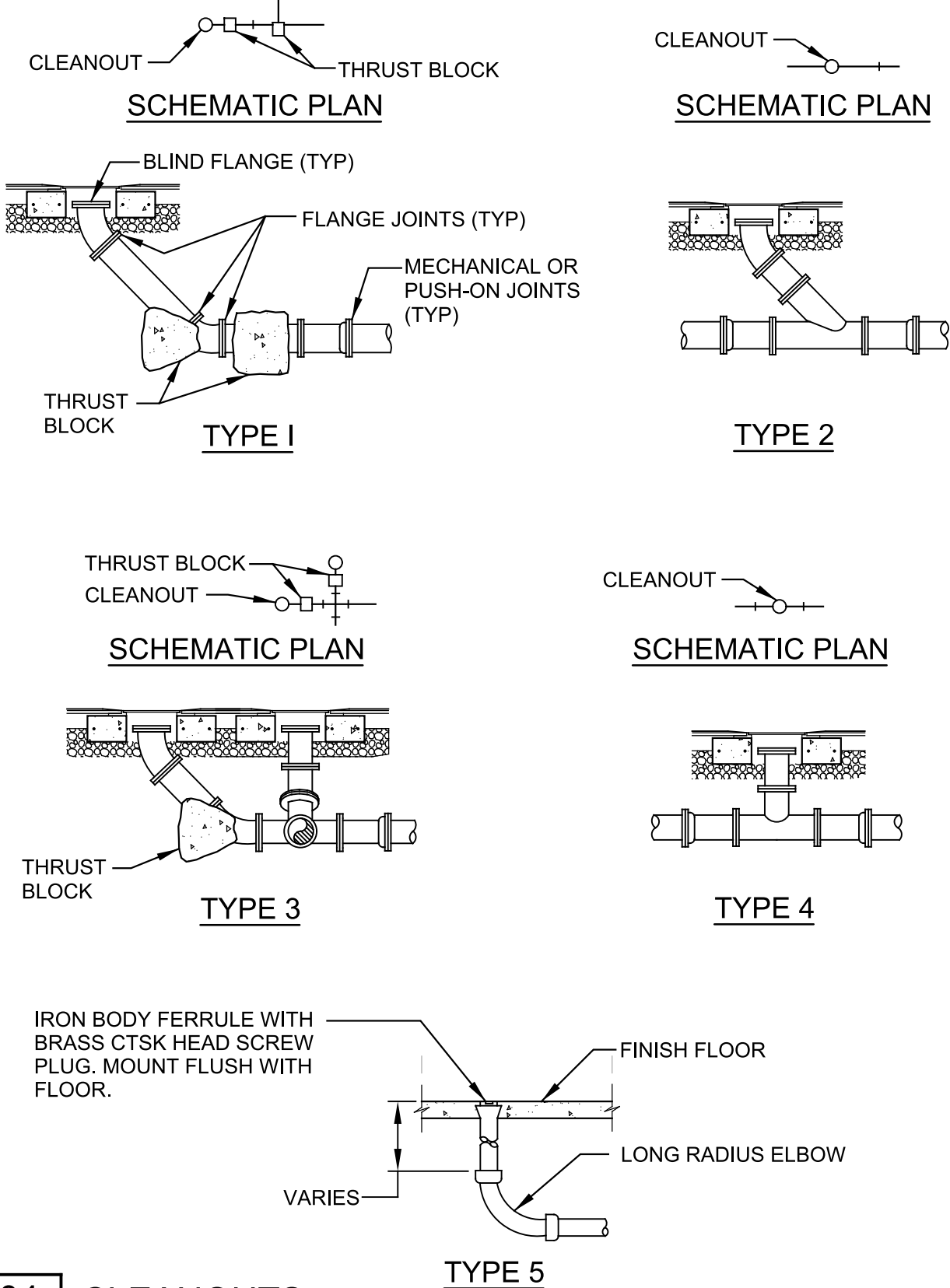
P002

PIPE INSTALLATION AND PAVEMENT REPLACEMENT

TYP

N

09/06/13



P004

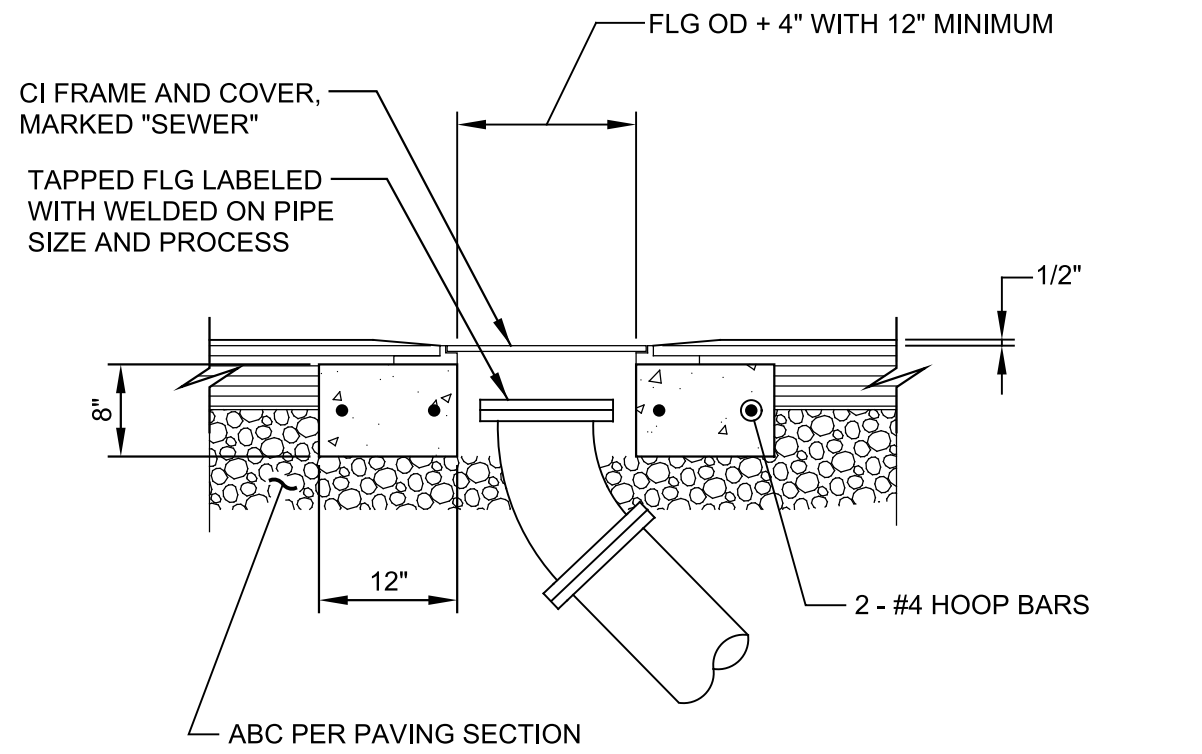
CLEANOUTS

TYP

S

SHEET 1 OF 2

07/31/08



TERMINATION IN PAVEMENT
ALL TYPES FOR 4"Ø TO 12"Ø

- NOTES:
- NOT USED.
 - CONCRETE RING SHALL BE PLACED AFTER PAVEMENT PLACEMENT.
 - ALL FLANGES CAST IN CONCRETE SHALL BE TAPPED TO ALLOW THE INSTALLATION OF BLIND FLANGES WITH BOLTS.
 - CLEANOUT PIPE SHALL BE SAME SIZE AS LINE PIPE.
 - FOR CLEANOUTS IN YARD AREA, PLACE 12" SQUARE BY 4" THICK CONCRETE PAD.

P004

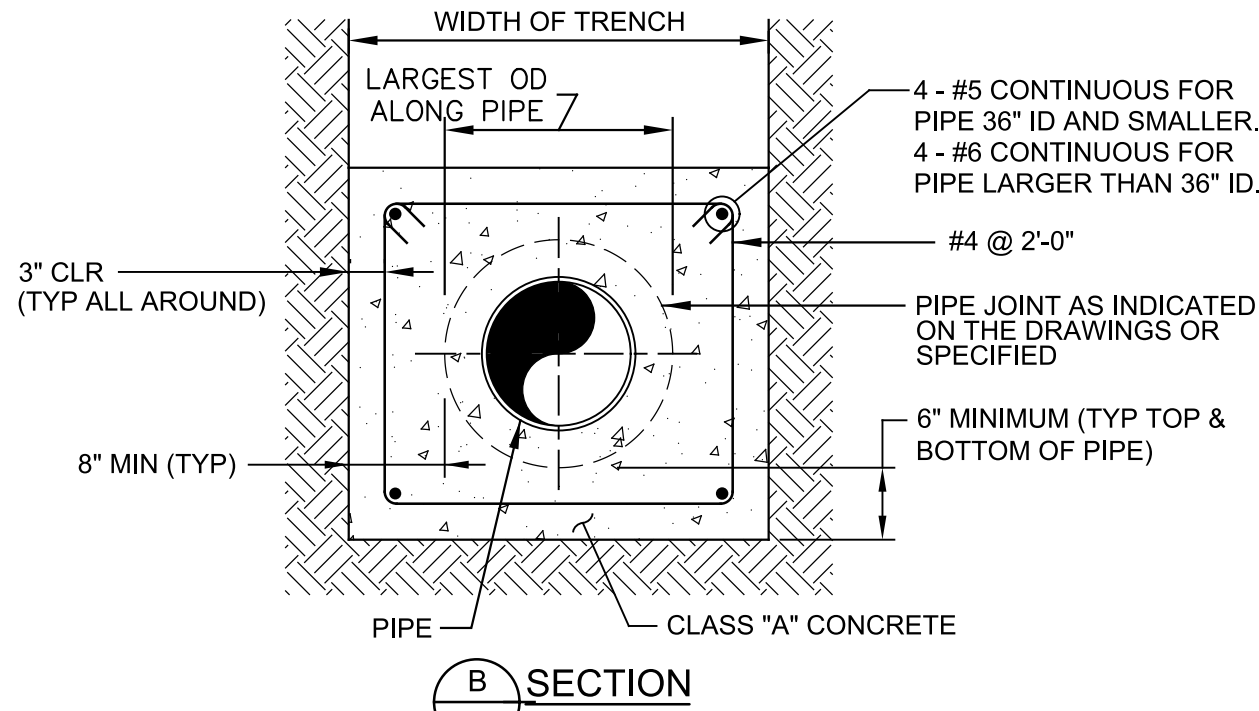
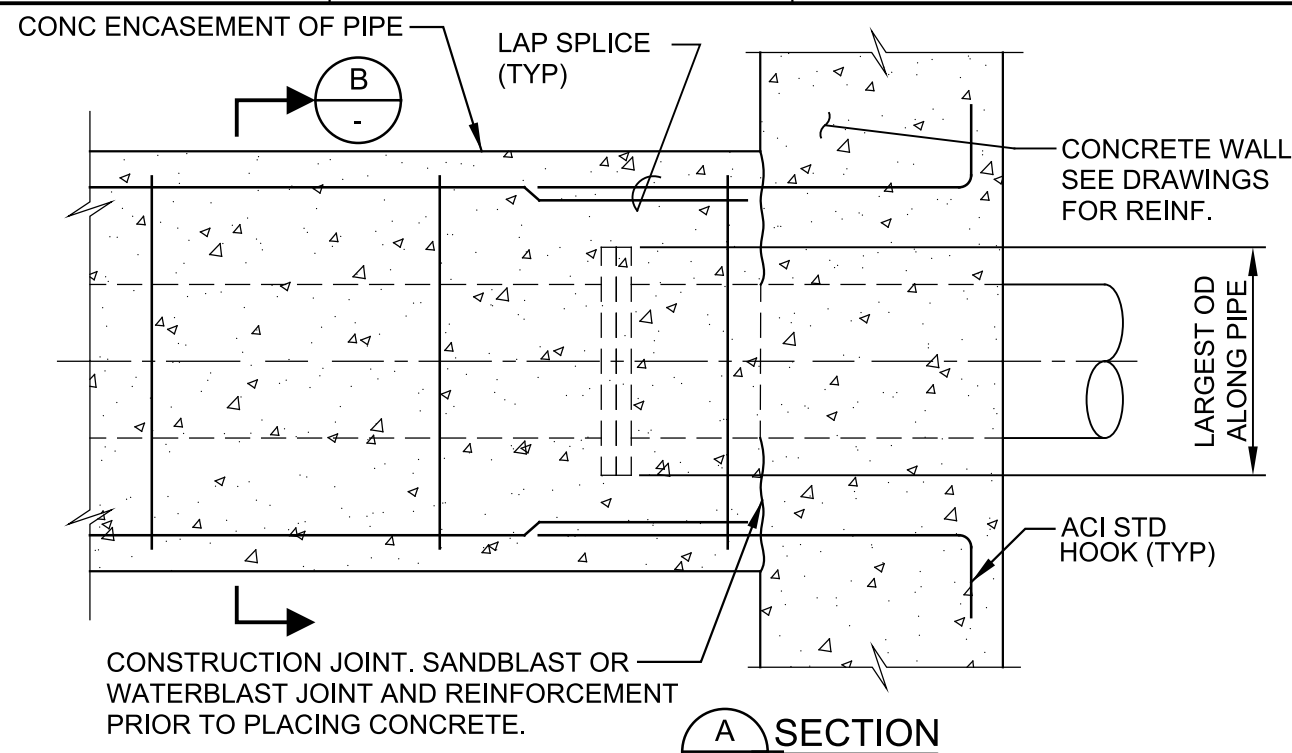
CLEANOUTS

TYP

S

SHEET 2 OF 2

07/31/08



- NOTE:
- TYPE OF PIPE AND TYPE OF PIPE JOINT OR COUPLER AS INDICATED ON THE DRAWINGS.

P040

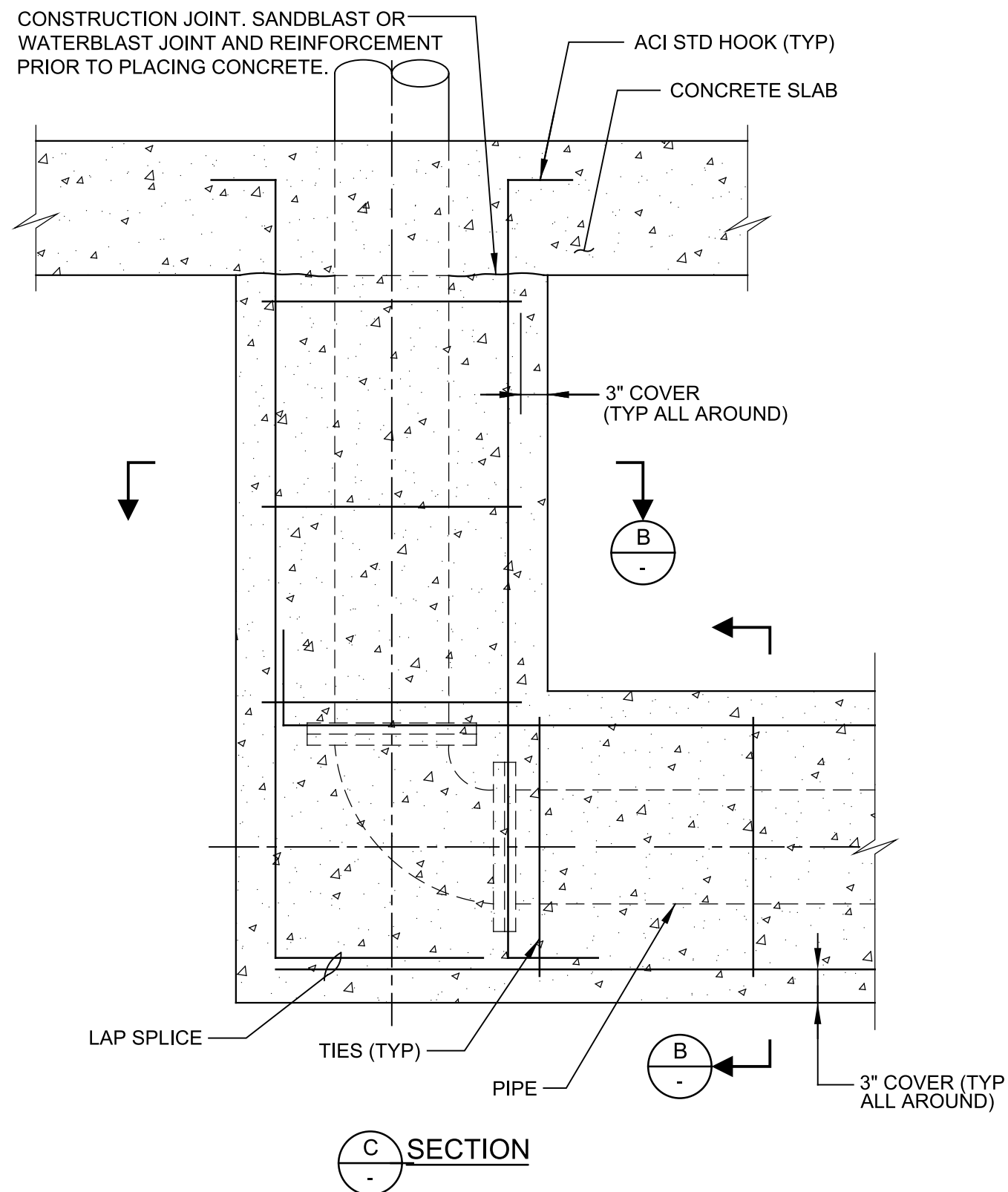
CONCRETE ENCASEMENT OF PIPE

TYP

NS

SHEET 1 OF 3

03/24/15



P040

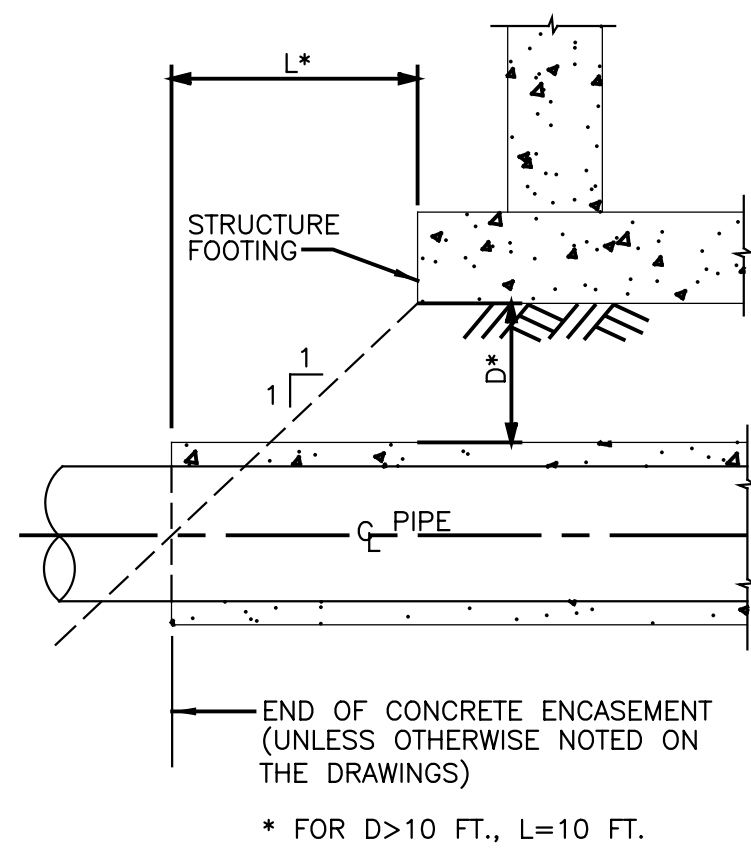
CONCRETE ENCASEMENT OF PIPE

TYP

NS

SHEET 2 OF 3

03/24/15



P040

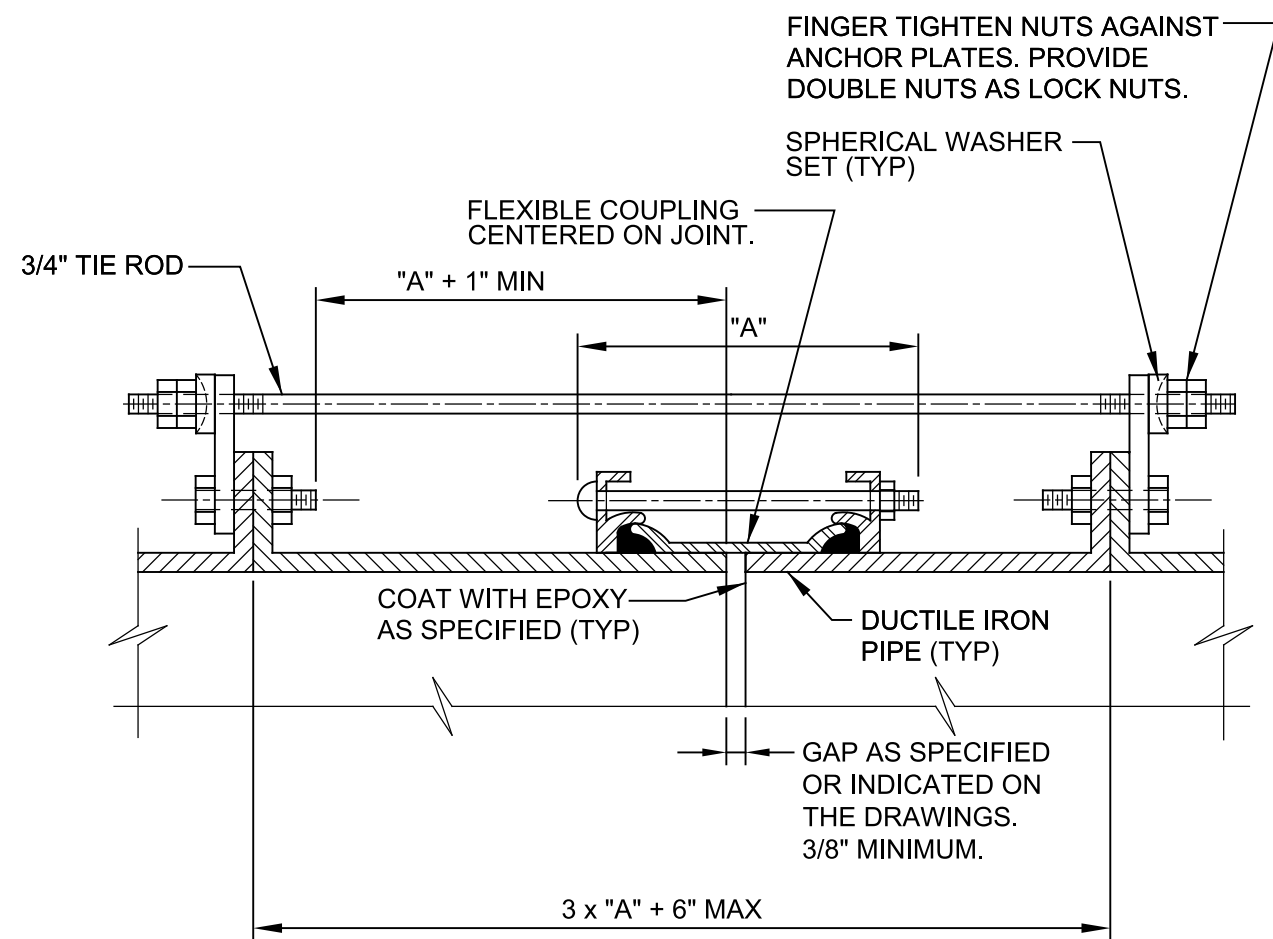
CONCRETE ENCASEMENT OF PIPE

TYP

NS

SHEET 3 OF 3

02/28/18



ROD SCHEDULE		
PIPE THRUST. SEE NOTE 2.	TYPE OF CONNECTION	NO. OF RODS
0-6,000#	I	2
6,001 - 12,000#	II	2
12,001 - 18,000#	II	3
18,001 - 24,000#	II	4
24,001 - 30,000#	II	5

P110

DIP FLEXIBLE COUPLING TIE DOWN

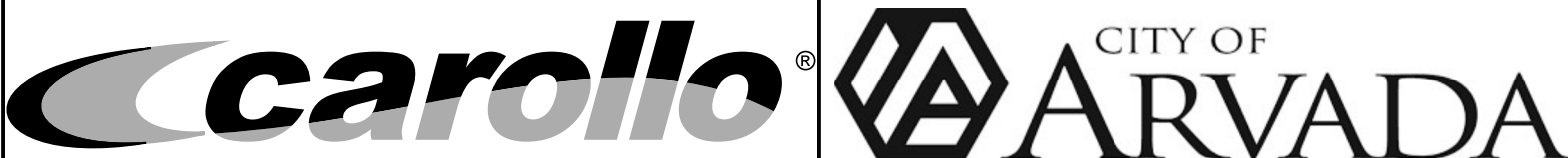
TYP

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SHEET 1 OF 2

04/21/15

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION				DESIGNED SH
				DRAWN TLR
				CHECKED WWS
				DATE OCTOBER 2022
REV	DATE	BY	DESCRIPTION	
1				
2				
3				



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
PIPING TYPICAL DETAILS 1

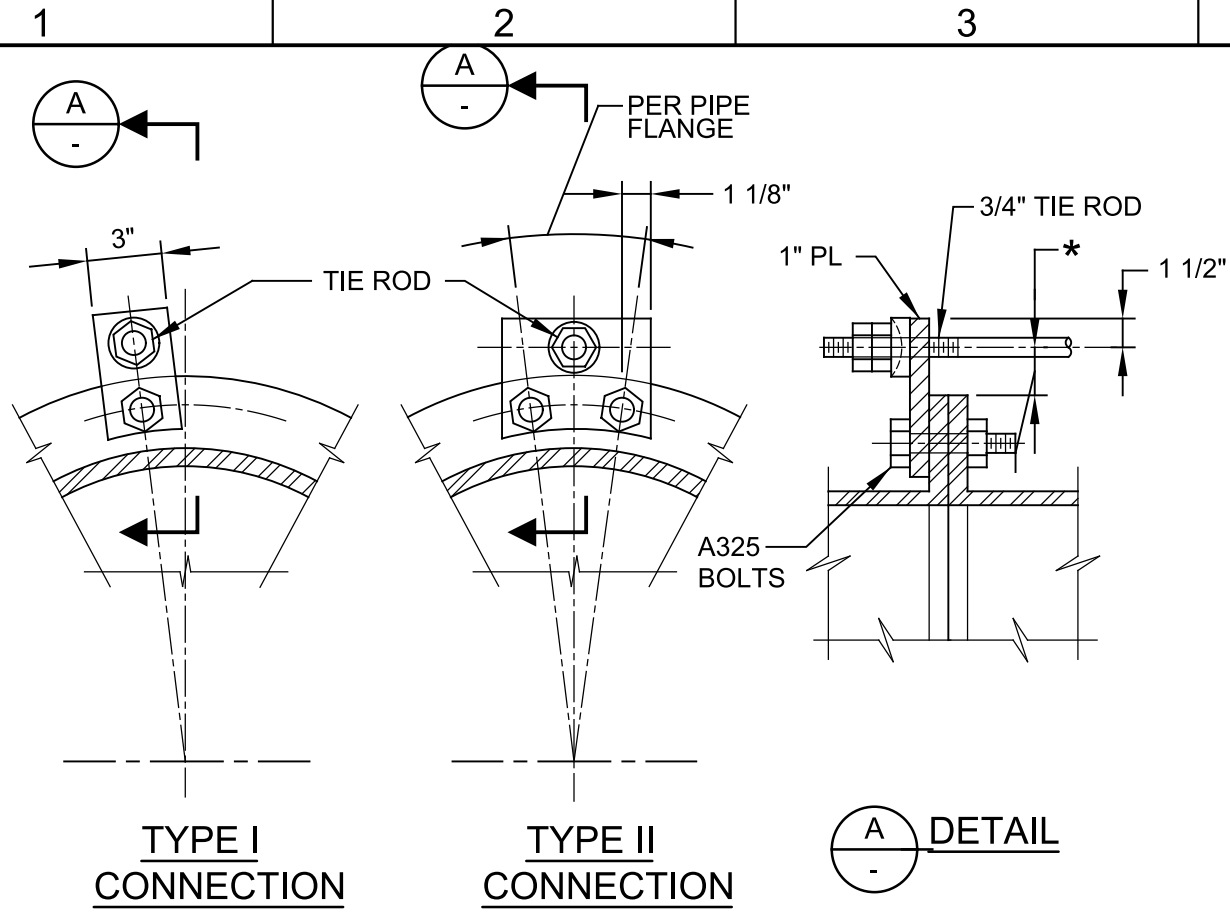
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

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LAST SAVED BY: irea



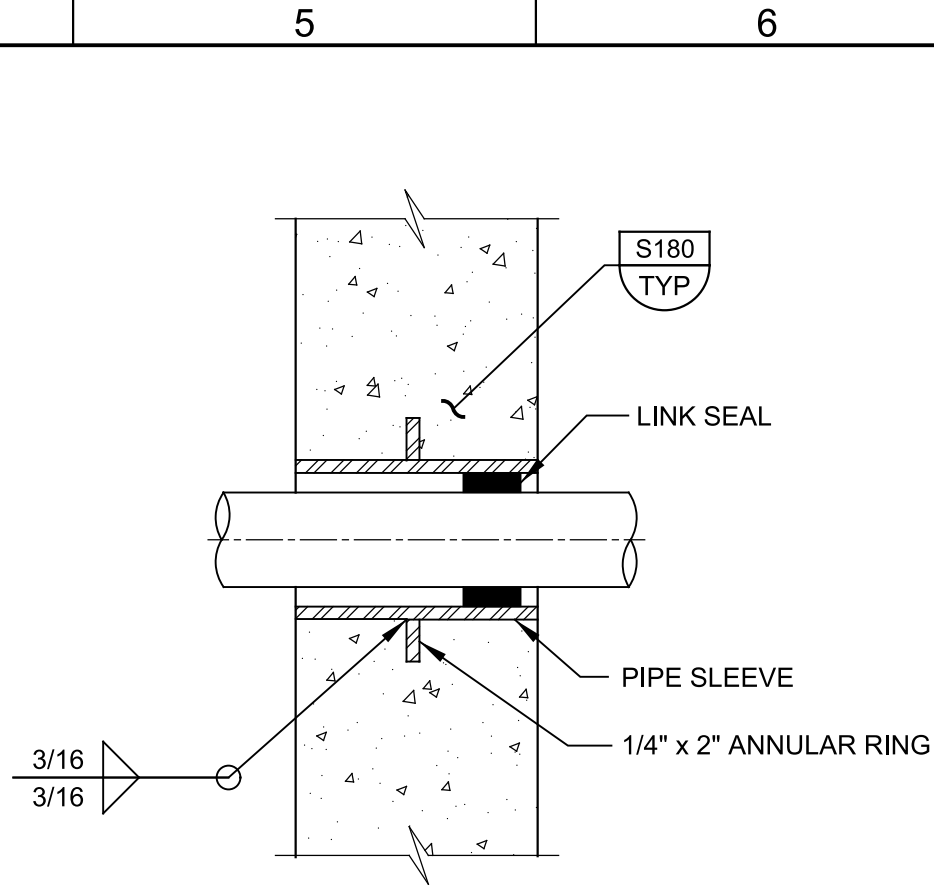
- NOTES:
- ALL EXPOSED FLEXIBLE COUPLINGS SHALL HAVE TIE RODS UNLESS SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS.
 - PIPE THRUST SHALL BE BASED ON TEST PRESSURE.
 - PIPE THRUST = $0.7854 \times D^2 \times \text{TEST PRESSURE}$, WHERE "D" IS PIPE OD.
 - MINIMUM TIE ROD YIELD = 48,000 PSI.
 - FOR THRUSTS GREATER THAN 30,000 POUNDS, ADD ONE 3/4 INCH DIAMETER TIE ROD FOR EVERY 6,000 POUNDS INCREASE IN THRUST.
 - ALL ROD CONNECTIONS SHALL BE TYPE II FOR THRUSTS GREATER THAN 30,000 POUNDS.
 - GRIND ALL CORNERS SMOOTH.
 - * = AS REQUIRED TO CLEAR FLEXIBLE COUPLING. 3/4" MINIMUM AND 1 1/2" MAXIMUM.

P110 DIP FLEXIBLE COUPLING TIE DOWN

TYP

SHEET 2 OF 2

04/21/15

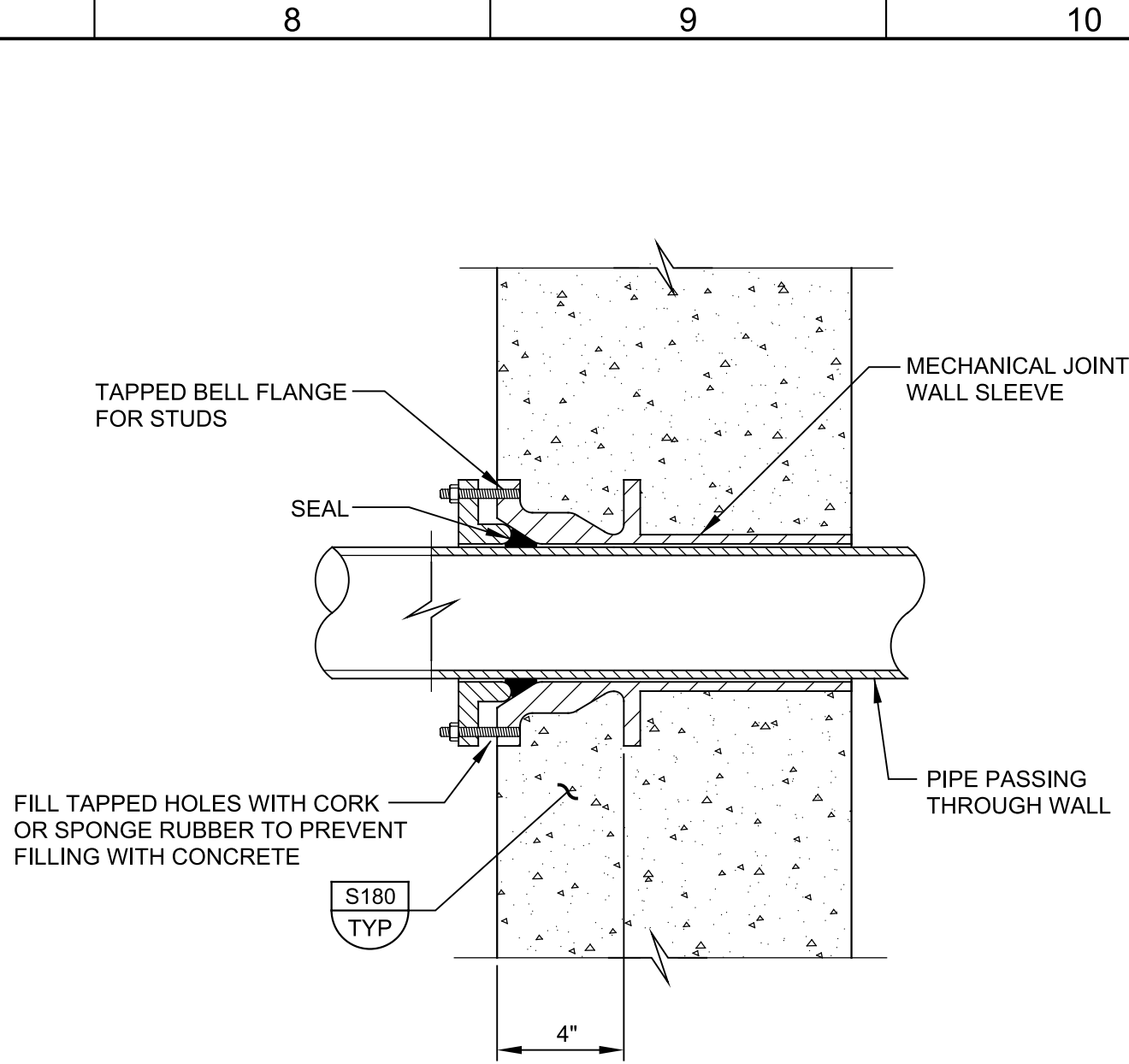


- NOTES:
- 6"Ø SLEEVES AND SMALLER SHALL BE SCH 40 STEEL PIPE.
 - SLEEVES LARGER THAN 6"Ø SHALL BE 1/4" THICK STEEL PIPE.
 - IN WALLS THICKER THAN 12", LINK SEAL SHALL BE INSTALLED AT BOTH ENDS OF WALL SLEEVE. SLEEVE DIAMETER SHALL BE PER LINK SEAL MANUFACTURER'S RECOMMENDATION.
 - SLEEVE SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.

P304 SLEEVE INSTALLATION THROUGH WALLS AND FLOOR SLABS

TYP

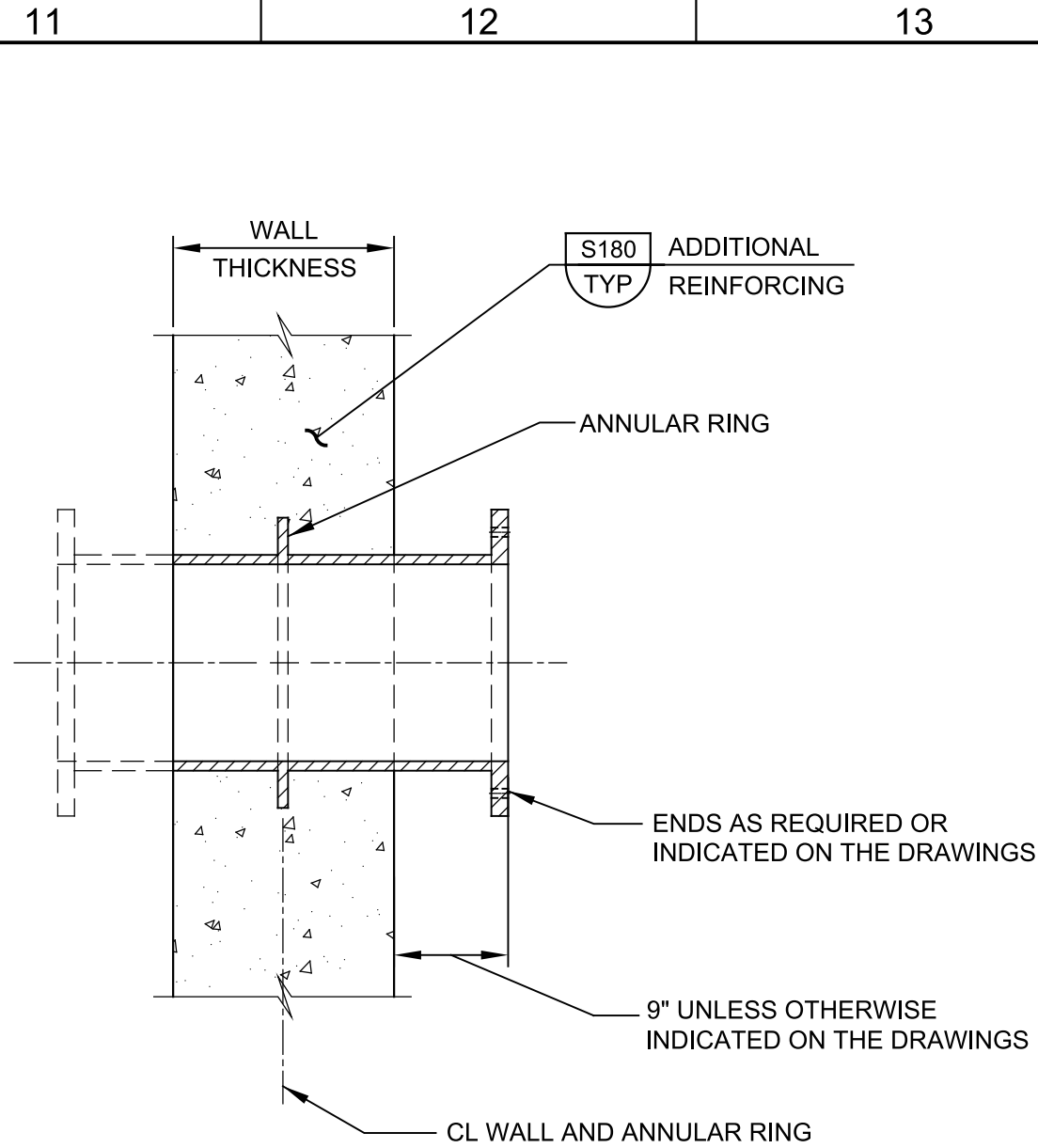
08/01/05



P308 DIP PIPE SLEEVE

TYP

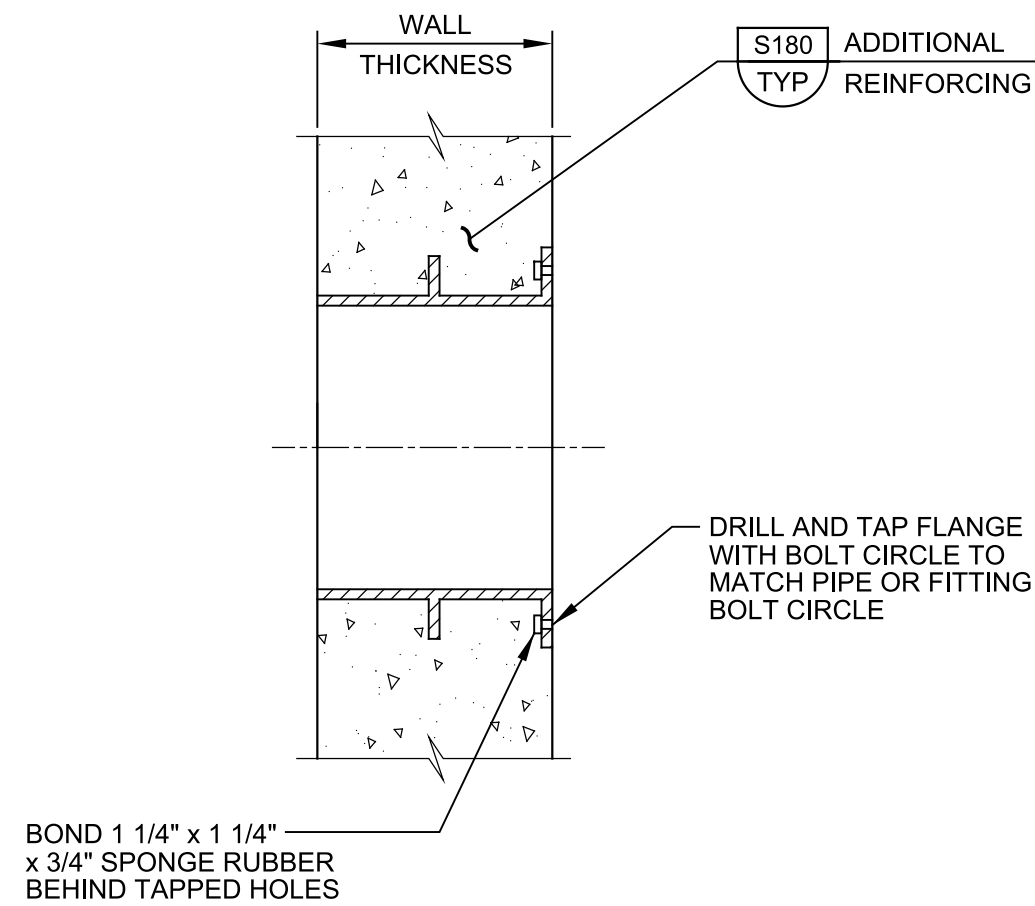
07/31/08



P312 WALL THIMBLE FOR DIP

TYP

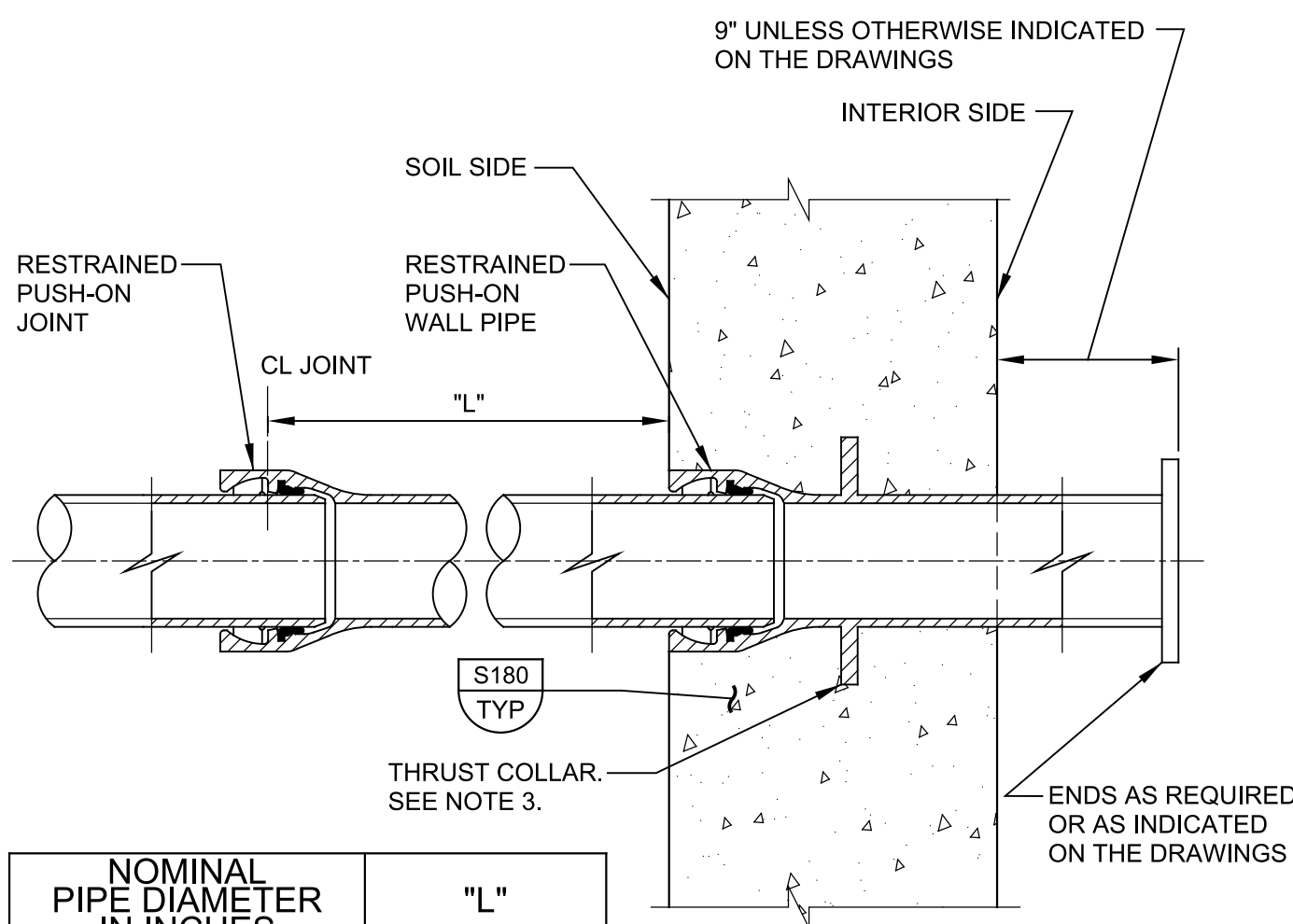
01/30/2015



P314 WALL THIMBLE WITH TAPPED FLANGE FOR DIP

TYP

08/01/05

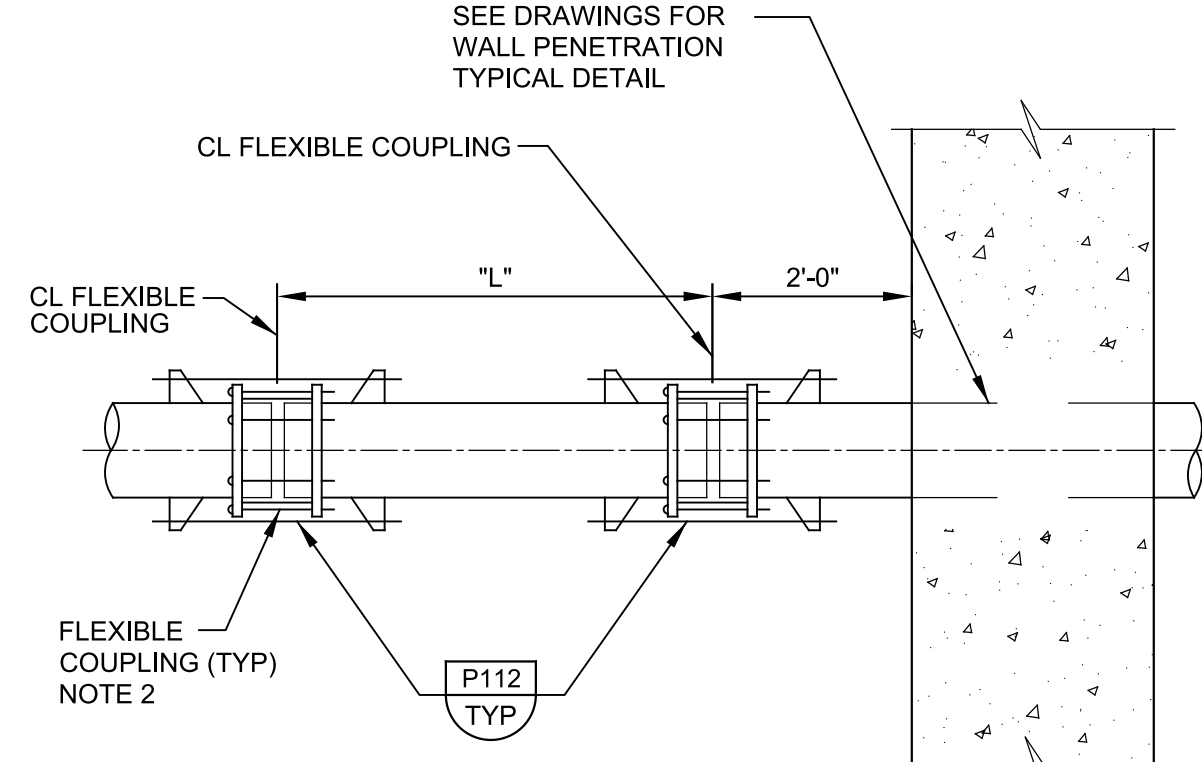


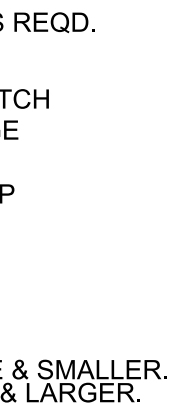
- NOTES:
- FLEXIBLE CONNECTION IS DESIGNED TO ACCOMMODATE SETTLEMENT AND EARTHQUAKE MOVEMENT.
 - PIPES SHALL BE INSTALLED STRAIGHT WITHOUT HORIZONTAL OR VERTICAL OFFSET. DO NOT USE JOINT ANGULAR DEFLECTION TO MAKE UP FOR MISALIGNED PIPE.
 - WALL PIPE WITH WEEP RING (THRUST COLLAR) SHALL BE CAPABLE OF RESISTING THRUST.

P342 RESTRAINED DIP FLEXIBLE CONNECTION AT WALL PENETRATION

TYP

07/31/08





TYP J 02/06/18



TYP NS 09/04/13

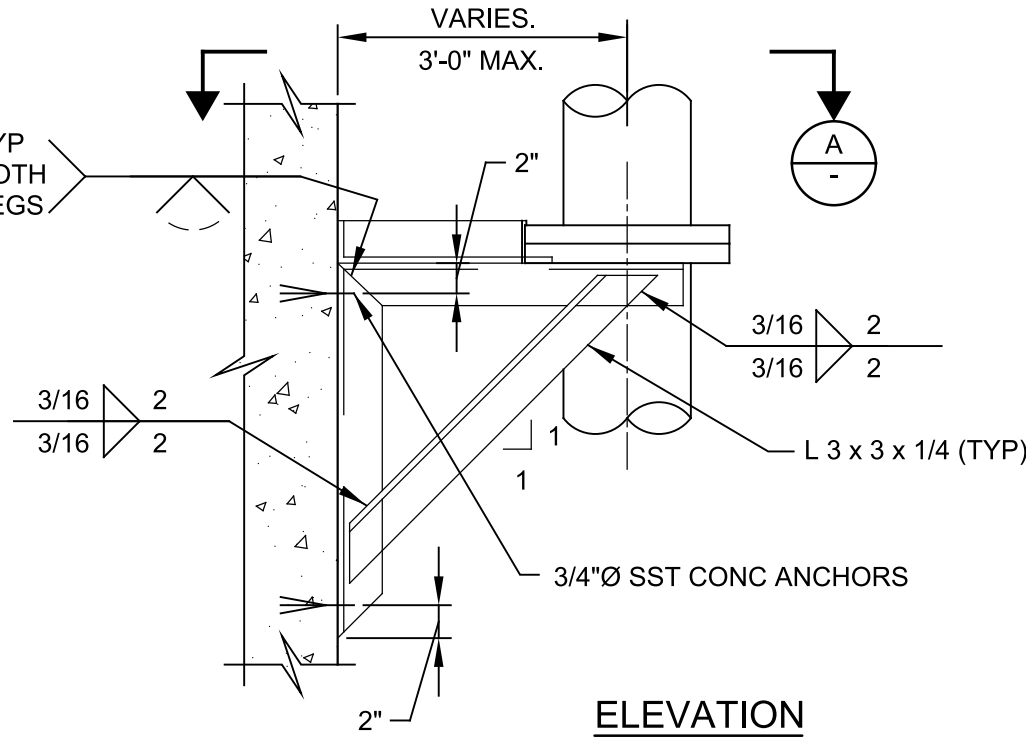
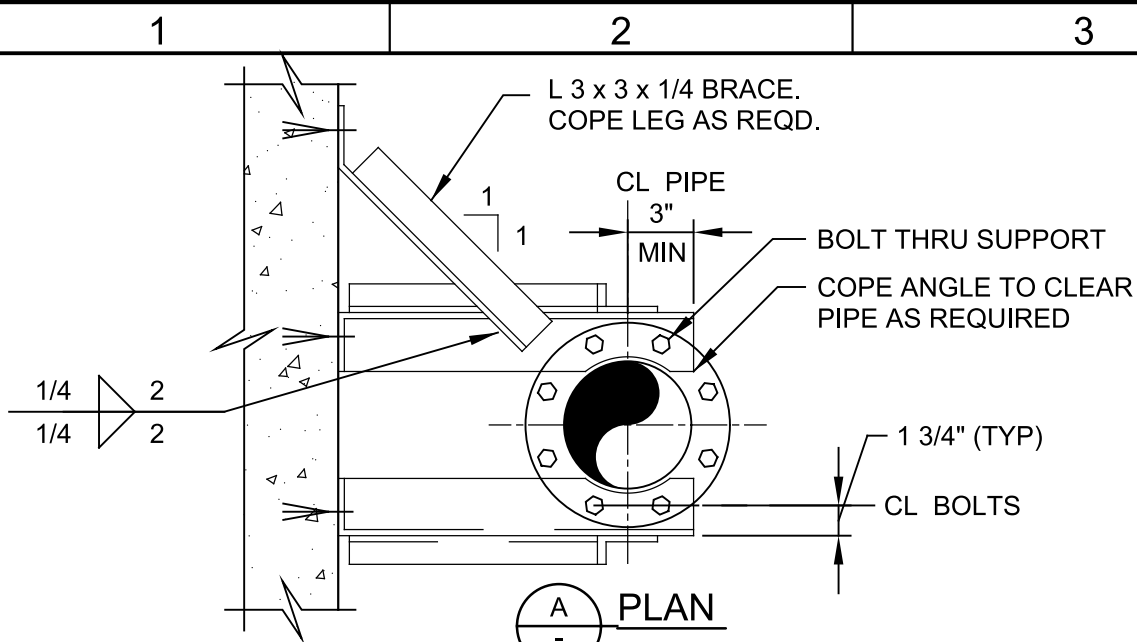


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LAST SAVED BY: irea

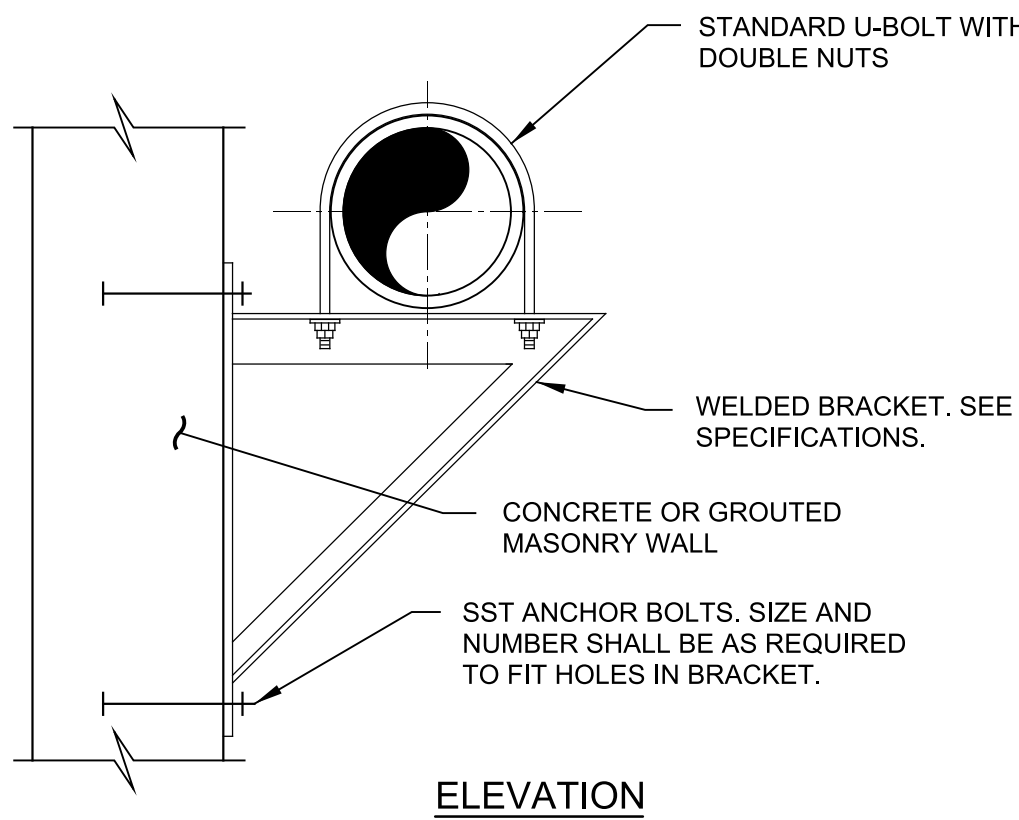
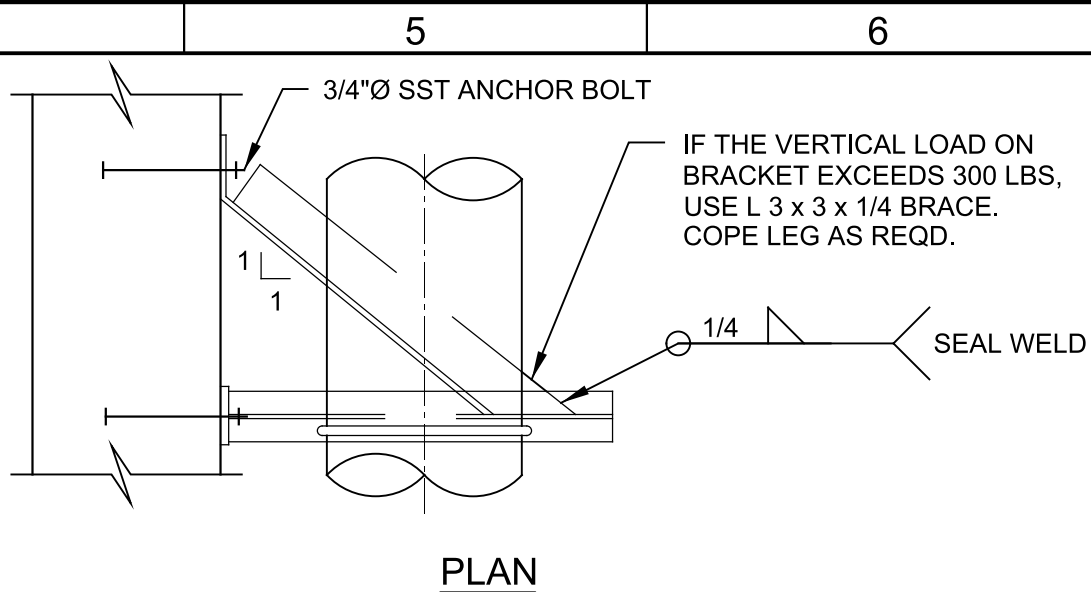


- NOTE:
- HOT-DIP GALVANIZE SUPPORT AFTER FABRICATION.

P656 VERTICAL PIPE SUPPORT - WALL BRACKET INSIDE

TYP
N

07/31/08

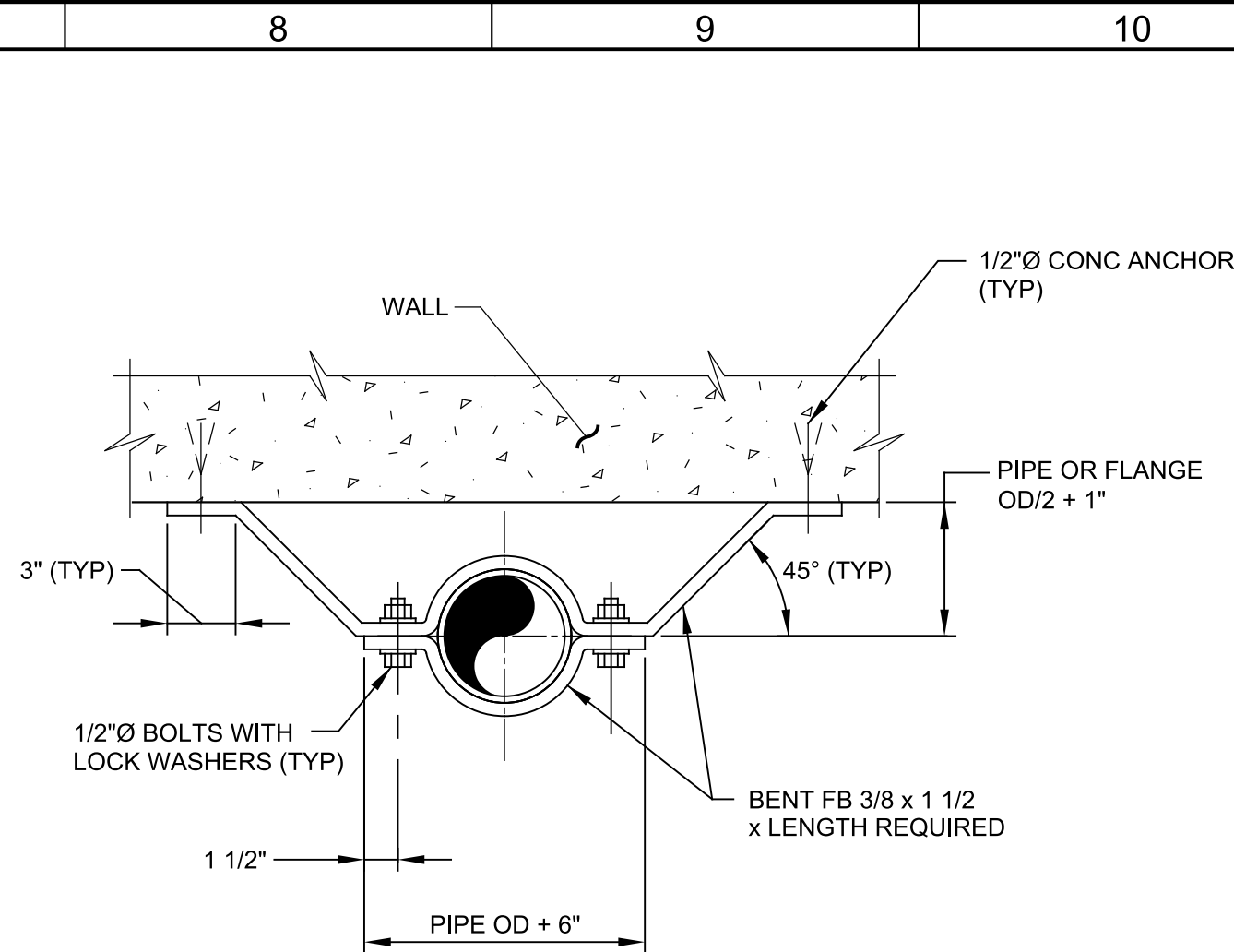


- NOTES:
- MAXIMUM ALLOWABLE VERTICAL LOAD IS THE SMALLER OF 1500 POUNDS AND THE MANUFACTURERS MAXIMUM ALLOWABLE BRACKET LOAD.
 - HOT-DIP GALVANIZE SUPPORT AFTER FABRICATION.
 - ISOLATE ALL COPPER PIPE WITH PVC TAPE.

P658 PIPE SUPPORT - WALL BRACKET BELOW

TYP
N

04/10/19

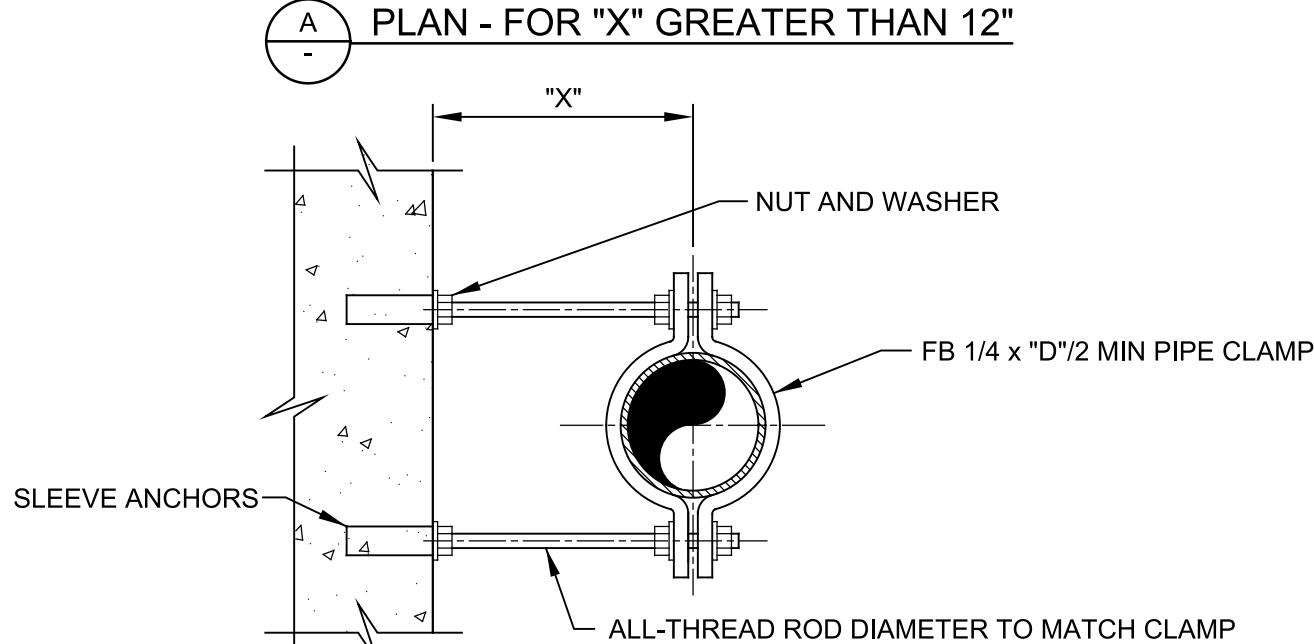
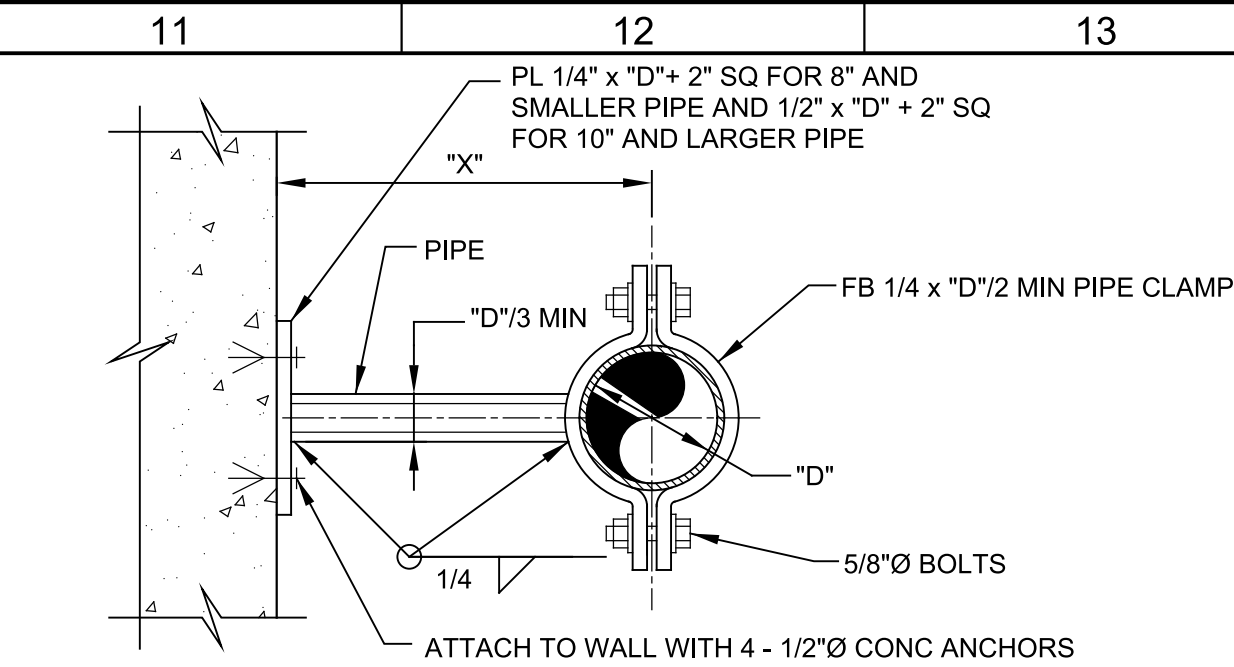


- NOTE:
- IF SUPPORT IS SUBMERGED OR LOCATED BELOW THE TOP OF WALL IN WATER BEARING STRUCTURE, ALL MATERIAL SHALL BE STAINLESS STEEL. IN ALL OTHER AREAS, ALL MATERIAL SHALL BE HOT-DIP GALVANIZED STEEL UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

P666 VERTICAL PIPE SWAY BRACE

TYP
N

07/31/08

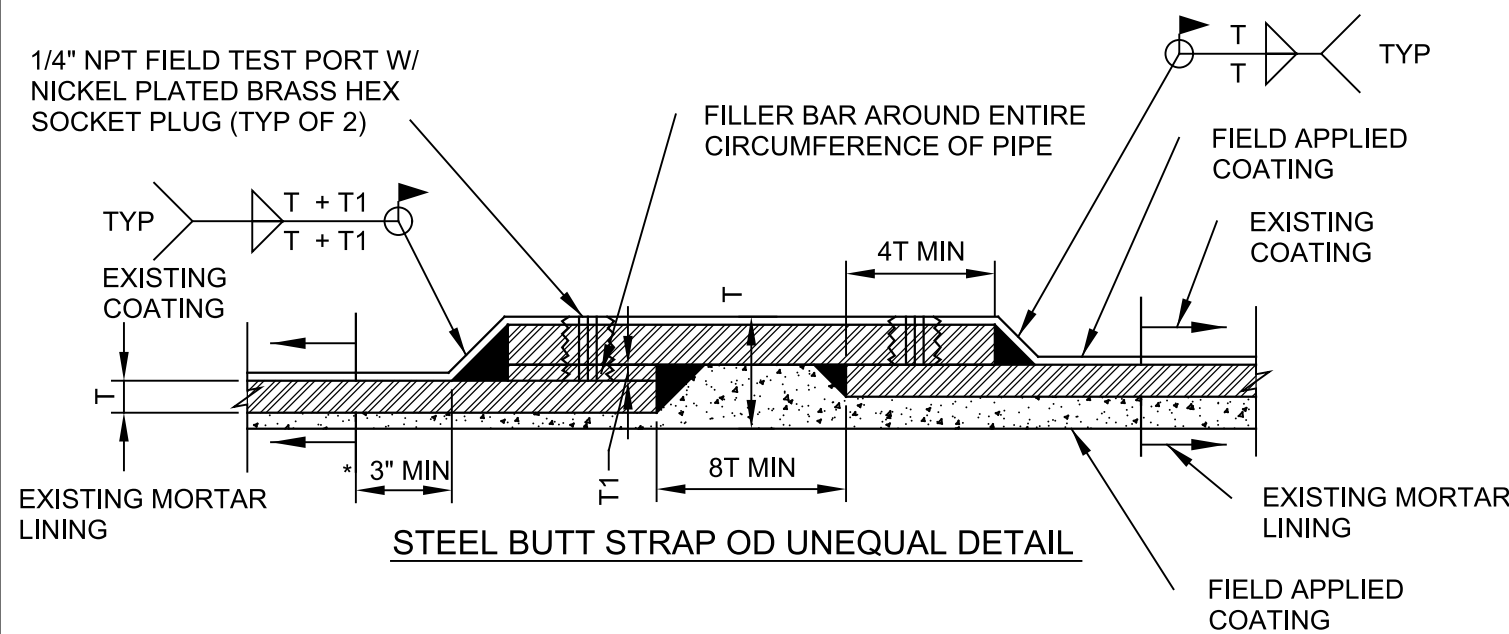
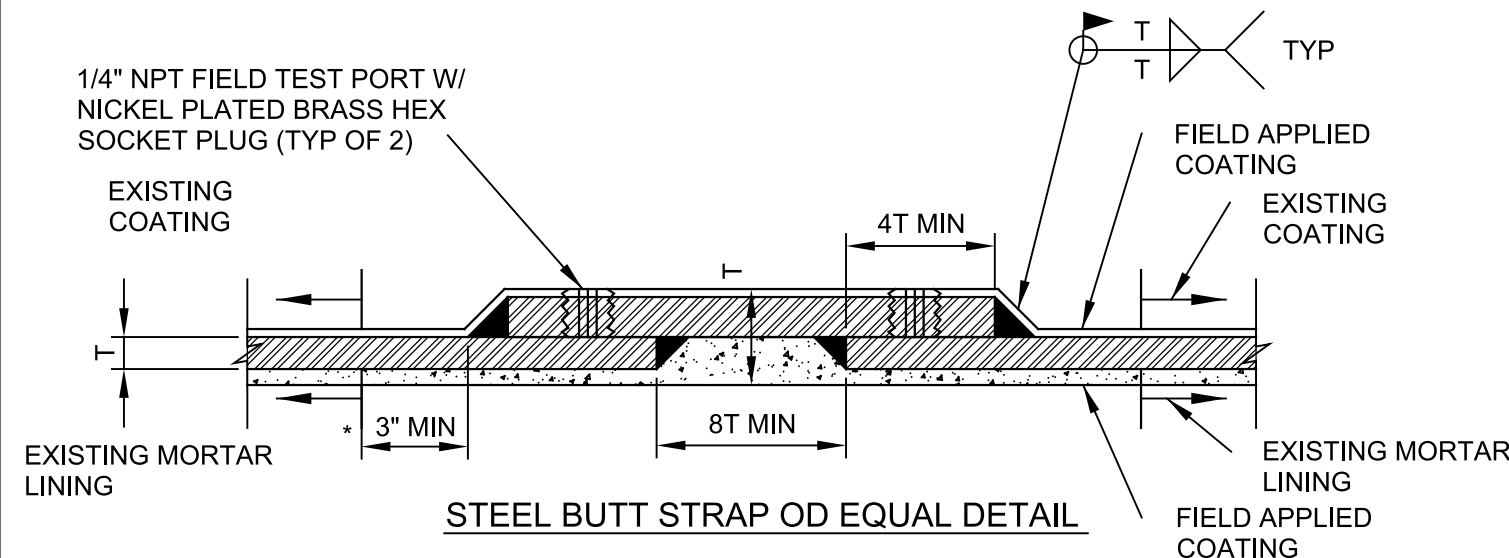


- NOTE:
- IF SUPPORT IS SUBMERGED OR LOCATED BELOW THE TOP OF WALL IN WATER BEARING STRUCTURE, ALL MATERIAL SHALL BE STAINLESS STEEL. IN ALL OTHER AREAS, ALL MATERIAL SHALL BE HOT-DIP GALVANIZED STEEL UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

P668 VERTICAL PIPE SWAY BRACE

TYP
S

07/31/08



- NOTES:
- * DENOTES COATING/LINING HOLDBACK.
 - IF TWO STEEL CYLINDERS OF DIFFERENT THICKNESSES ARE CONNECTED, T SHALL BE THE LARGER DIMENSION OF THE TWO CYLINDERS THICKNESSES.

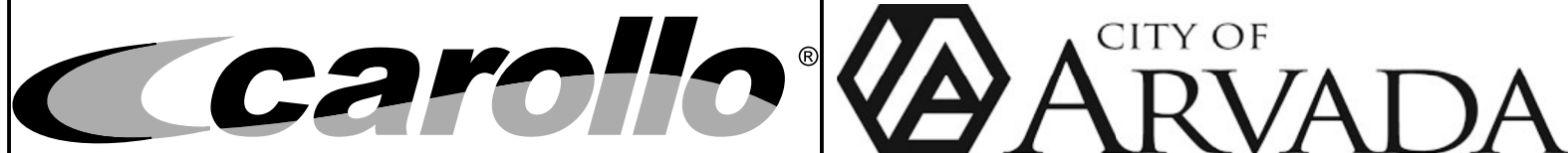
P835 BUTT-STRAP JOINT

TYP
J

07/27/18

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

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DATE
OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
PIPING TYPICAL DETAILS 4

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

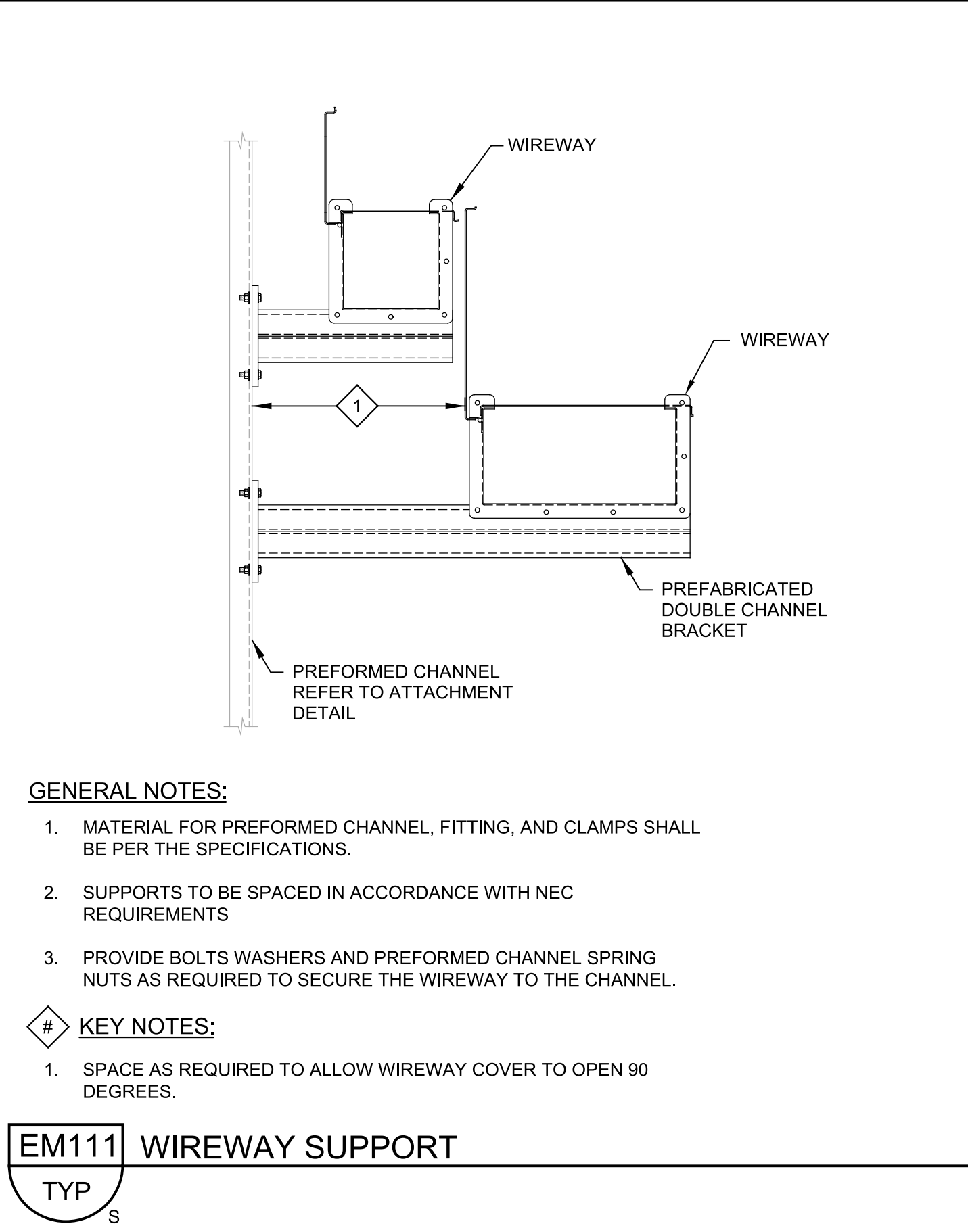
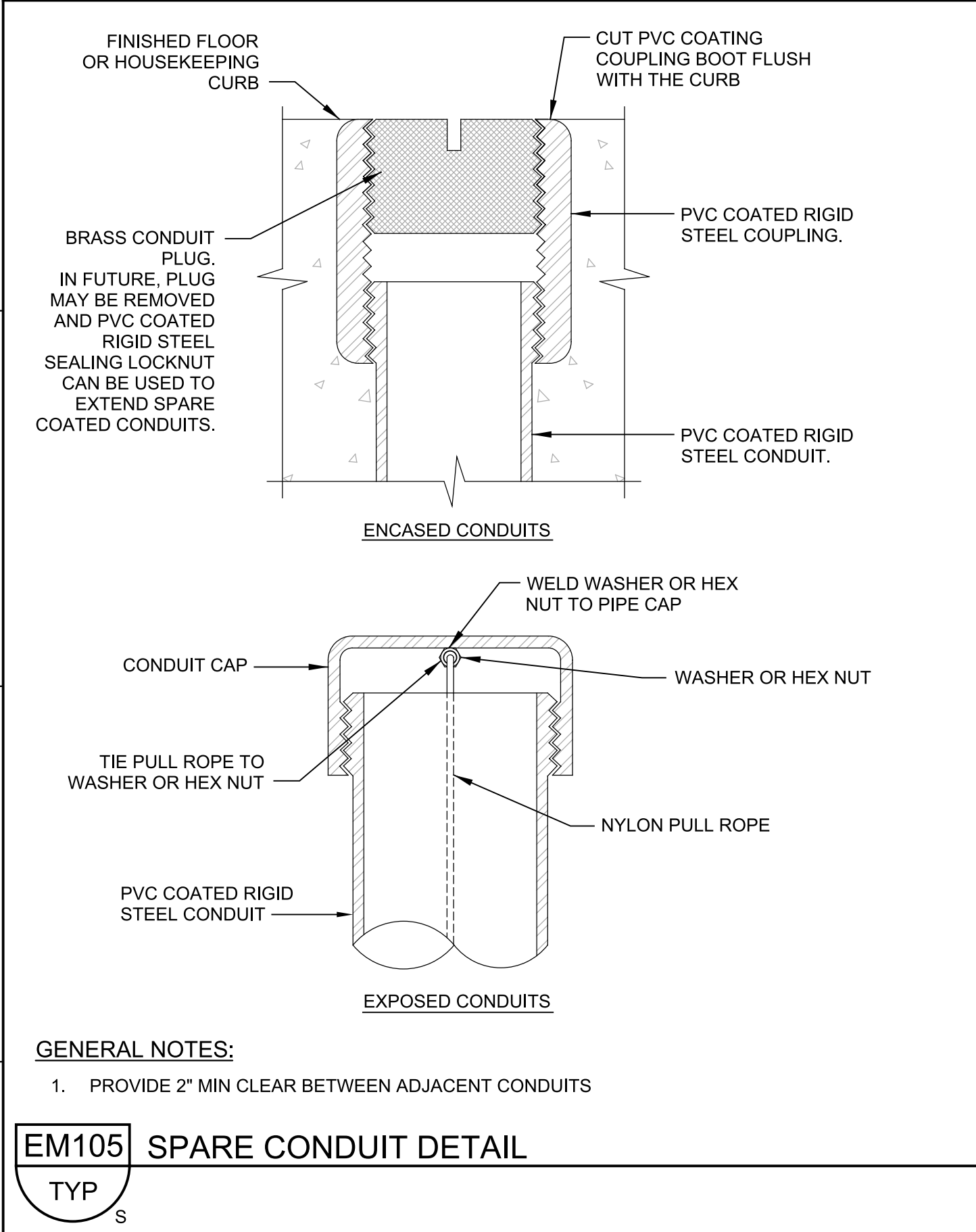
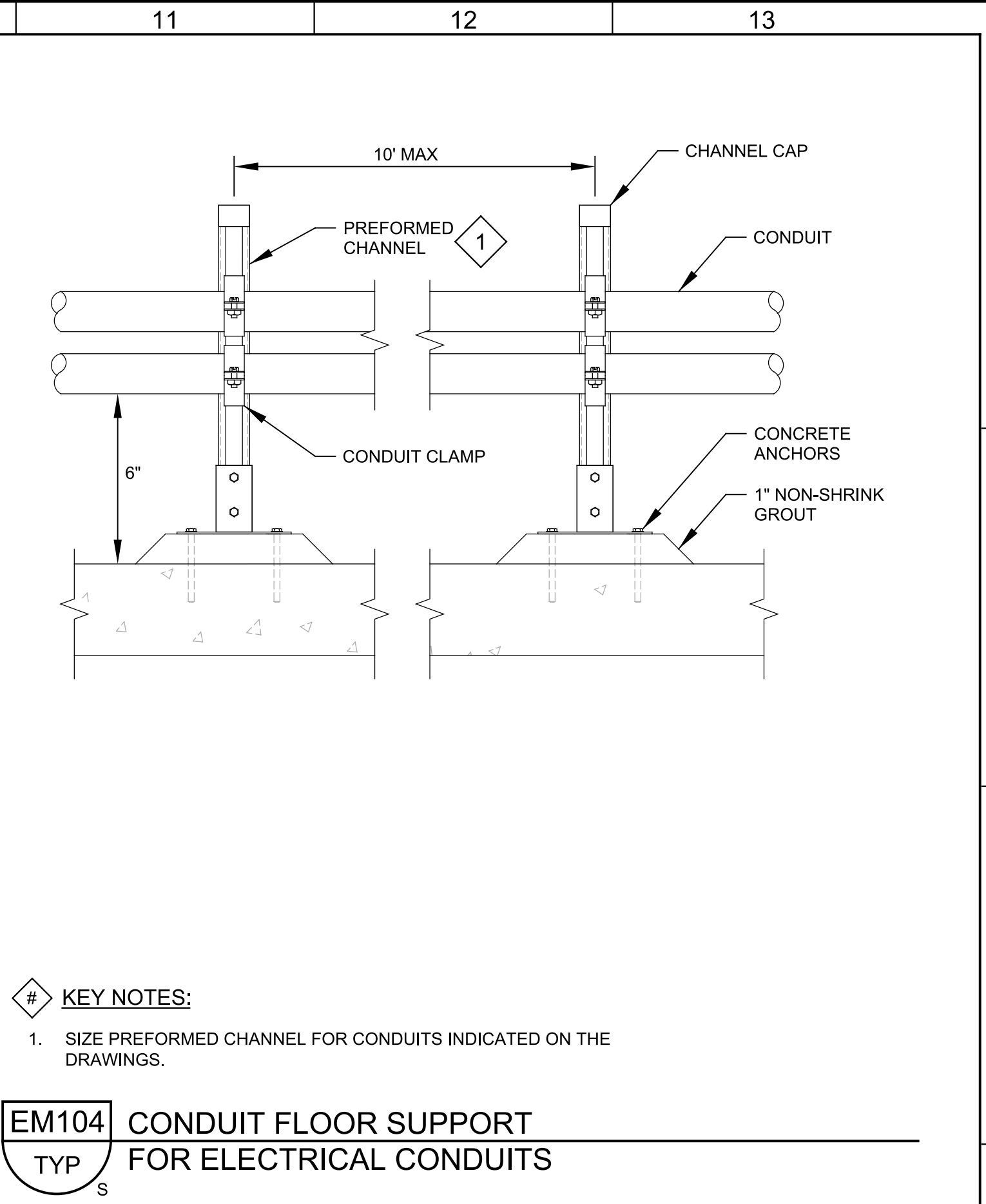
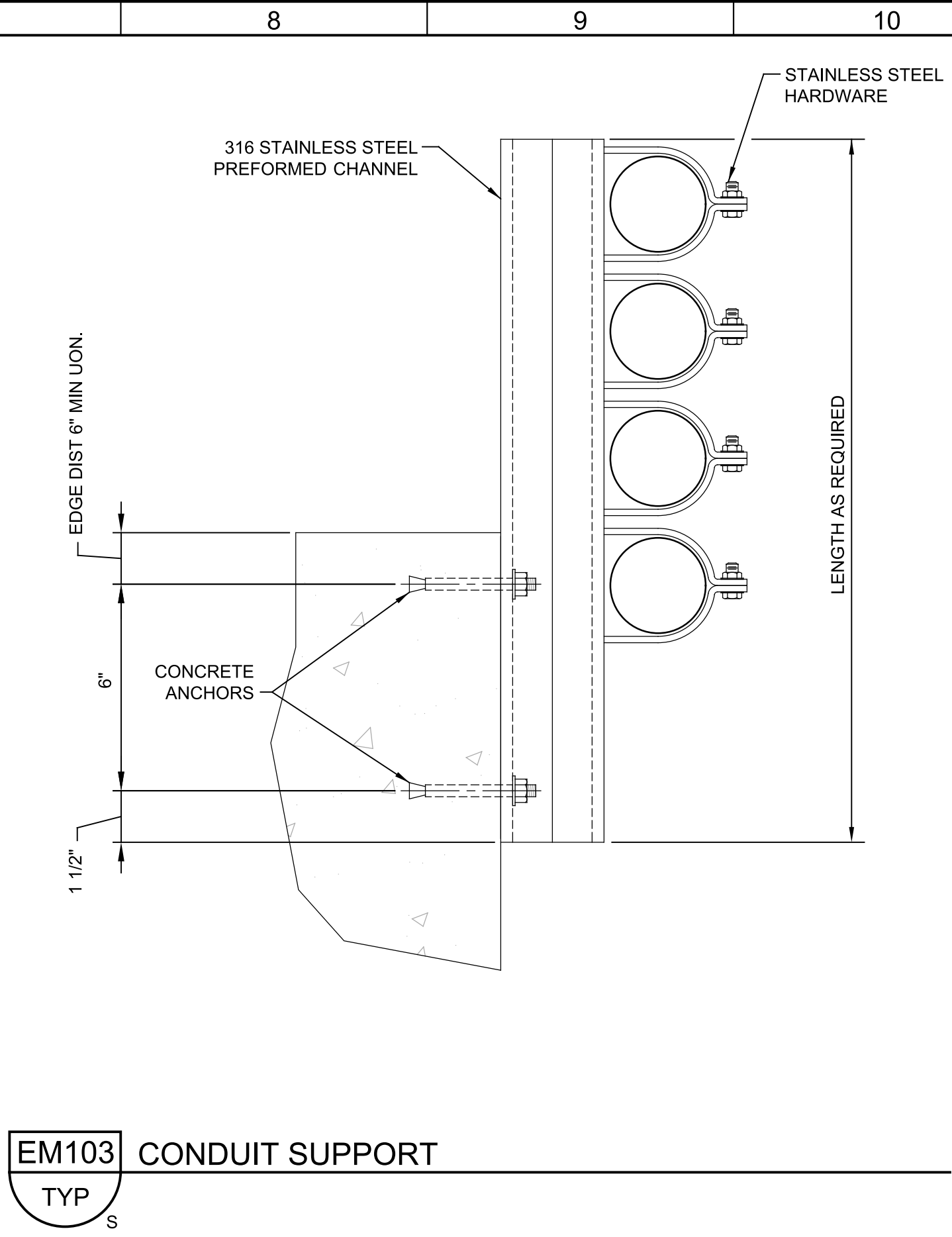
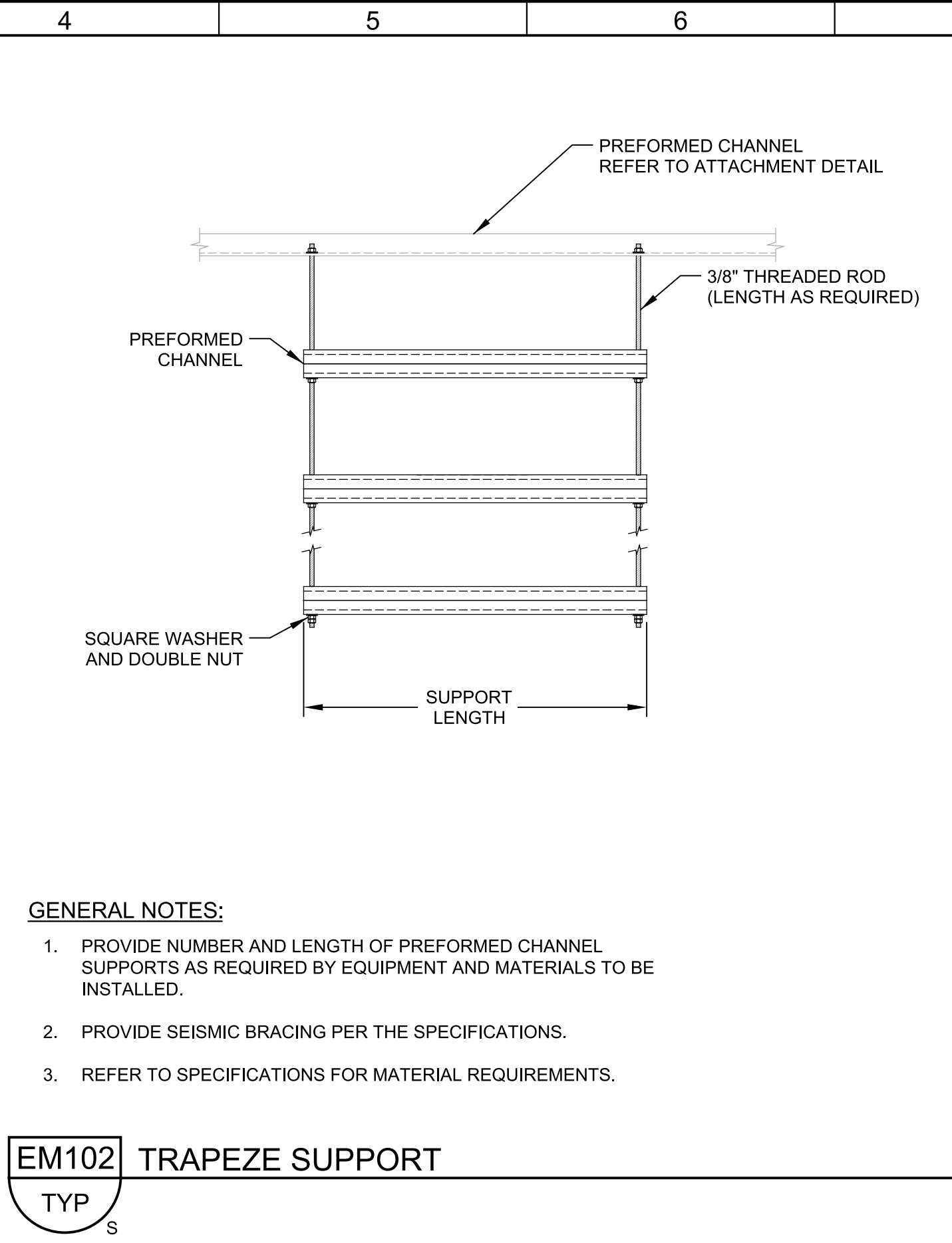
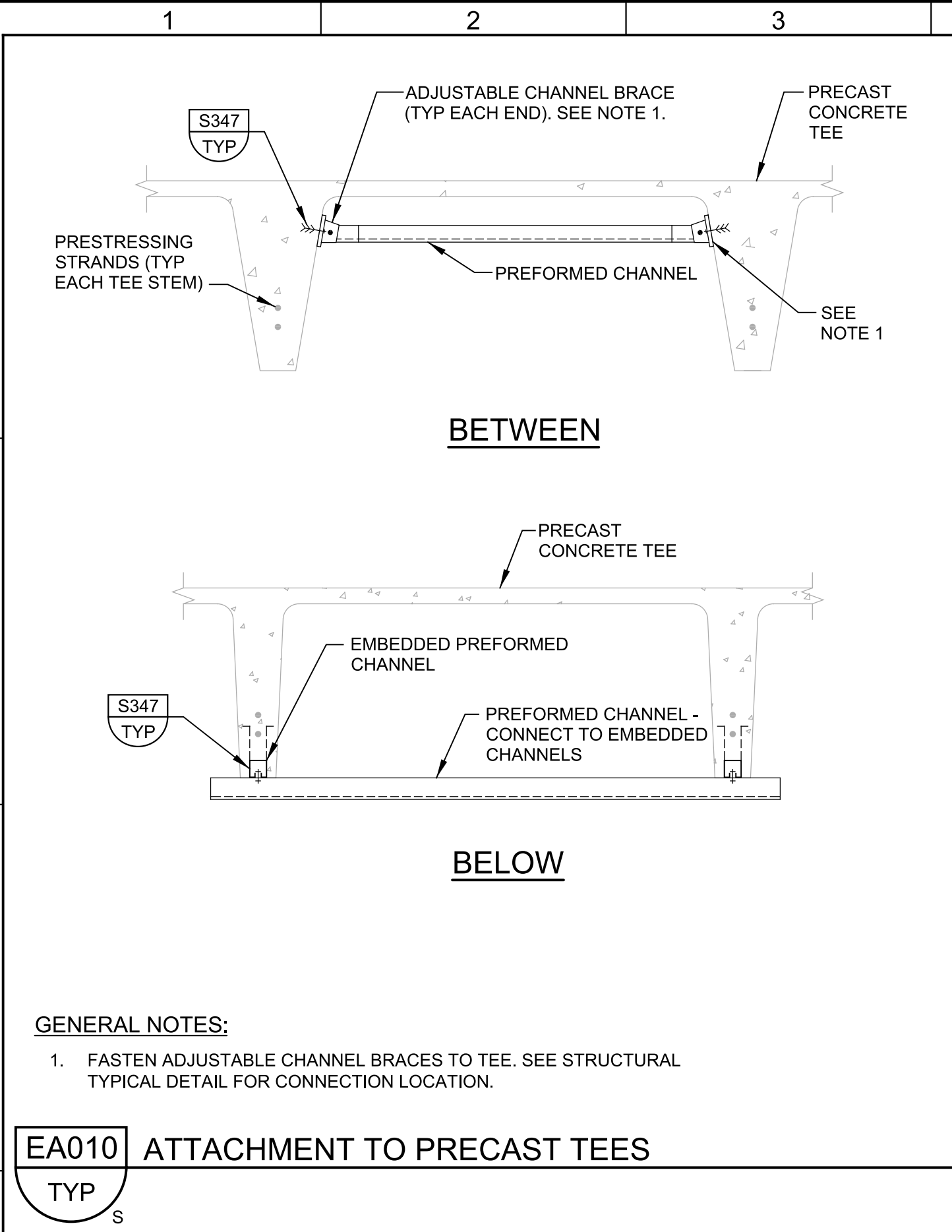
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SHEET NO.
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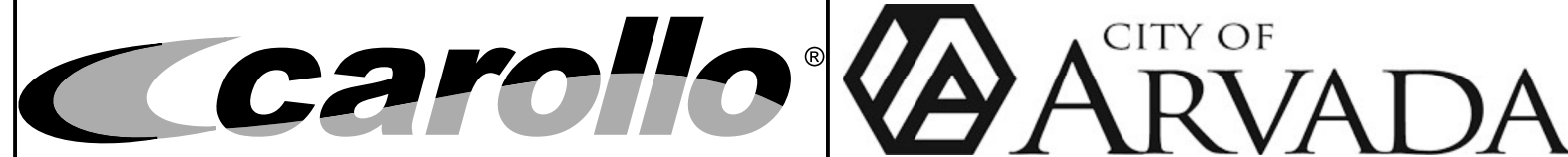
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				CHECKED	
				DATE OCTOBER 2022	
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CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

TYPICAL DETAILS

ELECTRICAL TYPICAL DETAILS 1

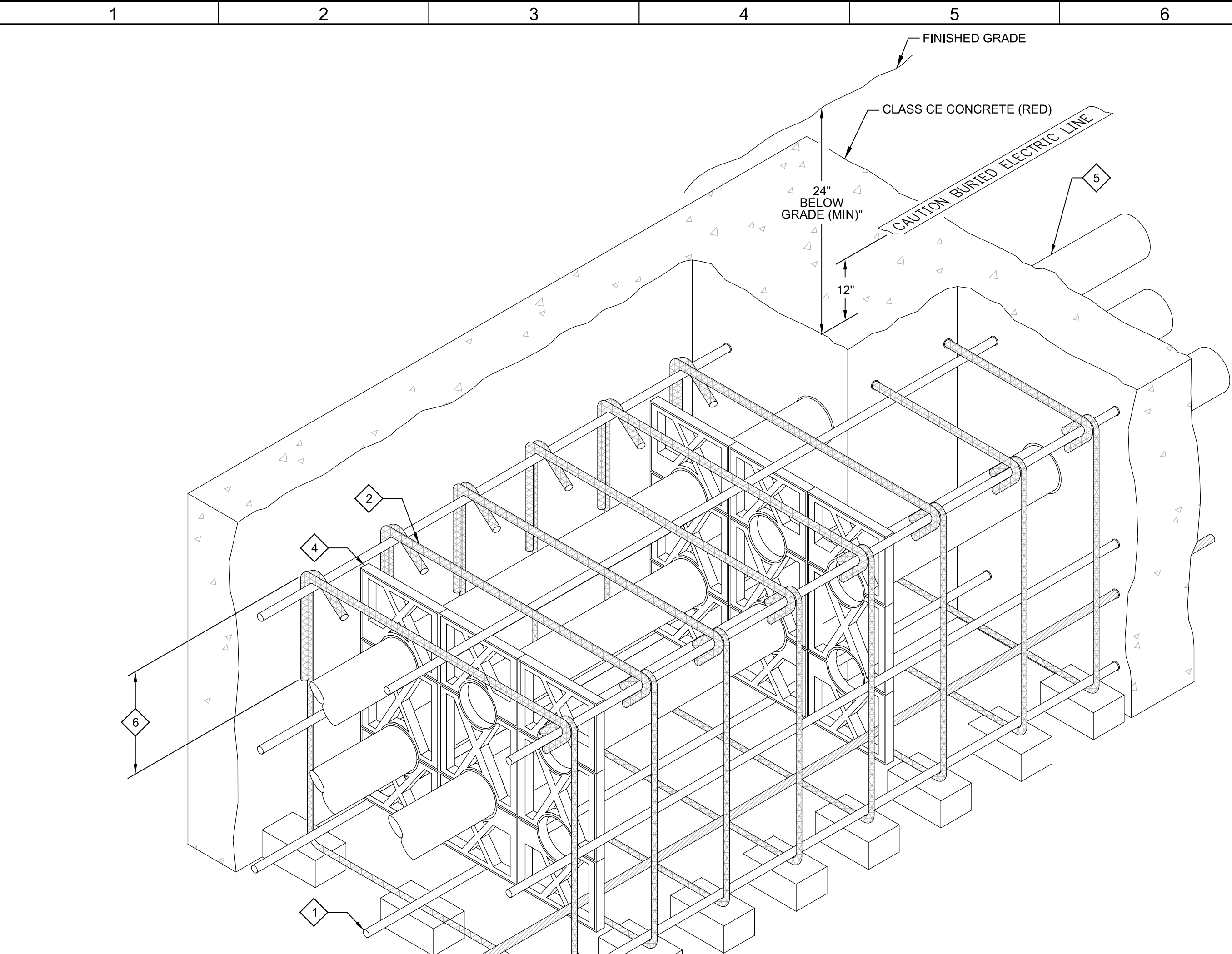
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

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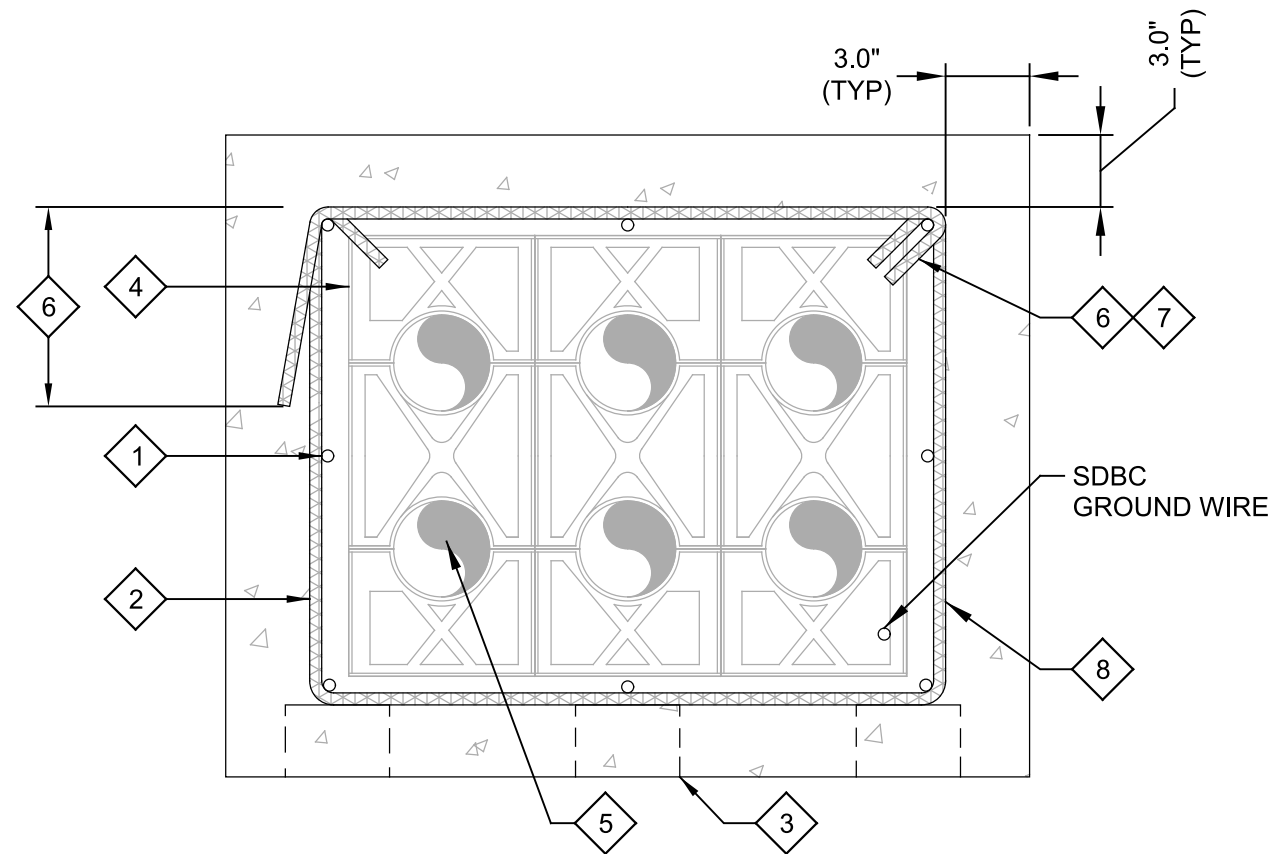
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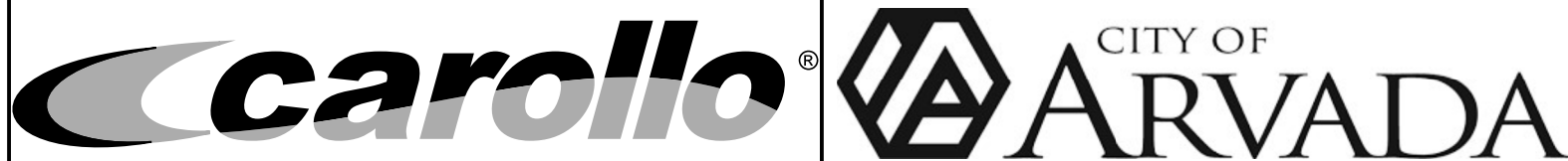
- GENERAL NOTES:**
- DIMENSIONS SHOWN ARE MINIMUM.
 - ADJUST SIZE OF DUCT BANK BASED UPON THESE GUIDELINES AND THE DUCT BANK SPECIFICATION TO ACCOMMODATE ACTUAL NUMBER OF CONDUITS WITHIN DUCT BANK. REFER TO DUCT BANK SECTIONS, AND CONDUIT SCHEDULE FOR NUMBER AND SIZE OF CONDUITS.
 - MAKE PROVISIONS TO PREVENT CONDUIT FLOTATION DURING CONCRETE PLACEMENT & CURING.
- KEY NOTES:**
- #4 REINFORCING STEEL 12" MAXIMUM ON CENTER AROUND ENTIRE PERIMETER OF DUCT BANK.
 - #4 REINFORCING STEEL TIES MAXIMUM 24" ON CENTER ALONG LENGTH OF DUCT BANK.
 - MINIMUM OF TWO PRECAST CONCRETE BAR SUPPORTS PLACED UNDER A TIE AT EACH PVC CONDUIT SPACER ALONG LENGTH OF DUCT BANK. PROVIDE PRECAST BAR SUPPORTS AT INTERVALS OF 24" TO REDUCE DEFLECTION.
 - PVC CONDUIT SPACERS ON 8'-0" CENTERS (MAXIMUM). LOCATE 12" FROM TIES.
 - REFER TO DUCT BANK SECTIONS AND SPECIFICATIONS FOR CONDUIT REQUIREMENTS.
 - 1'-4" OR 135 DEGREE HOOK FOR SHALLOW DUCT BANKS SHALLOWER THAN 21"
 - CONTRACTOR'S OPTION TO PROVIDE 1'-4" LAP LENGTH EACH SIDE OF HORIZONTAL TIE.
 - LOWER PORTION OF TIES COULD BE U-BARS IF UPPER PORTIONS PROVIDES 1'-4" VERTICAL LEGS EACH SIDE.
 - BOND THE DUCT BANK GROUND WIRE TO THE GROUNDING SYSTEM AT BOTH ENDS OF THE DUCT BANK.
- #4/0 SDBC GROUND WIRE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.



EM001 REINFORCED CONCRETE DUCT BANK

TYP

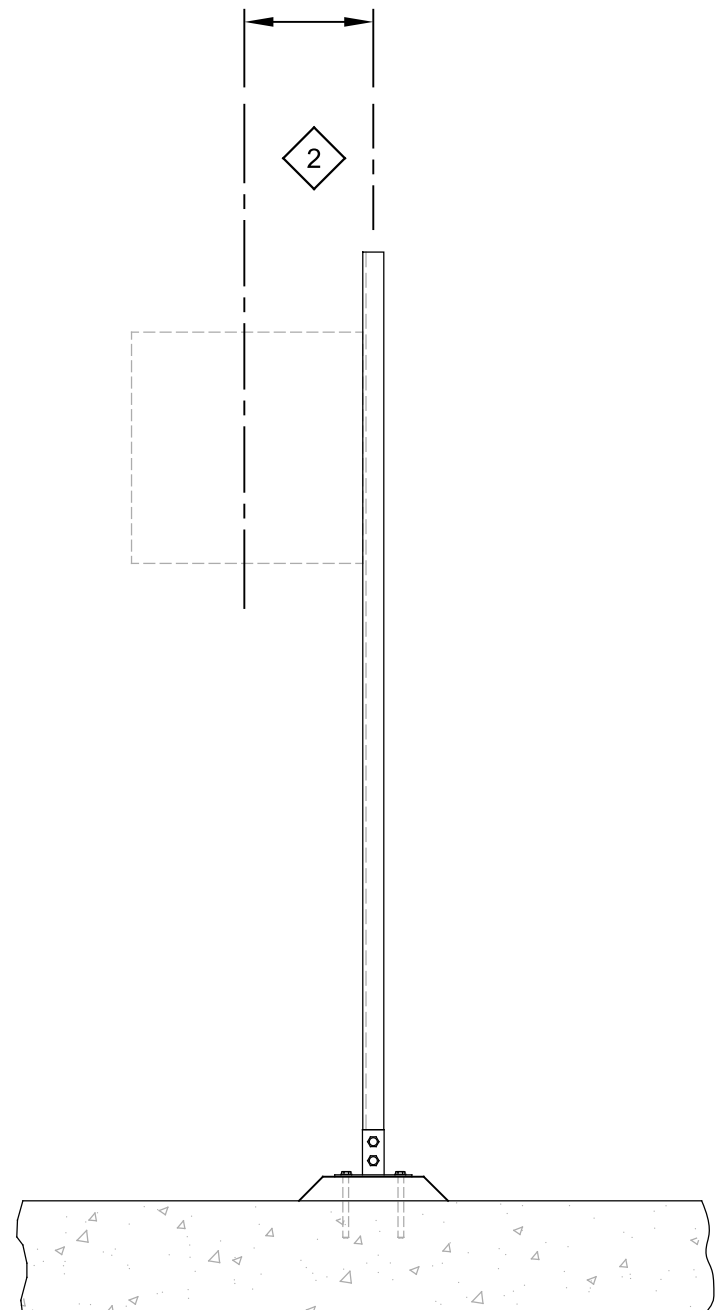
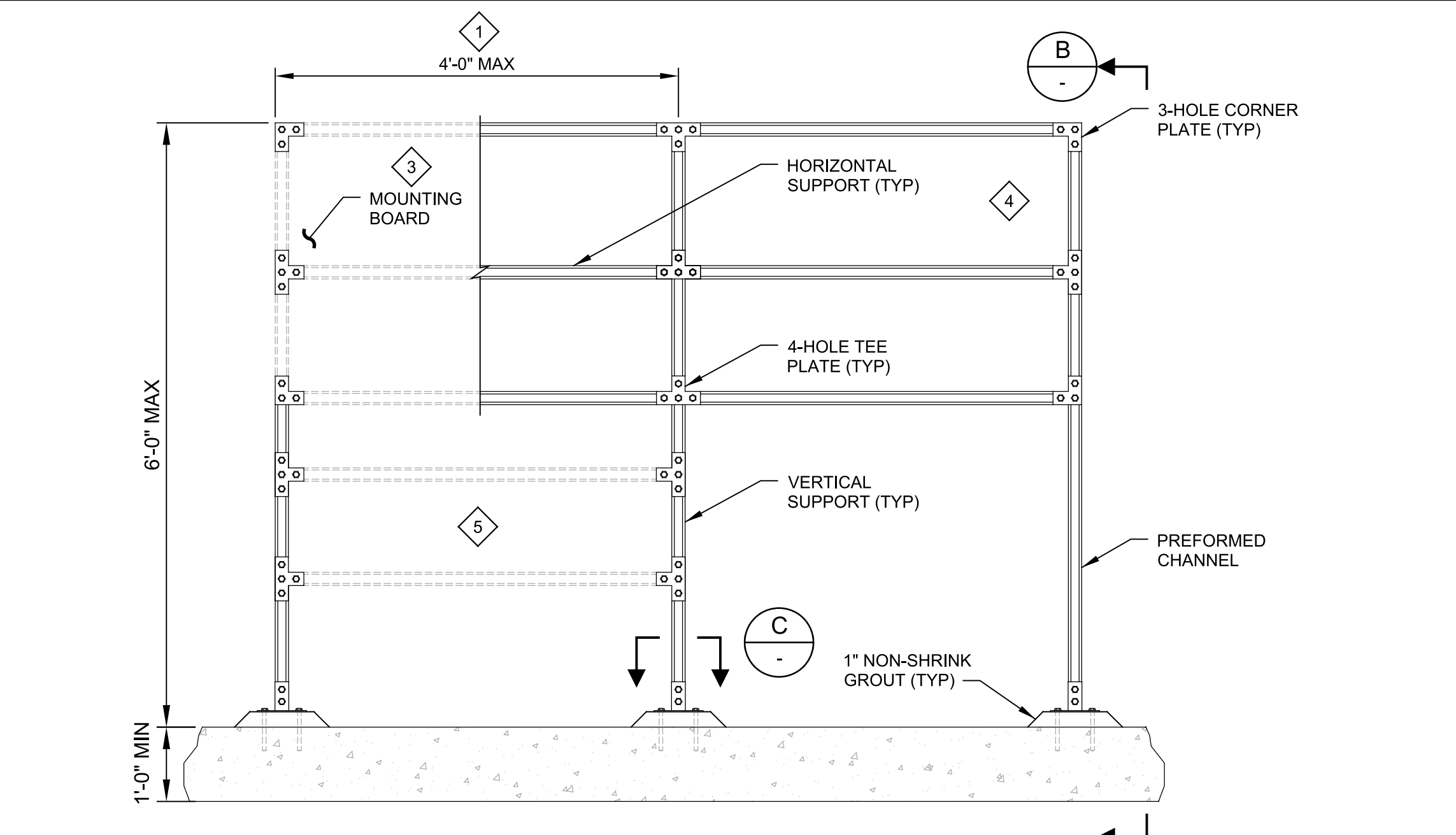
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				DATE OCTOBER 2022
REV	DATE	BY	DESCRIPTION	



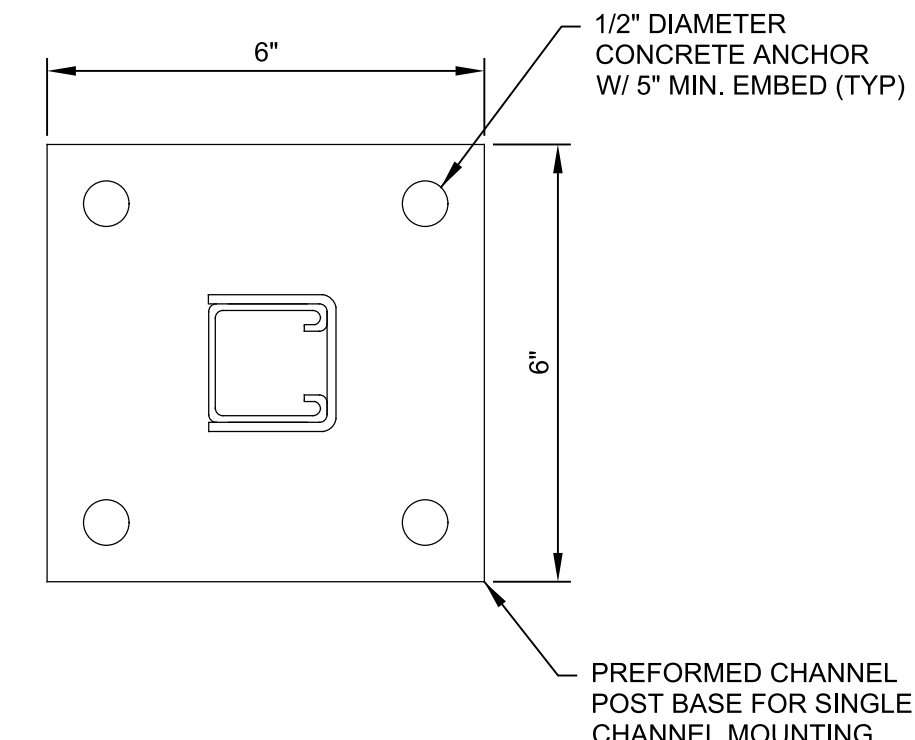
CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
ELECTRICAL TYPICAL DETAILS 2

VERIFY SCALES
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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201351
DRAWING NO.
00TE02
SHEET NO.
OF



B SECTION



C POST BASE

GENERAL NOTES:

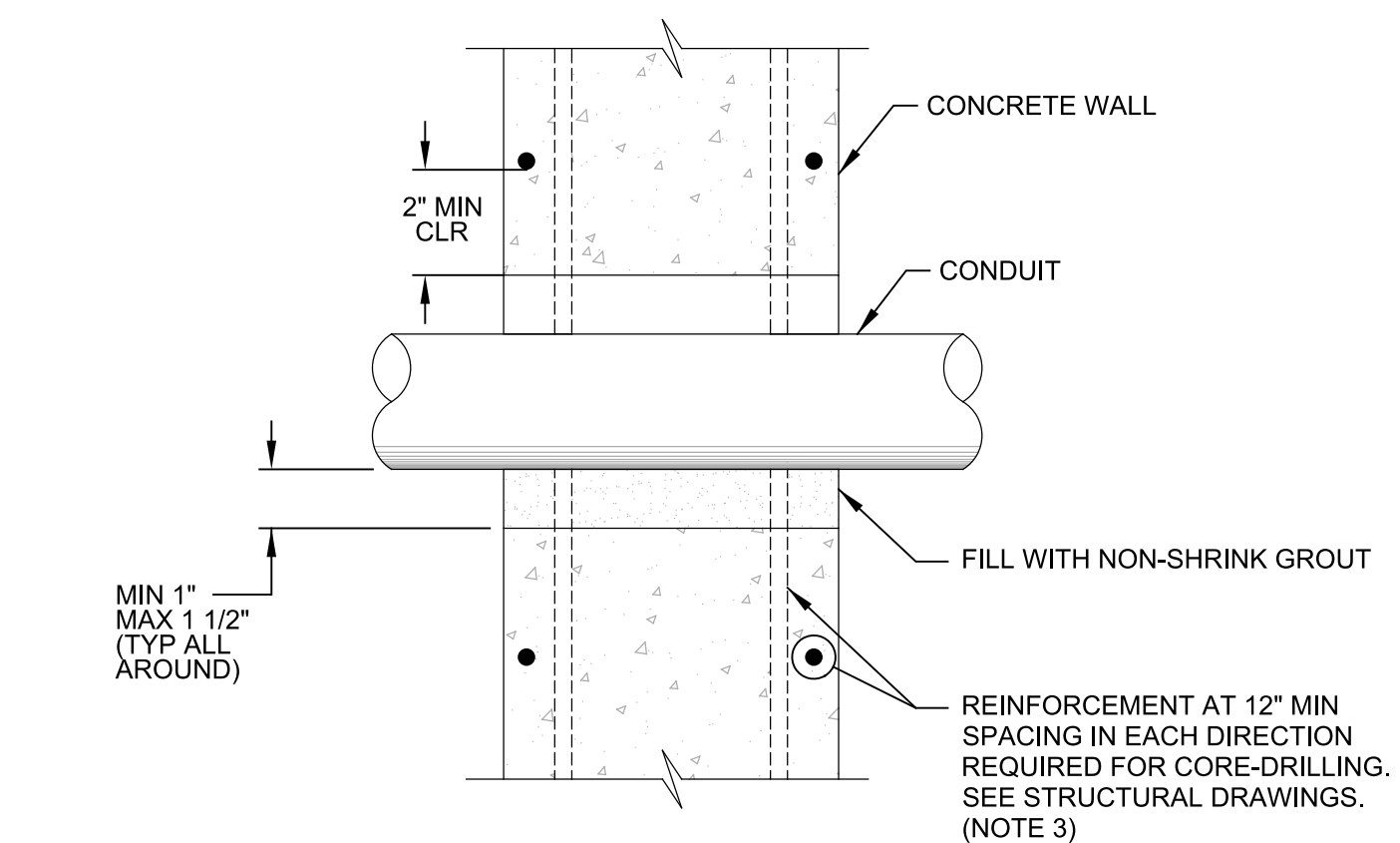
- AS SHOWN, THE MOUNTING STAND IS SUITABLE FOR THE FOLLOWING DESIGN CRITERIA.
 - STAINLESS STEEL OR HOT-DIPPED GALVANIZED PREFORMED CHANNEL
 - SEISMIC DESIGN CATEGORY: A THROUGH D
 - RISK CATEGORY: III AND IV
 - MAXIMUM EQUIPMENT LOAD OF 100 LBS PER VERTICAL SUPPORT
- SUBMIT DESIGN CALCULATIONS FOR EACH INSTALLATION THAT EXCEEDS THE SPECIFIED DESIGN CRITERIA OR DIMENSIONAL LIMITATIONS IN THIS DETAIL. REFER TO THE SPECIFICATIONS FOR DESIGN CALCULATION SUBMITTAL REQUIREMENTS
- REFER TO THE SPECIFICATIONS FOR MATERIAL REQUIREMENTS.
- WHERE CONCRETE ANCHORS COME IN CONTACT WITH DISSIMILAR METALS, ISOLATE DISSIMILAR METALS AS SPECIFIED IN THE SPECIFICATIONS.
- HORIZONTAL AND VERTICAL SUPPORTS SHALL CONSIST OF PREFORMED SINGLE CHANNELS.

EM210 INDOOR EQUIPMENT MOUNTING STAND

TYP

KEY NOTES:

- FOR MOUNTING STANDS WIDER THAN 4 FEET PROVIDE EQUALLY SPACED VERTICAL SUPPORTS AT 4 FOOT MAXIMUM SPACING.
- MAXIMUM OFFSET TO THE CENTERLINE OF EQUIPMENT OR ENCLOSURES IS 1'-6".
- PROVIDE A MOUNTING BOARD FOR INSTRUMENTS AND DEVICES WEIGHING LESS THAN 20 POUNDS THAT CANNOT BE MOUNTED DIRECTLY TO PREFORMED CHANNEL. EQUIPMENT ANCHORAGE TO THE MOUNTING BOARD SHALL BE DESIGNED BY THE CONTRACTOR.
- PROVIDE ADDITIONAL PREFORMED CHANNEL SUPPORTS FOR ENCLOSURES THAT CAN BE MOUNTED DIRECTLY TO THE PREFORMED CHANNEL.
- OPTIONAL HORIZONTAL SUPPORTS AND AVAILABLE SPACE FOR JUNCTION BOXES.

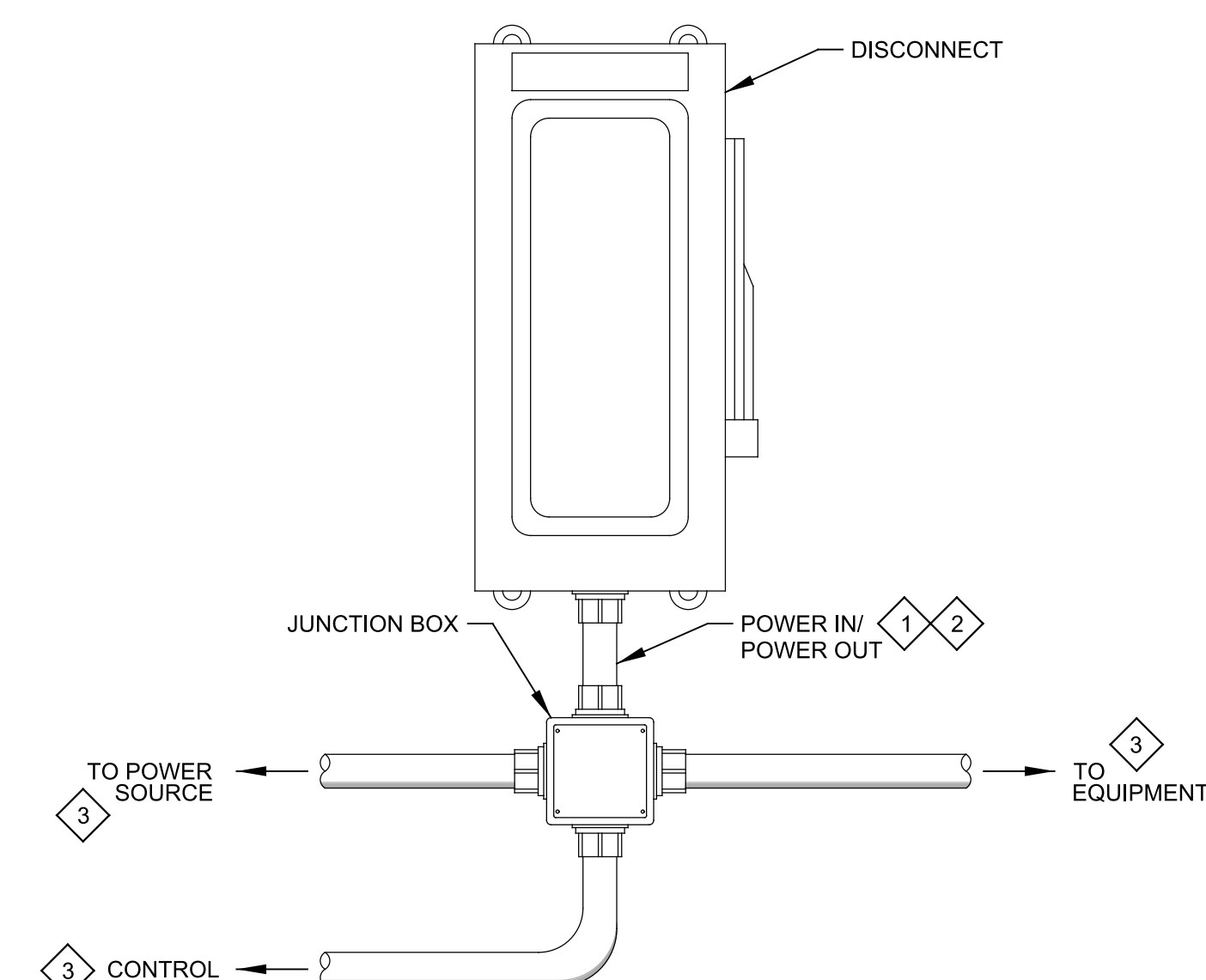


GENERAL NOTES:

- PROVIDE NON-DESTRUCTIVE TESTING TO DETERMINE LOCATIONS OF REINFORCEMENT. MAINTAIN MIN 2" CLEAR BETWEEN CORE DRILLED OPENING AND REINFORCEMENT.
- APPLY EPOXY CEMENT BONDING AGENT PRIOR TO GROUTING.
- PROVIDE CAST-IN SLEEVE FOR PENETRATIONS IN WALLS WITH REINFORCEMENT SPACING LESS THAN 2" IN EACH DIRECTION. REFER TO STRUCTURAL DRAWINGS.

EM163 CORE DRILLED PENETRATION CONCRETE WALL

TYP



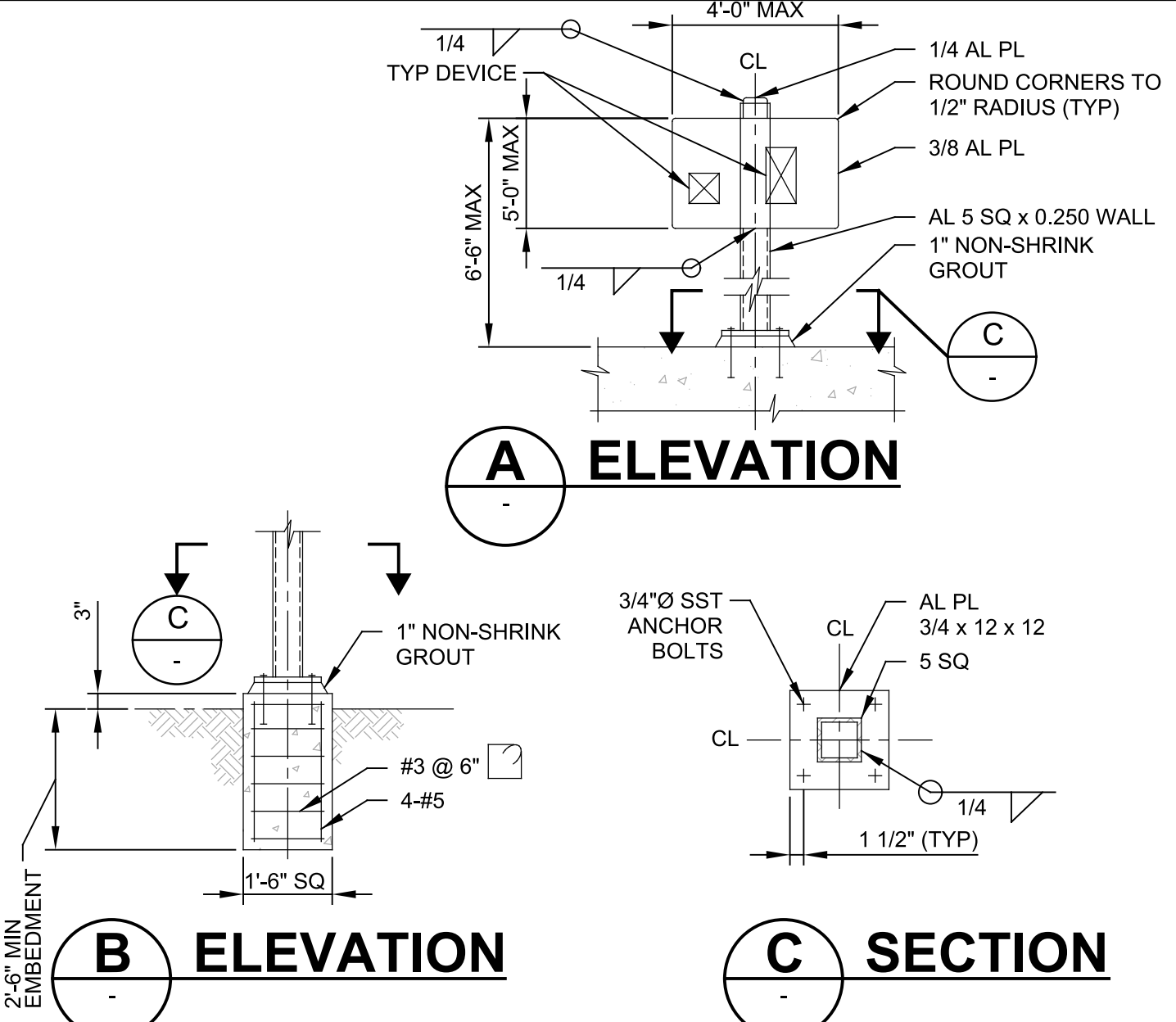
GENERAL NOTES:

- CONDUIT AND ENCLOSURE REQUIREMENTS AS SPECIFIED.
- CONDUIT IS NOT INCLUDED IN THE CONDUIT SCHEDULE.
- SIZE CONDUIT IN ACCORDANCE WITH THE NEC.
- REFER TO CONDUIT SCHEDULE FOR CONDUIT SIZE, WIRE SIZE AND QUANTITY.

KEY NOTES:

EM221 DISCONNECT CONDUIT INSTALLATION

TYP



GENERAL NOTES:

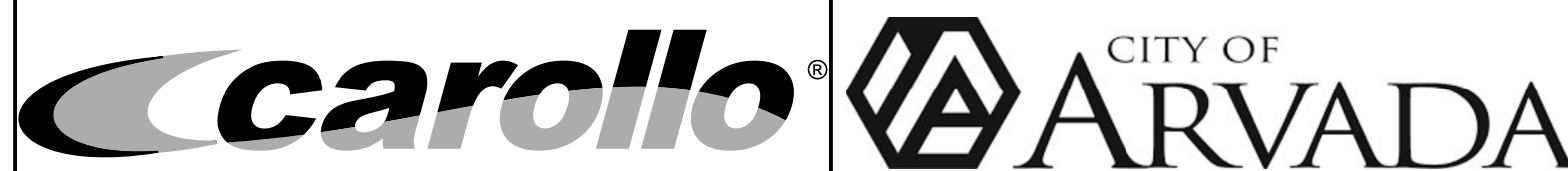
- USE ELEVATION B WHERE A SEPARATE FOUNDATION IS REQUIRED.
- COAT ALUMINUM SURFACES IN CONTACT W/ CONCRETE PER SPECIFICATIONS.
- USE STAINLESS STEEL FASTENERS FOR MOUNTING DEVICES.
- WEIGHT OF DEVICE(S) SHALL NOT EXCEED 300 POUNDS.

EM202 DEVICE SUPPORT AND MOUNTING

TYP

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			
REV	DATE	BY	DESCRIPTION

DESIGNED CGR
DRAWN QGS
CHECKED
DATE OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
ELECTRICAL TYPICAL DETAILS 3

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201351 DRAWING NO. 00TE03 SHEET NO. OF
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Plot Date: 12-OCT-2022 11:51:48 AM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

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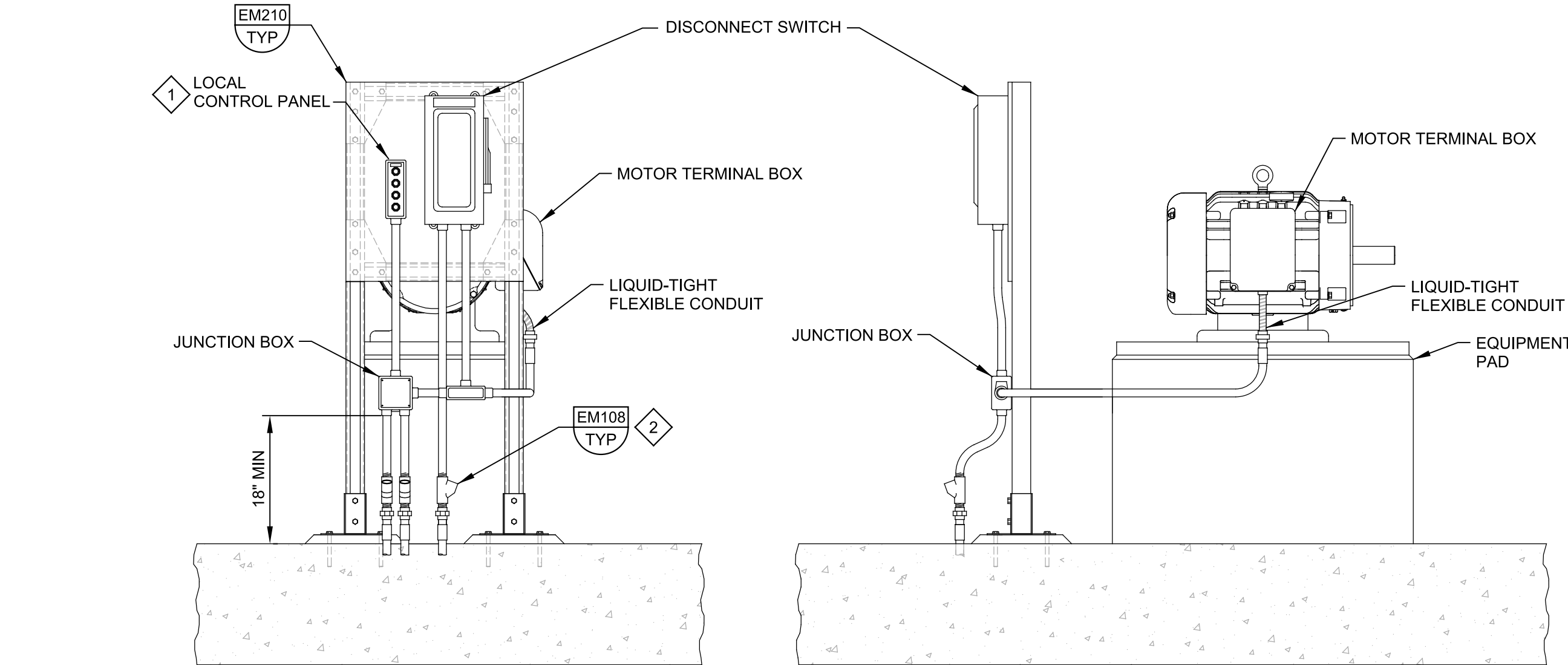
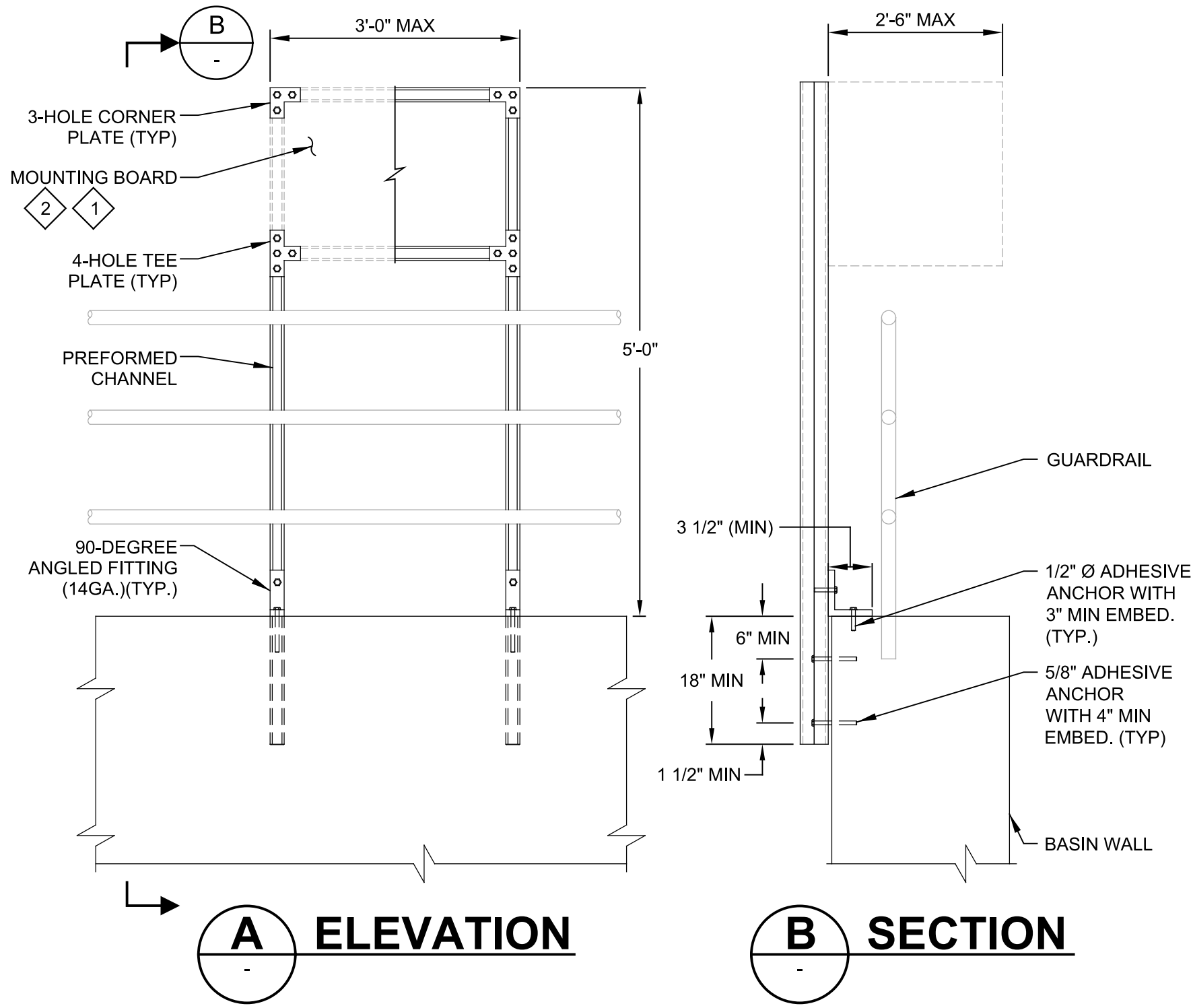
GENERAL NOTES:

- AS SHOWN, THE MOUNTING STAND IS SUITABLE FOR THE FOLLOWING DESIGN CRITERIA:
 - BASIC WIND SPEED (3 SECOND GUST, 33 FEET ABOVE GROUND) : 145 MPH
 - WIND EXPOSURE CATEGORY: D
 - NON-SPECIAL WIND REGIONS.
 - SEISMIC DESIGN CATEGORY: A, THROUGH D
 - RISK CATEGORY: III
 - MAXIMUM DEAD LOAD OF 200 LBS. SUBMIT DESIGN CALCULATIONS FOR EACH INSTALLATION THAT EXCEEDS THE SPECIFIED DESIGN CRITERIA. REFER TO THE SPECIFICATION FOR DESIGN CALCULATION SUBMITTAL REQUIREMENTS.
- REFER TO THE SPECIFICATIONS FOR MATERIAL REQUIREMENTS.
- PROVIDE ADDITIONAL SUPPORTS FOR ENCLOSURES THAT CAN BE MOUNTED DIRECTLY TO THE PREFORMED CHANNEL. USE STANDARD 4-HOLE TEE PLATES TO CONNECT TO THE MOUNTING STAND.
- LOCATE EXISTING REINFORCEMENT PRIOR TO DRILLING FOR ADHESIVE ANCHORS.
- COORDINATE MOUNTING LOCATION WITH GUARDRAIL POSTS WHEN USING SIDE MOUNTED POSTS.

KEY NOTES:

- PROVIDE A MOUNTING BOARD FOR INSTRUMENTS AND DEVICES WEIGHING LESS THAN 20 POUNDS THAT CANNOT BE MOUNTED DIRECTLY TO PREFORMED CHANNEL. EQUIPMENT ANCHORAGE TO THE MOUNTING BOARD TO BE DESIGNED BY THE CONTRACTOR. PROVIDE A PREFORMED CHANNEL BRACE BEHIND THE MOUNTING BOARD IF REQUIRED.
- PROVIDE ADDITIONAL PREFORMED CHANNEL SUPPORTS FOR ENCLOSURES THAT CAN BE MOUNTED DIRECTLY TO THE PREFORMED CHANNEL, WHERE REQUIRED.

EM212 EQUIPMENT MOUNTING STAND
TYP ON CONCRETE BASIN



KEY NOTES:

- SIZE AS REQUIRED WITH CONTROLS INDICATED ON THE CONTRACT DOCUMENTS.
- CONDUIT SEALS WHERE REQUIRED FOR THE AREA CLASSIFICATION. REFER TO THE SPECIFICATIONS.

EM302 TYPICAL MOTOR INSTALLATION
TYP WITH DISCONNECT SWITCH

60% DESIGN SUBMITTAL NOT FOR CONSTRUCTION			
REV	DATE	BY	DESCRIPTION

DESIGNED CGR
DRAWN QGS
CHECKED
DATE OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
ELECTRICAL TYPICAL DETAILS 4

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

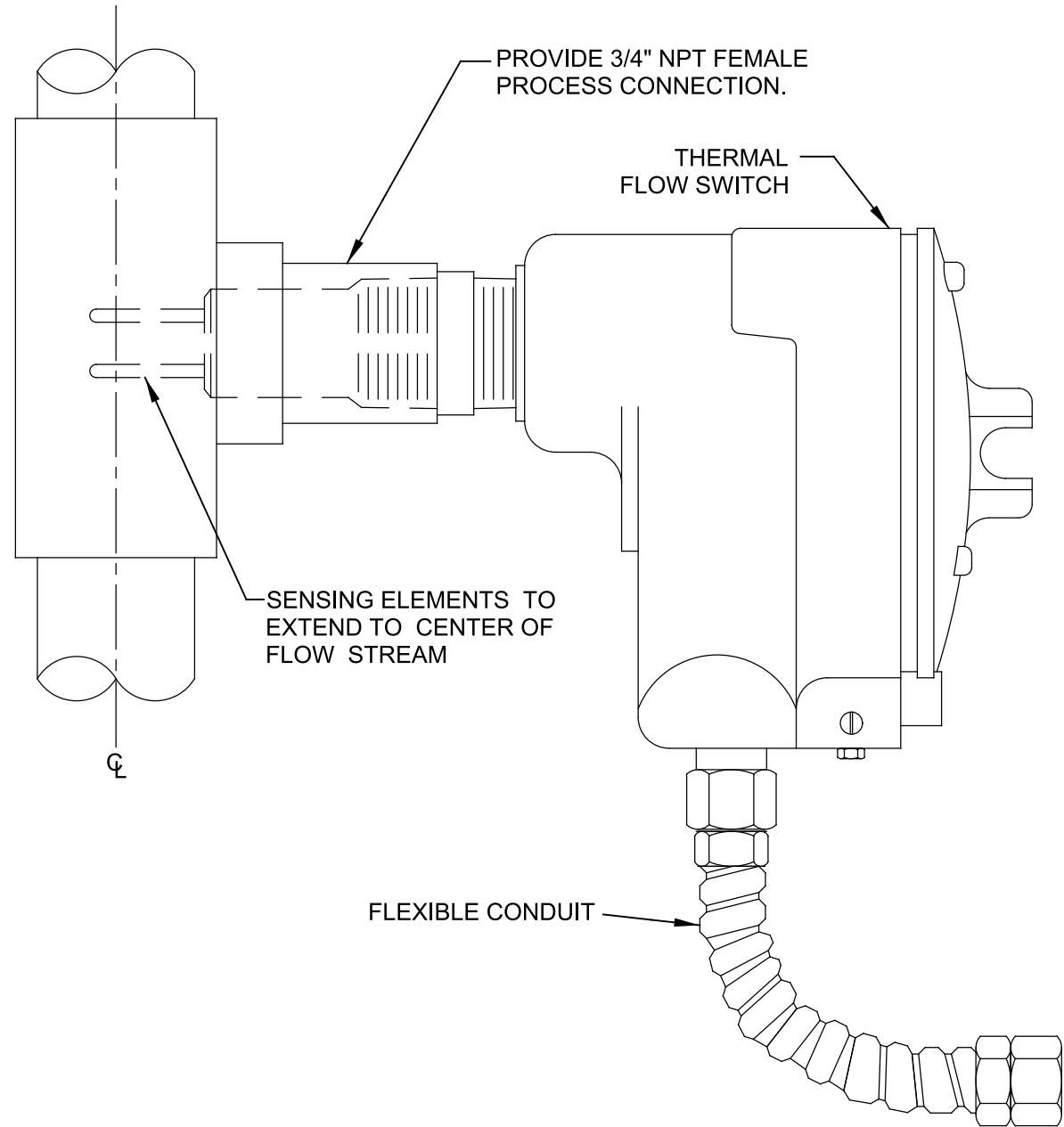
JOB NO.
201351
DRAWING NO.
00TE04
SHEET NO.
OF

Plot Date: 13-OCT-2022 7:43:07 AM

User: svcPW

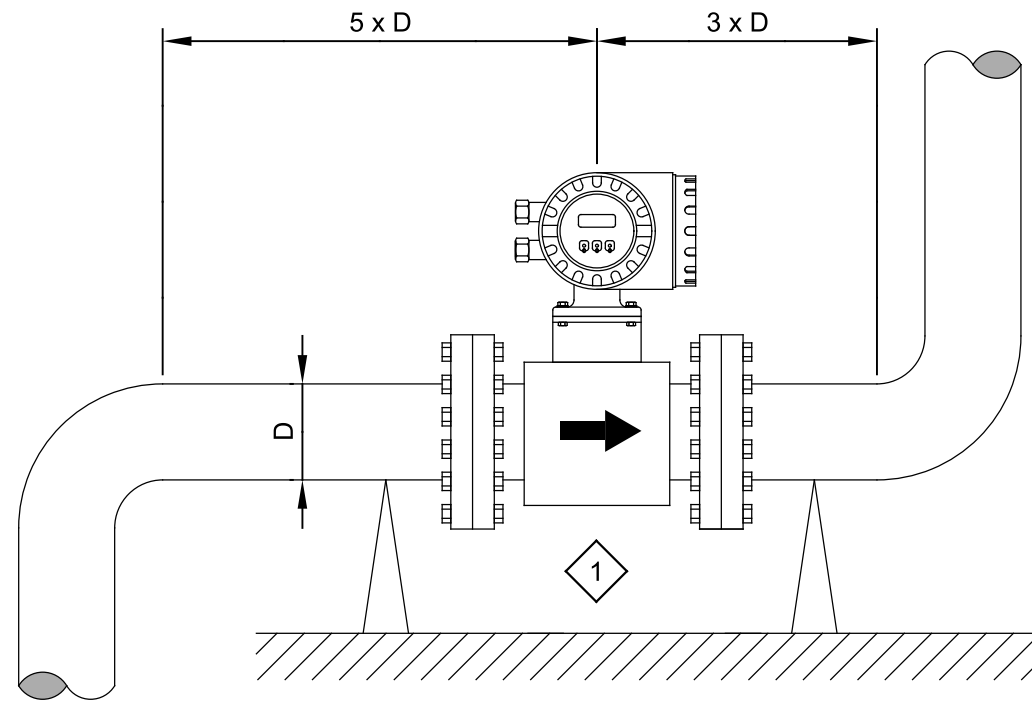
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LAST SAVED BY: sshepard



NF111
TYP

THERMAL FLOW SWITCH MOUNTING DETAIL



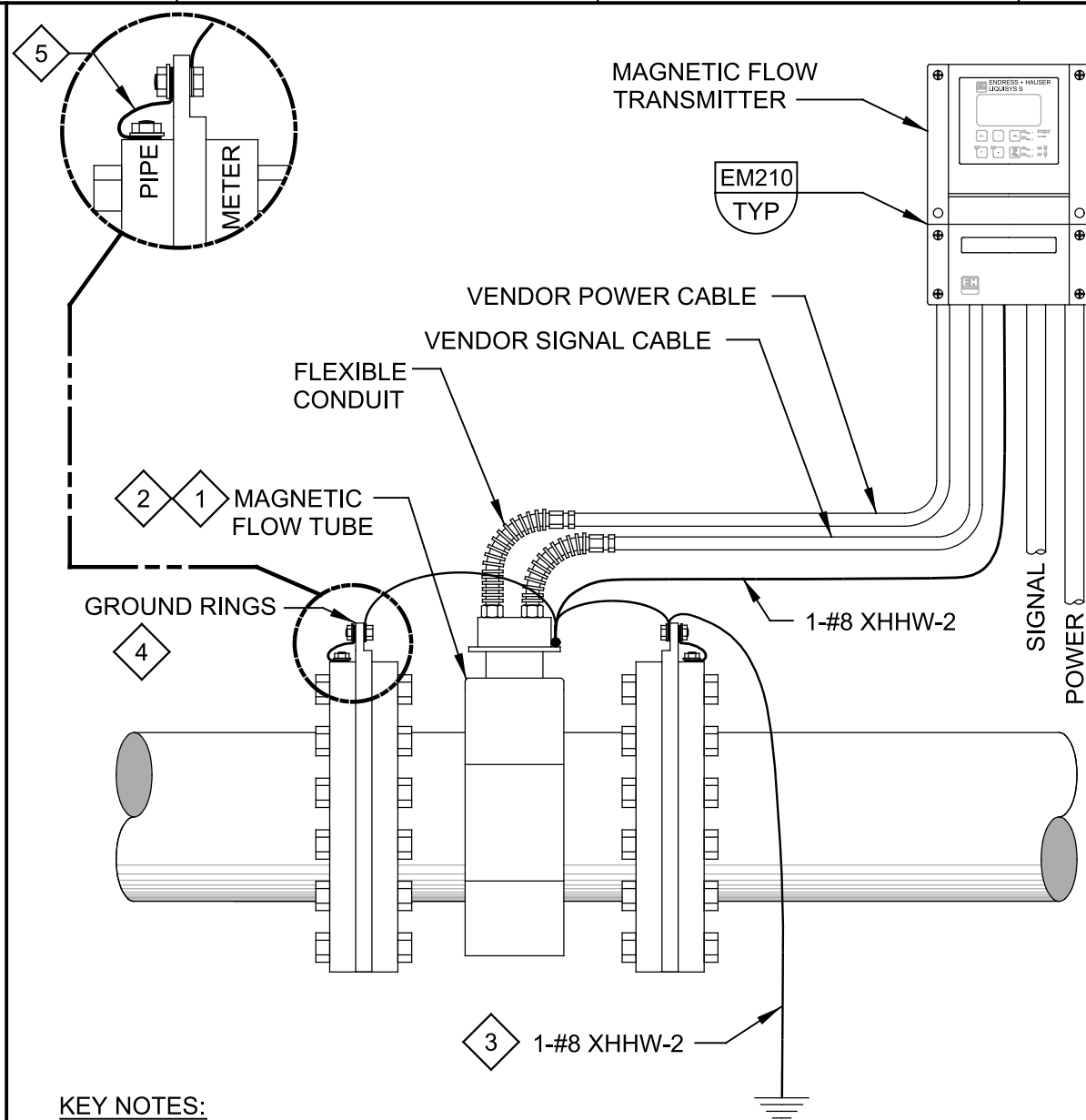
- NOTES:**
1. FOLLOW MANUFACTURER'S RECOMMENDED MAXIMUM TORQUE SETTINGS. DO NOT OVER-TORQUE FLANGE BOLTS. OVERTIGHTENING THE FASTENERS WILL DEFORM SEALING FACES OR DAMAGE THE LINE.
 2. ALWAYS TIGHTEN FLANGE BOLTS UNIFORMLY AND IN DIAGONALLY OPPOSITE SEQUENCE.
 3. MOUNT METER SO THAT IT REMAINS FULLY FLOODED.
 4. INSTALL METER SUCH THAT THERE ARE NO PIPE BENDS FOR 5 PIPE DIAMETERS UPSTREAM AND 3 PIPE DIAMETERS DOWNSTREAM OF THE METER.

KEY NOTES:

1 PIPE SUPPORTS BY MECHANICAL CONTRACTOR. NO SUPPORTS SHALL BE INSTALLED AT THE METER HOUSING.

NF130
TYP

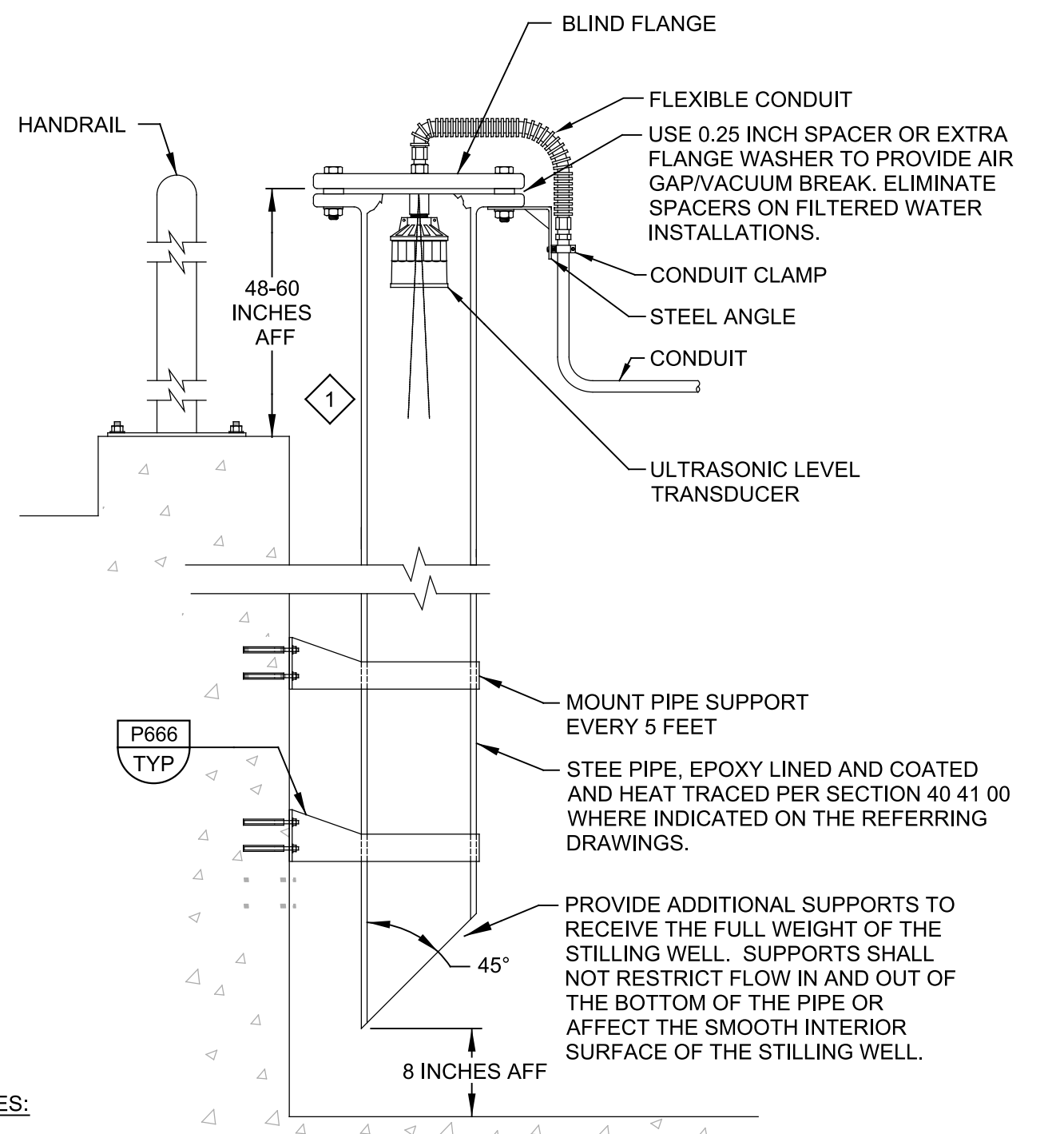
MAGNETIC FLOW MOUNTING DETAIL



- KEY NOTES:**
- 1 CONTRACTOR SHALL VERIFY ZERO POTENTIAL BETWEEN FLOW TUBE, EARTH GROUND AND TRANSMITTER GROUND TERMINAL.
 - 2 CONNECT TRANSMITTER GROUND TERMINAL TO GROUND RINGS.
 - 3 CONNECT METER BODY TO EARTH GROUND POTENTIAL.
 - 4 EQUALIZE POTENTIAL VIA GROUND RINGS BETWEEN FLUID AND MAGMETER.
 - 5 PROVIDE BONDING JUMPER ON CONDUCTIVE PIPES.

NF135
TYP

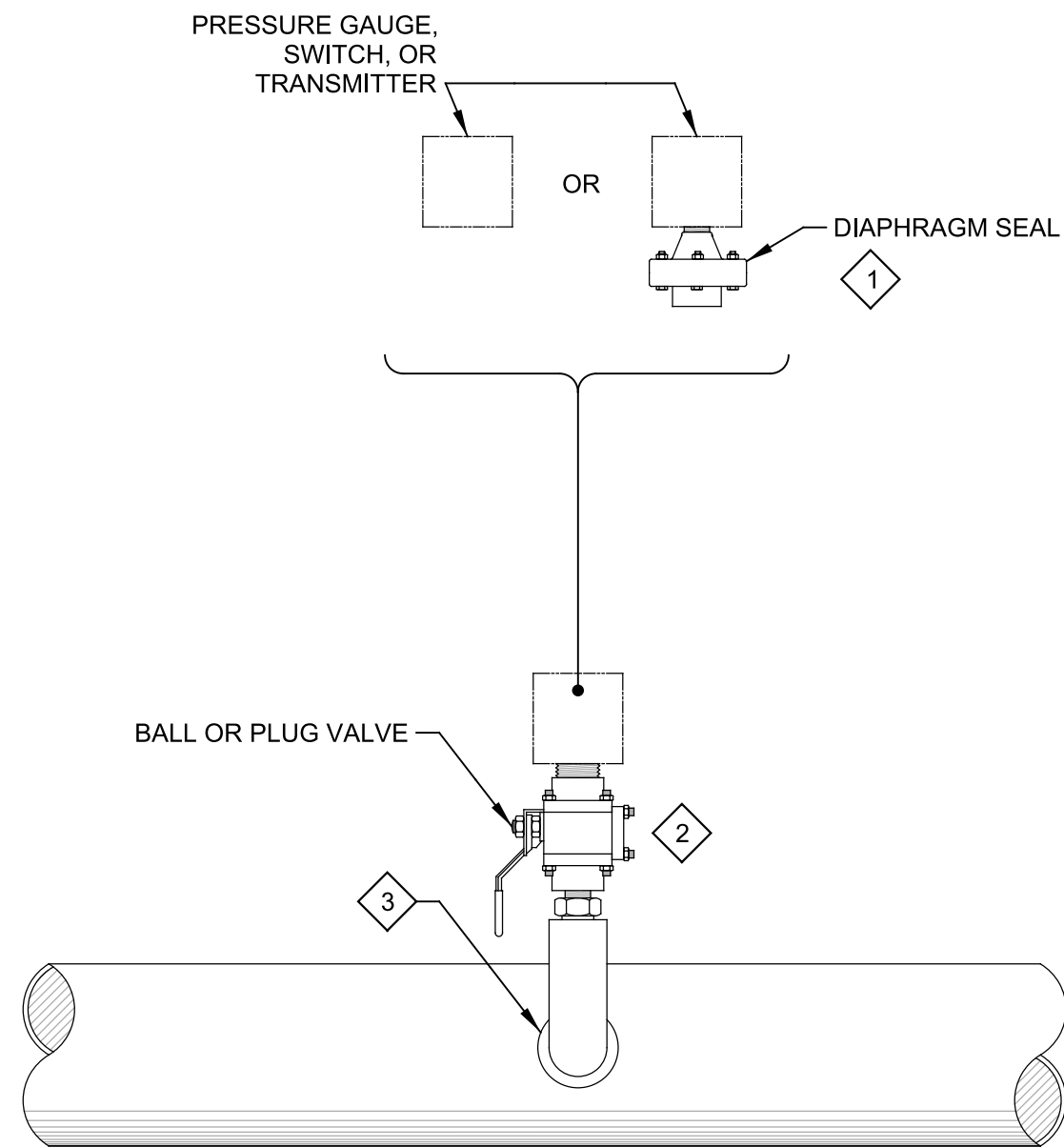
REMOTE TRANSMITTER MAGNETIC FLOWMETER GROUNDING DETAIL



- KEY NOTES:**
- 1 MINIMUM DISTANCE BETWEEN HIGHEST POSSIBLE LEVEL, INCLUDING OVERFLOW, AND PROBE FACE SHALL BE MANUFACTURER'S BLANKING ZONE PLUS 2 INCHES.
- NOTES:**
1. STILLING WELL NOMINAL DIAMETER SHALL BE 6 INCHES, MINIMUM.

NL900
TYP

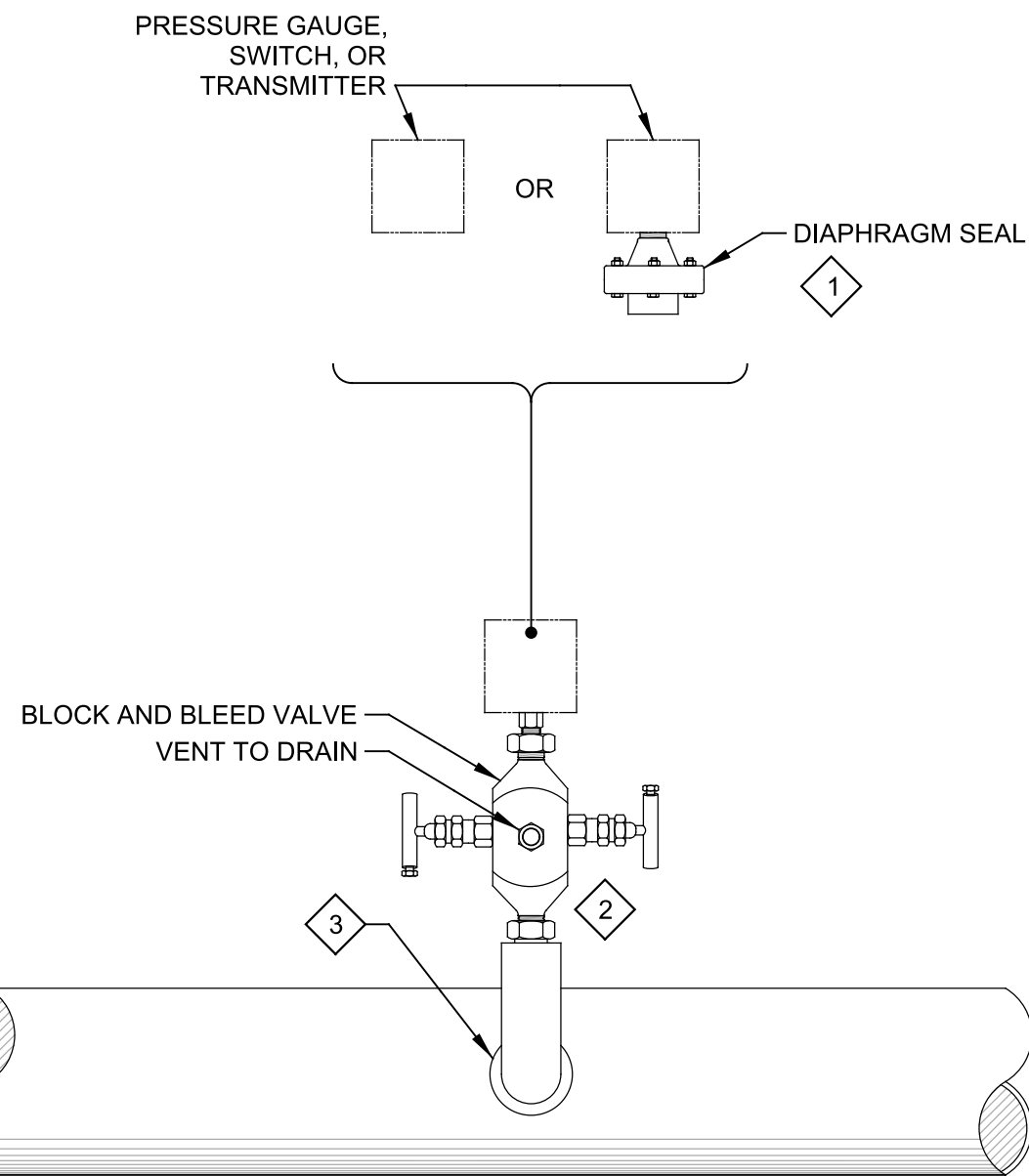
ULTRASONIC LEVEL TRANSDUCER STILLING WELL MOUNTING DETAIL



- KEY NOTES:**
1. USE THE INSTRUMENT DATA SHEETS IN DIVISION 17 OR DIVISIONS 40 SPECS TO IDENTIFY INDIVIDUAL REQUIREMENTS FOR DIAPHRAGM SEALS.
 2. ALL VALVE AND PIPE MATERIAL SHALL BE COMPATIBLE WITH PROCESS FLUID.
 3. THREADED TAP OR SADDLE CONNECTION FOR DUCTILE IRON PIPE. WELD-O-LET OR THREAD-O-LET FOR WELDED PIPE. TEE OR REDUCING TEE FOR NON-METALLIC PIPE.

NP503
TYP

ISOLATING PRESSURE INSTRUMENT MOUNTING DETAIL



- KEY NOTES:**
1. USE THE INSTRUMENT DATA SHEETS IN DIVISION 17 OR DIVISIONS 40 SPECS TO IDENTIFY INDIVIDUAL REQUIREMENTS FOR DIAPHRAGM SEALS.
 2. ALL VALVE AND PIPE MATERIAL SHALL BE COMPATIBLE WITH PROCESS FLUID.
 3. THREADED TAP OR SADDLE CONNECTION FOR DUCTILE IRON PIPE. WELD-O-LET OR THREAD-O-LET FOR WELDED PIPE. TEE OR REDUCING TEE FOR NON-METALLIC PIPE.

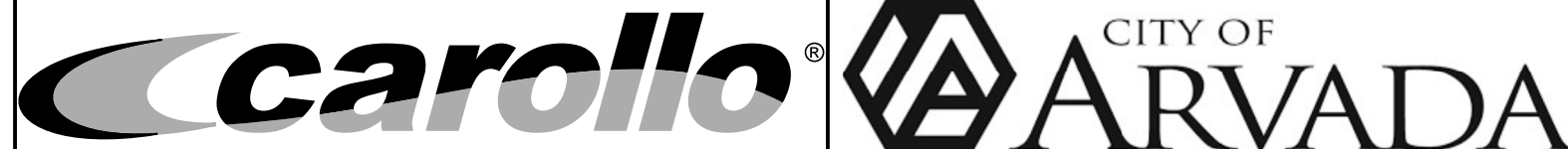
NP504
TYP

PRESSURE INSTRUMENT MOUNTING DETAIL

**60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION**

REV	DATE	BY	DESCRIPTION
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DESIGNED CE
DRAWN CE
CHECKED
DATE OCTOBER 2022



CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

TYPICAL

INSTRUMENTATION TYPICAL DETAILS 1

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.
201351

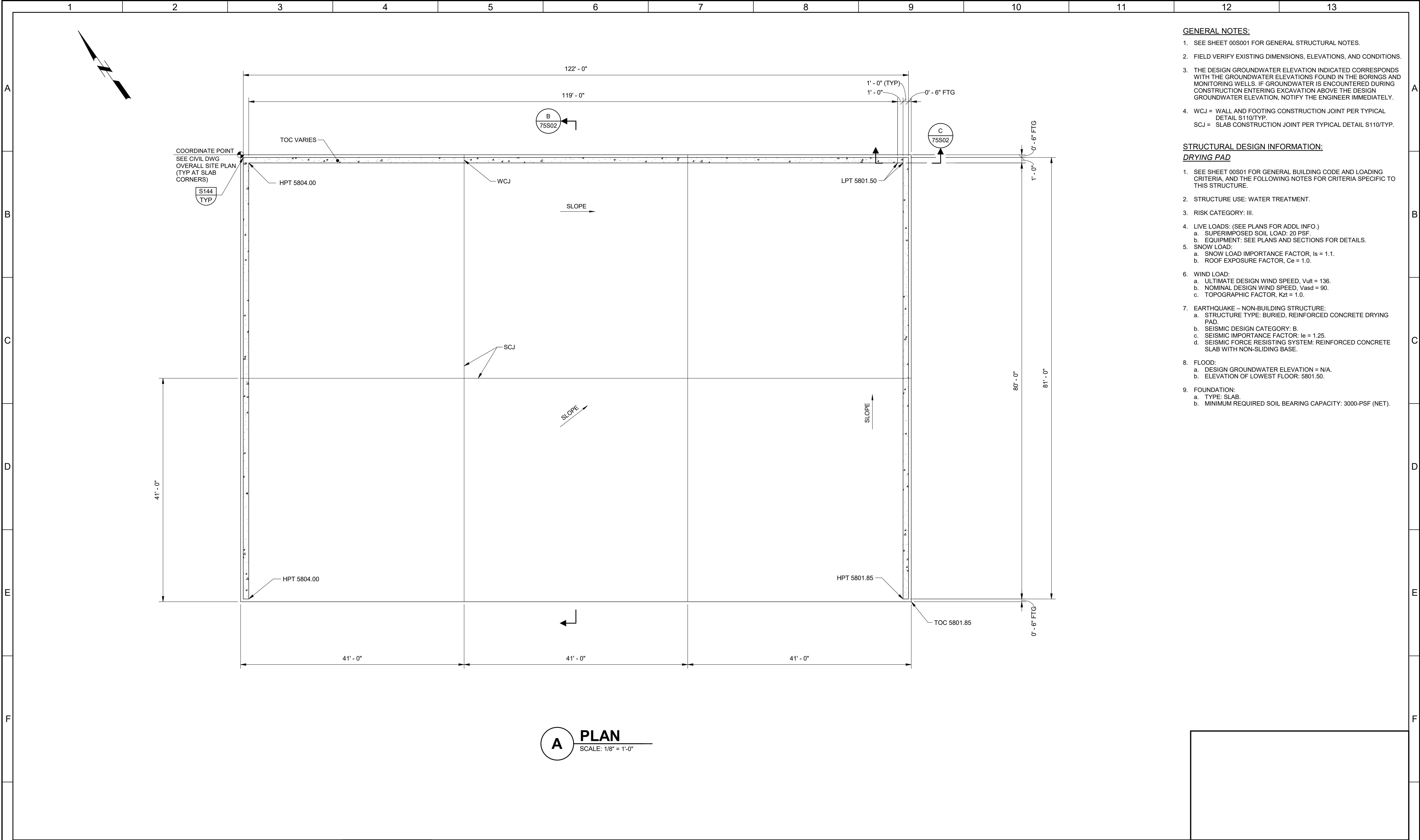
DRAWING NO.
00TN01

SHEET NO.
OF

Exhibit D

AMENDMENT NO. 3

**TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND PCL
CONSTRUCTION, INC. ESTABLISHING CONTRACTOR'S GUARANTEED MAXIMUM
PRICE III OF THE "CONSTRUCTION MANAGEMENT/GENERAL CONTRACTOR
AGREEMENT FOR PRECONSTRUCTION SERVICES FOR THE REHABILITATION AND
MODIFICATION OF THE FILTER AND SOLIDS HANDLING SYSTEMS AT THE RALSTON
WATER TREATMENT PLANT," IN AN AMOUNT NOT TO EXCEED \$3,518,653.00**

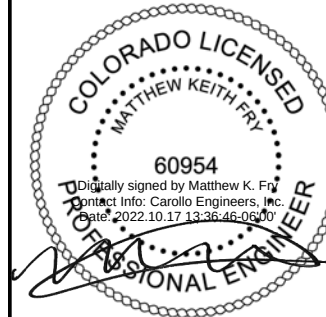


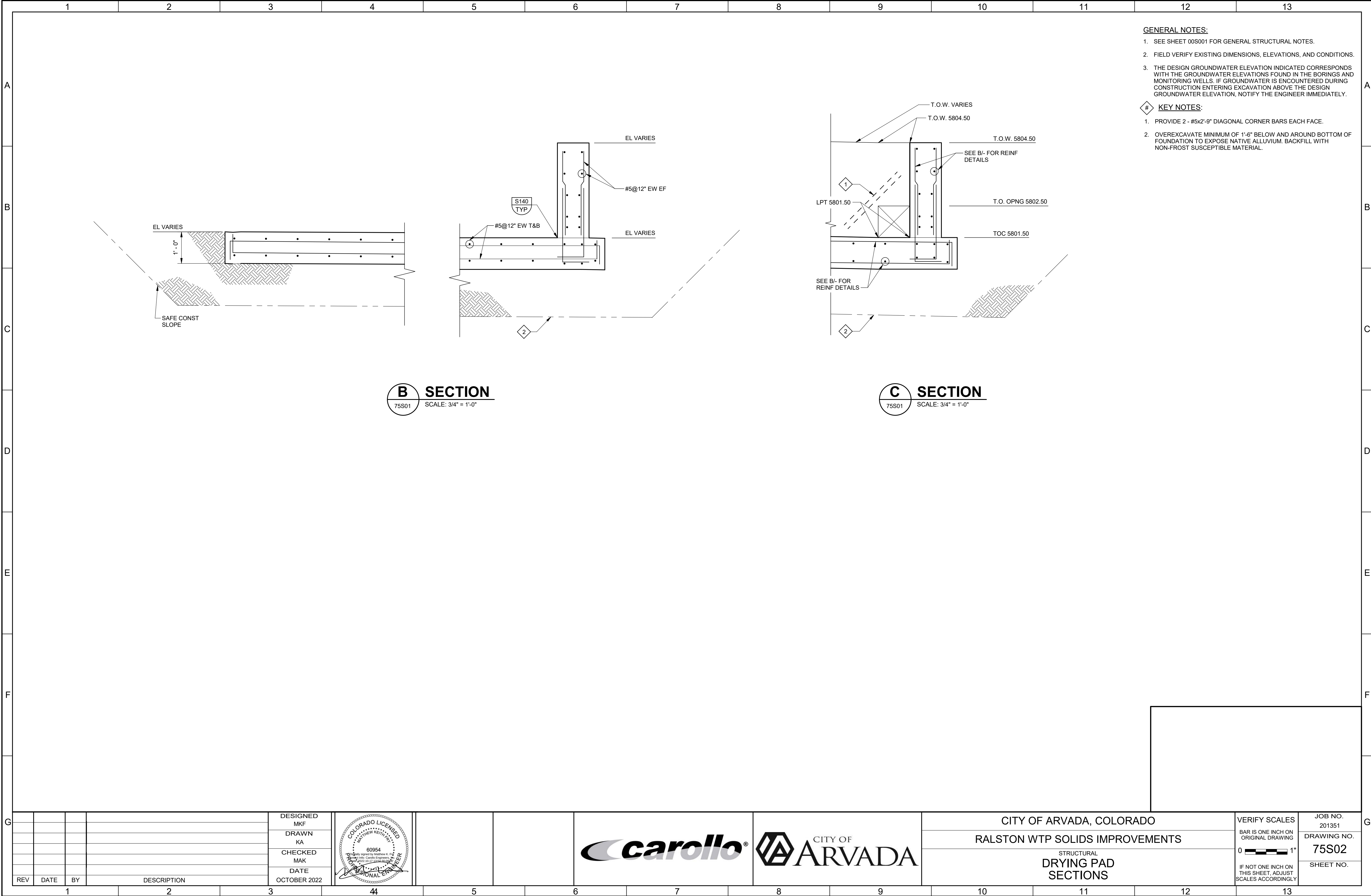
- GENERAL NOTES:**
- SEE SHEET 00S001 FOR GENERAL STRUCTURAL NOTES.
 - FIELD VERIFY EXISTING DIMENSIONS, ELEVATIONS, AND CONDITIONS.
 - THE DESIGN GROUNDWATER ELEVATION INDICATED CORRESPONDS WITH THE GROUNDWATER ELEVATIONS FOUND IN THE BORINGS AND MONITORING WELLS. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION ENTERING EXCAVATION ABOVE THE DESIGN GROUNDWATER ELEVATION, NOTIFY THE ENGINEER IMMEDIATELY.
 - WCJ = WALL AND FOOTING CONSTRUCTION JOINT PER TYPICAL DETAIL S110/TYP.
SCJ = SLAB CONSTRUCTION JOINT PER TYPICAL DETAIL S110/TYP.

- STRUCTURAL DESIGN INFORMATION:**
- DRYING PAD**
- SEE SHEET 00S01 FOR GENERAL BUILDING CODE AND LOADING CRITERIA, AND THE FOLLOWING NOTES FOR CRITERIA SPECIFIC TO THIS STRUCTURE.
 - STRUCTURE USE: WATER TREATMENT.
 - RISK CATEGORY: III.
 - LIVE LOADS: (SEE PLANS FOR ADDL INFO.)
 - SUPERIMPOSED SOIL LOAD: 20 PSF.
 - EQUIPMENT: SEE PLANS AND SECTIONS FOR DETAILS.
 - SNOW LOAD:
 - SNOW LOAD IMPORTANCE FACTOR, $I_s = 1.1$.
 - ROOF EXPOSURE FACTOR, $C_e = 1.0$.
 - WIND LOAD:
 - ULTIMATE DESIGN WIND SPEED, $V_{ult} = 136$.
 - NOMINAL DESIGN WIND SPEED, $V_{asd} = 90$.
 - TOPOGRAPHIC FACTOR, $K_{zt} = 1.0$.
 - EARTHQUAKE – NON-BUILDING STRUCTURE:
 - STRUCTURE TYPE: BURIED, REINFORCED CONCRETE DRYING PAD.
 - SEISMIC DESIGN CATEGORY: B.
 - SEISMIC IMPORTANCE FACTOR: $I_e = 1.25$.
 - SEISMIC FORCE RESISTING SYSTEM: REINFORCED CONCRETE SLAB WITH NON-SLIDING BASE.
 - FLOOD:
 - DESIGN GROUNDWATER ELEVATION = N/A.
 - ELEVATION OF LOWEST FLOOR: 5801.50.
 - FOUNDATION:
 - TYPE: SLAB.
 - MINIMUM REQUIRED SOIL BEARING CAPACITY: 3000-PSF (NET).

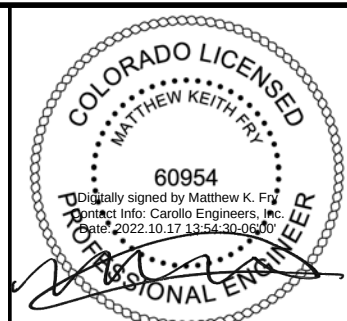
A PLAN
SCALE: 1/8" = 1'-0"

PLOT DATE: 10/17/2022 11:21:05 AM

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					DRAWN KA								RALSTON WTP SOLIDS IMPROVEMENTS			BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.		
					CHECKED MAK									STRUCTURAL			0  1"		75S01
					DATE OCTOBER 2022									DRYING PAD PLAN			IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY		SHEET NO.
	REV	DATE	BY	DESCRIPTION															
	1		2	3	44		5	6	7	8	9	10	11	12	13				



PLOT DATE: 10/17/2022 11:22:30 AM

G					DESIGNED MKF							CITY OF ARVADA, COLORADO			VERIFY SCALES	JOB NO. 201351	G
					DRAWN KA		RALSTON WTP SOLIDS IMPROVEMENTS					BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.				
					CHECKED MAK		STRUCTURAL					0  1"	75S02				
					DATE OCTOBER 2022		DRYING PAD SECTIONS					IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO.				
	REV	DATE	BY	DESCRIPTION													
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Plot Date: 17-OCT-2022 10:29:36 AM

User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen_v0905.pen PlotScale: 1:1

LAST SAVED BY: jbaumgarer

- SEE DIVISION 03 SPECIFICATION FOR REQUIREMENTS FOR CONCRETE CONSTRUCTION.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, MINIMUM REINFORCEMENT OF CONCRETE WALLS OR SLABS SHALL BE AS FOLLOWS. CONTACT ENGINEER FOR LOCATIONS INSIDE CONCRETE.
10" THICK OR LESS:#5 @ 12" EACH WAY.
MORE THAN 10" THICK:#5 @ 12" EACH WAY, EACH FACE.
- WALL REINFORCEMENT AT CORNERS OR JUNCTIONS OF WALLS SHALL BE CONTINUOUS. LAP SPliced, OR TERMINATED IN AN ACI STANDARD 90 DEGREE HOOK. SEE DETAIL S144/TYP.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, DOWELS BETWEEN ADJACENT CONCRETE PLACEMENTS SHALL BE THE SAME SIZE AND SPACING AS THE REINFORCEMENT WHICH IS SPliced TO THE DOWELS.
- SLAB, BEAM AND COLUMN REINFORCING BARS SHALL HAVE A MINIMUM EXTENSION OR ANCHORAGE INTO SUPPORTS IN ACCORDANCE WITH ACI 318 AND ACI 350.
- PROVIDE STIRRUP SUPPORT BARS SHALL BE TO SECURE TOP BARS AGAINST DISPLACEMENT AS REQUIRED.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS, CONCRETE COVER OVER #11 AND SMALLER REINFORCING BARS SHALL BE AS FOLLOWS:
A. SLABS AND JOISTS:
FORMED CONCRETE SURFACES AND UNFORMED TOP SURFACES FOR DRY CONDITIONS
#7 BARS AND SMALLER:1"
#8 BARS AND LARGER:1 1/2"
FORMED CONCRETE SURFACES AND UNFORMED TOP SURFACES EXPOSED TO WEATHER, IN CONTACT WITH SOIL OR FLUIDS, OR LOCATED OVER FLUIDS:2"
B. BEAMS AND COLUMNS:
FORMED CONCRETE SURFACES FOR DRY CONDITIONS:
STIRRUPS, SPIRALS, AND TIES:1 1/2"
PRINCIPAL REINFORCEMENT:2"
FORMED CONCRETE SURFACES EXPOSED TO WEATHER, IN CONTACT WITH SOIL OR FLUIDS, OR IN BEAMS LOCATED OVER FLUIDS:
STIRRUPS AND TIES:2"
PRINCIPAL REINFORCEMENT:2 1/2"
C. WALLS:
FORMED CONCRETE SURFACES FOR DRY CONDITIONS:
#7 BARS AND SMALLER:1"
#8 BARS AND LARGER:1 1/2"
FORMED CONCRETE SURFACES EXPOSED TO WEATHER, OR IN CONTACT WITH SOIL OR FLUIDS:2"

S101 REINFORCED CONCRETE NOTES
TYP

SHEET 1 OF 3 03/12/19

- FOOTINGS AND SLABS ON GRADE:
FORMED VERTICAL CONCRETE SURFACES:2"
AT UNFORMED CONCRETE SURFACES CAST AGAINST SOIL, ROCK, OR CONCRETE WORK MATS:3"
TOP SURFACE OF FOOTINGS AND SLABS:SAME AS SLABS
- WATERSTOPS:
A. PROVIDE WATERSTOPS AT JOINTS IN SLABS AND WALLS OF LIQUID-CONTAINING STRUCTURES, AND PORTIONS OF STRUCTURES BELOW THE DESIGN GROUNDWATER LEVEL. MAKE WATERSTOPS CONTINUOUS THROUGH STRUCTURE, SPlicing WATERSTOPS IN SLABS WITH WATERSTOPS IN WALLS.
B. END WATERSTOPS 3" BELOW TOP OF WALLS. WHERE TOP OF WALL IS COVERED BY A SLAB WITHOUT WATERSTOPS, CONTINUE WATERSTOP TO WALL/SLAB JOINT. WHERE TOP OF WALL IS COVERED BY A SLAB WITH WATERSTOP, MAKE WATERSTOPS CONTINUOUS, SPlicing WATERSTOPS IN WALLS WITH WATERSTOPS IN SLAB.
- CURE CONCRETE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. WHERE WATER CURING IS SPECIFIED, MEMBRANE CURING IS NOT ALLOWED.
A. THE CONTRACTOR IS WARNED THAT WATER CURING IS DIFFICULT AT TIMES DUE TO WIND AND DRY CONDITIONS. STUDY SPECIFICATION REQUIREMENTS AND FURNISH ADEQUATE SYSTEMS TO PROVIDE WATER CURING WHERE REQUIRED.
B. KEEP WATER CURED SURFACES VISIBLY MOIST AT ALL TIMES. FLOOD TOPS OF WALLS NOT LESS THEN 3 TIMES DAILY.
- DO NOT PLACE BACKFILL AGAINST WALLS UNTIL:
A. WALLS HAVE BEEN CAST TO FULL HEIGHT OF STRUCTURE AND CONCRETE HAS REACHED THE MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f_c).
B. CONNECTING SLABS AND BEAMS HAVE BEEN CAST AND CONCRETE IN THOSE ELEMENTS HAS REACHED THE MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f_c).
- LAP SPLICES:
A. SEE TABLE 1 OF THIS DETAIL FOR LAP SPlice LENGTHS.
B. WHEN MULTIPLE BARS ARE SPliced AT THE SAME SECTION, THE "CLEAR BAR SPACING" IS DEFINED AS THE MINIMUM CLEAR DISTANCE BETWEEN THE BARS OUTSIDE THE SPlice LENGTH MINUS ONE BAR DIAMETER.
C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, BARS AT A LAP SPlice SHALL BE IN CONTACT WITH EACH OTHER.
D. "TOP BARS" ARE HORIZONTAL REINFORCEMENT AT LOCATIONS WHERE MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
- FORM EXPOSED CONCRETE CORNERS AND EDGES WITH 3/4" CHAMFER UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

S101 REINFORCED CONCRETE NOTES
TYP

SHEET 2 OF 3 03/12/19

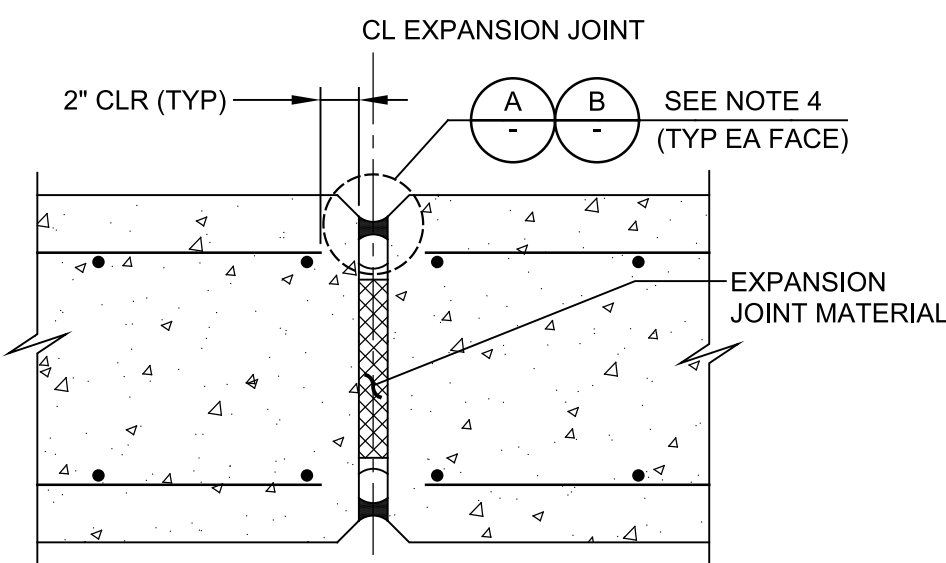
BAR SIZE	MINIMUM COVER (BAR DIA)	MINIMUM CLEAR BAR SPACING (BAR DIA)	LAP SPlice LENGTH (INCHES)	
			TOP BARS	OTHER BARS
#4	MORE THAN 1	MORE THAN 2	32 *	25 *
	MORE THAN 2	MORE THAN 4	20	16
#5	MORE THAN 1	MORE THAN 2	40 *	31 *
	MORE THAN 2	MORE THAN 4	26	20
#6	MORE THAN 1	MORE THAN 2	48 *	37 *
	MORE THAN 2	MORE THAN 4	30	24
#7	MORE THAN 1	MORE THAN 2	70 *	54 *
	MORE THAN 2	MORE THAN 4	43	33
#8	MORE THAN 1	MORE THAN 2	81 *	62 *
	MORE THAN 2	MORE THAN 4	50	38
#9	MORE THAN 1	MORE THAN 2	90 *	70 *
	MORE THAN 2	MORE THAN 4	56	42
#10	MORE THAN 1	MORE THAN 2	104 *	81 *
	MORE THAN 2	MORE THAN 4	62	48
#11	MORE THAN 1	MORE THAN 2	114 *	88 *
	MORE THAN 2	MORE THAN 4	69	54

REINFORCING BAR LAP SPlice TABLE NOTES:

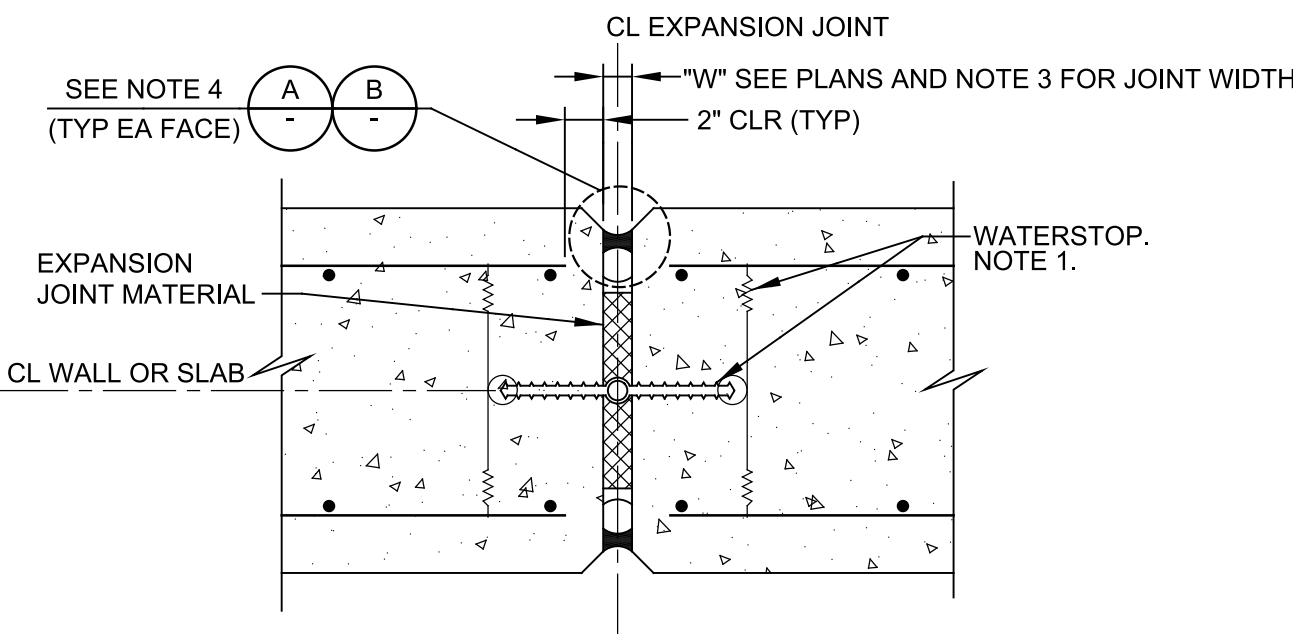
- TABULATED SPlice LENGTHS ARE APPLICABLE ONLY WHEN BOTH REQUIREMENTS FOR MINIMUM COVER AND FOR MINIMUM CLEAR BAR SPACING ARE SATISFIED.
- * = IF THE CLEAR BAR SPACING IS LESS THAN OR EQUAL TO TWO BAR DIAMETERS, OR THE COVER IS LESS THAN OR EQUAL TO ONE BAR DIAMETER, THE LAP SPlice LENGTH SHALL BE INCREASED BY 50 PERCENT.

S101 REINFORCED CONCRETE NOTES
TYP

SHEET 3 OF 3 03/12/19



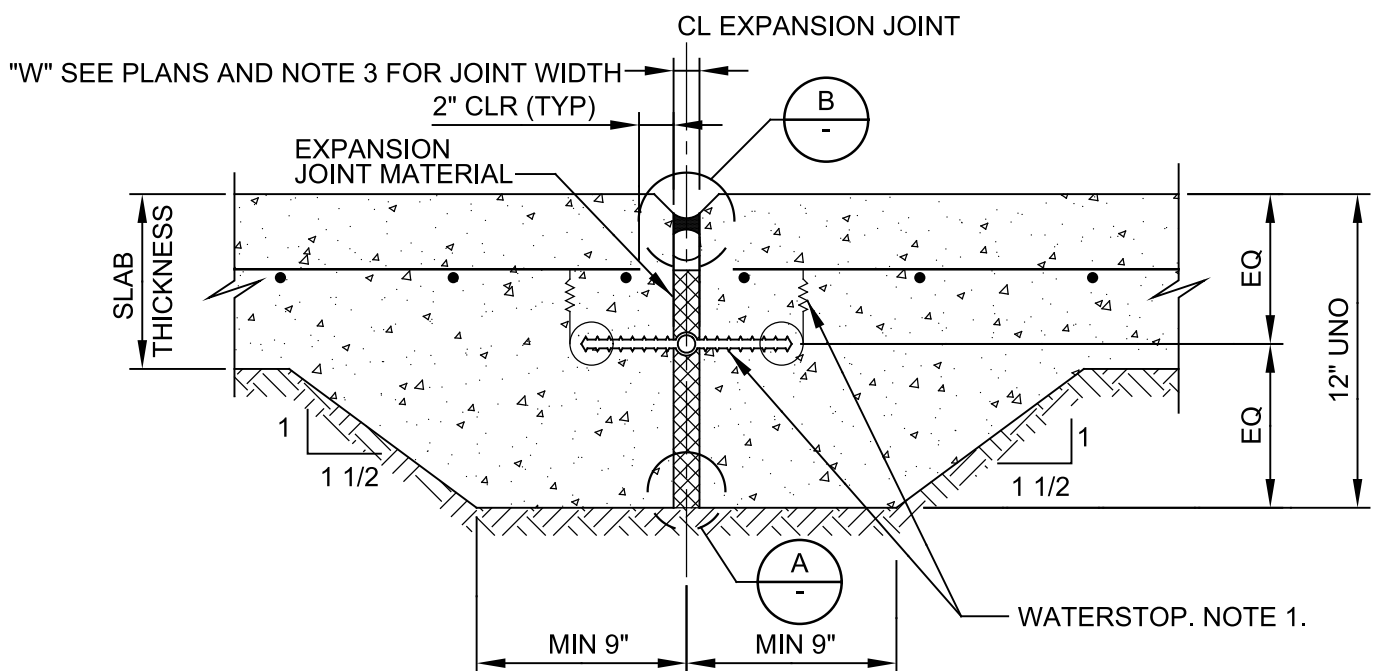
NON-WATER BEARING SLAB OR WALL



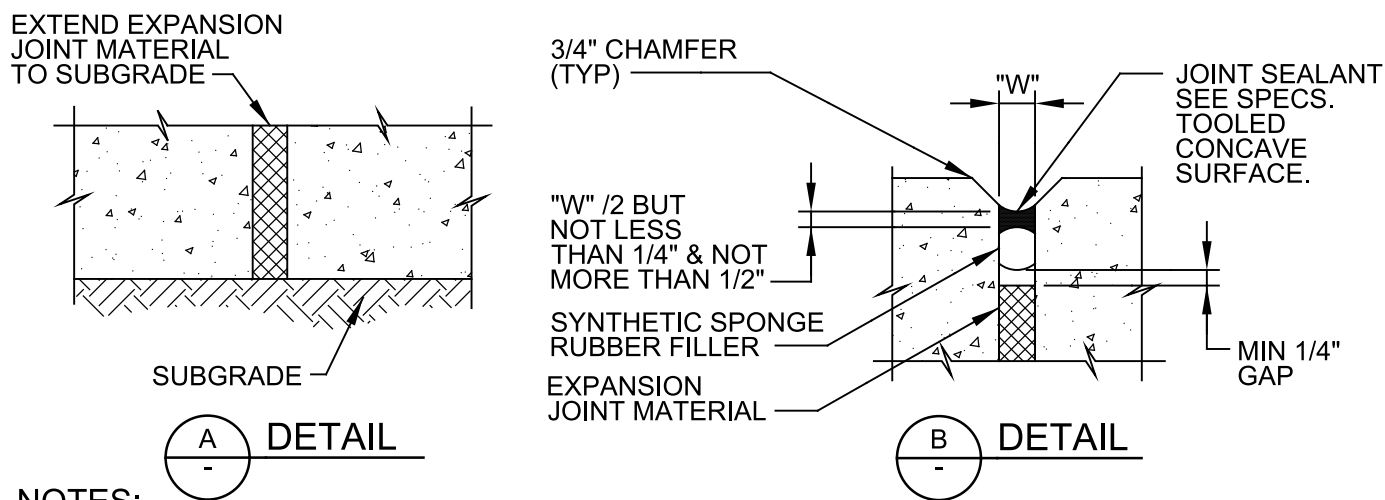
WATER BEARING SLAB OR WALL

S130 EXPANSION JOINT
TYP

SHEET 1 OF 2 07/22/16



WATER BEARING SLAB LESS THAN 12" THICK



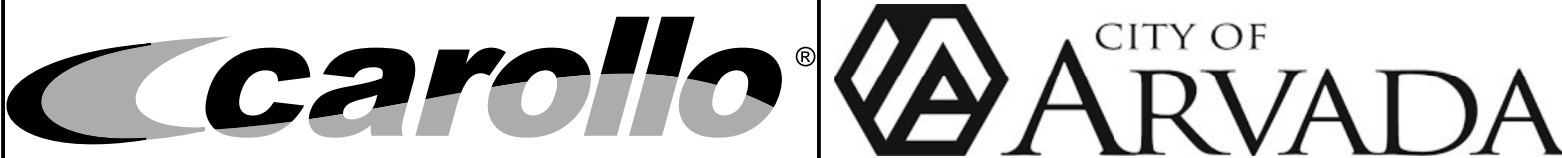
NOTES:

- 9" WATERSTOP WITH CENTER BULB CENTERED ON JOINT - SEE DETAIL S106/TYP. PROVIDE WIRE TIES MAX 2'-0" OC. HOG RINGS MAY BE USED IN LIEU OF WIRE LOOPS. THOROUGHLY CLEAN WATERSTOP BEFORE PLACING CONCRETE IN SECOND POUR.
- JOINT EDGES:
A. FOR WALLS AND BOTTOM OF EXPOSED SLABS: FORM EDGES WITH 3/4" CHAMFER.
B. FOR SLABS: EDGE TOP AND ENDS WITH 1/4" RADIUS.
"W" = 1" UNLESS OTHERWISE INDICATED ON PLANS. (MIN JOINT WIDTH = 3/8". MAX JOINT WIDTH = 2")
- USE DETAIL A ONLY AT SOIL SIDE OF SLABS ON GRADE. USE DETAIL B AT ALL OTHER LOCATIONS.

S130 EXPANSION JOINT
TYP

SHEET 2 OF 2 07/22/16

DESIGNED
MKF
DRAWN
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CHECKED
MAK
DATE
OCTOBER 2022



CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
STRUCTURAL TYPICAL DETAILS 1

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

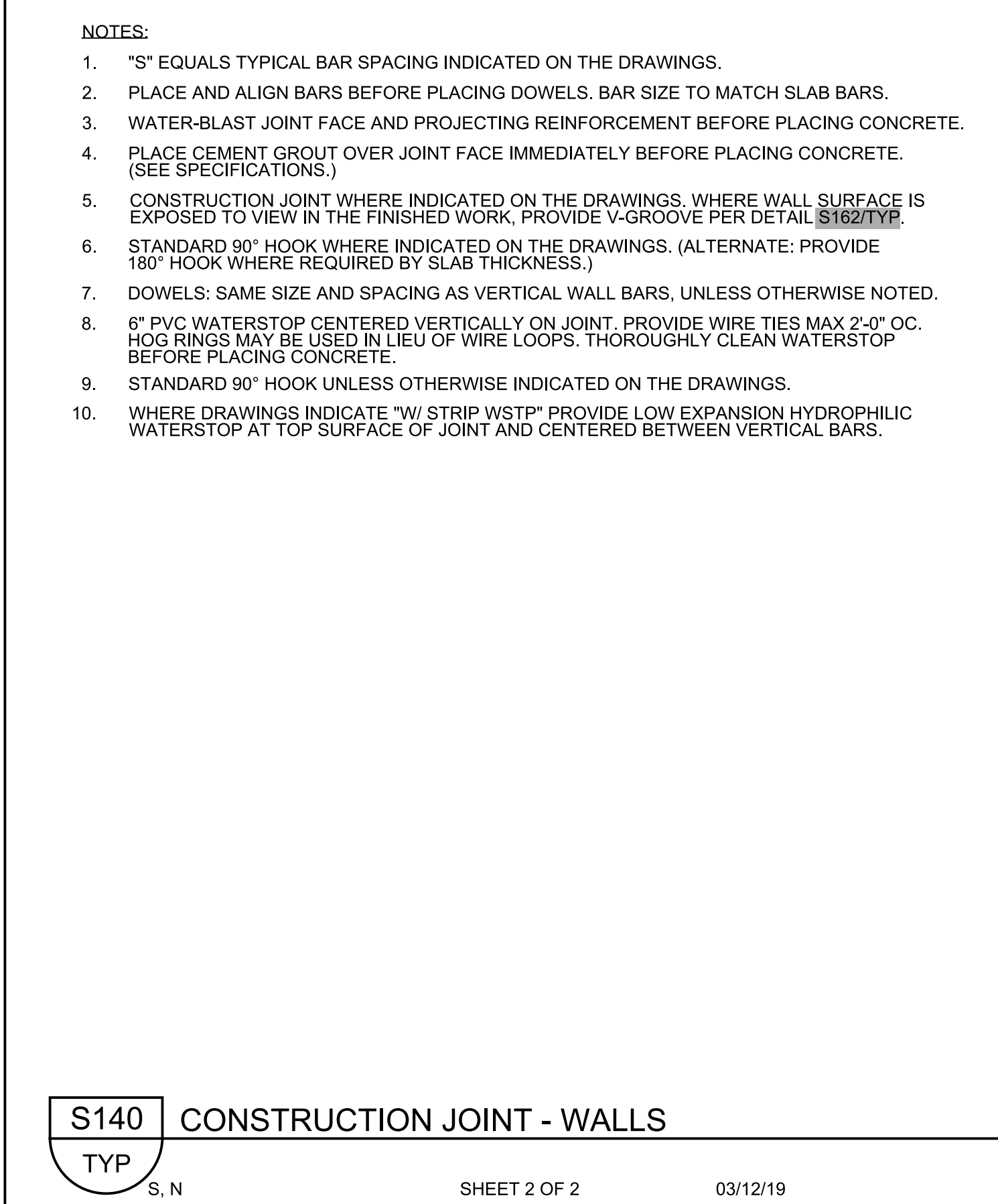
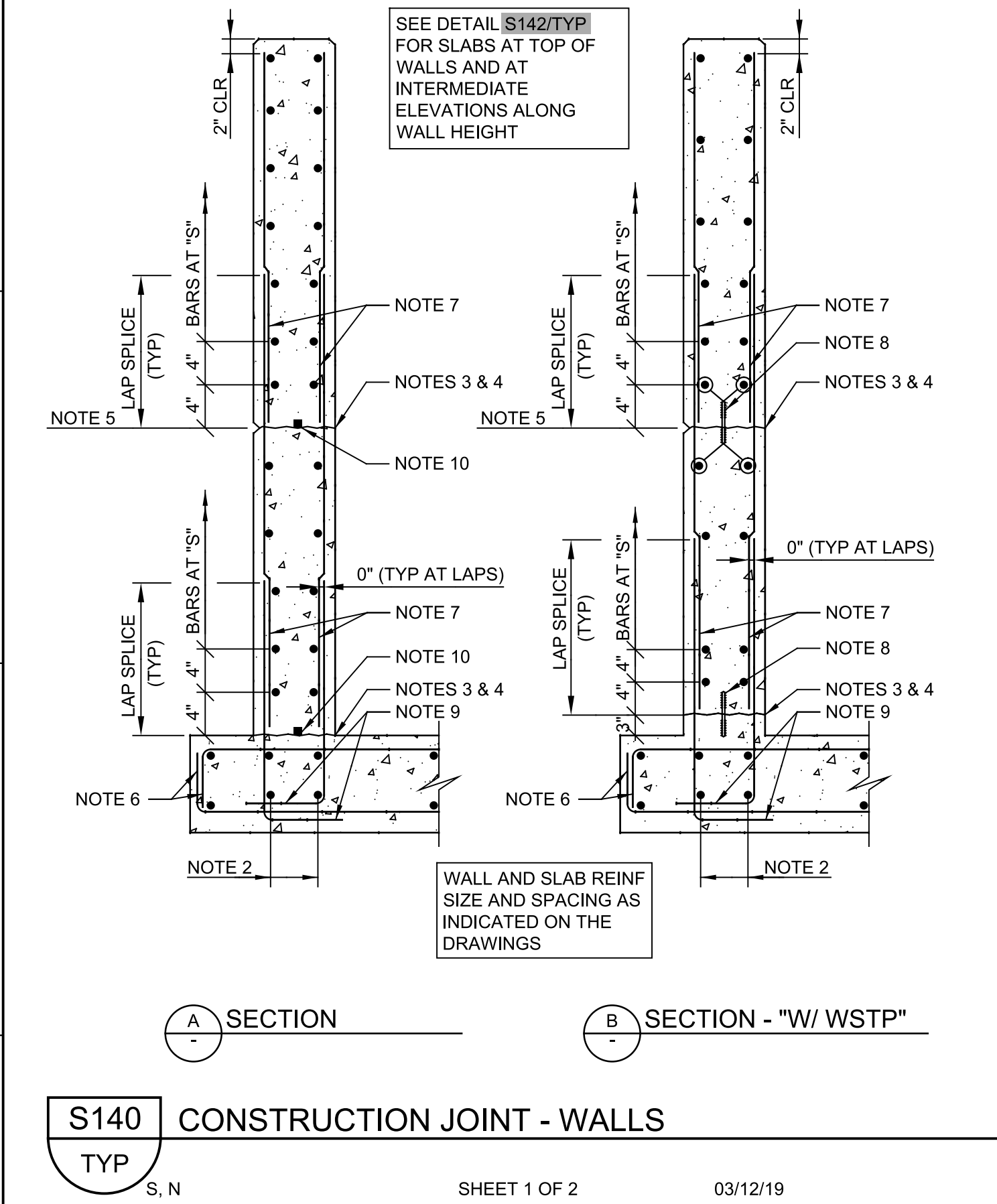
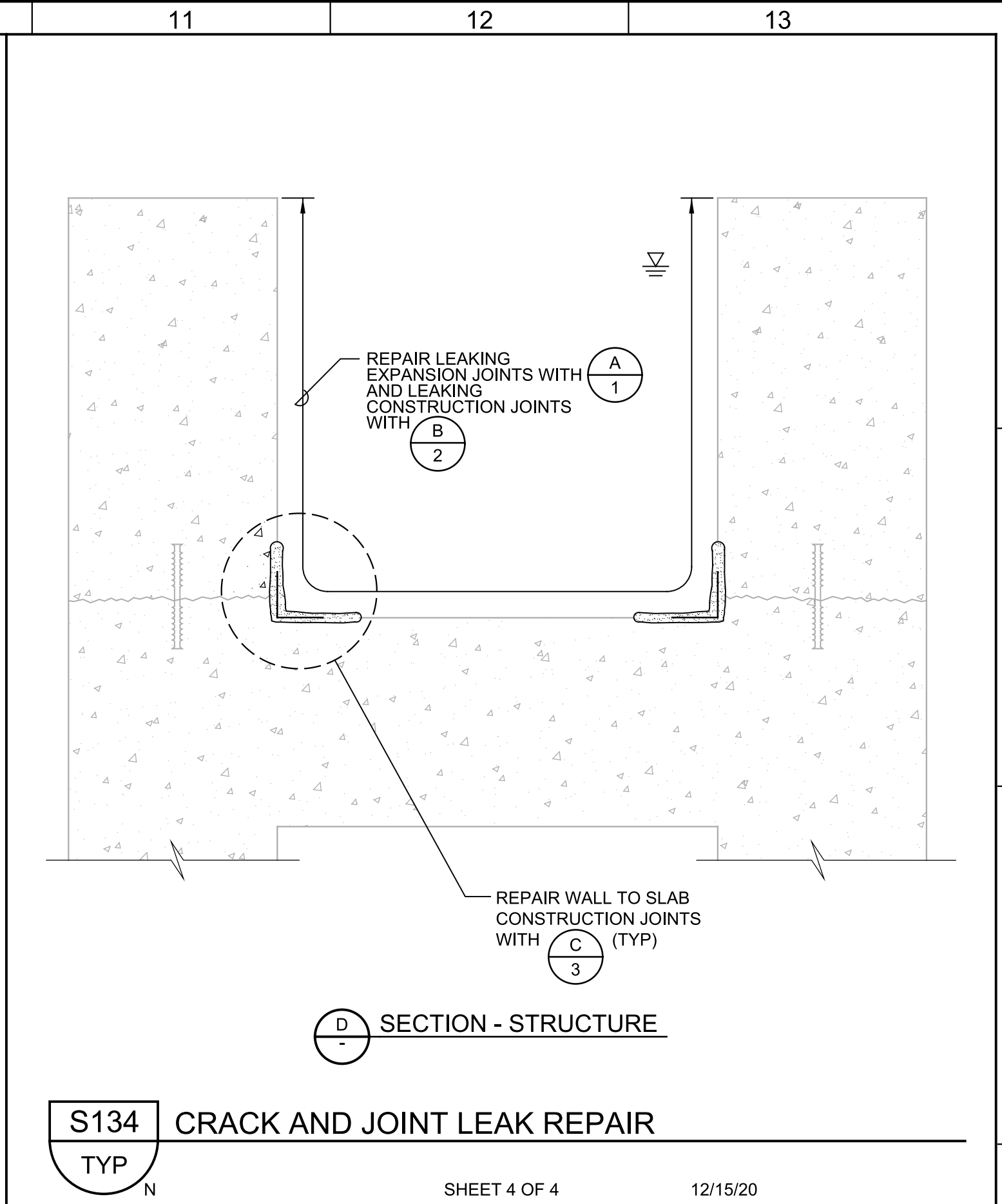
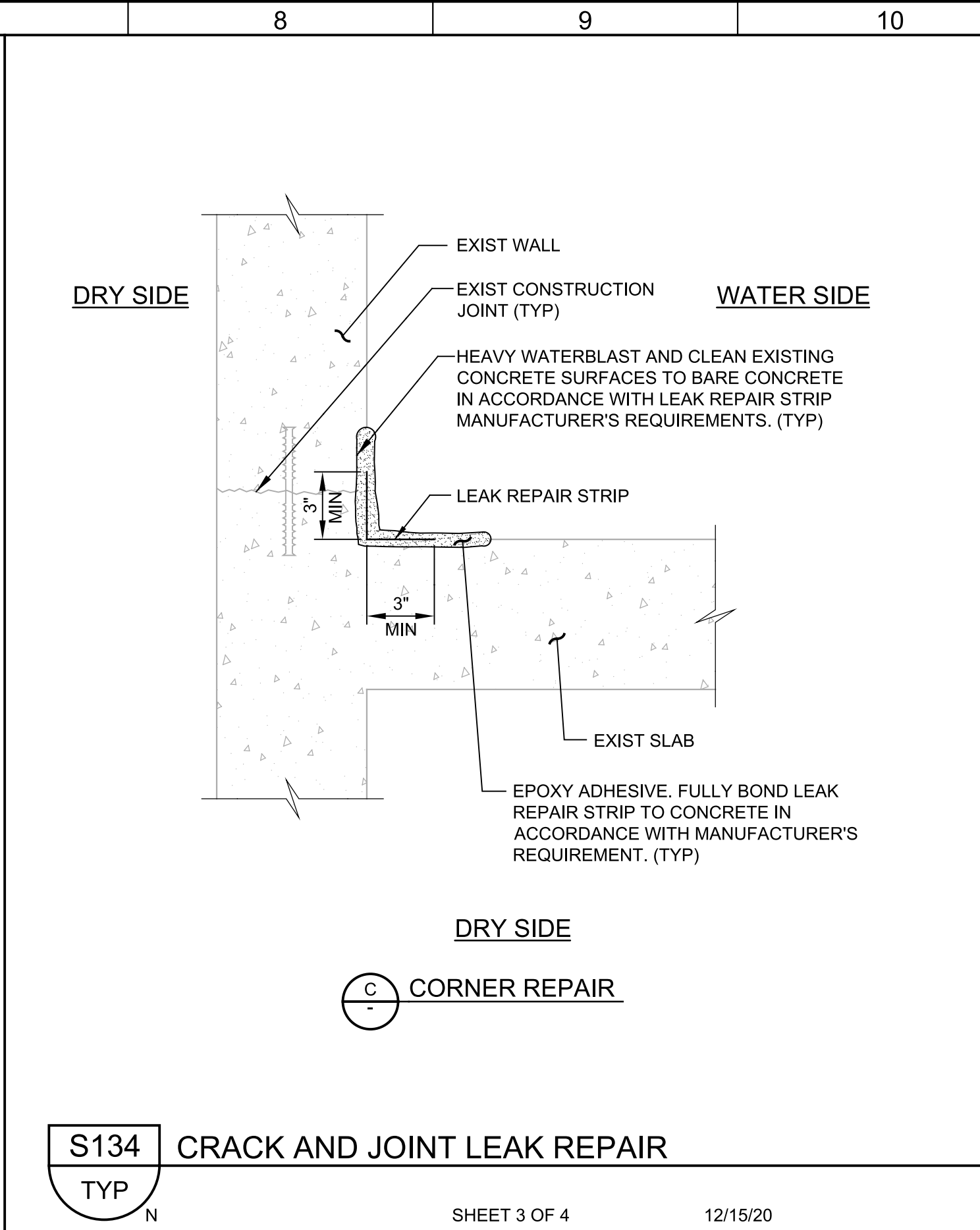
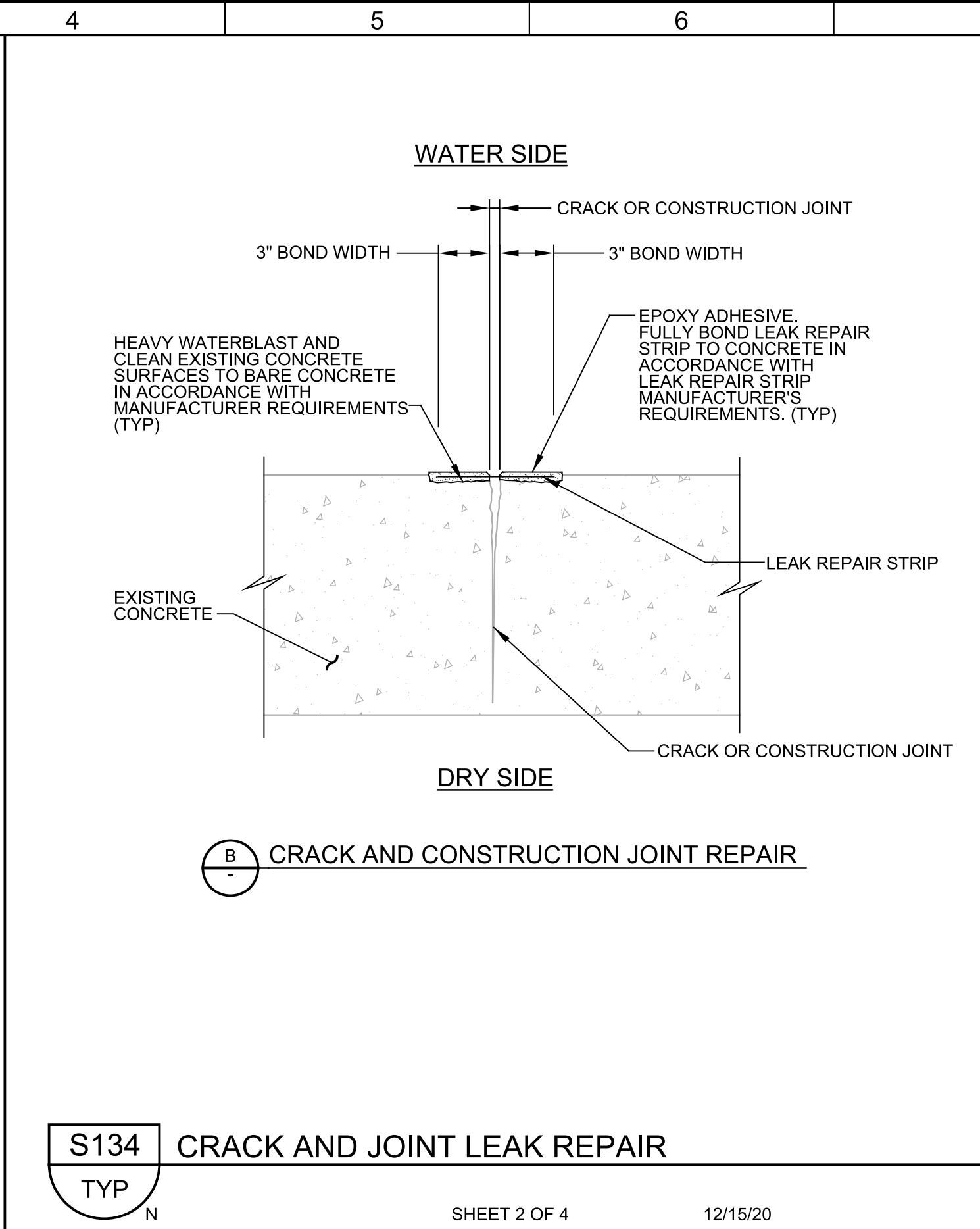
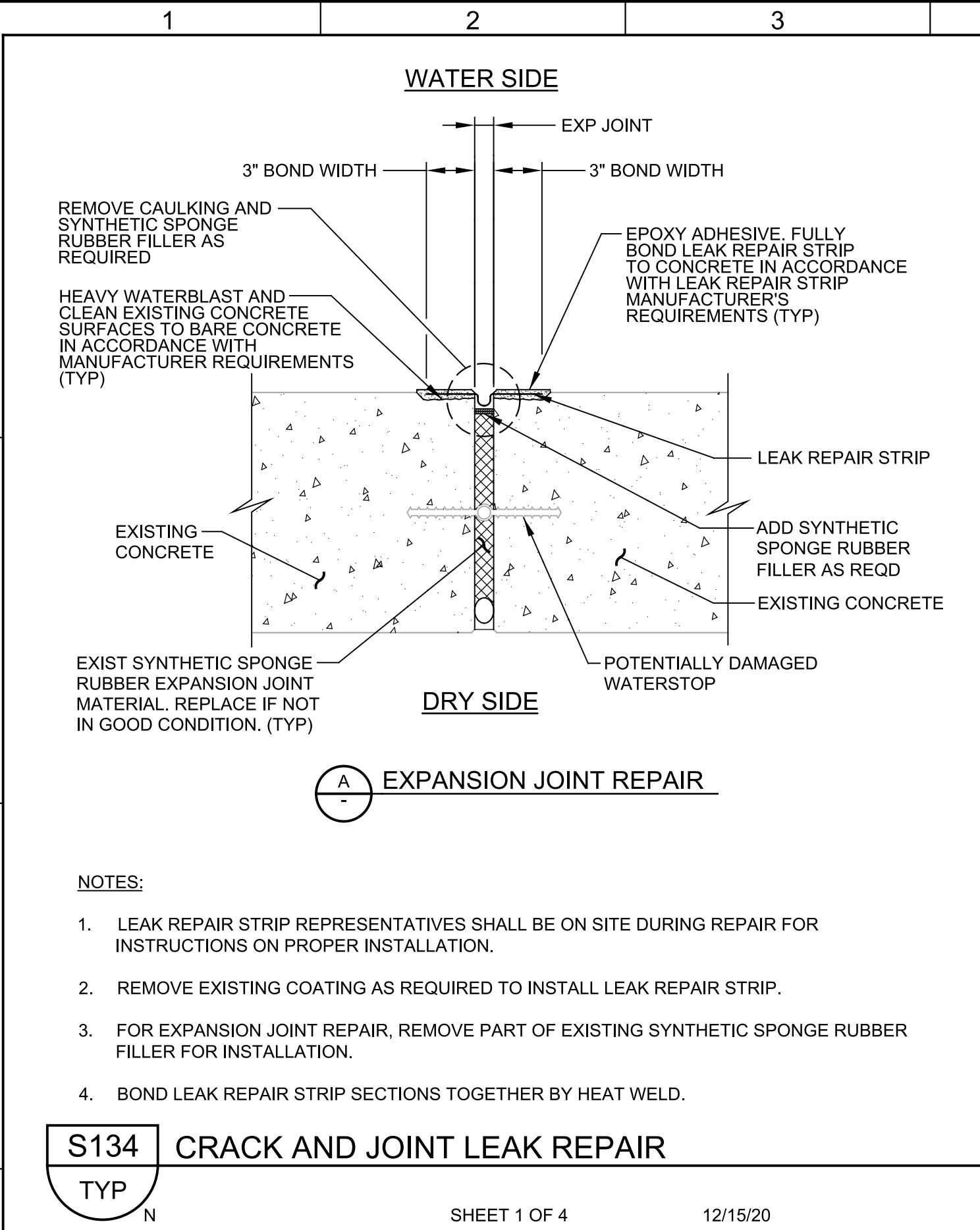
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201351
DRAWING NO.
00TS01
SHEET NO.
OF

Plot Date: 17-OCT-2022 11:37:50 AM

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LAST SAVED BY: trea



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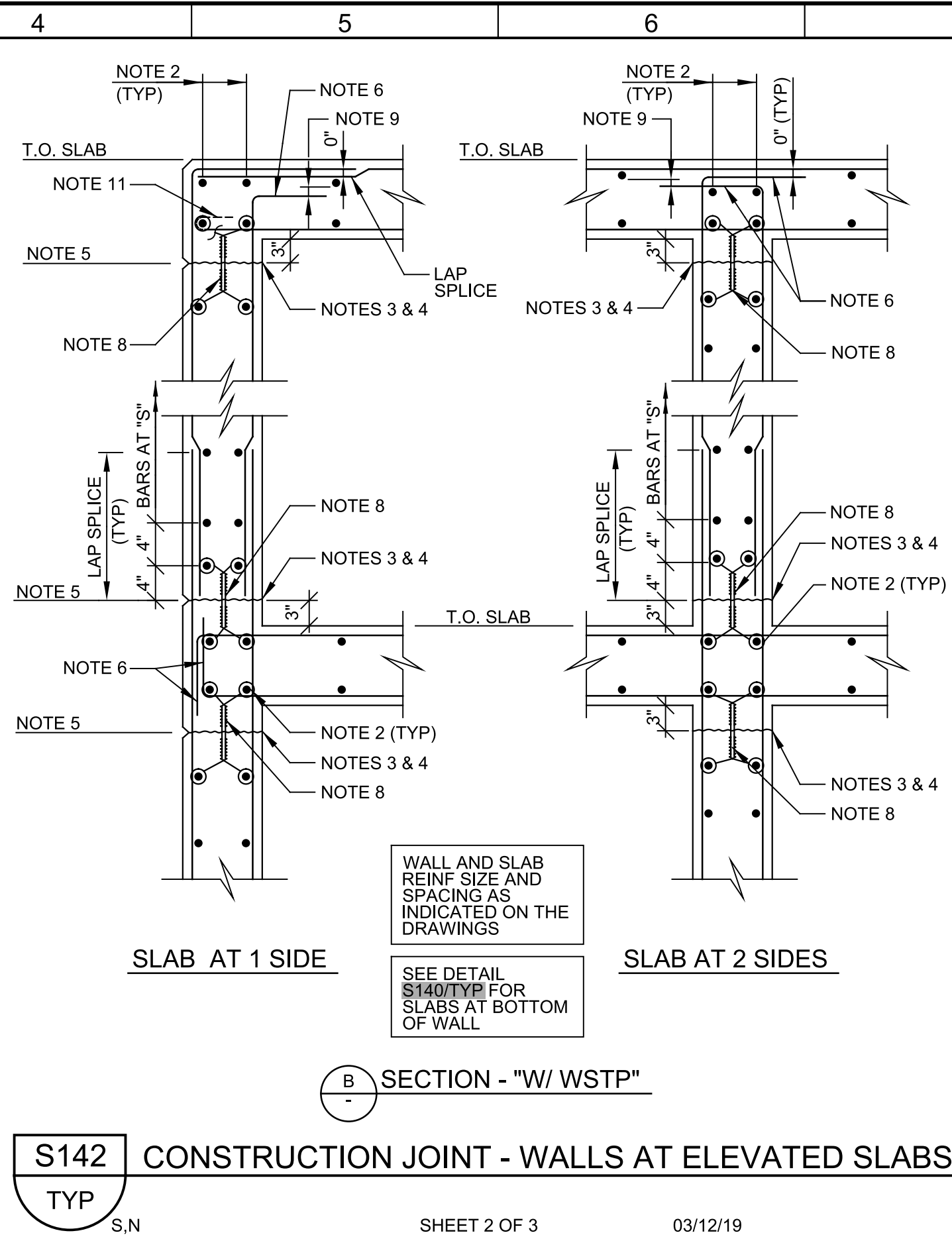


DESIGNED	MKF
DRAWN	KA
CHECKED	MAK
DATE	OCTOBER 2022

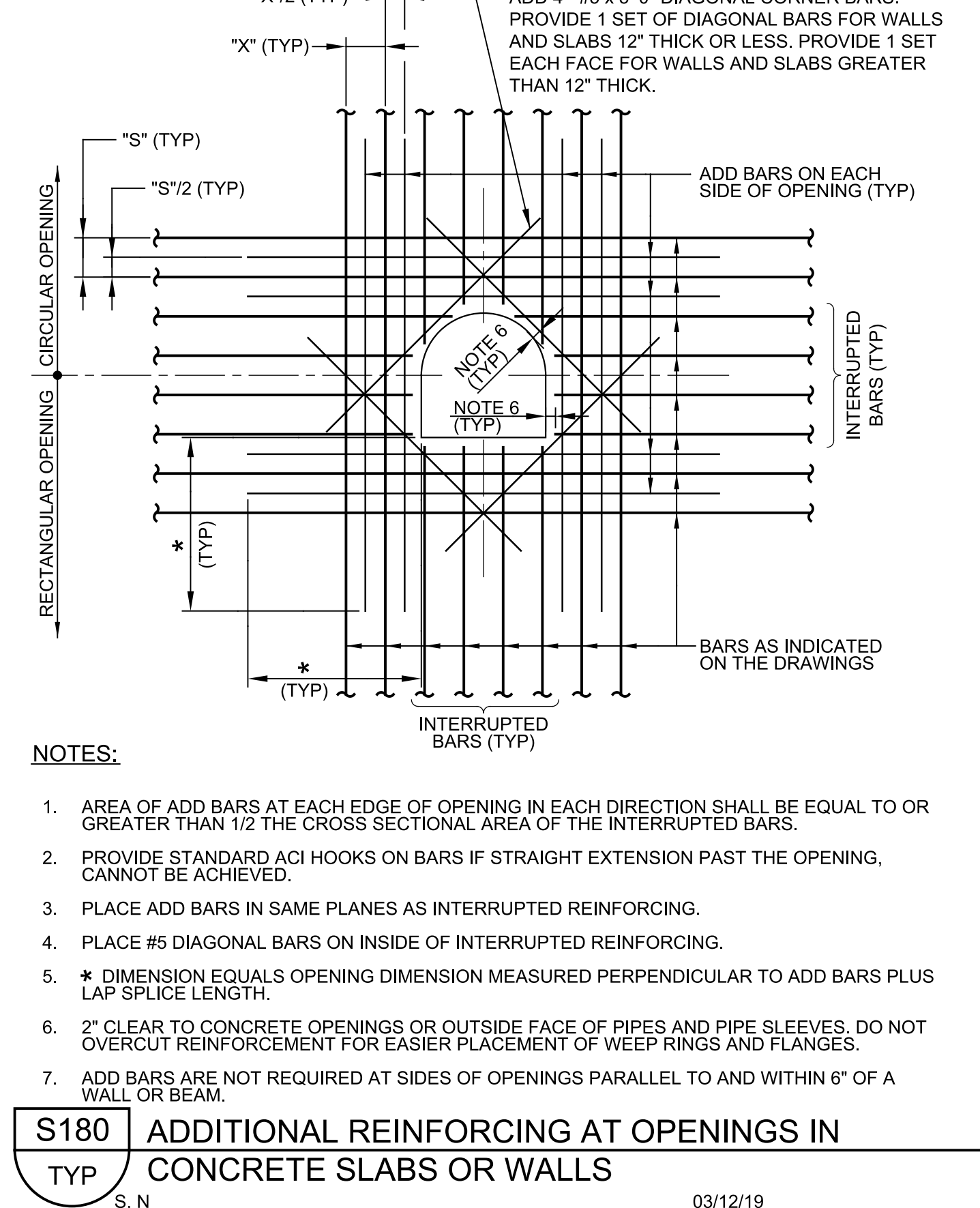


CITY OF ARVADA, COLORADO
RALSTON WTP SOLIDS IMPROVEMENTS
TYPICAL DETAILS
STRUCTURAL TYPICAL DETAILS 2

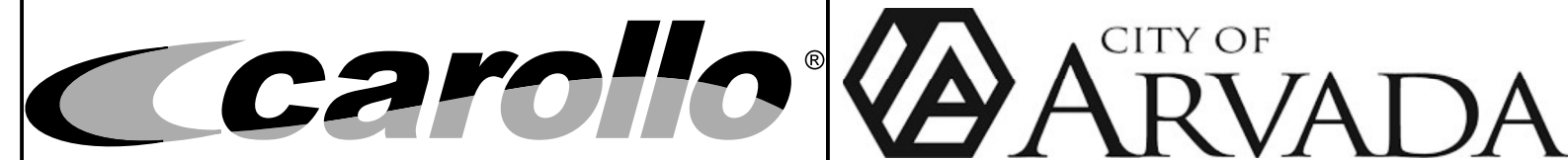
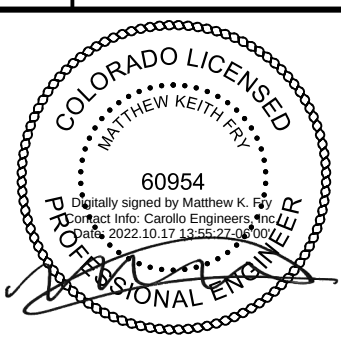
VERIFY SCALES	JOB NO. 201351
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. 00TS02
0 1"	SHEET NO. OF
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	



- 11
- 12
- 13
-
-
- A** DETAIL - CORNER:
DOUBLE MAT
- B** DETAIL - CORNER:
SINGLE MAT
-
-
- C** DETAIL - INTERSECTION:
DOUBLE MAT
- D** DETAIL - INTERSECTION:
SINGLE MAT
- NOTES:**
1. BAR SIZE, SPACING, AND ORIENTATION OF BAR LAYERS SHALL BE AS INDICATED ON THE DRAWINGS.
 2. AT INTERSECTION, MAKE BAR SIZE THE LARGER OF BAR SIZES IN CONNECTING WALLS. PLACE BARS IN SAME LAYERS AS AT CONNECTING WALLS (TYP).
 3. BAR TAILS: 12 BAR DIAMETERS PLUS 12".
- S144**
- TYP**
- S**
- WALL REINFORCEMENT AT CORNERS
& INTERSECTIONS**
- SHEET 1 OF 2**
- 05/31/16



				DESIGNED MKF
				DRAWN KA
				CHECKED MAK
EV	DATE	BY	DESCRIPTION	DATE OCTOBER 2022



CITY OF ARVADA, COLORADO

RALSTON WTP SOLIDS IMPROVEMENTS

TYPICAL DETAILS

STRUCTURAL TYPICAL DETAILS 3

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING  IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201351
	DRAWING NO. 00TS03
	SHEET NO. OF



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.2.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: R23-018, A Resolution Authorizing Amendment No. 2 to the Agreement Between the City of Arvada and Moltz Construction, Inc., Awarding Contractor Phase II and Establishing Contractor's Guaranteed Maximum Price for Phase II of the "The Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements" in an Amount not to Exceed \$838,985.00

Report in Brief

The Alkire Lift Station services development within the Jefferson Center Metropolitan District No. 1 and the Lift Station is currently operating at capacity. The existing pumps and motors need to be replaced to allow for additional planned development. This resolution will approve the second amendment to the construction contract awarding the contractor Phase II construction services.

The Arvada team recommends that the City Council approve R23-018, A Resolution Authorizing Amendment No. 2 to the Agreement Between the City of Arvada and Moltz Construction, Inc., Awarding Contractor Phase II and Establishing Contractor's Guaranteed Maximum Price for Phase II of "The Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements," in the amount of \$838,985.00 for a total contract amount Not to Exceed \$1,337,779.00.

Financial Impact

The City will provide 5% of the funding for the construction, \$66,888.95, and Jefferson Center Metropolitan District No. 1 will provide the remaining funding for this project. The project funds are available in Project 98538.

Background

In 2005, Jefferson Center Metropolitan District No. 1 (JCMD) constructed the Alkire Lift Station to serve development within the boundaries of JCMD. Expansion of the Lift Station was accounted for in the original design of the Lift Station. Due to development and increased demand, the Lift Station is currently operating at capacity and the existing pumps and motors need to be replaced to allow for additional planned development.

Discussion

In February of 2021, Arvada contracted with HDR to produce a technical memorandum that summarized the existing and future planned capacity of the Alkire Lift Station to determine its adequacy to serve existing flows and planned development within the boundaries of JCMD. The HDR report determined that the expansion plan will have sufficient pumping capacity for the currently planned buildout of the property within the boundaries of JCMD.

In August of 2021, Arvada competitively selected Muller Engineering Company to provide plans, specifications, and bid phase engineering services relative to upsizing the pumps, motors, and associated electrical equipment in accordance with the original designed expansion.

During the February 7, 2022, and August 15, 2022 meetings, Council approved an intergovernmental agreement to finance engineering services, preconstruction services, and construction of the improvements to the Alkire Lift Station. The City will provide 5% of the funding and Jefferson Center Metropolitan District No. 1 will provide the remaining funding for this project.

SUBJECT: R23-018, A Resolution Authorizing Amendment No. 2 to the Agreement Between the City of Arvada and Moltz Construction, Inc., Awarding Contractor Phase II and Establishing Contractor's Guaranteed Maximum Price for Phase II of the "The Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements" in an Amount not to Exceed \$838,985.00

PAGE: 2
ITEM: 8.A.2.

In June of 2022, Arvada competitively selected Moltz Construction Inc. to serve as the Construction Manager/General Contractor for the upgrades and improvements to Alkire Lift Station. Due to constraints in the current supply chain and long lead items, Moltz Construction Inc. was authorized through Amendment No. 1 in the amount of \$498,794 dated August 31, 2022, to secure purchases and procurement/fabrication of items that are critical for the timely completion of this project, including pumps and generators. This Amendment No. 2 will cover the scope of work to complete the construction not covered in Amendment No. 1.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

This action aligns with the Infrastructure Priority Area of the City Council Strategic Plan. Specifically, the recommended actions support the following principle within the Infrastructure Priority Area:

Provides the community with a safe, reliable, high-quality water supply, drainage system, and wastewater disposal services for full city build-out, as defined by the Comprehensive Plan.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R23-018, A Resolution Authorizing Amendment No. 2 to the Agreement Between the City of Arvada and Moltz Construction, Inc., Awarding Contractor Phase II and Establishing Contractor's Guaranteed Maximum Price for Phase II of "The Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements," in the amount of \$838,985.00 for a total contract amount Not to Exceed \$1,337,779.00.

Suggested Motion:

I move that R23-018, A Resolution Authorizing Amendment No. 2 to the Agreement Between the City of Arvada and Moltz Construction, Inc., Awarding Contractor Phase II and Establishing Contractor's Guaranteed Maximum Price for Phase II of "The Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements," in the amount of \$838,985.00 for a total contract amount Not to Exceed \$1,337,779.00, be (approved) (rejected).

Prepared by:
Kris Gardner, Civil Engineer III

Reviewed by:

SUBJECT: R23-018, A Resolution Authorizing Amendment No. 2 to the Agreement Between the City of Arvada and Moltz Construction, Inc., Awarding Contractor Phase II and Establishing Contractor's Guaranteed Maximum Price for Phase II of the "The Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements" in an Amount not to Exceed \$838,985.00

PAGE: 3
ITEM: 8.A.2.

Approved by:

Mary Stahl, Senior Civil Engineer	1/23/2023
Jenny Wolfschlag, City Engineer	1/23/2023
Jacqueline Rhoades, Public Works Director	1/23/2023
Bryan Archer, Director of Finance	1/24/2023
Tammy Hedlund, Legal Specialist	1/26/2023
Kelsy Sargent, Assistant City Attorney	1/26/2023
Rachel Morris, City Attorney	1/31/2023
Don Wick, Deputy City Manager	1/31/2023
Lorie Gillis, City Manager	2/1/2023

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R23-018

A RESOLUTION AUTHORIZING AMENDMENT NO. 2
TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND MOLTZ
CONSTRUCTION, INC., AWARDED CONTRACTOR PHASE II AND ESTABLISHING
CONTRACTOR'S GUARANTEED MAXIMUM PRICE FOR PHASE II OF THE "THE
CONSTRUCTION MANAGEMENT/ GENERAL CONTRACTOR AGREEMENT FOR
PRECONSTRUCTION SERVICES FOR ALKIRE LIFT STATION IMPROVEMENTS" IN
AN AMOUNT NOT TO EXCEED \$838,985.00

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The Mayor or Mayor Pro Tem is authorized to sign and the City Clerk to attest, in form approved by the City Attorney, an Amendment No. 2, which is in substantially the same form as that attached hereto, by and between the City of Arvada and Moltz Construction, Inc. awarding Contractor Phase II and establishing Contractor's Guaranteed Maximum Price for Phase II of the "Construction Management/General Contractor Agreement for Preconstruction Services for Alkire Lift Station Improvements" in an amount not to exceed \$838,985.00.

Section 2. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 13th day of February, 2023.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

AMENDMENT NO. 2
TO THE AGREEMENT BETWEEN THE CITY OF ARVADA AND MOLTZ
CONSTRUCTION, INC., AWARDED CONTRACTOR PHASE II AND
ESTABLISHING CONTRACTOR'S GUARANTEED MAXIMUM PRICE FOR PHASE
II OF THE "CONSTRUCTION MANAGEMENT/ GENERAL CONTRACTOR
AGREEMENT FOR PRECONSTRUCTION SERVICES FOR ALKIRE LIFT STATION
IMPROVEMENTS" IN AN AMOUNT NOT TO EXCEED \$838,985.00

1. PARTIES.

- 1.1. The parties to this Amendment No. 2 ("**Amendment No. 2**") are the City of Arvada, a Colorado home rule municipal corporation, whose mailing address is 8101 Ralston Road, Arvada, CO 80002 ("**Arvada**" or "**Owner**") and Moltz Construction, Inc. whose place of business is located at 975 Merchant Court, Windsor, Colorado 80550 ("**Contractor**").

2. RECITALS AND PURPOSE.

- 2.1. On or about June 9, 2022, Arvada and Contractor entered into an agreement wherein Contractor will provide preconstruction phase ("**Phase I**") Construction Management ("**CM**") services, including but not limited to cost estimating, constructability reviews, value engineering, development of a Guaranteed Maximum Price ("**GMP**"), and risk management (the "**Original Agreement**"). Pursuant to the Original Agreement, the cost of Phase I will not exceed \$45,000.00.
- 2.2. On or about August 31, 2022, Arvada and Contractor entered into an agreement establishing GMP No. 1 for purposes of securing the purchase of long lead items necessary for project delivery in an amount not to exceed \$498,794.00 ("**Amendment No. 1**").
- 2.3. The Amendment No. 1 did not establish the GMP for Phase II nor did it award Contractor Phase II of the Original Agreement.
- 2.4. For the convenience of the parties, (due to the voluminous nature of the Original Agreement), the Original Agreement and Amendment No. 1 not attached hereto but are incorporated herein by reference.
- 2.5. Pursuant to Article 2 of the Original Agreement, this Amendment No. 2 awards Contractor the Construction Phase of the Original Agreement for the construction of the improvements to the sanitary sewer lift station, Alkire ("**Alkire Lift Station**").
- 2.6. This Amendment No. 2 establishes Guaranteed Maximum Price No. 2 for Phase II in an amount not to exceed **\$838,985.00** ("**GMP No. 2**"). The Cost of GMP No. 2 is in addition to the cost of Phase I of the Original Agreement and GMP No. 1 of Amendment No. 1, for a total contract amount of **\$1,337,779.00**.

3. **CONTRACT DOCUMENTS AND EXHIBITS.** The Contract Documents shall consist of the Original Agreement, Amendment No. 1, and this Amendment No. 2 together with the following:

Exhibit A: Contractor's GMP No. 2 100% Cost Estimate

Exhibit B: 100% Design Documents by Muller Engineering

All exhibits referred to in this Amendment No. 2 are attached hereto and are, by reference, incorporated herein for all purposes. In the event any matter, term, provision, or condition that is the subject of this Amendment No. 2 requires clarification or is in dispute, or is the subject of a difference of opinion, the purpose and intent of the agreement shall be first ascertained by reference to the Contract Documents in their entirety. In the event of any dispute or differences between the respective documents that constitute the Contract Documents, then Contractor shall secure the written instructions from Arvada before proceeding with the performance of the services affected by such conflicts, omissions, or discrepancies

4. **CONTRACT TIME.**

- 4.1. The Guaranteed Date of Substantial Completion established by this Amendment No. 2 is December 15, 2023. The Date of Final Completion established by this Amendment No. 2 is December 29, 2023.

5. **AMENDMENTS TO THE ORIGINAL AGREEMENT.**

- 5.1. Section 2.4.3 of the Original Agreement is amended as follows:

2.4.3. Contingency Amounts - The estimated Cost of the Work shall include two Contingency Amounts, referred to as "**Contractor's Contingency**" and "**Material Escalation Contingency**."

2.4.3.1. **Contractor's Contingency** – A sum established by Contractor for the Contractor's exclusive use to cover costs arising under Subparagraph 2.4.2 and other costs such as scope gap, minor subcontractor bid errors, and minor clarifications between the drawing set used for GMP No. 2 and the final design drawings, which are properly reimbursable as Cost of the Work but not the basis for a Change Order.

2.4.3.2. **Material Escalation Contingency** – A sum established by Contractor for project use to account for changes in material costs due to current market conditions, and other costs such as material or equipment price changes, and delivery delay of materials or equipment, which are properly reimbursable as Cost of the Work but not the basis for a Change Order.

2.4.3.3. Contractor shall not use contingency funds for “Costs of Ineligible Work Items” as detailed in section 8.1.3 or for any of the following:

2.4.3.3.1. Legal fees or costs related to any claims arising from or related to this agreement or any other agreement;

2.4.3.3.2. Substantive changes in the Work;

2.4.3.3.3. Substantive design revisions, errors, or omissions;

2.4.3.3.4. Unknown conditions; or

2.4.3.3.5. Allowance adjustments.

2.4.3.4. Contractor shall provide Arvada notice of all anticipated charges against the Contingency Amounts, and shall provide Arvada as part of a monthly status report an accounting of each Contingency, including all reasonably foreseen uses or potential uses of any Contingency in the upcoming three months.

2.4.3.5. Arvada holds full rights to the Contingency Amounts and will be refunded any remaining Contingency Amounts upon Substantial Completion.

6. FULL FORCE AND EFFECT.

6.1. All other terms and conditions shall be as set forth in the Original Agreement and Amendment No. 1.

(Signatures on next page)

DATED this _____ day of _____, 2023.

CITY OF ARVADA, COLORADO

Marc Williams, Mayor
8101 Ralston Road
Arvada, CO 80002

ATTEST/WITNESS:

City Clerk

APPROVED AS TO FORM:

For Rachel A. Morris, City Attorney

By: _____

MOLTZ CONSTRUCTION, INC.

Mike Butler, President
975 Merchant Court
Windsor, CO 80550
mike@moltzconstruction.com

Exhibit A

AMENDMENT NO. 2
TO THE AGREEMENT BETWEEN THE CITY OF
ARVADA AND MOLTZ CONSTRUCTION, INC.,
AWARDING CONTRACTOR PHASE II AND
ESTABLISHING CONTRACTOR'S GUARANTEED
MAXIMUM PRICE FOR PHASE II OF THE
"CONSTRUCTION MANAGEMENT/ GENERAL
CONTRACTOR AGREEMENT FOR PRECONSTRUCTION
SERVICES FOR ALKIRE LIFT STATION
IMPROVEMENTS" IN AN AMOUNT NOT TO EXCEED
\$838,985.00



Moltz Construction Inc.
General Contractor/Construction Manager

8807 CR 175
P.O. Box 729
Salida, CO 81201
Phone: (719)539-7319
Fax: (719)539-7695

Attn.
Kris Gardner
Utilities Engineer,
City of Arvada
8101 Ralston Road
Arvada, CO 80002

January 13, 2023

Re: Alkire Lift Station Improvements Project – GMP No.2 100% Cost Estimate Final Amended

Mr. Gardner:

Moltz Construction is pleased to submit the attached GMP No.2 cost estimate for the City of Arvada Alkire Lift Station Improvements Project. This proposal is based on the 100% design documents and specifications provided by Muller Engineering dated 11-4-22. The scope of the GMP No.2 cost estimate is as follows.

- Contract professional engineering services for the architectural, structural design and permitting requirements for the new generator pad and enclosure in accordance with local and state regulations.
- Procure all required permits from the City of Arvada and Jefferson County.
- Provide all necessary labor, equipment, materials, and supervision to construct a new generator pad and enclosure. Constructed to the size and code requirements for the new generator. Includes the installation, testing and start up of the new pre-Procured Generator and the salvage, transport and unloading of the existing.
- Includes the phased removal of the existing pumps, pads, and piping with the coinciding installation of three pre-Procured Gorman Rupp Super VS Series pumps, motors, accessories, pads, associated piping and valves per the documents.
- Includes Floor and Pipe Coatings per the documents.
- Includes influent bypass pumping for the phased valve and piping installation including grinder vault modifications.
- Provide and install all electrical, instrumentation and control including three pre-procured 100hp VFDs per the documents.
- Includes the testing, start up, programming and training for the pre-procured pumps, VFDs, and generator.
- Provide product submittals, O&Ms, and start up services for above per specifications.

Attachments include a total GMP cost summary with a list of changes from 60% to 100% and assumptions (exhibit A) a detailed estimate (exhibit B) and an updated schedule (exhibit C) along with individual subcontractor and vendor proposals for the project. Amended 1-13-2023 to include \$121,616.00 in contingency.

The total cost of the GMP No.2 scope is **\$838,985.00**

Should you have any questions regarding this proposal, please do not hesitate to contact me.

Sincerely,
Dustin Miller,
Project Manager
Moltz Construction Inc.
720.862.5635
Dustin.Miller@moltzconstruction.com

**EXHIBIT
A**



8807 C.R. 175 | PO Box 729 | Salida, CO | 81201
MOLTZ CONSTRUCTION INC. Moltz // A Graham Group Company

Exhibit A 1 of 2



ALKIRE LIFT STATION IMPROVEMENTS Estimated Total Project Cost Summary

COST CATEGORY	%	60% GMP AMOUNT	100% GMP AMOUNT	Change AMOUNT
PRECONSTRUCTION SERVICES:				
SUBTOTAL PRECONSTRUCTION SERVICES COST (Labor, materials, subcontracts, etc.):		\$45,000	\$45,000	
CONSTRUCTION SERVICES:				
DIRECT CONSTRUCTION COSTS: GMP 1		\$384,142	\$384,142	
Division 11 - Equipment - (Supply 3 Pumps w/Start - up)		\$178,012	\$178,012	
Division 16 - Electrical - (Supply Generator and ATS w/Start-up) (Supply 3 VFD's and Enclosures w/Start-up)		\$206,130	\$206,130	
DIRECT CONSTRUCTION COSTS: GMP 2		\$402,933	\$607,262	\$204,329
Division 1 - Permits / Admin		\$47,652	\$84,945	\$37,293
Division 2 - Sitework / Demolition		\$54,150	\$79,660	\$25,510
Division 3 - Concrete		\$8,223	\$24,204	\$15,981
Division 4 - Masonry		\$22,074	\$23,574	\$1,500
Division 9 - Finishes		\$8,890	\$11,310	\$2,420
Division 11 - Equipment		\$27,035	\$24,594	-\$2,441
Division 15 - Mechanical		\$96,562	\$126,077	\$29,515
Division 16 - Electrical MCI		\$10,883	\$11,205	\$322
Division 16 - Electrical		\$127,464	\$221,693	\$94,229
SUBTOTAL DIRECT CONSTRUCTION COST:		\$827,368	\$991,404	\$164,036
INDIRECT CONSTRUCTION COSTS:		\$66,189		
General Conditions Cost (Job Indirect and Job Staff)	8.00%	\$66,189	\$79,312	\$13,123
SUBTOTAL DIRECT CONSTRUCTION + INDIRECT CONSTRUCTION:		\$893,557	\$1,070,716	\$177,159
Overhead and profit	7.50%	\$67,017	\$80,304	\$13,287
SUBTOTAL DIRECT CONSTRUCTION + INDIRECT CONSTRUCTION + OVERHEAD + PROFIT		\$960,574	\$1,151,020	\$190,446
Insurance and Bond Cost	1.75%	\$16,810	\$20,143	\$3,333
SUBTOTAL DIRECT CONSTRUCTION + INDIRECT CONSTRUCTION + OVERHEAD + PROFIT + INSURANCE + BONDS		\$977,384	\$1,171,163	\$193,779
Subtotal for Contingency			\$1,216,163	
Contingency 10% of Total Project Value (agreed @ 100%)	10%		\$121,616	\$81,323
CALCULATED ESTIMATE OF TOTAL PROJECT COST		\$1,022,384	\$1,337,779	\$315,395

Total Construction Services Fee			
B	Estimate GC Contingency	%-age	10.00%
C	General Conditions Cost	%-age	8.00%
D	Overhead Cost and Profit	%-age	7.50%
E	Profit	%-age	0.00%
F	Insurance and Bond Cost	%-age	1.75%

GMP 1	\$498,794
GMP 2 60%	\$523,590
GMP 2 100%	\$838,985

*The lump sum unit cost does not constitute the agreement type for preconstruction services.



MOLTZ CONSTRUCTION INC. Moltz // A Graham Group Company

8807 C.R. 175 | PO Box 729 | Salida, CO | 81201

Exhibit A 2 of 2



ALKIRE LIFT STATION IMPROVEMENTS

GMP Changes from 60% to 100% / Changes, Additions and Assumptions	\$ Change
Div. 1	
\$30,000 Budget # for Eng./Arch Engineering Scope @ 60% - Complete scope proposal @ 100% \$44,208 ENG + PM @ \$22,680	\$36,883.00
Changes in Permit and licensing requirements with the city of Arvada.	\$250.00
Additional special inspections	\$160.00
Div. 2	
Sitework and Demolition changes from 60% to 100% - Changed scope @ enclosure demo / Added Floor patching and sealing	\$25,510.00
Remove bypass from Grinder activity and listed with all bypassing in Bypass budget	
Div. 3	
Added Concrete Pads @ VFDs and Pumps	\$8,656.00
4500 psi concrete at Generator Slab 12" thick w/ 2 mats #6 @ 12" OC - REPLACING ENTIRE SLAB AT 100%	\$7,325.00
Div. 4	
Masonry w/Contingency Adder. Assuming lightweight 8" CMUw/ 3000psi grout and rounded mortar cap. 11.-4" high	\$1,500.00
Div. 9	
Painting Quote @ 60% vs. Tnemic Paint spec at 100%	\$2,420.00
Div. 11	
Budget Plug for Eradicator Weir / Guages not needed / Labor Adjustment	-\$2,441.00
Div. 15	
Ductile Iron Pipe Lining assumed CML @ 60% - Protecto 401 Lining @ 100% includes sizing, alignment and support \$ changes from 60% to 100%	\$6,124.00
Plug and Check Valves priced @ 60% vs. specified valves @ 100% GA SB200 Slaminator w/ position	\$4,506.00
Add Chainwheel at existing Plug Valve on Header	\$356.00
Threaded 1/2" SST Piping, Ball Valves and 1 Saddle(for discharge header) for PIT install 4 places	\$4,320.00
Change in Bypass Pumping Budget with a contingency pump	\$14,209.00
Div. 16 MCI	
MCI Budget change to temp in existing generator for outage	\$322.00
Div. 16 Subcontract	
Total Change Div. 16	\$94,229.00
Change in Sun Valley Electric Inc.	\$45,558.00
Change in Timberline Electric and Control Corp	\$48,671.00
Added SPD	
Add hardwired fault from each VFD to PLC	
Added Instruments	
Reverse engineering CP and incorporate with Red Lion HMI Addition	
PLC Modofications	
TOTAL	\$204,329.00

Spreadsheet Level	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Amount	Addon Amount	Grand Total
0 Permits/ Engineering/ Admin									
01000 General Requirements									
01 -100 General Conditions (mci)									
Project Manager work w/ Arch / Eng. on enclosure	9.00 wk	-	-	-	450	22,230	22,680		22,680
Structural Eng. and Architect for Generator Enclosure	1.00 ls	-	-	44,208	-	-	44,208	0	44,208
Permit - Building - by LS - JEFFCO	1.00 ls	-	-	-	-	10,440	10,440		10,440
Permit - Fire Dept. - Genrator	1.00 ls	-	0	-	-	1,588	1,588	0	1,588
Special Inspections	1.00 ls	-	0	1,360	-	-	1,360	0	1,360
Permit - Building - by LS - LOI Land Disturbance - JEFFCO	1.00 ls	-	-	-	-	1,000	1,000		1,000
Permit - Building - by LS - Electrical - JEFFCO	1.00 ls	-	-	-	-	1,762	1,762		1,762
Permit - Building - by LS - Certificate of Occupancy - JEFFCO	1.00 ls	-	-	-	-	750	750		750
Straw Wattles 9in	100.00 lf	83	105	-	-	-	187	31	218
Wood Stakes For Wattles	30.00 ea	82	10	-	-	-	92	31	123
Safety Fence Steel Tee Post 5'	20.00 ea	330	110	-	-	-	440	125	565
Permit - Arvada Engineering Licensing	1.00 ls	-	-	-	-	200	200		200
Permit - Arvada Division Public Improvement - LIMITS AND EXTENTS	1.00 ls	-	-	-	-	50	50		50
General Conditions (mci)	8.00 wk	495	224	45,568	450	38,020	84,757	188	84,945
01000 General Requirements		495	224	45,568	450	38,020	84,757	188	84,945
0 Permits/ Engineering/ Admin		495	224	45,568	450	38,020	84,757	188	84,945
1 Pump Station									
02000 Sitework / Demolition									
02-2b Demo Pipe - Ductile/Cast Iron Suction / Discharge Piping									
Demo DI Pipe 12"	33.00 lf	1,307	-	-	-	-	1,307	497	1,803
Demo Pipe Supports	12.00 ea	238	-	-	-	-	238	90	328
Demo Pipe Valves 12"	3.00 ea	79	-	-	-	-	79	30	109
Grind/Patch Slab Bottom @ Existing Supports	12.00 sf	594	240	-	-	-	834	226	1,060
Dumpster Pickups	2.00 ea	-	900	-	-	-	900		900
Demo DI Pipe 8"	42.00 lf	1,663	-	-	-	-	1,663	632	2,295
Demo Pipe Valves 8"	6.00 ea	158	-	-	-	-	158	60	219
Cut Existing 8"	0.00 ea	0	-	-	-	-	0	0	0
Demo Equipment for Salvage 3 ea. 8" vertical spools	0.00 ea	0	-	-	-	-	0	0	0
Demo Pipe - Ductile/Cast Iron Suction / Discharge Piping	47.25 lf	4,039	1,140				5,179	1,535	6,714
0204- Demo Pumps and Pump Pads									
Demo Conc SOG with Rebar	1.17 cy	1,236	-	-	-	-	1,236	470	1,705
90 lb Jack Hammer	0.15 mnth	-	-	-	53	15	68		68
Air Compressor 185 cfm (66 HP) (L)	0.70 mnth	-	-	-	525	494	1,019		1,019
Dumpster Pickups	2.00 ea	-	900	-	-	-	900		900
Temporary Protection - Protect / Plastic @ E-Gear / Instruments	1.00 ls	528	250	-	-	-	778	201	979
Demo Equipment for Salvage - Existing Pumps and Motors	3.00 ea	792	-	-	-	-	792	301	1,093
Grind/Patch Slab Bottom @ Pump Pads	27.00 sf	891	540	-	-	-	1,431	339	1,770
Seal Floors	575.00 sf	949	453	-	-	-	1,402	361	1,762
Demo Pumps and Pump Pads	1.17 cy	4,395	2,143		578	509	7,624	1,670	9,294
02000 Sitework / Demolition		8,434	3,283		578	509	12,803	3,205	16,008
03000 Concrete									
0310- Equipment Pad Concrete (mci) - Pump Pads									
Equipment Pad Form > 8"	49.80 sf	822	209	-	-	-	1,031	312	1,343
Oil Equipment Pad Form	49.80 sf	0	1	-	-	-	1	0	1
4500 psi Concrete	3.00 cy	-	743	-	-	840	1,583		1,583
Other Placement Count	9.00 ea	-	0	-	-	-	0		0
Buggy Place Equipment Pads	2.21 cy	391	-	-	-	-	391	148	539

Spreadsheet Level	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Amount	Addon Amount	Grand Total
0310- Equipment Pad Concrete (mci) - Pump Pads									
Set Anchor Bolts	36.00 ea	297	360	-	-	-	657	113	770
Liquid Curing Compounds	72.00 sf	5	2	-	-	-	7	2	9
Finish- Hard Trowel	72.00 sf	33		-	-	-	33	13	46
Chamfer	60.00 lf	99	9	-	-	-	108	38	146
Misc Pad Rebar # 4	0.08 tn	92	151	-	-	-	244	35	279
Misc Pad Rebar # 4	0.08 tn	92	151	-	-	-	244	35	279
Nails and Hardware	49.80 sf	0	2	-	-	-	2	0	2
Drill and Epoxy #4	60.00 ea	693	882	-	-	-	1,575	263	1,838
CJ Prep Slab	72.00 sf	475	11	-	-	-	486	181	667
Rub Curbs	49.80 sf	133	25	-	-	-	158	51	209
Equipment Pad Concrete (mci) - Pump Pads	2.21 cy	3,133	2,546			840	6,519	1,190	7,709
0310- Equipment Pad Concrete (mci) - 1 @ VFDs									
Equipment Pad Form 6"	13.00 sf	142	55	-	-	-	196	54	250
Oil Equipment Pad Form	13.00 sf		0	-	-	-	0		0
4500 psi Concrete	1.00 cy	-	241	-	-	-	241		241
Buggy Place Equipment Pads	0.56 cy	98	-	-	-	-	98	37	135
Liquid Curing Compounds	30.00 sf	2	1	-	-	-	3	1	4
Finish- Hard Trowel	30.00 sf	14		-	-	-	14	5	19
Chamfer	16.00 lf	26	3	-	-	-	29	10	39
Misc Pad Rebar # 4	0.02 tn	21	34	-	-	-	55	8	63
Misc Pad Rebar # 4	0.02 tn	17	29	-	-	-	46	7	53
Nails and Hardware	13.00 sf		1	-	-	-	1		1
Drill and Epoxy #4	16.00 ea	185	235	-	-	-	420	70	490
CJ Prep Slab	30.00 sf	198	5	-	-	-	203	75	278
Rub Curbs	13.00 sf	35	7	-	-	-	41	13	54
Equipment Pad Concrete (mci) - 1 @ VFDs	0.56 cy	738	609				1,346	280	1,627
03000 Concrete		3,870	3,155			840	7,865	1,471	9,336
09000 Finishes									
095 1- Painting - Piping (No Paint @ Bolts or Mfg. Coat) and Enclosure stripe									
Painting Subcontractor Interior - Paint all interior DIP Pump Piping	1.00 ls	-	-	11,310	-	-	11,310		11,310
<i>Painting Subcontractor Exterior - CMU @ Enclosure</i>	<i>1.00 ls</i>	<i>-</i>	<i>-</i>		<i>-</i>	<i>-</i>			
Painting - Piping (No Paint @ Bolts or Mfg. Coat) and Enclosure stripe	1.00 lf			11,310			11,310		11,310
09000 Finishes				11,310			11,310		11,310
11000 Equipment									
11-01 Pumps - MCI - Supply in GMP-1									
Horz Non Clog Centr Pump - 100 HP	3.00 ea	5,544		-	-	-	5,544	2,107	7,651
Anchors for Equipment	12.00 ea	139	240	-	-	-	379	53	431
Grout Equipment	36.31 cf	2,516	2,614	-	-	-	5,131	956	6,087
Pressure Gauge Assembly	9.00 ea	297	450	-	-	-	747	113	860
Start up and Training	16.00 mnhr	528	-	-	-	-	528	201	729
<i>Spare Parts</i>	<i>1.00 ls</i>			<i>-</i>	<i>-</i>	<i>-</i>			
<i>Extended Warranty -</i>	<i>1.00 ea</i>			<i>-</i>	<i>-</i>	<i>-</i>			
<i>Special - ERADICATOR WIER</i>	<i>0.00 ea</i>	<i>0</i>	<i>0</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>0</i>	<i>0</i>	<i>0</i>
Pumps - MCI - Supply in GMP-1	3.00	9,024	3,304				12,328	3,429	15,757
11000 Equipment		9,024	3,304				12,328	3,429	15,757
15000 Mechanical									
150-01 1c 12042002 Flanged DIP-Primed,Class 53, Protecto 401 lined - Pumps 1-3 Discharge									
DI Flanged 22-1/2 ell 8"	6.00 ea	297	960	-	-	-	1,257	113	1,370
DI Flanged 90 ell 6" x 8" Reducing	3.00 ea	99	330	-	-	-	429	38	467
<i>DI Pipe 6in. dia Fx F - 0ft. 7in. W/ 1" FIP TAP</i>	<i>0.00 ea</i>	<i>0</i>	<i>0</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>0</i>	<i>0</i>	<i>0</i>

Spreadsheet Level	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Amount	Addon Amount	Grand Total
150-01 1c 12042002 Flanged DIP-Primed,Class 53, Protecto 401 lined - Pumps 1-3 Discharge									
DI Pipe 8in. dia Fx F - 1ft. 6in.	3.00 ea	198	1,458	-	-	-	1,656	75	1,731
DI Pipe 8in. dia FxPE - 1FT.-10IN.	3.00 ea	198	1,458	-	-	-	1,656	75	1,731
DI Pipe 8in. dia FxPE - 1ft. 4in.	1.00 ea	66	486	-	-	-	552	25	577
DI Pipe 8in. dia FxPE - 2ft. 8in.	1.00 ea	66	755	-	-	-	821	25	846
DI MEGAFLANGE w/ Galv Bolts for DIP 8"	6.00 ea	792	1,560	-	-	-	2,352	301	2,653
NBG Kit 125# HDG 6in	9.00 ea	149	153	-	-	-	302	56	358
NBG Kit 125# HDG 8in	18.00 ea	297	378	-	-	-	675	113	788
PS Pipe Stand for 8in DIP 8ft 6in floor to CL ??MATERIAL ???	6.00 ea	495	1,872	-	-	-	2,367	188	2,555
Epoxy Anchor 3/4 x 8-1/2in SS 316	24.00 ea	198	120	-	-	-	318	75	393
PS Pipe Stand grout	6.00 ea	198	30	-	-	-	228	75	303
DI Flanged Tee 12" - Rotate Tee and Valve 90 Deg. (SHUTDOWN)	3.00 ea	1,200	0	-	-	-	1,200	456	1,656
NBG Kit 125# EG 12in	6.00 ea	198	1,320	-	-	-	1,518	75	1,593
Valve Check Flange 125# 8in - GOLDEN ANDERSON FIG. 200	3.00 ea	792	10,158	-	-	-	10,950	301	11,251
Valve Plug Flange 125# 8in DEZURIK RECTANGULAR PORT W/ CHAIN OPERATOR	3.00 ea	1,200	7,110	-	-	-	8,310	456	8,766
Valve Special 12in - Add Chainwheel Operator	1.00 ea	66	310	-	-	-	376	25	401
Flanged DIP-Primed,Class 53, Protecto 401 lined - Pumps 1-3 Discharge		6,509	28,458				34,967	2,473	37,440
150-01 1c 12042002 Moltz Construction DIP Takeoff - Pumps 1-3 Suction									
DI Flanged 22-1/2 ell 8"	2.00 ea	99	1,500	-	-	-	1,599	38	1,637
DI Flanged Ecc Red 12x8"	3.00 ea	198	3,717	-	-	-	3,915	75	3,990
DI Pipe 8in. dia FxPE - 3ft. 0in.	3.00 ea	149	2,265	-	-	-	2,414	56	2,470
DI Pipe 12in. dia FxPE - 2ft. 0in.	5.00 ea	330	4,975	-	-	-	5,305	125	5,430
DI MEGAFLANGE w/ Galv Bolts for DIP 8"	3.00 ea	297	780	-	-	-	1,077	113	1,190
DI MEGAFLANGE w/ Galv Bolts for DIP 12"	5.00 ea	2,250	2,365	-	-	-	4,615	855	5,470
NBG Kit 125# HDG 8in	18.00 ea	178	378	-	-	-	556	68	624
NBG Kit 125# HDG 12in	6.00 ea	99	306	-	-	-	405	38	443
PS Pipe Stand for 12in DIP 2ft 6in floor to CL MATERIAL???	6.00 ea	594	1,476	-	-	-	2,070	226	2,296
Epoxy Anchor 1/2 x 7in EG	24.00 ea	198	336	-	-	-	534	75	609
PS Pipe Stand grout	3.00 ea	50	15	-	-	-	65	19	83
Valve Plug Flange 125# 12in DEZURIK RECTANGULAR PORT W/ HANDWHEEL	3.00 ea	1,800	13,440	-	-	-	15,240	684	15,924
DI Pipe 8in. dia Fx F - 0ft. 6in.	0.00 ea	0	0	-	-	-	0	0	0
DI Pipe 8in. dia Fx F - 1ft. 0in.	1.00 ea	50	773	-	-	-	823	19	841
DI Pipe 8in. dia Fx F - 0ft. 8in.	1.00 ea	50	773	-	-	-	823	19	841
DI Flanged 22-1/2 ell 8"	6.00 ea	297	4,500	-	-	-	4,797	113	4,910
DI Pipe 12in. dia FxPE - 3ft. 0in.	1.00 ea	66	1,479	-	-	-	1,545	25	1,570
Cut Existing - Interior/Electric Saw 12"	3.00 ea	600	-	-	-	-	600	228	828
Moltz Construction DIP Takeoff - Pumps 1-3 Suction		7,303	39,078				46,381	2,775	49,156
150-01 1c 12042002 PIT Piping and Valves 4 ech									
Stainless Steel Nipple 1/2" X 2"	24.00 ea	198	840	-	-	-	1,038	75	1,113
Stainless Steel 90 Elbow 1/2"	8.00 ea	53	192	-	-	-	245	20	265
Stainless Steel Tee 1/2"	4.00 ea	26	72	-	-	-	98	10	108
Stainless Steel Bushing mpt x fpt 1/2in x 3/8in	4.00 ea	26	32	-	-	-	58	10	68
Valve Ball Threaded SS 1/2in	12.00 ea	214	2,112	-	-	-	2,326	81	2,407
Water Tap Saddle 12 x 3/4"	1.00 ea	30	300	-	-	-	330	11	341
Stainless Steel Bushing mpt x fpt 3/4in x 1/2in	1.00 ea	7	8	-	-	-	15	3	17
PIT Piping and Valves 4 ech		554	3,556				4,110	210	4,320
150-610 Pump Drains									
Stainless Steel Nipple 2" X 3"	9.00 ea	98	0	-	-	-	98	37	135
Stainless Steel 90 Elbow 2"	3.00 ea	20	0	-	-	-	20	8	27
Valve Ball Threaded SS 2in	3.00 ea	140	0	-	-	-	140	53	193
Camlock Adapter SS Female x Shank 2"	3.00 ea	25	0	-	-	-	25	9	34
HD Red PVC Disch Hose CPLD Mx F NST 2" x 25'	1.00 ea		185	-	-	-	185		185

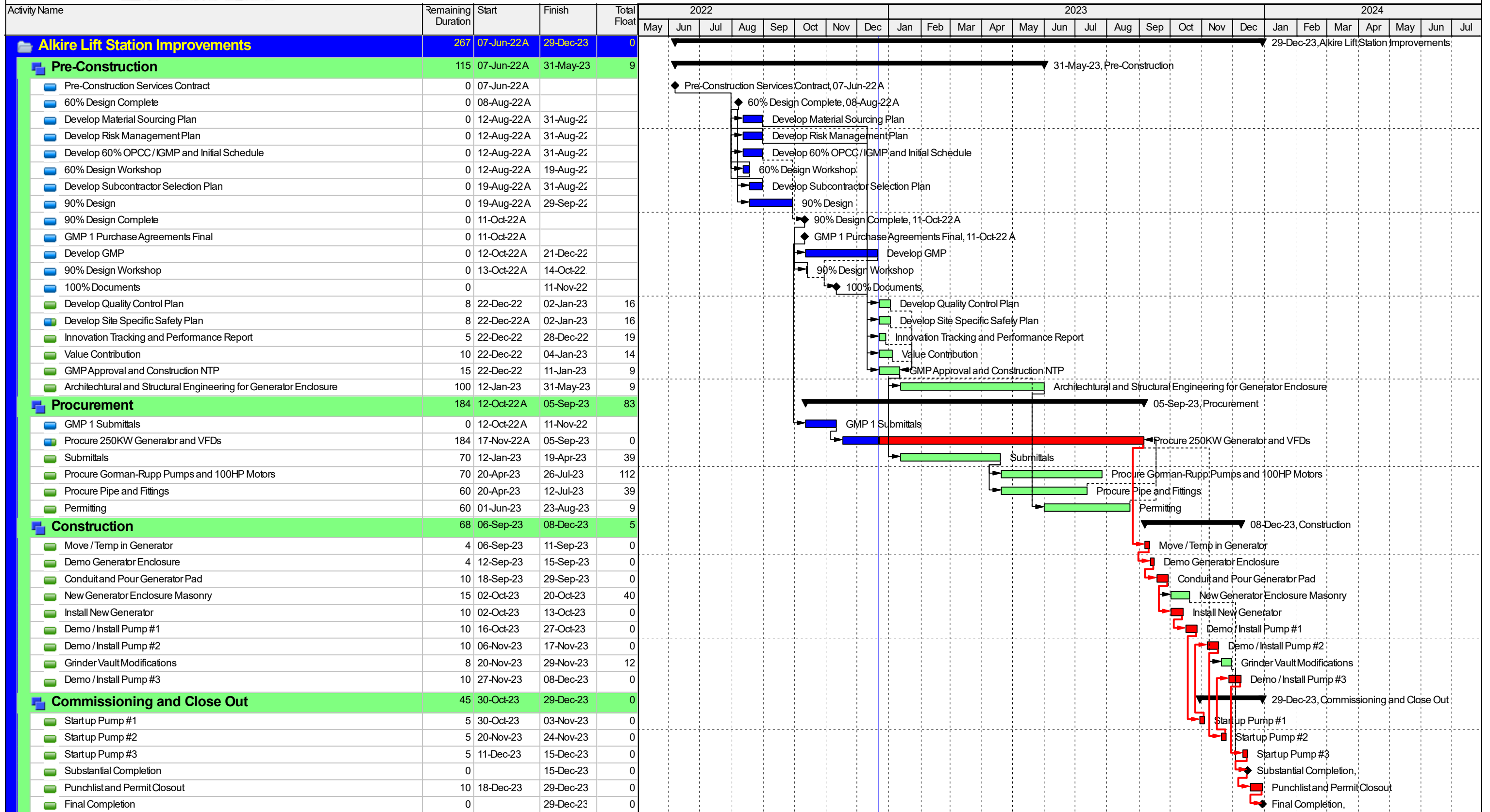
Spreadsheet Level	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Amount	Addon Amount	Grand Total
Pump Drains		282	185				467	107	574
15000 Mechanical		14,648	71,277				85,925	5,566	91,491
16000 Electrical, I. and C.									
16 -1 Electrical - Sub									
Electrical Sub	1.00 ls	-	-	132,929	-	-	132,929		132,929
Electrical Bond	1.00 ls	-	-	3,267	-	-	3,267	0	3,267
Instrumentation Sub	1.00 ls	-	-	84,871	-	-	84,871		84,871
Material Escalation	1.00 ls	-	-	0	-	-	0	0	0
Temporary Construction Power	1.00 ls	-	-		-	-			
Power Company Hook-Up Fee	1.00 ls	-	-		-	-			
Emergency Generator	1.00 ls	-	-		-	-			
Emergency Generator Fuel	0.00 gal	-	0	0	-	-	0	0	0
Electrical Permit	1.00 ls	-	-		-	-			
Elec. Special - Conduit Patching and Grouting Strut Stands	1.00 ls	396	80	0	-	-	476	150	626
Electrical - Sub	1.00 LS	396	80	221,067			221,543	150	221,693
16000 Electrical, I. and C.		396	80	221,067			221,543	150	221,693
1 Pump Station		36,372	81,099	232,377	578	1,349	351,775	13,821	365,596
2 Generator / Enclosure									
02000 Sitework / Demolition									
0204- Demo Conc Footings, Walls, & Slabs - Existing Generator Slab									
Demo Conc Footings Heavy Rebar	4.07 cy	1,610	-	-	-	-	1,610	612	2,222
CAT 262D Skid Steer 81HP (L)	1.00 mnth	-	-	-	3,300	2,000	5,300		5,300
Stanley Hydraulic Breaker (Skid Steer Attachment)	0.10 mnth	-	-	-	240	25	265		265
John Deere 410 Backhoe (96 HP) (L)	0.20 mnth	-	-	-	580	300	880		880
(3rd Party) Dump Truck, 10 wheel	3.28 hr	-	-	394	-	-	394		394
Dump Fees by ton	8.54 tn	-	726	-	-	-	726		726
Demo Conc Footings, Walls, & Slabs - Existing Generator Slab	4.07 cy	1,610	726	394	4,120	2,325	9,175	612	9,787
0204-1 Demo Brick & Masonry - Generator Enclosure									
Demo 8" CMU Block No Reinf	272.00 sf	1,616	-	-		-	1,616	614	2,230
John Deere 410 Backhoe (96 HP) (L)	0.80 mnth	-	-	-	2,320	1,200	3,520		3,520
90 lb Jack Hammer	0.10 mnth	-	-	-	35	10	45		45
Air Compressor 185 cfm (66 HP) (L)	0.70 mnth	-	-	-	525	494	1,019		1,019
CAT 262D Skid Steer 81HP (L)	1.00 mnth	-	-	-	3,300	2,000	5,300		5,300
(3rd Party) Dump Truck, 10 wheel	6.00 hr	-	-	720	-	-	720		720
Dump Fees by ton	12.83 tn	-	1,091	-	-	-	1,091		1,091
Temporary Protection - Protect/ Relocate exist Elect. - Communications Tower	1.00 ls	528	750	1,200	-	-	2,478	201	2,679
Remove Gate Posts 8'	2.00 ea	66	-	16	-	-	82	25	107
Grind/Patch Slab Bottom	0.00 sf	0	0	-	-	-	0	0	0
Support Existing - Communications Tower	0.00 ea	0	0	-	-	-	0	0	0
8' Fence Vehicle Gate 12' - Salvage	1.00 ea	132	-	600	-	-	732	50	782
Elec. Special - Conduit Patching	0.00 ls	0	0	0	-	-	0	0	0
Demo Brick & Masonry - Generator Enclosure	272.00 sf	2,342	1,841	2,536	6,180	3,704	16,602	890	17,492
0234- Excavate / Grade / Precompact for New Generator Slab									
Excavation - Mass	20.00 cy	264	-	-	-	-	264	100	364
John Deere 410 Backhoe (96 HP) (L)	0.80 mnth	-	-	-	2,320	1,200	3,520		3,520
CAT 262D Skid Steer 81HP (L)	1.00 mnth	-	-	-	3,300	2,000	5,300		5,300
Wacker/Rammer Pad Foot Trench Roller (L)	0.23 mnth	-	-	-	499	68	568		568
Mikasa Jumping Jack Compactor (L)	0.23 mnth	-	-	-	45	23	68		68
Precompact Subgrade Below Foundations	60.00 sy	297	-	-	-	-	297	113	410
Machine Grade Below Structure	60.00 sy	495	-	-	-	-	495	188	683
Road Base Below Concrete	12.00 cy	277	404	-	-	-	681	105	786
(3rd Party) Dump Truck, 10 wheel	5.00 hr	-	-	425	-	-	425		425

Spreadsheet Level	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Amount	Addon Amount	Grand Total
Excavate / Grade / Precompact for New Generator Slab	20.00 cy	1,333	404	425	6,165	3,291	11,618	507	12,124
16-01 Site Electrical (MCI) - New Generator Conduits / Gate Post Bases									
Duct Bank Excavation/Backfill	12.00 lf	158	-	-	12	-	170	60	231
Duct Bank Formwork	48.00 sf	87	12	-	-	-	99	33	132
Duct Bank Concrete	1.78 cy	25	400	-	-	380	805	9	814
Color Dye	1.78 cy	-	11	-	-	-	11		11
Duct Bank Rebar	0.03 tn	37	86	-	-	-	123	14	137
Electrical Handholes	1.00 ea	264	0	-	-	-	264	100	364
Electrical Light Pole Base	1.00 ea	528	100	-	-	-	628	201	829
John Deere 410 Backhoe (96 HP) (L)	0.20 mnth	-	-	-	580	300	880		880
CAT 262D Skid Steer 81HP (L)	1.00 mnth	-	-	-	3,300	2,000	5,300		5,300
Mikasa Jumping Jack Compactor (L)	0.05 mnth	-	-	-	10	5	15		15
Wacker/Rammer Pad Foot Trench Roller (L)	0.05 mnth	-	-	-	110	15	125		125
Site Electrical (MCI) - New Generator Conduits / Gate Post Bases	12.00 lf	1,099	610		4,012	2,700	8,421	418	8,839
02000 Sitework / Demolition		6,384	3,580	3,355	20,477	12,019	45,815	2,426	48,241
03000 Concrete									
0302- Slab (mci) - New Generator Slab - 12" w/2 mats #6 @ 12" OC									
4500 psi Concrete	13.33 cy	-	3,210	-	-	-	3,210		3,210
Slab Placement Count	1.00 ea	-	0	-	-	-	0		0
Truck Place Slab on Grade	13.33 cy	471	-	-	-	-	471	179	650
Formwork S.O.G. Edge Form < 1'	78.00 sf	1,287	61	-	-	-	1,348	489	1,837
Finegrade Below Concrete	360.00 sf	238	-	-	-	-	238	90	328
Finish- Broom	360.00 sf	594	2	-	-	-	596	226	822
Liquid Curing Compounds	360.00 sf	24	11	-	-	-	35	9	44
Chamfer 3/4"	56.00 lf	92	9	-	-	-	101	35	136
Expansion Joint	22.00 sf	145	7	-	-	-	152	55	207
Expansion Joint Sealant	22.00 lf	145	46	-	-	-	191	55	247
Oil SOG Form	78.00 sf	0	2	-	-	-	2	0	2
Nails and Hardware	78.00 sf	0	3	-	-	-	3	0	3
Dimension Lumber	78.00 sf	0	156	-	-	-	156	0	156
SOG Rebar # 6	0.78 tn	900	1,800	-	-	-	2,699	342	3,041
SOG Rebar # 6	0.76 tn	878	1,756	-	-	-	2,633	334	2,967
Drill & Set Dowels	24.00 ea	198	336	-	-	-	534	75	609
Drill & Set Masonry Dowels	24.00 ea	198	336	-	-	-	534	75	609
Slab (mci) - New Generator Slab - 12" w/2 mats #6 @ 12" OC	13.33 cy	5,170	7,734				12,904	1,964	14,868
03000 Concrete		5,170	7,734				12,904	1,964	14,868
04000 Masonry									
04000 - MASONRY - Sub - Generator Enclosure - 11'-4" High									
Sub - Masonry Subcontr - 487 SF	1.00 ls	-	-	20,945	-	-	20,945		20,945
Sub - Masonry Bond	1.00 ls	-	-	-	-	-	-	-	-
Temporary Protection - Protect Existing Generator	1.00 ls	528	400	-	-	1,500	2,428	201	2,629
MASONRY - Sub - Generator Enclosure - 11'-4" High	1.00 LS	528	400	20,945		1,500	23,373	201	23,574
04000 Masonry		528	400	20,945		1,500	23,373	201	23,574
11000 Equipment									
11-500 Process Equipment - Remove / Replace Generator Supply in GMP-1									
Emergency Generator - Remove / Replace	1.00 ls	1,584			-	-	1,584	602	2,186
Anchors for Equipment	8.00 ea	132	160	-	-	-	292	50	342
Start up and Training	8.00 mnhr	264	-	-	-	-	264	100	364
Specialty Rigging -	1.00 ls	264	1,000	-	1,000	-	2,264	100	2,364
Crane Mob by Sub	1.00 ea		-		0	500	500		500
3rd Party Crane w Operator ??? Ton - Rent	8.00 hr		-	3,080	-	-	3,080		3,080

Spreadsheet Level	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Amount	Addon Amount	Grand Total
Process Equipment - Remove / Replace Generator Supply in GMP-1	1.00 ls	2,244	1,160	3,080	1,000	500	7,984	853	8,837
11000 Equipment		2,244	1,160	3,080	1,000	500	7,984	853	8,837
16000 Electrical, I. and C.									
16 -1 Electrical - Temp in Generator for Outage									
Electrical Sub	1.00 ls	-	-	0	-	-	0	0	0
Electrical Bond	1.00 ls	-	-	-	-	-	-	-	-
Instrumentation Sub	1.00 ls	-	-	-	-	-	-	-	-
Instrumentation Bond	1.00 ls	-	-	-	-	-	-	-	-
Temporary Construction Lighting	1.00 ls	-	-	-	-	-	-	-	-
Temporary Construction Power	1.00 ls	-	-	-	-	-	-	-	-
Temporary Electrical Service	1.00 ls	-	-	-	-	-	-	-	-
Power Company Hook-Up Fee	1.00 ls	-	-	-	-	-	-	-	-
Emergency Generator	1.00 ls	-	-	-	-	-	-	-	-
Emergency Generator Fuel	500.00 gal	-	2,500	-	-	-	2,500	-	2,500
Fire Alarm	1.00 ls	-	-	-	-	-	-	-	-
MCI Temp Generator Pad	1.00 ls	1,320	1,000	-	-	-	2,320	502	2,822
Electrical Permit	1.00 ls	-	-	-	-	-	-	-	-
Elec. Special - Conduit Patching	1.00 ls	198	40	-	-	-	238	75	313
3rd Party Crane w Operator ??? Ton - Rent	10.00 hr	-	-	3,850	-	-	3,850	-	3,850
Crane Mob by Sub	2.00 ea	-	-	-	-	1,000	1,000	-	1,000
(3rd Party) Semi Tractor	6.00 hr	-	-	720	-	-	720	-	720
Electrical - Temp in Generator for Outage	1.00 LS	1,518	3,540	4,570		1,000	10,628	577	11,205
16000 Electrical, I. and C.		1,518	3,540	4,570		1,000	10,628	577	11,205
2 Generator / Enclosure		15,844	16,414	31,950	21,477	15,019	100,704	6,021	106,725
3 Grinder Vault									
02000 Sitework / Demolition									
02-2b Demo Concrete Fillets at Grinder Channel (Low Flow)									
Demo Concrete Fillets @ Grinder Channel	2.00 ea	1,600	-	-	-	-	1,600	608	2,208
Non Routine Task Safety	1.00 ls	200	500	-	-	-	700	76	776
Temporary Protection - Davit Retrieval	1.00 ls	200	100	-	-	-	300	76	376
Temporary Protection - Temp Screen @ Effluent	1.00 ls	200	250	-	-	-	450	76	526
Instrument - Level - Ultrasonic Sensor - Relocate	1.00 ea	264	0	-	-	-	264	100	364
In Line Grinder 12" (mci) - Remove / Salvage	1.00 ea	264	0	-	-	-	264	100	364
John Deere 410 Backhoe (96 HP) (L)	2.00 mnth	-	-	-	5,800	3,000	8,800	-	8,800
90 lb Jack Hammer	0.10 mnth	-	-	-	35	10	45	-	45
Cut N Break Saw (Add Blade Pricing)	0.05 mnth	-	-	-	25	8	33	-	33
Air Compressor 185 cfm (66 HP) (L)	0.70 mnth	-	-	-	525	494	1,019	-	1,019
Dumpster Pickups	2.00 ea	-	900	-	-	-	900	-	900
Bypass Pumping	0.00 ls	0	0	-	0	-	0	0	0
Temp Plugs	0.00 ls	0	0	-	0	-	0	0	0
Containment	0.00 ls	0	0	-	0	-	0	0	0
Non Routine Task Safety	0.00 ls	0	0	-	-	-	0	0	0
Demo Concrete Fillets at Grinder Channel (Low Flow)	1.00 lf	2,728	1,750		6,385	3,511	14,374	1,037	15,411
02000 Sitework / Demolition		2,728	1,750		6,385	3,511	14,374	1,037	15,411
3 Grinder Vault		2,728	1,750		6,385	3,511	14,374	1,037	15,411
4 Bypass									
15000 Mechanical									
150-01 1c 12042002 Bypass Pumping									
Containment	3.00 ls	1,584	1,500	-	-	-	3,084	602	3,686
8,000 Gallon Mobile Fuel Tank (L)	0.80 g	-	2,000	-	0	0	2,000	-	2,000
Maintain Unwater Pumping	4.00 ls	1,600	-	-	-	-	1,600	608	2,208
Non Routine Task Safety	4.00 ls	1,600	2,000	-	-	-	3,600	608	4,208

Spreadsheet Level	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Amount	Addon Amount	Grand Total
150-01 1c 12042002 Bypass Pumping									
Bypass Pumping	3.00 ls	1,200	13,920	-		3,900	19,020	456	19,476
Temp Plugs	4.00 ls	1,600	800	-		-	2,400	608	3,008
Bypass Pumping - SUB	1.00 ls			-		-			
Bypass Pumping		7,584	20,220			3,900	31,704	2,882	34,586
15000 Mechanical		7,584	20,220			3,900	31,704	2,882	34,586
4 Bypass		7,584	20,220			3,900	31,704	2,882	34,586

Alkire Lift Station Improvements



Actual Level of Effort Critical Remaining Work
Actual Work Milestone
Remaining Work summary

Sun Valley Electric Inc.
Lic#1900

12/20/2022

Moltz Construction
Attn: Dustin Miller

Re: Alkire Lift Station Improvements **100% rev.01**
Bid Date- 12/9/2022

Sun Valley Contractors appreciates the opportunity to provide you with the following proposal for the **Alkire Lift Station Improvements Project**. We look forward to a long-term mutually beneficial relationship. We understand that you expect a high level of quality, and you can rest assured that we will live up to your expectations. We look forward to working with you soon.

Sincerely,

MATT WEBER
VICE PRESIDENT



5475 Hwy. 86 Unit #3
Elizabeth, CO 80107-7451
Office: 303.646.6339 Ext. 203
Email: matt@sv-contractors.com

Sun Valley Electric Inc.

Lic#1900

Alkire Lift Station Improvements

Scope of Work- 100% rev.01

12/20/2022

General

Sun Valley Electric hereby proposes to furnish labor & materials as specified below in accordance with the recognized drawings & specifications listed below.

Documents Recognized

- 100% Drawings
- Specifications (Division 26 05 00,26 05 73,26 29 23,16 2 30)

Warranty

All labor and materials provided and installed by Sun Valley Contractors will be warranted for (1) year per recognized specifications.

Items Included:

General

- Submittals and O&M Manuals per Recognized Project Documents
- Project Supervision per Recognized Documents
- Project Coordination and Project Meetings per Recognized Project Documents
- Electrical Acceptance Testing per Recognized Project Documents
- Arc Flash/ Coordination Study per Recognized Project Documents
- Core Drilling
- Training per Recognized Project Documents

Specific Inclusions

- Demolish Existing Pump Starters and Feeders per Recognized Project Documents
- Demolish Existing Generator Wiring per Recognized Project Documents
- Demolish Existing Deragger and Grinder Systems per Recognized Project Documents
- Demolish Existing Generator Enclosure Lighting and Receptacles, Reinstall after new Enclosure is Complete
- Temporarily wire existing generator during pad replacement/installation of new permanent generator
- Install new Pump #1, Pump #2, Pump #3 VFD's (Provided by TLECC)
- Provide and Install new Transguard 3 SPD
- Provide Power/ Motor temperature and Heater Wiring per Recognized Project Documents
- Provide and install new generator raceways and wiring per recognized project documents
- Provide and Install new Feeder Breakers and Wiring for Pump #1, Pump#2, Pump #3
- Cover all Un-used Openings in Existing Buckets
- Provide and install the following instrumentation:
 - LS 100, 101, 102
 - Wet well level display

Sun Valley Electric Inc.
Lic#1900

- PIT 100, 101, 102, 103
- Provide and Install Power/Control Raceways and Wiring for VFD's (Assuming Ethernet Connection to PLC)
- Provide Temporary Wiring and Sequence Shutdowns as Required to Maintain Operation of Lift Station during Construction
- Programming (by TLECC)
- As-builts/reverse engineering of existing control panel (no documentation exists for existing control panel)

Exclusions

The following items are specifically excluded from this scope of work. These items are noted for clarification purposes. This list is not intended to include all items on the project that are excluded.

- Procurement/ Installation of Generator
- Procurement of VFD'S
- Procurement/Installation of check valve position indicators
- Procurement/Installation of Pumps/Piping/Appurtenances
- Procurement/Installation of HVAC Equipment
- Removal/Disposal of Demolished Materials
- Excavation/ Backfill
- Painting/Patching
- Bypass Pumping/Temporary Process Connections to Facilitate Work
- Concrete Work of Any Type Including Cutting/Patching/Demolition/Placement
- Erosion Control
- This Work Will Require Shutdowns. Nighttime work is Excluded
- Relocation of Owner's Property to Facilitate Installation
- Construction Fencing/Security
- Custom Scaffolding
- Landscape Repair
- Engineering of any Type
- Utility Fees
- Taxes
- Bonding (1.5%)

Please see Attached TLECC Control Scope for Additional Inclusions/Exclusions

Pricing:

Total Proposal-

\$217,800.00 Two Hundred Seventeen Thousand Eight Hundred Dollars



*P.O. Box 793
Morrison CO 80465-0793
303-697-0440
Fax: 303-697-0450*

SCOPE OF WORK

DATE: 12/15/2022

PROJECT: Arvada Alkire LS improvements

QUOTATION NO. J6198

Addendum's received: **100% DESIGN** Timber Line Electric & Control Corporation's (TLECC) quotation for the above referenced Project includes equipment and materials specified below, and is limited to the equipment listed in the following Bill of Materials.

PLEASE NOTE:

- ~~• Per a conference call with Arvada on 11/22/22 (for the Ralston Filter Project), Kim was informed that Arvada specifically wants Mitsubishi drives as their standard. I have adjusted this quote accordingly.~~
- ~~• For heat management purposes, the VFDs will need ample spacing between them. Per Sun Valley, they are planning on top entry conduits, therefore cooling fans cannot be top mounted. Moltz may need to help design this floorplan/layout and check on adequate air conditioning/ventilation.~~
- Please see additional VE notes after pricing.

EXCEPTIONS

- **Bonding unless specifically described below.**
- **Sales Tax unless specifically listed below**
- **Please see notes for clarifications**
- **Installation of the VFD panels including unloading, installation of any new instruments, conduit, wire, or enclosures.**
- **Replacement breakers for LRP1 power panel on sheet E5**
- **Concrete housekeeping pad under the VFDs**
- **Existing wet well level transmitter**
- **Existing toxic gas monitor: Beacon 410**
- **Existing flow meter (my best guess that one exists)**
- **Existing grinder vault level to be reinstalled**
- **Sump pump (unknown if this is existing)**
- **All VFDS**

QUOTATION

12/15/22

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- *This quote is specifically limited to the listed items below!*

Bid Item	Description:	Pricing
1a	(3) 200 Amp breakers to be installed in existing MCC by electrician. These will probably be complete buckets. <i>Approximate lead time is XXXX??.</i>	\$25,590.00
1b	Specified Transguard 3 SPD with Modbus communication. Please see VE notes below.	\$12,545.00
1c	Labor by TLECC for interfacing with Browns Hill or VFD vendor for startup of the three drives. This is based on 12 total hours for a mix of field service, PM and 6 programmer hours. Labor in excess of 12 hours will be billed as service.	\$2,225.00
2	Instruments: (1) flood switch LS 102, (2) level floats for C1D2 area wet well LS100,101, (1) small digital panel meter mounted in small poly-pro enclosure to display wet well level on lower level, (4) pressure transmitters for individual and combined pump pressures PIT 100,101,102,103. Please see VE notes below.	\$11,400.00
3	Modification to PLCs programs for proper ramp and rotation of VFD sequence as well as additional I/O for pressures and floats. Modification to centralized computer for VFD speed selection and any required alarms or reporting. Also includes one 10" Red Lion touch screen with development for the existing and new I/O on the lift station and the TWO control narratives shown on 40 90 01 page 2. Each control narrative must be tested from each of the Red Lion and the computer iFix programming. Includes labor to retrieve program from Modicon and labor to attend design/construction meetings.	\$25,351.00
4	Reverse engineering for existing control panel. Per Spencer Page at Arvada, there are not existing prints for this control panel. We will retrieve the data base on the iFix computer and the program from the Modicon PLC and create an I/O list. This will be used on-location to determine/fill in primary sensing device part numbers and to purge any obsolete I/O or the I/O to be removed from the de-ragger and grinder. We will then create a complete set of prints showing the existing components in the control panel such as the power supplies, radios, UPS, Ethernet switches, etc. These prints will be the basis for adding the new I/O.	\$6,060.00

QUOTATION

12/15/22

Page 3

4	Presumed (not yet specified) 1 day of training	\$1,700.00
	Project total	\$84,871.00

Notes:

- No specification provided for PIT, used Siemens 7MF as basis
- No Specification provided for floats, used Flygt ENM-10 as basis
- ~~We anticipate (3) pad-mount free-standing enclosures, 72x36x18 for the three 100hp drives. They will have the vendor-provided HIM on the enclosure door and a specified pilot devices. Communication for the Drives is assumed to be Ethernet (not hardwired).~~
- Our startup time includes testing both control narratives on 40 90 01-2, from BOTH the Red Lion and from the computer iFix. If we are not able to do Maximum capacity pumping due to "no-approval", Timber Line's testing will be considered complete. Future testing for maximum pumping will be on an hourly service billing to Arvada.
- **VE notes:** The specified Transguard SPD/TVSS unit sees about 3x more cost than a typical 480V TVSS. The Modbus requirement add almost \$2000! We would be happy to discuss a more reasonably-priced product.
- ~~**VE: Notes:** We have used Nema 4 enclosures for the VFDs per note on sheet E8. These enclosures will have to be cut-out on the back for the heat sinks, and on the front or sides for the cooling fans. These cut outs will reduce the enclosure to a Nema 12 status. It might be cheaper to start with a Nema 12.~~

DELIVERY TIMES

- **Instrument Submittals will be delivered no sooner than **4** weeks from receipt of purchase order or contract.**
- **VFD/Electrical submittals will be delivered no sooner than 12 weeks from receipt of PO**
- **Instrumentation equipment and PLC will be delivered no sooner than **18** weeks from receipt of approved submittals**
- **Electrical gear delivery varies by vendor for the VFDs. The shortest lead time is 12 weeks, longest is 30. We will need at least three weeks beyond VFD factory shipment to finish and deliver the enclosures.**

If an order should result from this quotation, please reference the above quotation number and address the order as follows:

Timber Line Electric & Control Corporation

TERMS:

- All prices include delivery to job site unless noted.

QUOTATION

12/15/22

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- All quotations issued and orders received by TLECC are subject to final acceptance by a corporate principal. Quote is valid for 30 days.
 - Shipping dates are based on the best information available from equipment suppliers AT THE TIME OF THE QUOTATION. Thank you for the inquiry.
- Timber Line Electric & Control Corporation Kim Evezich

Merrick will provide design services and prepare construction documents suitable for constructing the City of Arvada Alkire Lift Station Improvements Project and provide engineering services during construction of the Project. Merrick will perform all work in accordance with state and local regulations to allow the Moltz Construction and the City of Arvada to construct and operate the Project as intended.

Specifically, this Scope of Services consists of structural design of one new slab and attached masonry walls for the generator enclosure.

Merrick will provide Services in the following phases more fully described below:

- 1) Project Management
- 2) Study and Report Phase
- 3) Final Design Phase
- 4) Construction Phase
- 5) Closeout Phase

Project Phases

Phase 1 – Project Management

- 1.0 **Description:** The Project Management phase continues throughout the duration of the project, and includes the effort required to coordinate and administer the project. It includes communications with all project team members and invoicing.
 - 1.1 **Communication:** The Project Manager is responsible for maintaining communication with all project stakeholders as needed. This communication will include regular calls, emails, and meetings as needed.
 - 1.2 **Quality:** The Project Manager is responsible for all aspects of Quality on the project and will designate an experienced reviewer for Quality reviews.
 - 1.3 **Schedule:** The Project Manager will manage the work to meet the defined milestone dates and provide prompt notification of any risks to the project schedule.
 - 1.4 **Budget:** The Project Manager is responsible for tracking progress against the budget, submitting monthly invoices, and providing prompt notification of any risks to the project budget.
 - 1.5 **Scope:** The Project Manager is responsible for tracking scope of work as the work progresses and providing prompt notification of any variances from the original Scope of Services.
 - 1.6 **Meetings:** Meetings in this project include up to four (4) teleconference meetings Moltz Construction for establishing design basis, reviewing design documents, and/or addressing permit review comments.
 - 1.7 **Deliverables:** Deliverables for this phase include (All documentation submitted shall be in electronic PDF format unless otherwise designated.)
 - 1.7.1 Invoices

Phase 2 – Study and Report Phase (30% Design)

2.0 Description: Study and Report phase includes effort associated with defining and collecting data to establish the basis of design for the project. It also includes the documentation of the initial design decisions in a final Technical Memorandum for review.

2.1 Data Collection: Data collection efforts include work to refine and further detail project requirements and will include input from project stakeholders. It will also include the following data of the project:

2.1.1 Review of plans of record for existing construction

2.1.2 Review of current design plans

2.2 Permitting: Other collected data will include applicable regulations from all Authorities Having Jurisdiction (AHJs) and the associated permit process requirements. Expected AHJs for this project include:

2.2.1 Colorado Department of Public Health and Environment (CDPHE)

2.2.2 City of Arvada

2.2.3 Jefferson County

2.3 Design Elements: Design decisions may change as data is collected, but the anticipated items to be developed in this phase include:

2.3.1 Slab design, including coordination with existing slab

2.3.2 Wall design, including coordination with existing building

2.3.3 Incorporation of relocated existing components as indicated in the plans (e.g. gate, antenna)

2.4 Deliverables: Deliverables for this phase include (All documentation submitted shall be in electronic PDF format unless otherwise designated.)

2.4.1 One (1) Technical Memorandum to fully document the collected data and design decisions.

2.5 Required Input: Required Moltz Construction input includes assistance in identifying sources of data, providing internal documentation on the site and applicable plans of record, coordination of design with other project elements (e.g. site layout, drainage, electrical) and review and comment on submitted Technical Memoranda.

Phase 3 – Final Design Phase (100% Design)

3.0 Description

3.1 The Final Design Phase includes effort required to implement the approved design decisions as well as feedback from the prior phase in a detailed design. Merrick will prepare and submit documents that adequately describe the final design for purposes of obtaining feedback and permit approval. Deliverables represent a complete design concept and are near-construction ready, excepting final comments resulting from permit review.

3.2 Though the specific sheets included in the final plan set is subject to change as the design is developed, a list of anticipated sheets includes:

- Cover
- General Notes
- Sheet index, abbreviations, and legend
- Slab plan and sections
- Slab details
- Wall plan and sections

- Wall details

3.3 Deliverables in this phase include:

- 3.3.1 Plans sealed for permit review,
- 3.3.2 Specifications sealed for permit review,
- 3.3.3 Permit applications, and
- 3.3.4 A technical memorandum describing design decisions and changes since the previous phase
- 3.3.5 One (1) revision to plans and specifications based on permit comments.

3.4 Required Moltz Construction input includes an initial Notice to Proceed with this phase of the work, and feedback on the submitted documents, and payment of permit fees.

Phase 4 – Construction Phase

4.0 Description:

- 4.1 Construction Phase effort includes review of and response to Contractor Documents, preparation for and attendance at meetings, notification letters as required by permits, and letters regarding substantial and final completion of construction.
- 4.2 Contractor Documents include Requests for Information (RFIs), documentation related to Construction Change Orders, and Submittals.
- 4.3 Meetings in this phase include a Pre-Construction Meeting, and up to three (3) other construction phase meetings. All meetings will be via teleconference.
- 4.4 Deliverables in this phase include:
 - 4.4.1 Responses to Contractor Document reviews and
 - 4.4.2 Any notifications required by permitting agencies.
- 4.5 Moltz Construction input required in this phase includes input on Contractor Document reviews.

Phase 5 – Closeout Phase

5.0 Description:

- 5.1 The Closeout Phase includes efforts to complete the project, primarily including preparation and submission of Plans of Record based on Construction Redline Plans.
- 5.2 No meetings are included in this phase.
- 5.3 Deliverables in this phase include
 - 5.3.1 Plans of Record,
 - 5.3.2 Electronic CAD files, and
 - 5.3.3 Notifications required by permitting agencies.
- 5.4 Required Moltz Construction input includes feedback on the submitted documents.

Exclusions

6.0 Description:

- 6.1 Work excluded from the scope of this project includes, but is not limited to, the following:
 - 6.1.1 Electrical design, including modifications to conduits for generator, antenna, lights and receptacle(s) and all associated wiring, etc.
 - 6.1.2 Site layout and site drainage design
 - 6.1.3 Survey and geotechnical services

Constraints

7.0 Description:

- 7.1 The design effort for this project is understood to be subject to the following constraints:
- 7.1.1 Existing 90% design elements are to be accommodated as presented in October 2022 plan set, including no modifications to main lift station building
 - 7.1.2 New Generator enclosure walls should match (if possible) material and style of existing building

Assumptions

8.0 Description:

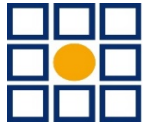
- 8.1 The scope and hour estimates are based on the following assumptions:
- 8.1.1 The documentation for the existing building, slab, etc. contain adequate detail to develop the design of the new elements
 - 8.1.2 Moltz Construction certifies that the documentation for the existing site, including plans of record and geotechnical report, are accurate and correct for the purposes of this design effort.
 - 8.1.3 Moltz Construction will support coordination efforts of this project design with other project elements, including electrical, site layout and drainage, etc.

Schedule

The work depends on input from and action by others including permit reviewers, City Staff, Moltz Construction Staff, and construction activity. Given these uncertainties, our estimated milestone schedule is:

Milestone	Estimated Date
Notice to Proceed (NTP)	TBD
Submit Study & Report Phase TM	10 working days from NTP
Submit Final Design Documents & Permit Applications	40 working days from NTP
Submit Construction Plans and Specifications	10 working days from receipt of final permit comment
Start Construction	TBD
End Construction	TBD
Submit Plans of Record	20 working days from End of Construction

Scope & Fee are based on completion of all work (other than plans of record) by December 21, 2023



MERRICK®

Project Name: Alkire Lift Station Impvmts - Generator Enclosure

Merrick Project Number: TBD

Merrick Project Manager: Keller Drozdick

Merrick Project Engineer(s): TBD

FEE PROPOSAL

Scope of Work		Merrick								Total Cost	Percent of Total	Notes	
		Position Description / Title & Labor Billing Rates						Task Labor Costs	Phase Labor Costs				Expenses
		Architect	Project Manager	Project Engineer	Design Engineer / Graduate Engineer	Designer / Drafter	Project Accountant / Technical Writer						
		\$225.00	\$225.00	\$175.00	\$140.00	\$125.00	\$110.00			(Estimated at 5% of Labor)			
Phase	Task												
Project Management	Project Setup	2						\$ 450.00	\$ 7,225.00	\$ 22.50	\$ 7,247.50	16%	Assuming 8 week design & permit duration
	Coordination & Administration	16						\$ 4,480.00					
	Meetings	6						\$ 2,295.00					
Study & Report Phase (30%)	Data Collection	1	2	4	4			\$ 1,935.00	\$ 10,485.00	\$ 96.75	\$ 10,581.75	24%	Includes summary TM
	Permitting		2	4	4			\$ 1,710.00					
	Data Analysis & Schematic Design	4	4	16	16			\$ 6,840.00					
Final Design (100%)	Plans	4						\$ 10,940.00	\$ 19,470.00	\$ 547.00	\$ 20,017.00	45%	Includes summary TM
	Specifications	4						\$ 6,820.00					
	Permits & Plat Applications	2						\$ 1,710.00					
Construction	Review of Construction Documents	2						\$ 2,970.00	\$ 4,570.00	\$ 148.50	\$ 4,718.50	11%	
	Meetings	4						\$ 1,600.00					
Closeout	Plans of Record	2						\$ 1,350.00	\$ 1,575.00	\$ 67.50	\$ 1,642.50	4%	
	Internal Project Closure	1						\$ 225.00					
	TOTALS	5	49	77	71	48	16	\$ 43,325.00		\$ 882.25	\$ 44,207.25	100%	
	Percentage of Total	1.88%	18.42%	28.95%	26.69%	18.05%	6.02%						



Bid Proposal for Copy of Alkire LS Improvements 90%

CUSTOMER	MOLTZ CONSTRUCTION, INC. 8807 CR 175 SALIDA, CO 81201	Job Copy of Alkire LS Improvements 90% Arvada, CO Bid Date: 08/22/2022 05:00 pm Bid #: 2638387
CONTACT	Sales Representative Jim Webster (M) 303-210-4672 (T) 303-394-0004 (F) 303-394-4450 Jim.Webster@coreandmain.com	Core & Main 9451 Yosemite St Henderson, CO 80640 (T) 303-394-0004
NOTES		



Bid Proposal for Copy of Alkire LS Improvements 90%

MOLTZ CONSTRUCTION, INC.
Job Location: Arvada, CO
Bid Date: 08/22/2022 05:00 pm
Core & Main 2638387

Core & Main
 9451 Yosemite St
 Henderson, CO 80640
Phone: 303-394-0004
Fax: 303-394-4450

Seq#	Qty	Description	Units	Price	Ext Price
		DUE TO CURRENT SUPPLY CHAIN DISRUPTIONS, MATERIALS ARE SUBJECT TO PRICING AT TIME OF SHIPMENT. MATERIAL AVAILABILITY AND TIMELINESS OF SHIPMENTS CANNOT BE GUARANTEED. THIS TERM SUPERSEDES ALL OTHER CONTRACTUAL PROVISIONS.			
20		ATTN DUSTIN			
30		FROM JIM			
40		BID# 2638387			
60		PUMP 1			
70	1	12 EBAA MEGAFLANGE 2112	EA	472.48	472.48
80	1	12 FLGXPE DI PIPE P401 PR 4' PRIMED IMP	EA	1,478.57	1,478.57
90	1	DENVER HEAVY PIPE SUP 16"-24"	EA	245.72	245.72
100	1	12 FLG 118 PLUG VLV W/HW ACT 1200,FIG118,F,6,RS17,AGG6H8	EA	4,000.00	4,000.00
110	1	12 EBAA MEGAFLANGE 2112	EA	472.48	472.48
120	1	12 FLGXPE DI PIPE P401 PR 2' PRIMED IMP	EA	994.95	994.95
130	1	DENVER HEAVY PIPE SUP 16"-24"	EA	245.72	245.72
140	1	12X8 FLG ECC RED C110 P401 PR IMP	EA	1,238.05	1,238.05
150	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
160	1	8 FLGXPE DI PIPE P401 PR 1'6" PRIMED IMP	EA	485.34	485.34
170	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
180	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
200	1	8"X 6" FLGXFLG P401/PR W/1" TAP	EA	772.34	772.34
210		MANUAL AIR VENT			
220	1	1 BRASS ST 90 NO LEAD (I)	EA	13.39	13.39
230	2	1X3 BRASS NIPPLE NO LEAD (I)	EA	6.81	13.62
240	1	1 R&W F/P BALL VALVE 5544AB NO LEAD BRASS	EA	18.85	18.85
250	1	1 BRASS 90 NO LEAD (I)	EA	9.59	9.59
270	2	12X1/8 FLG ACC RR FF ZINC B&NG	EA	50.29	100.58
280	4	8X1/8 FLG ACC RR FF ZINC B&NG	EA	20.88	83.52
300		PUMP BY OTHERS			
320	1	6"X 6" FLGXFLG P401/PR W/1" TAP	EA	587.84	587.84
330		MANUAL AIR VENT			
340	1	1 BRASS ST 90 NO LEAD (I)	EA	13.39	13.39
350	2	1X3 BRASS NIPPLE NO LEAD (I)	EA	6.81	13.62
360	1	1 R&W F/P BALL VALVE 5544AB NO LEAD BRASS	EA	18.85	18.85
370	1	1 BRASS 90 NO LEAD (I)	EA	9.59	9.59



Bid Proposal for Copy of Alkire LS Improvements 90%

Bid #: 2638387

Seq#	Qty	Description	Units	Price	Ext Price
390	1	8X6 FLG 90 C110 P401 PR IMP	EA	816.75	816.75
400	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
410	1	8 FLGXPE DI PIPE P401 PR 3' PRIMED IMP	EA	754.40	754.40
420	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
430	1	HEAVY PIPE SUPPORT 98"-106"	EA	311.43	311.43
440	1	8"CK VLV SLAMINATOR FLG EPXY	EA	3,385.60	3,385.60
		W/SPDT NEMA 1/4/13 POS SWITCH			
		12-14 WEEK LEAD TIME			
470	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
480	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
490	1	8 FLGXPE DI PIPE P401 PR 5' PRIMED IMP	EA	1,113.15	1,113.15
500	1	HEAVY PIPE SUPPORT 98"-106"	EA	311.43	311.43
510	1	8" FLG PLUG VALVE W/CWA	EA	1,812.50	1,812.50
520	2	6X1/8 FLG ACC RR FF ZINC B&N&G	EA	16.24	32.48
530	5	8X1/8 FLG ACC RR FF ZINC B&N&G	EA	20.88	104.40
PUMP 1					23,706.55
550		PUMP 2			
560	1	12 EBAA MEGAFLANGE 2112	EA	472.48	472.48
570	1	12 FLGXPE DI PIPE P401 PR 4' PRIMED IMP	EA	1,478.57	1,478.57
580	1	DENVER HEAVY PIPE SUP 16"-24"	EA	245.72	245.72
590	1	12 FLG 118 PLUG VLV W/HW ACT 1200,FIG118,F,6,RS17,AGG6H8	EA	4,000.00	4,000.00
600	1	12 EBAA MEGAFLANGE 2112	EA	472.48	472.48
610	1	12 FLGXPE DI PIPE P401 PR 1' PRIMED IMP	EA	651.39	651.39
620	1	DENVER HEAVY PIPE SUP 16"-24"	EA	245.72	245.72
630	1	12X8 FLG ECC RED C110 P401 PR IMP	EA	1,238.05	1,238.05
640	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
650	1	8 FLGXPE DI PIPE P401 PR 1'6" PRIMED IMP	EA	485.34	485.34
660	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
670	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
680	1	8 FLG 90 C110 P401 IMP	EA	851.95	851.95
700	1	8"X 6"FLGXFLG P401/PR W/1" TAP	EA	772.34	772.34
710		MANUAL AIR VENT			
720	1	1 BRASS ST 90 NO LEAD (I)	EA	13.39	13.39
730	2	1X3 BRASS NIPPLE NO LEAD (I)	EA	6.81	13.62
740	1	1 R&W F/P BALL VALVE 5544AB NO LEAD BRASS	EA	18.85	18.85
750	1	1 BRASS 90 NO LEAD (I)	EA	9.59	9.59
770	2	12X1/8 FLG ACC RR FF ZINC B&N&G	EA	50.29	100.58
780	5	8X1/8 FLG ACC RR FF ZINC B&N&G	EA	20.88	104.40
800		PUMP BY OTHERS			
820	1	6"X 6"FLGXFLG P401/PR W/1" TAP	EA	587.84	587.84
830		MANUAL AIR VENT			
840	1	1 BRASS ST 90 NO LEAD (I)	EA	13.39	13.39
850	2	1X3 BRASS NIPPLE NO LEAD (I)	EA	6.81	13.62
860	1	1 R&W F/P BALL VALVE 5544AB NO LEAD BRASS	EA	18.85	18.85
870	1	1 BRASS 90 NO LEAD (I)	EA	9.59	9.59



Bid Proposal for Copy of Alkire LS Improvements 90%

Bid #: 2638387

Seq#	Qty	Description	Units	Price	Ext Price
890	1	8X6 FLG 90 C110 P401 PR IMP	EA	816.75	816.75
900	1	8 FLGXFLG DI PIPE P401 PR 2' PRIMED IMP	EA	810.78	810.78
910	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
920	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
930	1	8 FLGXPE DI PIPE P401 PR 3' PRIMED IMP	EA	754.40	754.40
940	1	HEAVY PIPE SUPPORT 98"-106"	EA	311.43	311.43
950	1	8"CK VLV SLAMINATOR FLG EPXY	EA	3,385.60	3,385.60
		W/SPDT NEMA 1/4/13 POS SWITCH			
		12-14 WEEK LEAD TIME			
980	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
990	1	8" FLG PLUG VALVE W/CWA	EA	1,812.50	1,812.50
1010	2	6X1/8 FLG ACC RR FF ZINC B&N&G	EA	16.24	32.48
1020	6	8X1/8 FLG ACC RR FF ZINC B&N&G	EA	20.88	125.28
				PUMP 2	23,383.06
1040		PUMP 3			
1050	1	12 EBAA MEGAFLANGE 2112	EA	472.48	472.48
1060	1	12 FLGXPE DI PIPE P401 PR 4' PRIMED IMP	EA	1,478.57	1,478.57
1070	1	DENVER HEAVY PIPE SUP 16"-24"	EA	245.72	245.72
1080	1	12 FLG 118 PLUG VLV W/HW ACT 1200,FIG118,F,6,RS17,AGG6H8	EA	4,000.00	4,000.00
1090	1	12 EBAA MEGAFLANGE 2112	EA	472.48	472.48
1100	1	12 FLGXPE DI PIPE P401 PR 2'6" PRIMED IMP	EA	1,064.98	1,064.98
1110	1	DENVER HEAVY PIPE SUP 16"-24"	EA	245.72	245.72
1120	1	12X8 FLG ECC RED C110 P401 PR IMP	EA	1,238.05	1,238.05
1130	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
1140	1	8 FLGXPE DI PIPE P401 PR 1'6" PRIMED IMP	EA	485.34	485.34
1150	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
1160	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
1170	1	8 FLG 90 C110 P401 IMP	EA	851.95	851.95
1190	1	8"X 6"FLGXFLG P401/PR W/1" TAP	EA	772.34	772.34
1200		MANUAL AIR VENT			
1210	1	1 BRASS ST 90 NO LEAD (I)	EA	13.39	13.39
1220	2	1X3 BRASS NIPPLE NO LEAD (I)	EA	6.81	13.62
1230	1	1 R&W F/P BALL VALVE 5544AB NO LEAD BRASS	EA	18.85	18.85
1240	1	1 BRASS 90 NO LEAD (I)	EA	9.59	9.59
1260	2	12X1/8 FLG ACC RR FF ZINC B&NG	EA	50.29	100.58
1270	5	8X1/8 FLG ACC RR FF ZINC B&N&G	EA	20.88	104.40
1290		PUMP BY OTHERS			
1310	1	6"X 6"FLGXFLG P401/PR W/1" TAP	EA	587.84	587.84
1320		MANUAL AIR VENT			
1330	1	1 BRASS ST 90 NO LEAD (I)	EA	13.39	13.39
1340	2	1X3 BRASS NIPPLE NO LEAD (I)	EA	6.81	13.62
1350	1	1 R&W F/P BALL VALVE 5544AB NO LEAD BRASS	EA	18.85	18.85
1360	1	1 BRASS 90 NO LEAD (I)	EA	9.59	9.59
1380	1	8X6 FLG 90 C110 P401 PR IMP	EA	816.75	816.75

11/17/2022 - 2:52 PM

Actual taxes may vary

Page 4 of 5



Bid Proposal for Copy of Alkire LS Improvements 90%

Bid #: 2638387

Seq#	Qty	Description	Units	Price	Ext Price
1390	1	8 FLGXFLG DI PIPE P401 PR 2' PRIMED IMP	EA	810.78	810.78
1400	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
1410	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
1420	1	8 FLGXPE DI PIPE P401 PR 3' PRIMED IMP	EA	754.40	754.40
1430	1	8"CK VLV SLAMINATOR FLG EPXY	EA	3,385.60	3,385.60
		W/SPDT NEMA 1/4/13 POS SWITCH			
		12-14 WEEK LEAD TIME			
1460	1	8 FLG 22-1/2 C110 P401 PR IMP	EA	749.10	749.10
1470	1	HEAVY PIPE SUPPORT 98"-106"	EA	311.43	311.43
1480	1	8 EBAA MEGAFLANGE 2108	EA	259.84	259.84
1490	1	8 FLGXPE DI PIPE PR 1'6" PRIMED IMP	EA	485.34	485.34
1500	1	HEAVY PIPE SUPPORT 98"-106"	EA	311.43	311.43
1510	1	8" FLG PLUG VALVE W/CWA	EA	1,812.50	1,812.50
1530	2	6X1/8 FLG ACC RR FF ZINC B&N&G	EA	16.24	32.48
1540	6	8X1/8 FLG ACC RR FF ZINC B&N&G	EA	20.88	125.28
				PUMP 3	24,853.26
				Sub Total	71,942.87
				Tax	0.00
				Total	71,942.87
Branch Terms:					
CORE & MAIN WATERWORKS IS NOT LIABLE FOR DELIVERY DELAYS, CANCELLATIONS OR PRICE INCREASES RESULTING FROM ANY CAUSE BEYOND OUR CONTROL. THESE INCLUDE BUT ARE NOT LIMITED TO:MANUFACTURERS SHORTAGES, AVAILABILITY OR TIMELINESS OF TRANSPORTATION, MATERIALS, FUELS, OR SUPPLIES. THIS QUOTE IS NOT A CONTRACT TO SUPPLY MATERIAL OR GUARANTEE OF PRODUCT AVAILABILITY.					

SALES TAXES NOT INCLUDED					
ITEMS PICKED UP AT OUR FACILITY MAY BE SUBJECT TO CITY TAXES					
UNLESS OTHERWISE SPECIFIED HEREIN, PRICES QUOTED ARE VALID IF ACCEPTED BY CUSTOMER AND PRODUCTS ARE RELEASED BY CUSTOMER FOR MANUFACTURE WITHIN THIRTY (30) CALENDAR DAYS FROM THE DATE OF THIS QUOTATION. CORE & MAIN LP RESERVES THE RIGHT TO INCREASE PRICES TO ADDRESS FACTORS, INCLUDING BUT NOT LIMITED TO, GOVERNMENT REGULATIONS, TARIFFS, TRANSPORTATION, FUEL AND RAW MATERIAL COSTS. DELIVERY WILL COMMENCE BASED UPON MANUFACTURER LEAD TIMES. ANY MATERIAL DELIVERIES DELAYED BEYOND MANUFACTURER LEAD TIMES MAY BE SUBJECT TO PRICE INCREASES AND/OR APPLICABLE STORAGE FEES. THIS BID PROPOSAL IS CONTINGENT UPON BUYER'S ACCEPTANCE OF SELLER'S TERMS AND CONDITIONS OF SALE, AS MODIFIED FROM TIME TO TIME, WHICH CAN BE FOUND AT: https://coreandmain.com/TandC/					



M.A. Bemus Painting, Inc.

Mark Bemus
3373 Yarrow Ct.
Wheat Ridge, CO 80033
303-431-8445

B I D

Project: Alkire L.S. 90% / Moltz

Bid Date: Aug. 22, 2022

Location: Arvada, CO

Plans dated:

Addenda:

Sections Bid:

Exclusions:

Inclusions: New and existing D.I. pipe, Exterior CMU screen wall

Base Bid: **\$11,310**

Alternates:

Comments:

Respectfully,

Mark Bemus, President

NACE Coating Inspector Level 1

Cert. #102219



BID PROPOSAL

Date: 8/22/2022

Project Name: Alkire Lift Station Improvements

Plans Dated: 8/2/2022

Project Location: 9005 Alkire Street, Arvada, CO

Includes	Excludes
CMU Light Weight in 8"	Permits/Plan Fees
Grout 3,000psi	Staking
Debris to Dumpsters Provided by GC	Caissons/Dead Men for Wall Bracing
Mortar Type S Color H series	Engineering
Setting of Embeds Supplied by Others	Waterproofing/Sealer/Sealants
Flashing, Weeps, Drip, Term-bar at CMU Veneer-Only	Dust control for other trades
Ties for 4" CMU Veneer	Bond Cost
Wall Bracing	Embeds/Layout of embeds
Setting of Hollow Metal Door Frames in Masonry Only	Lath/Scratch/Brown coats
Rebar Supply and Placement in CMU Only	Winter Protection Labor/material
Taxes included at 7.96%.	Demo/Restoration
Bond Not Included, 1.0%.	Lintels
Taxes included at 7.96%.	Caulking/Backer Rod
Includes slightly rounded mortar cap.	Shoring
	Moisture barriers, Fluid Applied, Felt Paper, ETC (labor & Materials)
	Rigid, spray, foam, any Insulation
	Fireproofing, fire stop
	Temporary facilities, power, water, etc
	Retaining Walls
	Shop drawings
	Welding
	Water meter
	Dumpsters
	Eco Pan/Wash Out
	Protection of masonry work after completion
	Dry packing embeds/high strength grout
	Drilling and epoxy of any kind
	Grouting Joist Pockets
	Window Protection
	Any & All Site Work
Addendums:	Crane

The following is required to begin construction

Subcontract agreement to include the terms of this proposal

220/110 power

Access to Water/meter

Level compacted area to erect scaffold

Mixing area within 100 yards of work area

stock area within 100 yards of work area

*Payment Terms 30 Days After Invoice

* Retention to be held at 10% (Retention reduced to 5% after 75% complete)

* JVS has a Full Time Safety Director on Staff

* This bid is good for 35 days

Base Bid: \$20,944.22

Aaron Mason

Chief Estimator

Cell: 720.626.6931

Office: 303-289-6015

Email: amason@jvsmasonry.com

Exhibit B

AMENDMENT NO. 2

TO THE AGREEMENT BETWEEN THE CITY OF
ARVADA AND MOLTZ CONSTRUCTION, INC.,
AWARDING CONTRACTOR PHASE II AND
ESTABLISHING CONTRACTOR'S GUARANTEED
MAXIMUM PRICE FOR PHASE II OF THE
"CONSTRUCTION MANAGEMENT/ GENERAL
CONTRACTOR AGREEMENT FOR PRECONSTRUCTION
SERVICES FOR ALKIRE LIFT STATION
IMPROVEMENTS" IN AN AMOUNT NOT TO EXCEED
\$838,985.00

CITY OF ARVADA

ALKIRE LIFT STATION IMPROVEMENTS PROJECT

LIFT STATION MODIFICATIONS AT 9005 ALKIRE STREET, ARVADA COLORADO
NOVEMBER 2022

EXHIBIT
B



ADMINISTRATION

MAYOR	MARC WILLIAMS
CITY MANAGER	MARK DEVEN
DIRECTOR OF UTILITIES	SHARON ISRAEL
UTILITIES ENGINEERING MANAGER	MARY STAHL
PROJECT MANAGER	KRIS GARDNER



VICINITY MAP

SCALE: 1" = 500'



SHEET INDEX

SHEET NO.	DWG NO.	TITLE
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GENERAL

1	G-1	COVER SHEET
2	G-2	GENERAL NOTES

PIPING

3	P-1	STATION DEMOLITION PLAN
4	P-2	PIPING DEMOLITION - SECTION A
5	P-3	PIPING DEMOLITION - SECTION B
6	P-4	PROPOSED PIPING PLAN
7	P-5	PROPOSED PIPING - SECTION A
8	P-6	PROPOSED PIPING - SECTION B
9	P-7	PROPOSED PIPING - SECTION C & SECTION D
10	P-8	DETAILS
11	P-9	GRINDER VAULT DEMOLITION AND PROPOSED PLANS AND SECTIONS

ELECTRICAL

12	E1	GENERAL LEGEND AND ABBREVIATIONS
13	E2	DEMOLITION ONE-LINE DIAGRAM AND PANEL SCHEDULE
14	E3	LIFT STATION ELECTRICAL DEMOLITION PLAN
15	E4	GRINDER ELECTRICAL DEMOLITION PLAN
16	E5	ONE-LINE DIAGRAM AND PANEL SCHEDULE
17	E6	EQUIPMENT ONE-LINE DIAGRAMS
18	E7	PUMP VFD SCHEMATIC
19	E8	LIFT STATION ELECTRICAL PLAN
20	E9	LIFT STATION ELECTRICAL SECTION
21	E10	GRINDER ELECTRICAL PLAN
22	E11	ELECTRICAL DETAILS

PLOTTED: 11/11/2022 8:21:08 AM
NAME: P:\2021 PROJECTS\21-057.01 ALKIRE LIFT STATION IMPROVEMENTS - ARVADA\CAD\DRAWINGS\21-057.01 - COVER SHEET.DWG

PREPARED UNDER
THE SUPERVISION OF

DESIGNED:
TCB

DRAWN:
TAD

CHECKED:
GBH

100% DESIGN

MEC PROJECT NO. 21-057.01
ARVADA PROJECT NO. 21-SR03

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



City of Arvada

8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

COVER SHEET

DATE

11/04/2022

DRAWING NO.

G-1

SHEET NO.

1 of 22

PLOTTED: 11/11/2022 8:21:11 AM
NAME: P:2021 PROJECTS\21-057.01 ALKIRE LIFT STATION IMPROVEMENTS - ARVADA\ADD\DRAWINGS\21-057.01 - COVER SHEET.DWG

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF ARVADA ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS, LATEST EDITION, UNLESS OTHERWISE SPECIFIED HEREIN.
2. THE PROJECT SITE IS LOCATED IN JEFFERSON COUNTY. CONTRACTOR SHALL COMPLY WITH ALL COUNTY LICENSE AND PERMIT REQUIREMENTS, INCLUDING EROSION AND DUST CONTROL, SITE ACCESS AND TRAFFIC CONTROL, NOTIFICATIONS, AND BUILDING AND ELECTRICAL PERMITTING AND COMPLIANCE. CITY OF ARVADA REQUIREMENTS RELATED TO CONTRACTOR LICENSING, PERMITTING AND GENERAL CONDITIONS SHALL BE AS SET FORTH IN SECTION 100 OF THE CITY'S ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL PROJECT SAFETY INCLUDING, BUT NOT LIMITED TO, TRENCH EXCAVATION AND SHORING, TRAFFIC CONTROL AND SITE SECURITY.
4. RECORD DRAWING REQUIREMENTS SHALL BE AS SET FORTH IN SECTION 100 OF THE CITY'S ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS.
5. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE CITY OF ARVADA. THE CITY RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH SECTION 100 OF ITS ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS.
6. ACCEPTANCE OF THE WORK SHALL BE IN ACCORDANCE WITH SECTION 200 OF THE CITY'S ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS.
7. SUBMITTALS SHALL BE REQUIRED FOR REVIEW AND APPROVAL BY CITY OF ARVADA AND ENGINEER FOR ALL MATERIALS AND EQUIPMENT PROPOSED FOR PERMANENT INSTALLATION AT THE SITE.
8. MOTORS, ELECTRICAL EQUIPMENT, CABINETS, AND ANY OTHER ITEMS EXPRESSLY IDENTIFIED BY CITY OF ARVADA FOR SALVAGE SHALL BE RETURNED TO CITY OF ARVADA.
9. ALL PIPE EQUIPMENT LOCATIONS SHOWN IN THE "P" SERIES DRAWINGS SHALL SUPERSEDE ANY PIPE EQUIPMENT LOCATIONS SHOWN IN ANY OTHER SERIES. ALL ELECTRICAL EQUIPMENT LOCATIONS SHOWN IN THE "E" SERIES DRAWINGS SHALL SUPERSEDE ANY ELECTRICAL EQUIPMENT SHOWN IN ANY OTHER SERIES.
10. STARTUP TESTING SHALL BE CONDUCTED BY THE CONTRACTOR IN COORDINATION WITH CITY OF ARVADA AND ENGINEER.
11. AN EXISTING BRIDGE CRANE AND HOIST IS LOCATED INSIDE THE LIFT STATION AND CAN BE USED BY THE CONTRACTOR TO REMOVE AND INSTALL EXISTING AND NEW PIPING AND EQUIPMENT. THE CAPACITY OF THE CRANE IS 2 TONS.

GRINDER NOTES:

1. GRINDER WORK SHALL CONSIST OF REMOVAL AND SALVAGE OF EXISTING GRINDER AND CONTROLS, DEMOLITION AND WIDENING OF THE CONCRETE GRINDER CHANNEL AS PLANNED FOR IN THE ORIGINAL DESIGN AND CONSTRUCTION OF THE CHANNEL, AND RELOCATION OF THE LEVEL TRANSMITTER AS SHOWN ON THE GRINDER DETAILS.
2. THE PROPOSED INSTALLATION OF NEW GRINDER EQUIPMENT IS NOT A PART OF THE CURRENT CONSTRUCTION WORK AND WILL ONLY BE IMPLEMENTED AT THE DISCRETION OF THE CITY OF ARVADA AFTER THE INITIAL OPERATION AND ASSESSMENT OF THE PERFORMANCE OF THE UPGRADED LIFT STATION.

CMU GENERATOR ENCLOSURE NOTES:

1. CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF COLORADO TO PROVIDES PLANS, DETAILS AND SPECIFICATIONS PERTAINING TO THE DEMOLITION AND EXPANSION OF THE EXISTING SLAB-ON-GRADE AND CMU WALL SHOWN ON THE PLANS TO ACCOMMODATE THE PROPOSED LARGER GENERATOR WITH ADEQUATE SERVICE CLEARANCES.
2. DESIGN SHALL BE IN COMPLIANCE WITH ALL PERTINENT JEFFERSON COUNTY REQUIREMENTS AND UTILIZED BY CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS.
3. SOUND ATTENUATION PROVISIONS ARE NOT REQUIRED FOR THE NEW CMU ENCLOSURE.
4. RELOCATION OF EXISTING ANCILLARY EQUIPMENT WITHIN THE CMU ENCLOSURE SHALL BE AS NOTED ON THE ELECTRICAL DRAWINGS.
5. GENERAL NOTES PROVIDED HEREIN SHALL APPLY TO THE CONSTRUCTION OF THE CMU GENERATOR ENCLOSURE.

STATION PIPING AND VALVE NOTES:

1. STATION PIPING, FITTINGS AND RESTRAINT SHALL BE IN ACCORDANCE WITH SPECIFICATIONS SECTION 33-31-26.
2. SUCTION PIPING PLUG VALVES SHALL BE 12" DEZURIK PEF ECCENTRIC PLUG VALVES WITH HANDWHEEL OPERATOR, OR APPROVED EQUAL.
3. DISCHARGE PIPING PLUG VALVES SHALL BE 8" DEZURIK PEF ECCENTRIC PLUG VALVES WITH CHAIN DRIVEN HANDWHEELS, OR APPROVED EQUAL.
4. DISCHARGE PIPING CHECK VALVES SHALL BE 8" GOLDEN ANDERSON FIGURE SB200 SPRING ASSISTED RUBBER FLAPPER CHECK VALVES, OR APPROVED EQUAL.
5. PIPE SUPPORT DESIGN SHALL BE STAMPED BY A PROFESSIONAL ENGINEER AND SUBMITTED TO CITY OF ARVADA FOR REVIEW AND APPROVAL.
6. PIPE SUPPORTS SHALL BE MANUFACTURED FOR THE SIZE AND TYPE OF PIPE TO WHICH THEY ARE APPLIED AND BE CAPABLE OF SUPPORTING THE COMBINED WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED COMPONENTS WITHOUT MOVEMENT OR SAGGING BETWEEN SUPPORTS.
7. PIPE SUPPORTS SHALL BE IN CONFORMANCE WITH MSS SP-58-2009 TYPE 36 OR 38 (SUCTION PIPING) AND TYPE 37 (DISCHARGE PIPING), OR APPROVED EQUALS.
8. PIPE SUPPORTS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 AND A358, OR ZINC-PLATED IN ACCORDANCE WITH ASTM B633, SC4, UNLESS APPROVED OTHERWISE.
9. ALL VALVES AND MEGAFLANGES SHALL COME WITH STANDARD FACTORY COATING AND WILL NOT BE PAINTED TO MATCH STATION PIPING. ANY DAMAGE TO FACTORY COATINGS SHALL BE REPAIRED IN A MANNER CONSISTENT WITH MANUFACTURE RECOMMENDATIONS.
10. NO PAINT COATING SHALL BE APPLIED TO PIPING BOLTS/NUTS.

BYPASS PUMPING NOTES:

1. CONTRACTOR SHALL SUBMIT A BYPASS PUMPING PLAN FOR REVIEW AND APPROVAL BY THE CITY OF ARVADA.
2. BYPASS PUMPING OPERATIONS SHALL BE REQUIRED ANY TIME MORE THAN ONE PUMP IS OUT OF SERVICE, AND SHALL BE PLANNED FOR LOW-FLOW, DRY-WEATHER PERIODS ONLY.
3. CONTRACTOR SHALL COORDINATE WITH THE CITY TO ASSESS AVAILABLE FLOW MONITORING DATA AND ENSURE BYPASS PUMPING EQUIPMENT CAN PROPERLY CONNECT TO FORCE MAIN BYPASS CONNECTIONS PRIOR TO COMMENCING BYPASS OPERATIONS.
4. CONTRACTOR IS RESPONSIBLE FOR ENSURING BYPASS PUMPS AND CONNECTIONS ARE ADEQUATELY SIZED TO CONVEY THE ANTICIPATED FLOWS WITH AN APPROPRIATE FACTOR OF SAFETY.
5. CONTRACTOR SHALL HAVE AN EMERGENCY BACKUP PLAN IN PLACE TO ADDRESS ANY FAILURE OF BYPASS OPERATIONS WHILE THE LIFT STATION IS OUT OF SERVICE.
6. ALL STATION OUTAGES MUST BE COORDINATED WITH THE CITY OF ARVADA AT LEAST 48 HOURS IN ADVANCE.

PREPARED UNDER THE SUPERVISION OF

DESIGNED: TCB
DRAWN: TAD
CHECKED: GBH

100% DESIGN

MEC PROJECT NO. 21-057.01
ARVADA PROJECT NO. 21-SR03

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



777 S. WADSWORTH BLVD, 4-100 LAKEWOOD, COLORADO 80226



City of Arvada

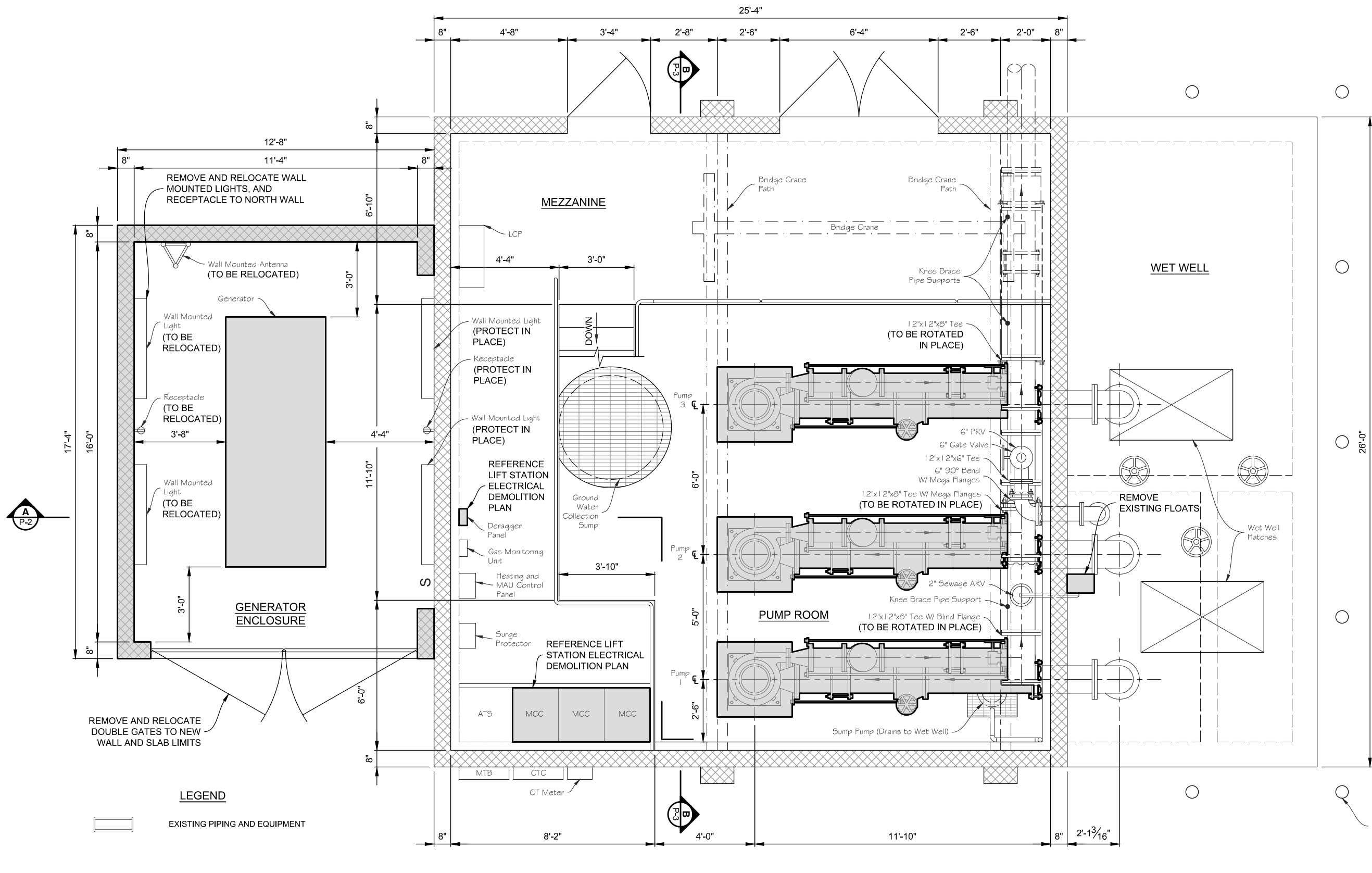
8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

GENERAL NOTES

DATE 11/04/2022
DRAWING NO. G-2
SHEET NO. 2 of 22

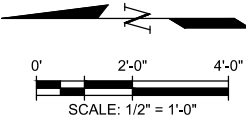
PLOTTED: 11/11/2022 8:21:25 AM
 NAME: P:\2021 PROJECTS\21-057.01 ALKIRE LIFT STATION IMPROVEMENTS - ARVADA\CAD\DRAWINGS\21-057.01 - EXISTING CONDITIONS FLOOR PLAN AND SECTION A.DWG
 AND SECTION A.DWG



- NOTES:**
- EXISTING PUMPS AND MOTORS, PUMP PEDESTALS, CHECK VALVES, PLUG VALVES, PIPING, FITTINGS, TIE RODS, GENERATOR, AND SCREEN WALL TO BE REMOVED.
 - ALL EXISTING PLAIN END 12" SUCTION LINES WHICH ARE STUBBED THROUGH WET WELL WALL TO BE PROTECTED IN PLACE.
 - PUMP PEDESTALS SHALL BE REMOVED IN THEIR ENTIRETY. CONCRETE IN THESE AREAS SHALL BE GROUND DOWN UNTIL SMOOTH AND FLUSH WITH EXISTING FLOOR.
 - SADDLE TAPS AND DRAIN HOSE ON SUCTION PIPING SHALL BE REMOVED AND DISPOSED OF.

LEGEND

EXISTING PIPING AND EQUIPMENT



PREPARED UNDER THE SUPERVISION OF	DESIGNED: TCB	100% DESIGN	SHEET REVISIONS				 777 S. WADSWORTH BLVD, 4-100 LAKEWOOD, COLORADO 80226	 CITY OF ARVADA	City of Arvada 8101 Ralston Rd. Arvada CO 80002 (720) 898-7760	ALKIRE LIFT STATION IMPROVEMENTS		DATE 11/04/2022
	DRAWN: TAD		NO.	DATE	DESCRIPTION	BY				STATION DEMOLITION PLAN		DRAWING NO. P-1
	CHECKED: GBH											SHEET NO. 3 OF 22

1. EXISTING PUMPS AND MOTORS, PUMP PEDESTALS, CHECK VALVES, PLUG VALVES, PIPING, FITTINGS, TIE RODS, GENERATOR, AND SCREEN WALL TO BE REMOVED.
2. HANDWHEEL OPERATOR ON 6" GATE VALVE FOR PRESSURE RELIEF VALVE TO BE REMOVED ONLY. GATE VALVE WILL REMAIN IN SERVICE.



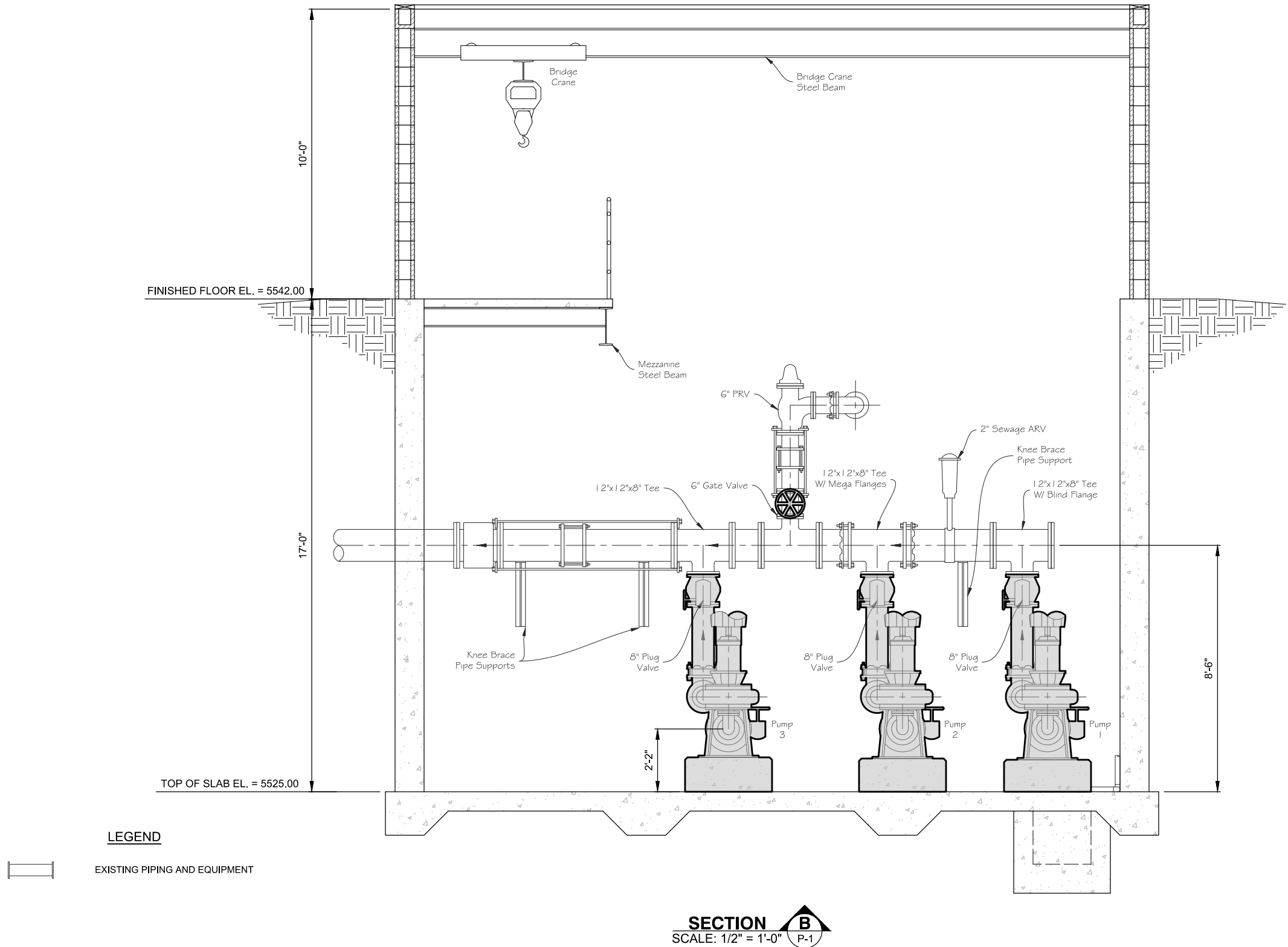
SECTION
SCALE: 1/2" = 1'-0"

PREPARED UNDER THE SUPERVISION OF	DESIGNED:	TCB 100% DESIGN MEC PROJECT NO. 21-057.01 ARVADA PROJECT NO. 21-SR03	SHEET REVISIONS <table><tr><th>NO.</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>				NO.	DATE	DESCRIPTION	BY																																	 MULLER ENGINEERING COMPANY 777 S. WADSWORTH BLVD, 4-100 LAKEWOOD, COLORADO 80226		 CITY OF ARVADA		City of Arvada 8101 Ralston Rd. Arvada CO 80002 (720) 898-7760		ALKIRE LIFT STATION IMPROVEMENTS		DATE 11/04/2022	
	NO.		DATE	DESCRIPTION	BY																																															
DRAWN:	TAD								PIPING DEMOLITION - SECTION A		DRAWING NO. P-2																																									
CHECKED:	GBH										SHEET NO. 4 OF 22																																									

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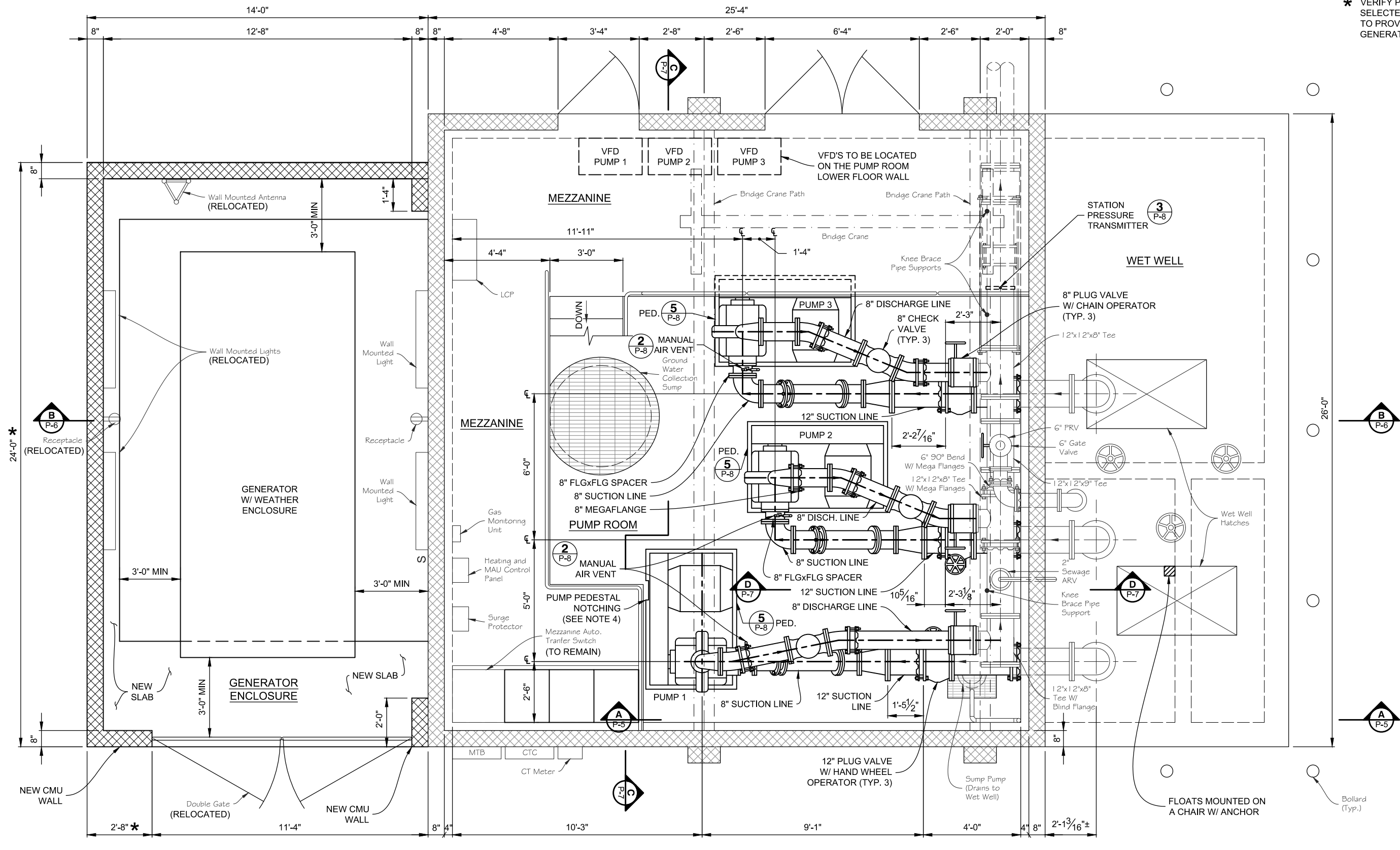
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- NOTES:**
- HANDWHEEL OPERATOR ON 6" GATE VALVE FOR PRESSURE RELIEF VALVE TO BE REMOVED ONLY. GATE VALVE WILL REMAIN IN SERVICE.



PREPARED UNDER THE SUPERVISION OF	DESIGNED:	TCB	100% DESIGN	MEC PROJECT NO. 21-057.01 ARVADA PROJECT NO. 21-SR03	SHEET REVISIONS				 777 S. WADSWORTH BLVD, 4-100 LAKEWOOD, COLORADO 80226	 City of Arvada 8101 Ralston Rd. Arvada CO 80002 (720) 898-7760	ALKIRE LIFT STATION IMPROVEMENTS		DATE 11/04/2022
	DRAWN:				TAD	PIPING DEMOLITION - SECTION B	DRAWING NO. P-3						
	CHECKED:				GBH		SHEET NO. 5 OF 22						

PLOTTED: 11/11/2022 8:21:53 AM
 NAME: P:\2021 PROJECTS\21-057.01 ALKIRE LIFT STATION IMPROVEMENTS - ARVADACAD\DRAWINGS\21-057.01 - PROPOSED FLOOR PLAN AND SECTION
 ADWG



* VERIFY PAD DIMENSIONS WITH
 SELECTED ELECTRICAL EQUIPMENT
 TO PROVIDE 36" CLEARANCE AROUND
 GENERATOR

NOTES:

- CONTRACTOR SHALL ENSURE ALL STATION PIPING IS ADEQUATELY SUPPORTED IN ACCORDANCE WITH PIPING NOTES ON DWG G-2.
- ALL PUMPS SHALL COME WITH A DRAIN KIT INSTALLED ON THE BOTTOM OF THE FIRST STAGE. DRAIN KIT SHALL CONSIST OF RIGID METAL PIPING, A BALL VALVE SHUT OFF, AND A QUICK CONNECT MALE ADAPTER. SIZING OF PUMP DRAIN KITS SHALL MATCH DIAMETER OF THE PUMP DRAIN PORT, ONE 30' FLEXIBLE HOSE ASSEMBLY WITH FEMALE QUICK CONNECT SHALL BE PROVIDED.
- EACH PUMP SHALL INCLUDE A MANUALLY OPERATED VENT ON BOTH THE SUCTION AND DISCHARGE LINES TO AID IN DRAINING THE PUMP.
- PUMP PEDESTAL TO BE NOTCHED SUCH THAT THERE IS A MINIMUM 1-1/2" CLEARANCE FROM MEZZANINE SUPPORTS.
- A CLEAR, HIGH-SOLIDS WATER-PROOF FLOOR SEALANT SHALL BE APPLIED TO ALL AREAS WHERE FLOOR WAS EXPOSED DUE TO DEMO WORK, ON NEW PUMP PEDESTALS, AND FOR GENERAL TOUCH UP.

PREPARED UNDER
 THE SUPERVISION OF

DESIGNED:
 TCB

DRAWN:
 TAD

CHECKED:
 GBH

100% DESIGN

MEC PROJECT NO. 21-057.01
 ARVADA PROJECT NO. 21-SR03

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



City of Arvada

8101 Ralston Rd.
 Arvada CO 80002
 (720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

PROPOSED PIPING PLAN

DATE

11/04/2022

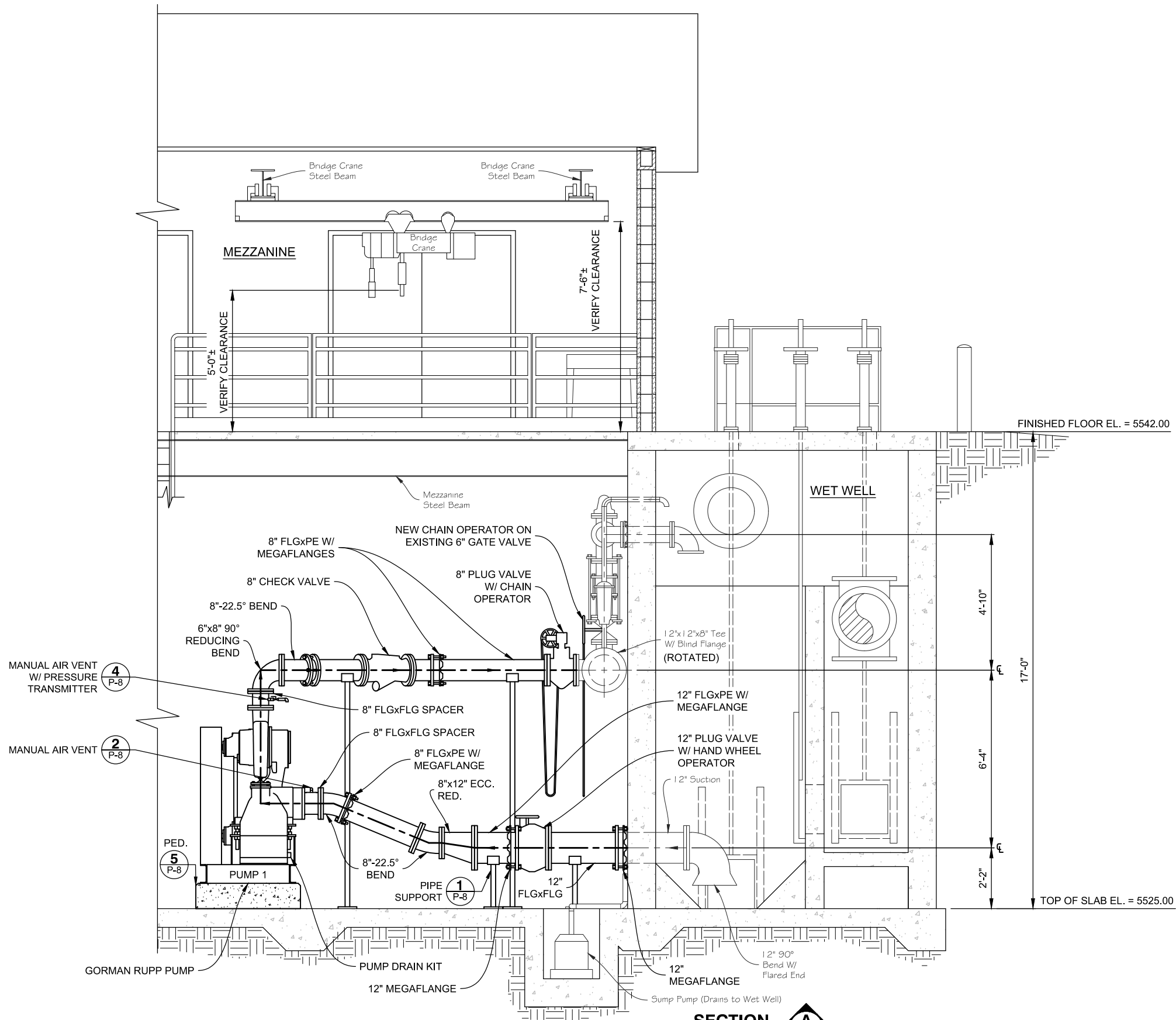
DRAWING NO.

P-4

SHEET NO.

6 OF 22

PLOTTED: 11/11/2022 8:22:01 AM
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 ADWG



NOTES:

- ALL VALVES WITH CHAIN DRIVEN OPERATORS SHALL BE PROVIDED WITH CHAINS LONG ENOUGH TO BE EASILY OPERATED FROM PUMP GALLERY FLOOR.
- A CLEAR, HIGH-SOLIDS WATER-PROOF FLOOR SEALANT SHALL BE APPLIED TO ALL AREAS WHERE FLOOR WAS EXPOSED DUE TO DEMO WORK, ON NEW PUMP PEDESTALS, AND FOR GENERAL TOUCH UP.

SECTION **A**
 SCALE: 1/2" = 1'-0"

PREPARED UNDER
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TCB

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TAD

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GBH

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MEC PROJECT NO. 21-057.01
 ARVADA PROJECT NO. 21-SR03

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



City of Arvada

8101 Ralston Rd.
 Arvada CO 80002
 (720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

PROPOSED PIPING - SECTION A

DATE

11/04/2022

DRAWING NO.

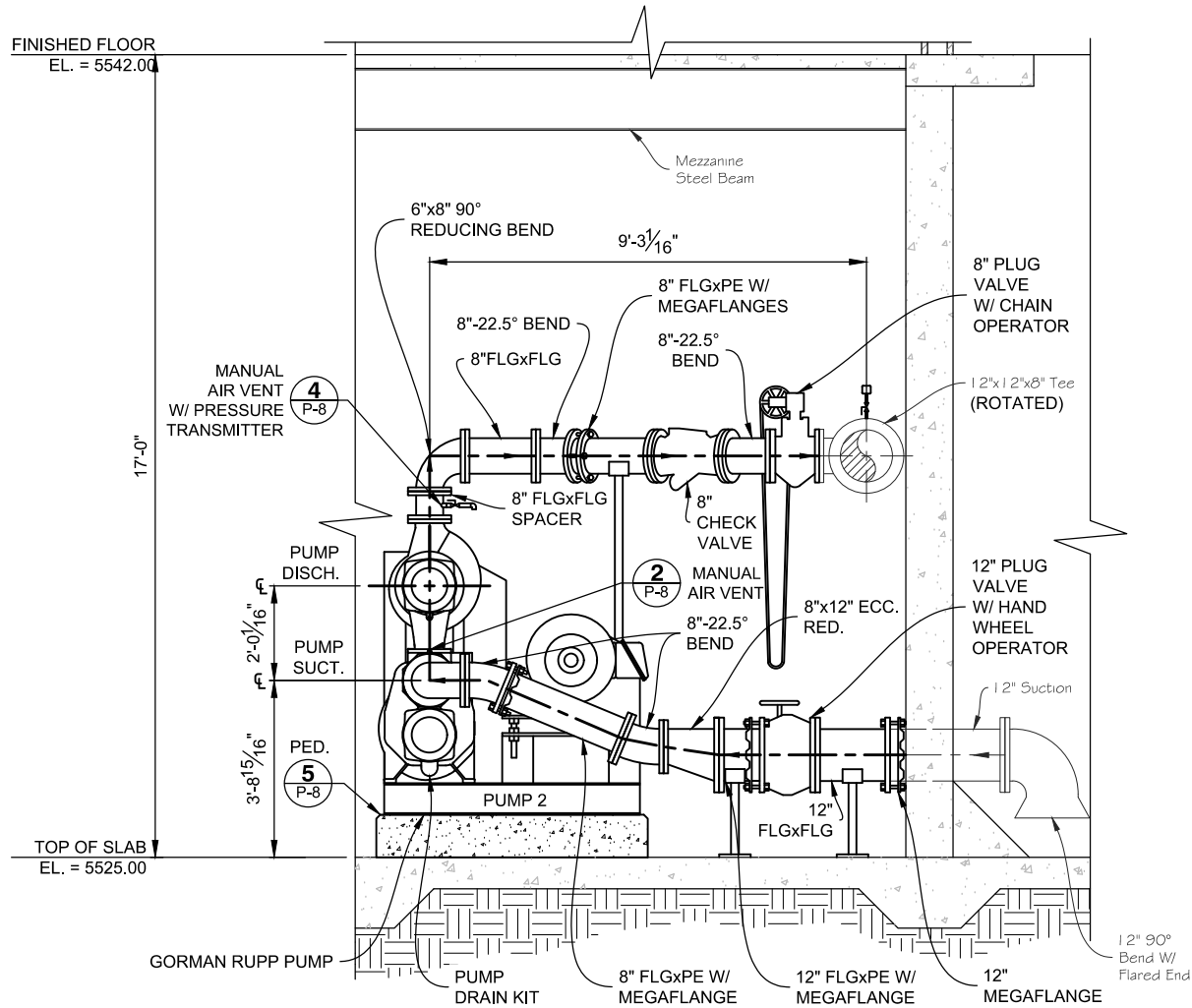
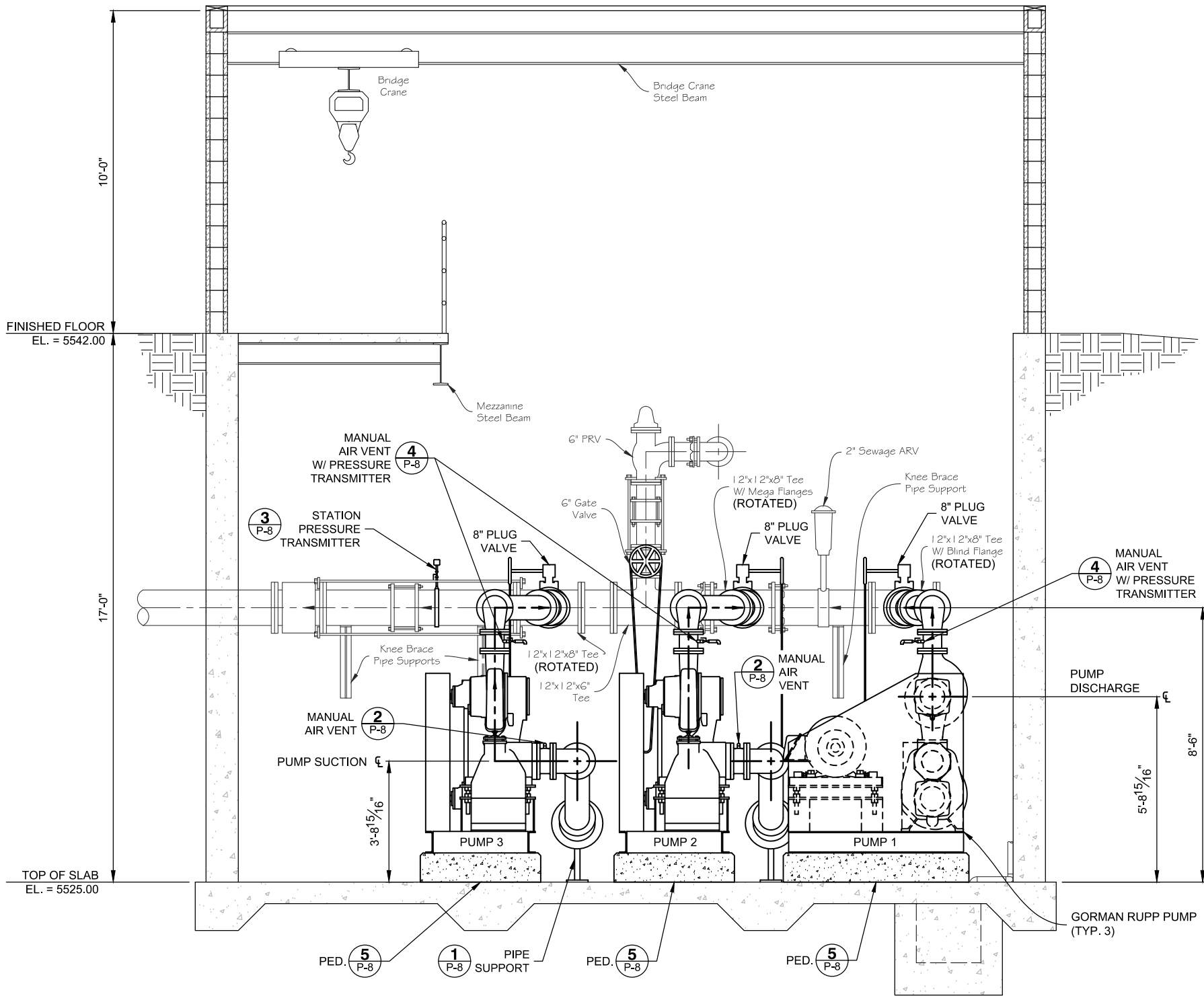
P-5

SHEET NO.

7 OF 22

NOTES:

- ALL VALVES WITH CHAIN DRIVEN OPERATORS SHALL BE PROVIDED WITH CHAINS LONG ENOUGH TO BE EASILY OPERATED FROM PUMP GALLERY FLOOR.
- A CLEAR, HIGH-SOLIDS WATER-PROOF FLOOR SEALANT SHALL BE APPLIED TO ALL AREAS WHERE FLOOR WAS EXPOSED DUE TO DEMO WORK, ON NEW PUMP PEDESTALS, AND FOR GENERAL TOUCH UP.



SECTION C
SCALE: 1/2" = 1'-0" P-4

SECTION D
SCALE: 1/2" = 1'-0" P-4

PREPARED UNDER
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DESIGNED:
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TAD

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MEC PROJECT NO. 21-057.01
ARVADA PROJECT NO. 21-SR03

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



City of Arvada

8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

PROPOSED PIPING - SECTION C
& SECTION D

DATE

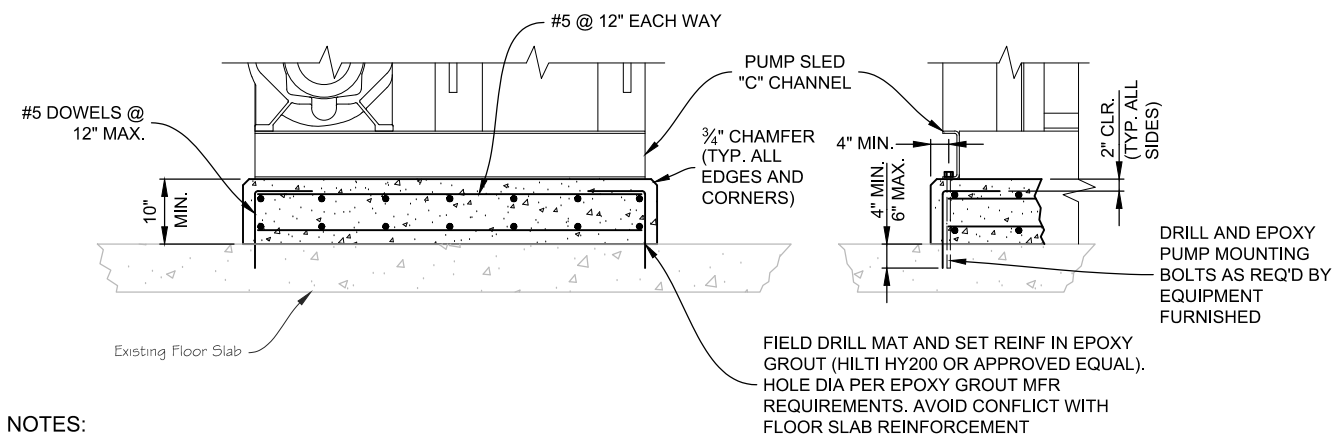
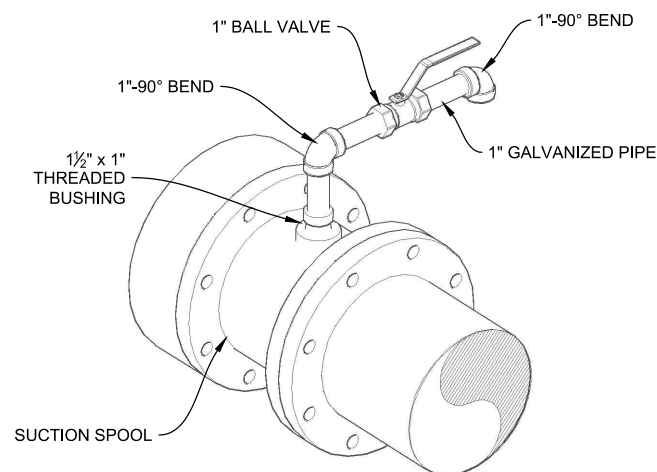
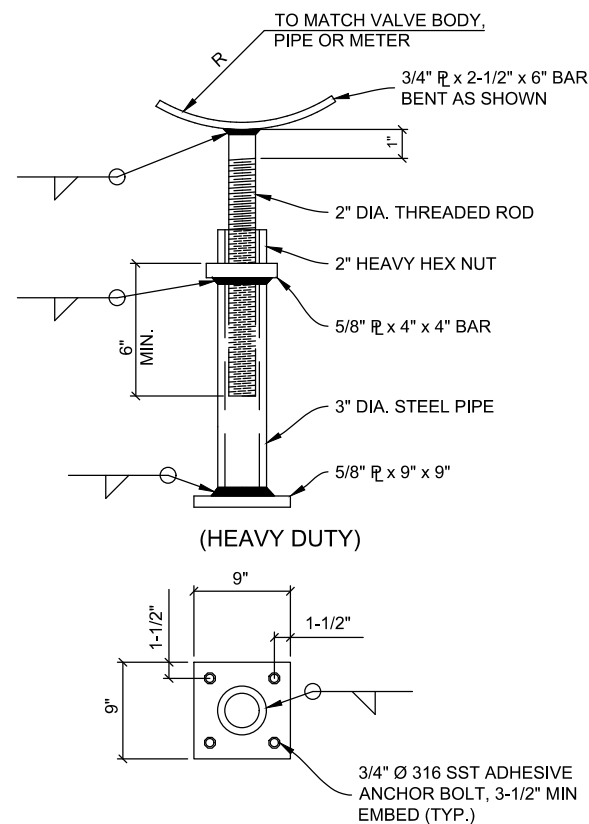
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DRAWING NO.

P-7

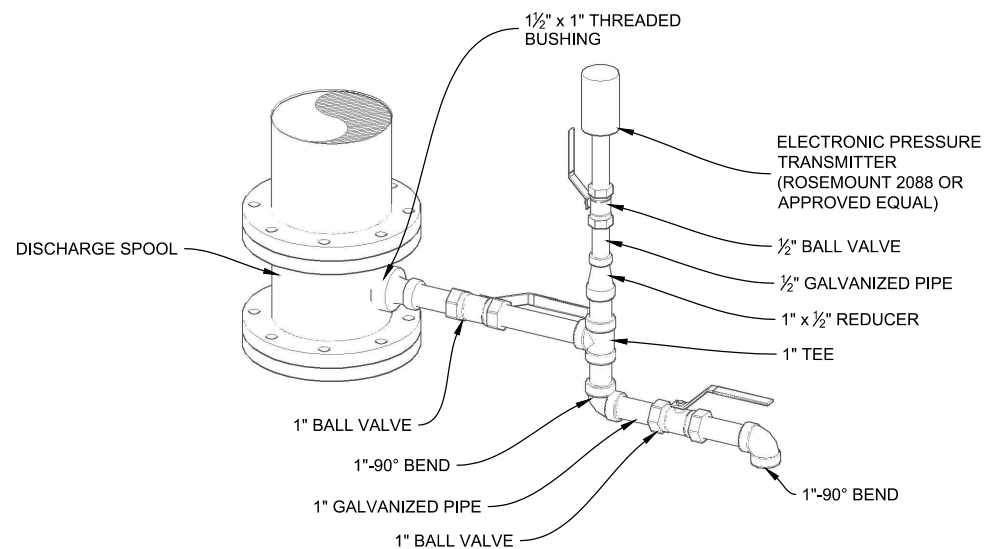
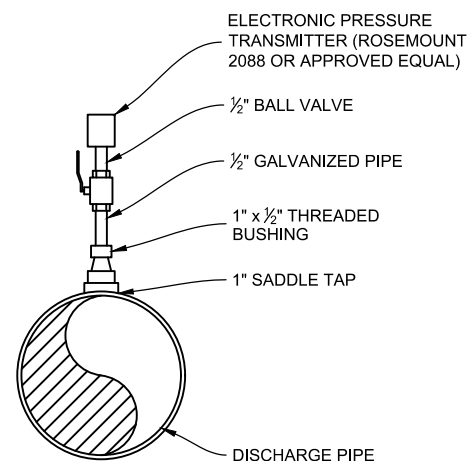
SHEET NO.

9 OF 22



- NOTES:

1. ROUGHEN EXISTING FLOOR SLAB BEFORE INSTALLATION OF PUMP PEDESTAL.

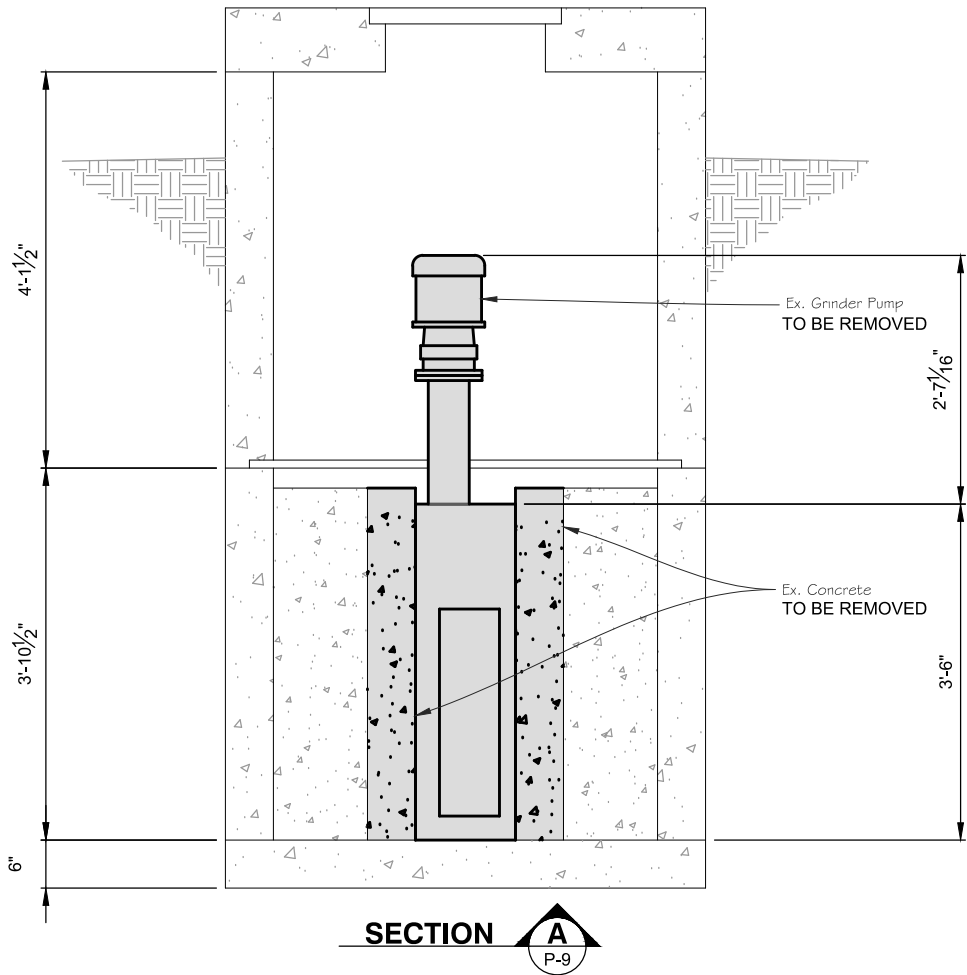
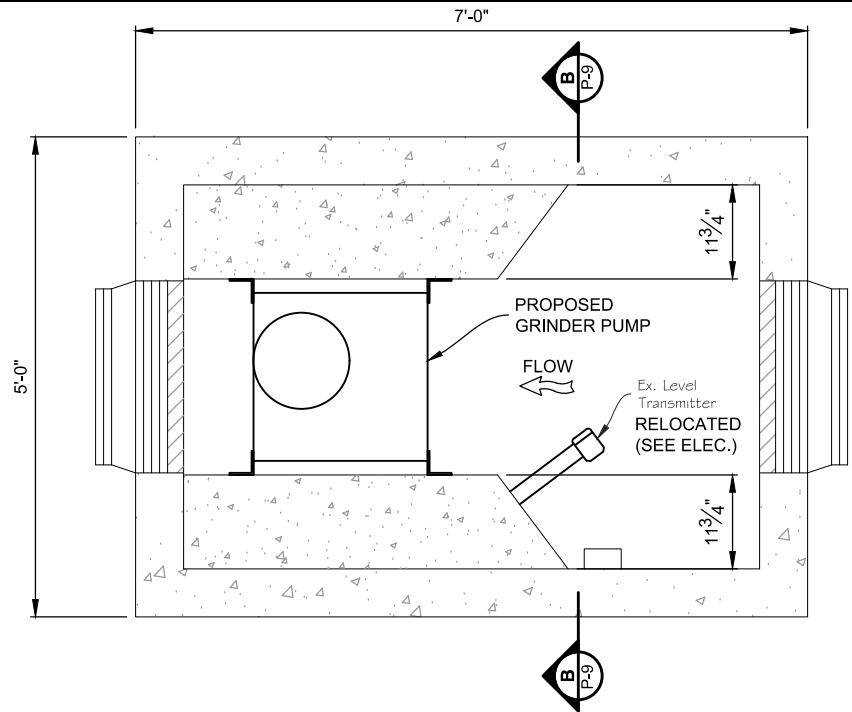
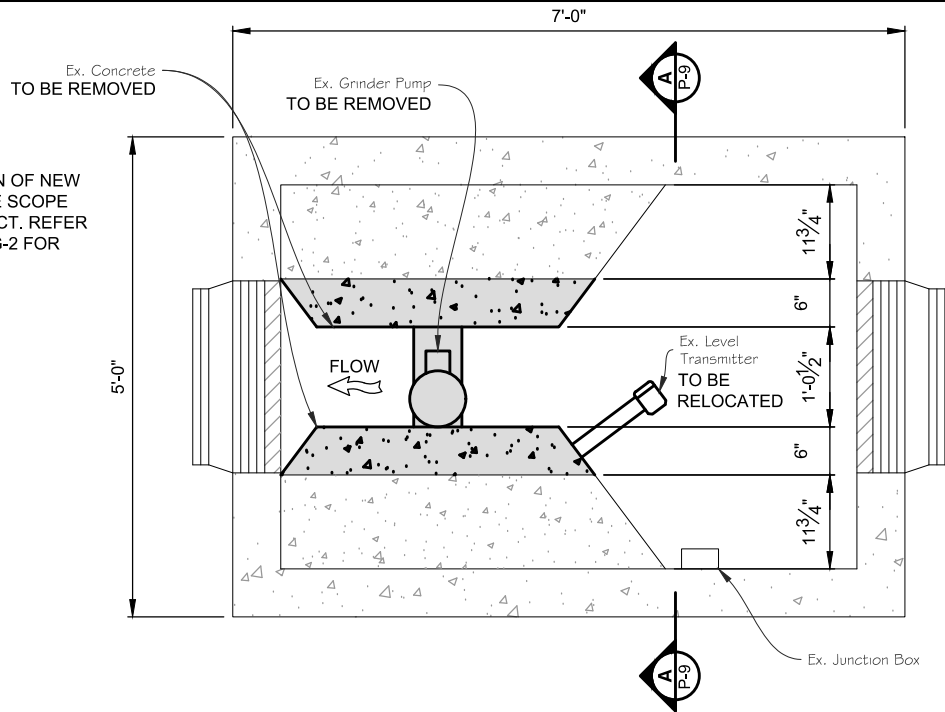


- NOTES:

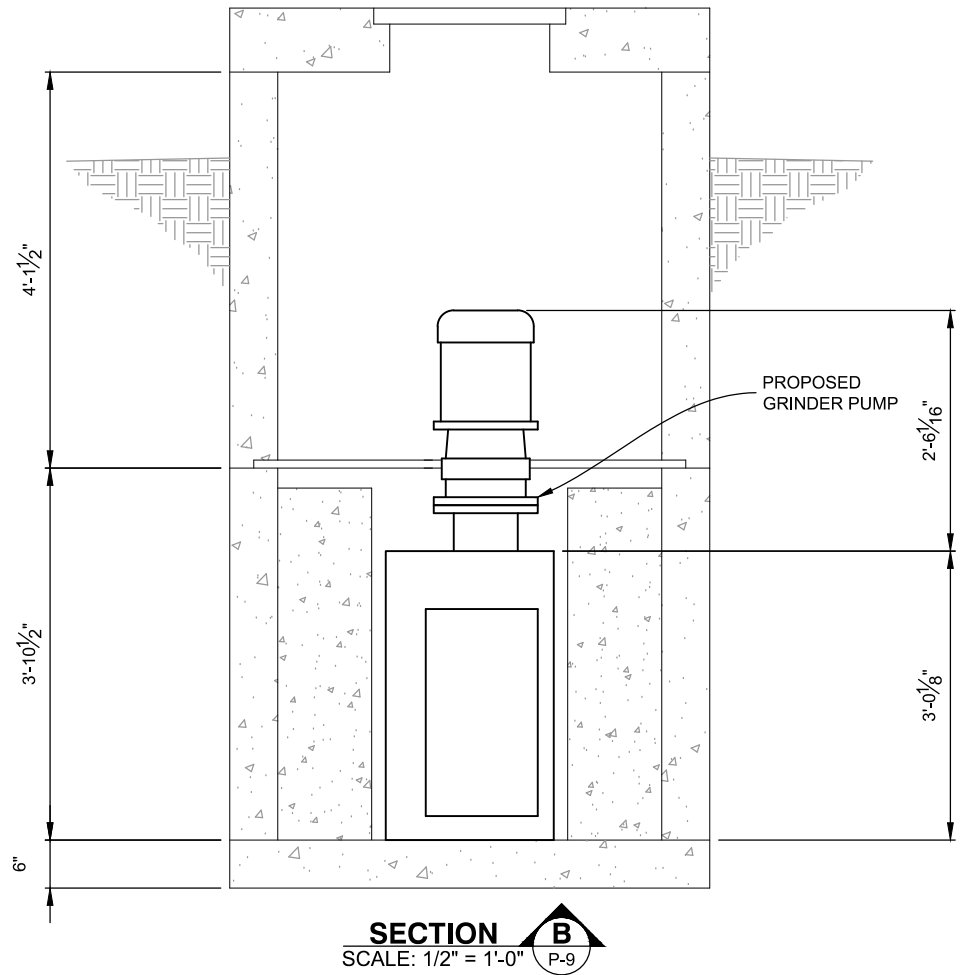
1. EXISTING FLOOR SEALANT SYSTEM TO BE REMOVED IN LOCATION OF NEW PUMP PEDESTAL INSTALL. EXISTING CONCRETE SHALL THEN BE ROUGHENED AND CLEANED BEFORE NEW CONCRETE POURED.
2. CONCRETE SHALL BE CDOT CLASS D WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI.
3. REINFORCEMENT SHALL HAVE A CLEAR COVERAGE OF 2". CLEAR COVERAGE SHALL BE MEASURED FROM THE SURFACE OF THE CONCRETE TO THE OUTSIDE OF THE NEAREST REINFORCEMENT.
4. ALL REINFORCING STEEL SHALL BE BLACK (UNCOATED) STEEL REINFORCING BARS WITH A YIELD STRENGTH OF 60,000 PSI.
5. PUMP PEDESTAL FINISH SHALL MATCH THAT OF EXISTING FLOOR. FLOOR SEALANT SYSTEM SHALL BE SPECIFIED BY OWNER.

PREPARED UNDER THE SUPERVISION OF	DESIGNED: TCB	100% DESIGN MEC PROJECT NO. 21-057.01 ARVADA PROJECT NO. 21-SR03	SHEET REVISIONS				 777 S. WADSWORTH BLVD, 4-100 LAKEWOOD, COLORADO 80226	 City of Arvada 8101 Ralston Rd. Arvada CO 80002 (720) 898-7760	ALKIRE LIFT STATION IMPROVEMENTS		DATE 11/04/2022
	DRAWN: TAD		NO.	DATE	DESCRIPTION	BY			DETAILS	DRAWING NO. P-8	
	CHECKED: GBH						SHEET NO. 10 OF 22				

NOTES:
1. PROPOSED INSTALLATION OF NEW GRINDER IS OUTSIDE THE SCOPE OF THE CURRENT PROJECT. REFER TO GRINDER NOTES ON G-2 FOR FURTHER DETAILS.



GRINDER VAULT: DEMOLITION PLAN
SCALE: 1/2" = 1'-0"



GRINDER VAULT: PROPOSED PLAN
SCALE: 1/2" = 1'-0"

PLOTTED: 11/11/2022 8:22:40 AM
NAME: E:\2021 PROJECTS\21-057.01 ALKIRE LIFT STATION IMPROVEMENTS - ARVADA\CAD\DRAWINGS\21-057.01 - GRINDER DEMOLITION AND PROPOSED PLANS AND SECTIONS.DWG

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THE SUPERVISION OF

DESIGNED:
TCB

DRAWN:
TAD

CHECKED:
GBH

100% DESIGN

MEC PROJECT NO. 21-057.01
ARVADA PROJECT NO. 21-SR03

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



City of Arvada
8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

GRINDER VAULT DEMOLITION AND
PROPOSED PLANS AND SECTIONS

DATE
11/04/2022

DRAWING NO.
P-9

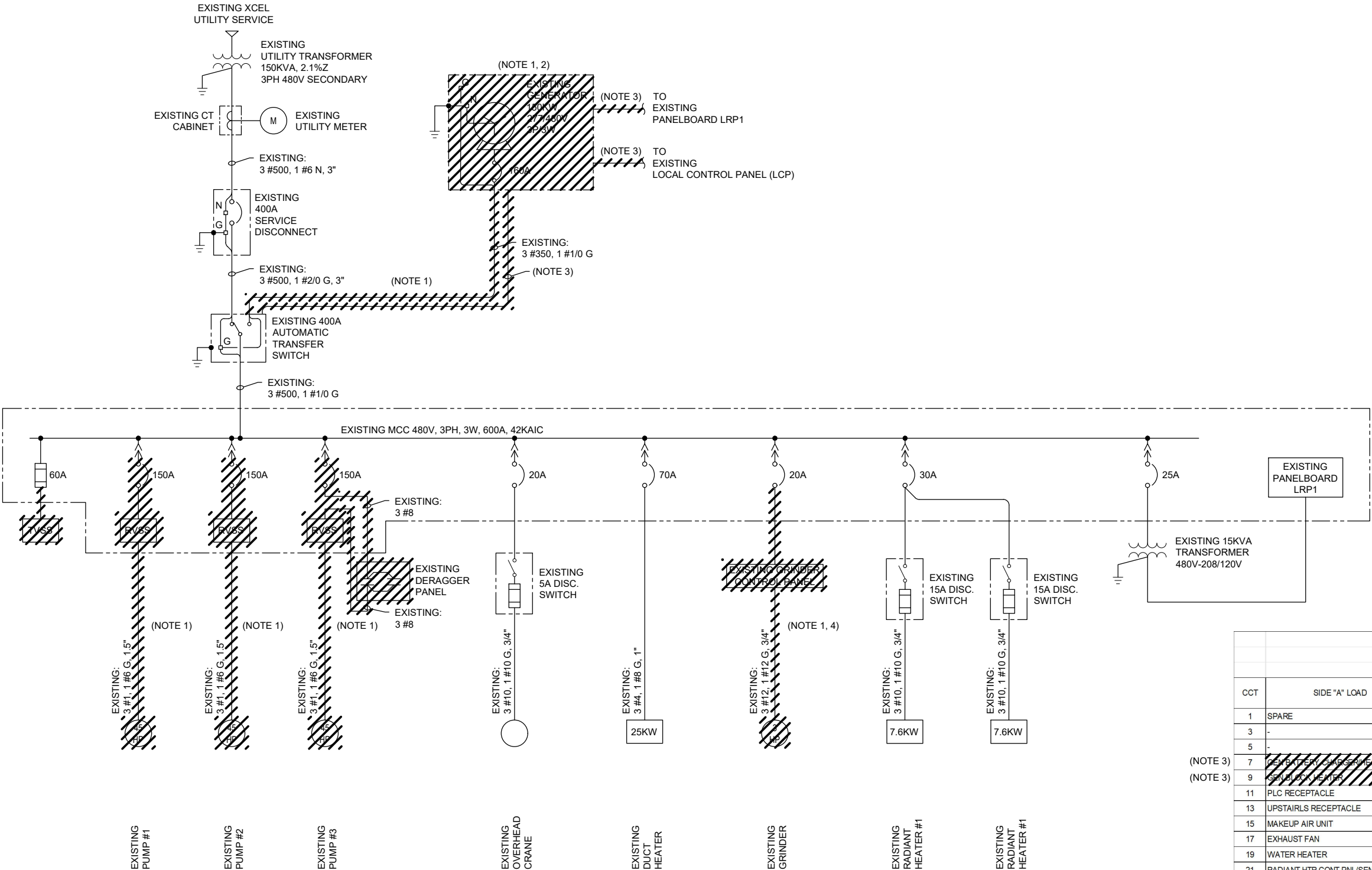
SHEET NO.

11 OF 22

PLOTTED: 11/2/2022 10:04:34 AM
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LOW TENSION AND SIGNAL		SINGLE LINE & SCHEMATIC		SINGLE LINE & SCHEMATIC (CONT)		GENERAL NOTES:		ABBREVIATIONS:			
	WALL MOUNTED COMBINATION DATA PORT GENERAL NETWORK / PLANT NETWORK		POTHEAD OR CABLE/BUS-JUNCTION		CONTACTOR: NORMALLY OPEN	1. INFORMATION SHOWN ON THE DRAWINGS IS DIAGRAMTIC. DATA PRESENTED ON THE DRAWINGS IS AS ACCURATE AS PLANNING CAN DETERMINE, BUT ACCURACY IS NOT GUARANTEED AND FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO BEST SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, CIVIL, STRUCTURAL AND MECHANICAL DRAWINGS AND ALL SPECIFICATIONS AND ADJUST ALL WORK TO CONFORM TO ALL CONDITIONS SHOWN THEREIN. 2. WHERE WIRE AND CABLE ROUTING IS NOT SHOWN, AND DESTINATION ONLY IS INDICATED, DETERMINE EXACT ROUTING AND LENGTHS REQUIRED BY FIELD VERIFICATION.		#	NUMBER	MAU	MAKEUP AIR UNIT
	WALL MOUNTED DATA PORT		CAPACITOR		HEATER			A	AMPS (AMPERES)	MCC	MOTOR CONTROL CENTER
	UTILITY COLUMN MOUNTED DATA PORT		POWER TRANSFORMER		FLOAT SWITCH	SPECIAL AREA DESIGNATIONS THE DESIGNATIONS BELOW ARE LOCATED ON THE ELECTRICAL DRAWINGS TO DEFINE INSTALLATION REQUIREMENTS FOR THAT AREA. DESIGNATIONS ARE LOCATED WITHIN THE ROOM. ALL INDOOR AREAS NOT INDICATED BELOW ARE CLASSIFIED TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES. NEMA TYPE 4XA CORROSIVE STORAGE AND CHEMICAL FEED AREAS. CONDUIT SYSTEMS SHALL BE PVC-COATED RIGID STEEL CONDUIT AND ACCESSORIES. ENCLOSURES AND BOXES SHALL BE TYPE 4X PLASTIC. NEMA TYPE 4 INDOOR WET LOCATIONS; VAULTS, HOSEDOWN, BASEMENTS, ETC. MINIMUM TYPE 4 ENCLOSURES FOR EQUIPMENT AND GASKETED FITTINGS FOR ALL CONDUITS. NEMA TYPE 4X CORROSIVE STORAGE AND CHEMICAL FEED AREAS. CONDUIT SYSTEMS SHALL BE PVC-COATED RIGID STEEL CONDUIT AND ACCESSORIES. ENCLOSURES AND BOXES SHALL BE TYPE 4X 316 STAINLESS STEEL. NEMA TYPE 12 INDOOR, DRY, DIRTY AREAS, DUSTY. ENCLOSURES AND EQUIPMENT SHALL BE MINIMUM TYPE 12 GASKETED. NEMA TYPE 7A CLASS 1, DIVISION 1, GROUP C AND D AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA. NEMA TYPE 7B CLASS 1, DIVISION 2, GROUP C AND D AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.		A/C	AIR CONDITIONING	MCP	MOTOR CIRCUIT PROTECTOR
	FLOOR MOUNTED DATA PORT		POWER CIRCUIT BREAKER		PRESSURE SWITCH (CLOSING ON RISING PRESSURE)			MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES A-B-1 WALL MTD. DUPLEX RECEPTACLE (CCT. A-B-1) DOUBLE DUPLEX RECEPTACLE SPECIAL PURPOSE RECEPTACLE SPLIT FED RECEPTACLE SPECIAL RECEPTACLE E - EMERGENCY G - GROUND H - HOUSEKEEPING S - SAFETY IP- ISOLATED POWER IG- ISOLATED GROUND UTILITY COLUMN MTD. RECEPTACLE FLOOR MOUNTED RECEPTACLE 20 AMPS S_Y^X SWITCH (X:SWITCH LABEL; Y: 3-3 WAY, 4-4 WAY, Y:T TIMED SWITCH) S^X SINGLE POLE SWITCH (X:SWITCH LABEL) WALL MOUNTED JUNCTION BOX WALL MOUNTED SINGLE FACED CLOCK WALL MOUNTED CLOCK OUTLET SECURITY CAMERA		AC	ALTERNATING CURRENT
	CEILING MOUNTED SPEAKER F-FLUSH MTD. S-SURFACE MTD.		LOW VOLTAGE CIRCUIT BREAKER		PRESSURE SWITCH (OPENING ON RISING PRESSURE)	GENERAL NOTES: 1. INFORMATION SHOWN ON THE DRAWINGS IS DIAGRAMTIC. DATA PRESENTED ON THE DRAWINGS IS AS ACCURATE AS PLANNING CAN DETERMINE, BUT ACCURACY IS NOT GUARANTEED AND FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO BEST SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, CIVIL, STRUCTURAL AND MECHANICAL DRAWINGS AND ALL SPECIFICATIONS AND ADJUST ALL WORK TO CONFORM TO ALL CONDITIONS SHOWN THEREIN. 2. WHERE WIRE AND CABLE ROUTING IS NOT SHOWN, AND DESTINATION ONLY IS INDICATED, DETERMINE EXACT ROUTING AND LENGTHS REQUIRED BY FIELD VERIFICATION.				AFF	ABOVE FINISHED FLOOR
	WALL MOUNTED SPEAKER		LOAD BREAK SWITCH		ANALOG SIGNAL			AFG	ABOVE FINISHED GRADE	MM	MULTIMODE
	SPEAKER HORN		FUSED DISCONNECT SWITCH		DIGITAL SIGNAL	SPECIAL AREA DESIGNATIONS THE DESIGNATIONS BELOW ARE LOCATED ON THE ELECTRICAL DRAWINGS TO DEFINE INSTALLATION REQUIREMENTS FOR THAT AREA. DESIGNATIONS ARE LOCATED WITHIN THE ROOM. ALL INDOOR AREAS NOT INDICATED BELOW ARE CLASSIFIED TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES. NEMA TYPE 4XA CORROSIVE STORAGE AND CHEMICAL FEED AREAS. CONDUIT SYSTEMS SHALL BE PVC-COATED RIGID STEEL CONDUIT AND ACCESSORIES. ENCLOSURES AND BOXES SHALL BE TYPE 4X PLASTIC. NEMA TYPE 4 INDOOR WET LOCATIONS; VAULTS, HOSEDOWN, BASEMENTS, ETC. MINIMUM TYPE 4 ENCLOSURES FOR EQUIPMENT AND GASKETED FITTINGS FOR ALL CONDUITS. NEMA TYPE 4X CORROSIVE STORAGE AND CHEMICAL FEED AREAS. CONDUIT SYSTEMS SHALL BE PVC-COATED RIGID STEEL CONDUIT AND ACCESSORIES. ENCLOSURES AND BOXES SHALL BE TYPE 4X 316 STAINLESS STEEL. NEMA TYPE 12 INDOOR, DRY, DIRTY AREAS, DUSTY. ENCLOSURES AND EQUIPMENT SHALL BE MINIMUM TYPE 12 GASKETED. NEMA TYPE 7A CLASS 1, DIVISION 1, GROUP C AND D AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA. NEMA TYPE 7B CLASS 1, DIVISION 2, GROUP C AND D AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.		AHU	AIR HANDLING UNIT	MOV	MOTOR OPERATED VALVE
	PUSH BUTTON		FUSED DISCONNECT (AIR)	MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES A-B-1 WALL MTD. DUPLEX RECEPTACLE (CCT. A-B-1) DOUBLE DUPLEX RECEPTACLE SPECIAL PURPOSE RECEPTACLE SPLIT FED RECEPTACLE SPECIAL RECEPTACLE E - EMERGENCY G - GROUND H - HOUSEKEEPING S - SAFETY IP- ISOLATED POWER IG- ISOLATED GROUND UTILITY COLUMN MTD. RECEPTACLE FLOOR MOUNTED RECEPTACLE 20 AMPS S_Y^X SWITCH (X:SWITCH LABEL; Y: 3-3 WAY, 4-4 WAY, Y:T TIMED SWITCH) S^X SINGLE POLE SWITCH (X:SWITCH LABEL) WALL MOUNTED JUNCTION BOX WALL MOUNTED SINGLE FACED CLOCK WALL MOUNTED CLOCK OUTLET SECURITY CAMERA				AIC	AMPS INTERRUPTING CURRENT	MSH	MOTOR SPACE HEATER
	BELL		BUSDUCT	MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES A-B-1 WALL MTD. DUPLEX RECEPTACLE (CCT. A-B-1) DOUBLE DUPLEX RECEPTACLE SPECIAL PURPOSE RECEPTACLE SPLIT FED RECEPTACLE SPECIAL RECEPTACLE E - EMERGENCY G - GROUND H - HOUSEKEEPING S - SAFETY IP- ISOLATED POWER IG- ISOLATED GROUND UTILITY COLUMN MTD. RECEPTACLE FLOOR MOUNTED RECEPTACLE 20 AMPS S_Y^X SWITCH (X:SWITCH LABEL; Y: 3-3 WAY, 4-4 WAY, Y:T TIMED SWITCH) S^X SINGLE POLE SWITCH (X:SWITCH LABEL) WALL MOUNTED JUNCTION BOX WALL MOUNTED SINGLE FACED CLOCK WALL MOUNTED CLOCK OUTLET SECURITY CAMERA		ATS	AUTOMATIC TRANSFER SWITCH	MTS	MOTOR TEMPERATURE SWITCH		
	BUZZER		POTENTIAL TRANSFORMER	MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES A-B-1 WALL MTD. DUPLEX RECEPTACLE (CCT. A-B-1) DOUBLE DUPLEX RECEPTACLE SPECIAL PURPOSE RECEPTACLE SPLIT FED RECEPTACLE SPECIAL RECEPTACLE E - EMERGENCY G - GROUND H - HOUSEKEEPING S - SAFETY IP- ISOLATED POWER IG- ISOLATED GROUND UTILITY COLUMN MTD. RECEPTACLE FLOOR MOUNTED RECEPTACLE 20 AMPS S_Y^X SWITCH (X:SWITCH LABEL; Y: 3-3 WAY, 4-4 WAY, Y:T TIMED SWITCH) S^X SINGLE POLE SWITCH (X:SWITCH LABEL) WALL MOUNTED JUNCTION BOX WALL MOUNTED SINGLE FACED CLOCK WALL MOUNTED CLOCK OUTLET SECURITY CAMERA		AUTO	AUTOMATIC	MUX	MULTIPLEXER		
	CARD READER		CURRENT TRANSFORMER	MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES A-B-1 WALL MTD. DUPLEX RECEPTACLE (CCT. A-B-1) DOUBLE DUPLEX RECEPTACLE SPECIAL PURPOSE RECEPTACLE SPLIT FED RECEPTACLE SPECIAL RECEPTACLE E - EMERGENCY G - GROUND H - HOUSEKEEPING S - SAFETY IP- ISOLATED POWER IG- ISOLATED GROUND UTILITY COLUMN MTD. RECEPTACLE FLOOR MOUNTED RECEPTACLE 20 AMPS S_Y^X SWITCH (X:SWITCH LABEL; Y: 3-3 WAY, 4-4 WAY, Y:T TIMED SWITCH) S^X SINGLE POLE SWITCH (X:SWITCH LABEL) WALL MOUNTED JUNCTION BOX WALL MOUNTED SINGLE FACED CLOCK WALL MOUNTED CLOCK OUTLET SECURITY CAMERA		AUX	AUXILIARY	N	NEUTRAL		
	WIRELESS ACCESS POINT		ZERO SEQUENCE CURRENT TRANSFORMER	MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES A-B-1 WALL MTD. DUPLEX RECEPTACLE (CCT. A-B-1) DOUBLE DUPLEX RECEPTACLE SPECIAL PURPOSE RECEPTACLE SPLIT FED RECEPTACLE SPECIAL RECEPTACLE E - EMERGENCY G - GROUND H - HOUSEKEEPING S - SAFETY IP- ISOLATED POWER IG- ISOLATED GROUND UTILITY COLUMN MTD. RECEPTACLE FLOOR MOUNTED RECEPTACLE 20 AMPS S_Y^X SWITCH (X:SWITCH LABEL; Y: 3-3 WAY, 4-4 WAY, Y:T TIMED SWITCH) S^X SINGLE POLE SWITCH (X:SWITCH LABEL) WALL MOUNTED JUNCTION BOX WALL MOUNTED SINGLE FACED CLOCK WALL MOUNTED CLOCK OUTLET SECURITY CAMERA		AWG	AMERICAN WIRE GAUGE	NC	NORMALLY CLOSED		
LIGHTING CEILING MOUNTED FIXTURE TYPE:1 PANEL:A-B SWITCH-b CIRCUIT-2 WALL MOUNTED FIXTURE SURFACE MTD. FLUORESCENT FIXTURE WALL MTD. FLUORESCENT FIXTURE RECESSED FLUORESCENT FIXTURE INDICATOR LIGHT EXIT LIGHT: WALL OR SURFACE MOUNT, ARROW AS (ARROW AS INDICATED ON DRAWINGS) EMERGENCY LIGHT WALL MOUNTED FLOODLIGHTS POLE MOUNTED FLOODLIGHTS PHOTOCELL TIME CLOCK CONTROLLED CEILING MTD. RECESSED EMERG. BATTERY PACK			FUSE	MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES A-B-1 WALL MTD. DUPLEX RECEPTACLE (CCT. A-B-1) DOUBLE DUPLEX RECEPTACLE SPECIAL PURPOSE RECEPTACLE SPLIT FED RECEPTACLE SPECIAL RECEPTACLE E - EMERGENCY G - GROUND H - HOUSEKEEPING S - SAFETY IP- ISOLATED POWER IG- ISOLATED GROUND UTILITY COLUMN MTD. RECEPTACLE FLOOR MOUNTED RECEPTACLE 20 AMPS S_Y^X SWITCH (X:SWITCH LABEL; Y: 3-3 WAY, 4-4 WAY, Y:T TIMED SWITCH) S^X SINGLE POLE SWITCH (X:SWITCH LABEL) WALL MOUNTED JUNCTION BOX WALL MOUNTED SINGLE FACED CLOCK WALL MOUNTED CLOCK OUTLET SECURITY CAMERA		BATT	BATTERY	NEC	NATIONAL ELECTRIC CODE		
CONDUIT AND WIRING SURFACE MOUNTED PANEL FLUSH MOUNTED PANEL CONDUIT (RUN IN WALLS, CEILING, OR ABOVE GRADE) CONDUIT (RUN IN SLAB, UNDERGROUND OR BEHIND OBSTRUCTION) CONDUIT (CAPPED) CONDUIT (TURNS AS INDICATED) FLEX CONDUIT (NOT ALWAYS SHOWN) GROUND CONDUCTOR UNDERGROUND CONCRETE ENCASED DUCTBANK			GROUND TEST WELL	MOTORS AND CONTROL MCC MOTOR CONTROL CENTER COMBINATION STARTER FUSED DISCONNECT SWITCH UNFUSED DISCONNECT SWITCH MANUAL MOTOR STARTER P-c/w PILOT LIGHT K-KEY OPERATED THERMOSTAT EXHAUST FAN RESISTANCE TEMPERATURE DETECTOR MOTOR GENERATOR OUTLETS AND DEVICES							

PLOTTED: 11/2/2022 10:04:52 AM
 NAME: C:\USERS\LORENZO\ONE LINE DIAGRAM & PANEL SCHEDULE_REVA.DWG
 MAGNA VM4745M4745-8\10 DRAWINGS\03_WIPE2_DEMOLITION ONE LINE DIAGRAM &



- NOTES:
1. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING EQUIPMENT AS SHOWN. CONDUIT AND CONDUCTORS SHALL BE REMOVED BACK TO THEIR POINT OF ORIGIN AND ANY INSLAB CONDUITS SHALL BE SEALED & CAPPED WATER TIGHT.
 2. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING GENERATOR AS SHOWN. CONTRACTOR SHALL COORDINATE WITH CITY OF ARVADA FOR REMOVAL AND/OR SALVAGE OF UNIT.
 3. CONTRACTOR SHALL DISCONNECT AND REMOVE CONDUIT & CONDUCTORS EXISTING GENERATOR ANCILLARY DEVICES.
 4. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING GRINDER CONTROL PANEL ENCLOSURE IN ITS ENTIRETY. THE EXISTING EQUIPMENT RACK THE CONTROL PANEL IS MOUNTED & BURIED CONDUITS SHALL BE PROTECTED AND REMAIN FOR FUTURE INSTALLATION OF NEW GRINDER EQUIPMENT.
 5. CONTRACTOR SHALL COORDINATE WITH CITY OF ARVADA PRIOR TO ANY OUTAGES AND EQUIPMENT DOWNTIME.

EXISTING PANEL: LRP1											
CCT	SIDE "A" LOAD	LOAD VA	BKR SIZE	A	B	C	BKR SIZE	LOAD VA	SIDE "B" LOAD	CCT	
1	SPARE		50	X			20	360	SUMP PUMP RECEPTACLE	2	
3	-				X		20	500	SUMP PUMP	4	
5	-		3P		X		20	800	PLC POWER	6	
7	GEN BATTERY CHARGER/MENT 1000	1000	20	X			20	350	UPSTAIRS LIGHTS	8	
9	SPRINKLER CENTER	500	20		X		20	600	DOWNSTAIRS LIGHTS	10	
11	PLC RECEPTACLE	360	20			X	20	300	OUTSIDE LIGHTS	12	
13	UPSTAIRS RECEPTACLE	360	20		X		20	360	GEN RECEPTACLE	14	
15	MAKEUP AIR UNIT	600	20		X		20	200	GEN LIGHTS	16	
17	EXHAUST FAN	500	20			X	20	360	DOWNSTAIRS RECEPTACLE	18	
19	WATER HEATER	1300	20	X			20		BIOXIDE TANK (OFF)	20	
21	RADIANT HTR CONT PNL/SENSOR PNL	300	15		X		20		SPARE	22	
23	SPARE		20			X	20		SPARE	24	
25	SPARE		20		X		20		SPARE	26	
27	SPARE		20		X		20		SPARE	28	
29	SPARE		20			X	20		SPARE	30	
TOTAL PHASE "A" LOAD		2.880	KVA								
TOTAL PHASE "B" LOAD		2.700	KVA								
TOTAL PHASE "C" LOAD		2.320	KVA								
CONNECTION: EXISTING 15KVA XFMR									LOCATION: INTERNAL TO MCC		
BUS SIZE: 100A									VOLTAGE: 208/120VAC		
FEEDER: EXISTING									PHASE: 3P/4W		
MAIN BREAKER: 50A									MOUNTING: BUCKET		

PREPARED UNDER THE SUPERVISION OF

DESIGNED: RL

DRAWN: RL

CHECKED: SD

100%
DESIGN

PROJECT NO. 21-057.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY
A	8/2/2022	60% DESIGN REVIEW	RL
B	10/3/2022	90% DESIGN REVIEW	RL
C	10/31/2022	100% DESIGN REVIEW	RL



777 S. WADSWORTH BLVD. 4-100
LAKEWOOD, COLORADO 80226



City of Arvada

8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

DEMOLITION ONE-LINE DIAGRAM AND
PANEL SCHEDULE

DATE

11/04/2022

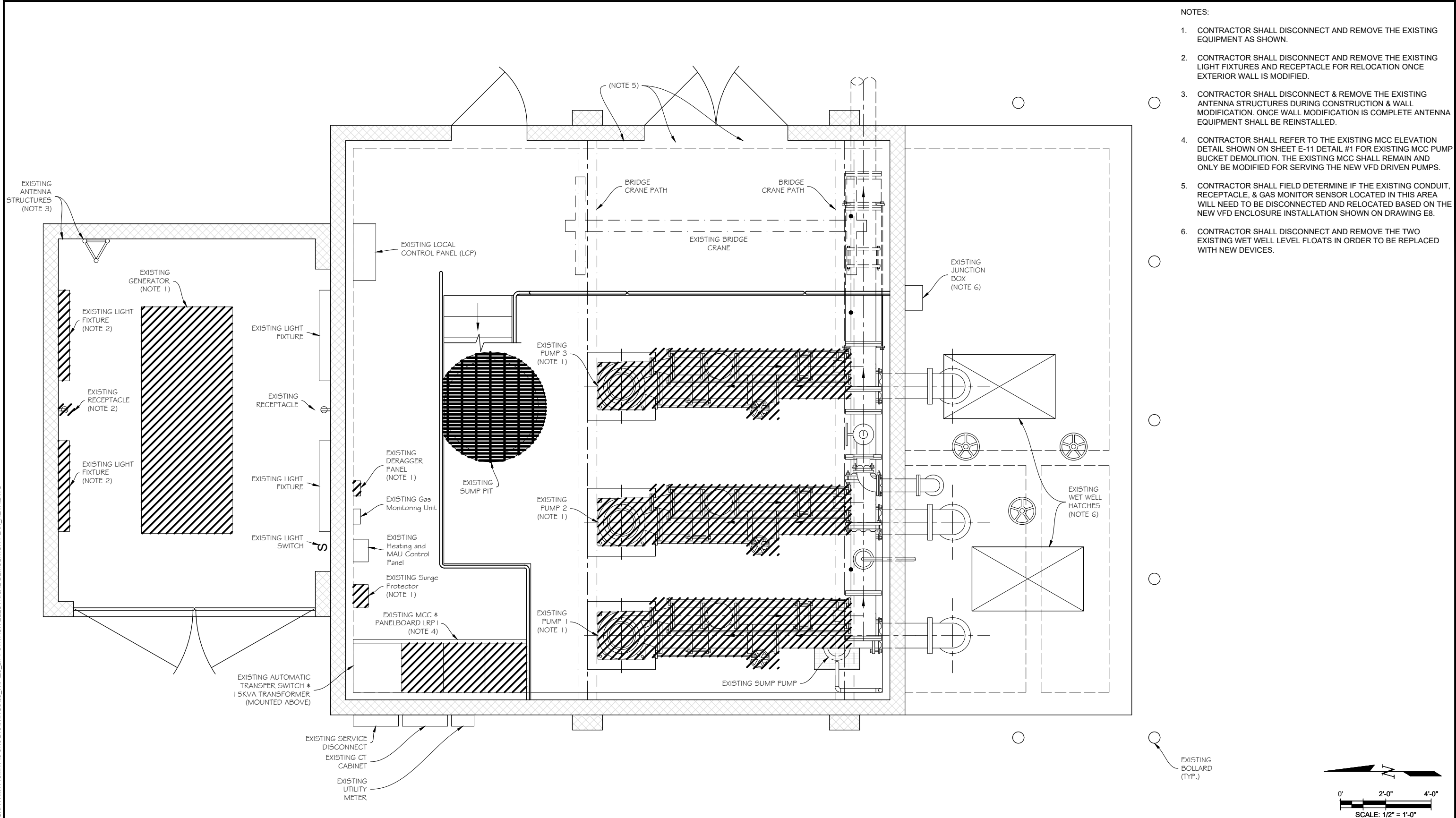
DRAWING NO.

E2

SHEET NO.

13 OF 22

PLOTTED: 11/2/2022 10:04:59 AM
 NAME: C:\USERS\LORENZO\ONE DRIVE - MAGNA\11414745\11414745-8\10 DRAWINGS\03_WIPE3_LIFT STATION ELECTRICAL DEMOLITION PLAN_REV4.DWG



- NOTES:
1. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING EQUIPMENT AS SHOWN.
 2. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING LIGHT FIXTURES AND RECEPTACLE FOR RELOCATION ONCE EXTERIOR WALL IS MODIFIED.
 3. CONTRACTOR SHALL DISCONNECT & REMOVE THE EXISTING ANTENNA STRUCTURES DURING CONSTRUCTION & WALL MODIFICATION. ONCE WALL MODIFICATION IS COMPLETE ANTENNA EQUIPMENT SHALL BE REINSTALLED.
 4. CONTRACTOR SHALL REFER TO THE EXISTING MCC ELEVATION DETAIL SHOWN ON SHEET E-11 DETAIL #1 FOR EXISTING MCC PUMP BUCKET DEMOLITION. THE EXISTING MCC SHALL REMAIN AND ONLY BE MODIFIED FOR SERVING THE NEW VFD DRIVEN PUMPS.
 5. CONTRACTOR SHALL FIELD DETERMINE IF THE EXISTING CONDUIT, RECEPTACLE, & GAS MONITOR SENSOR LOCATED IN THIS AREA WILL NEED TO BE DISCONNECTED AND RELOCATED BASED ON THE NEW VFD ENCLOSURE INSTALLATION SHOWN ON DRAWING E8.
 6. CONTRACTOR SHALL DISCONNECT AND REMOVE THE TWO EXISTING WET WELL LEVEL FLOATS IN ORDER TO BE REPLACED WITH NEW DEVICES.

LIFT STATION: ELECTRICAL DEMOLITION PLAN
 SCALE: 1/2" = 1'-0"

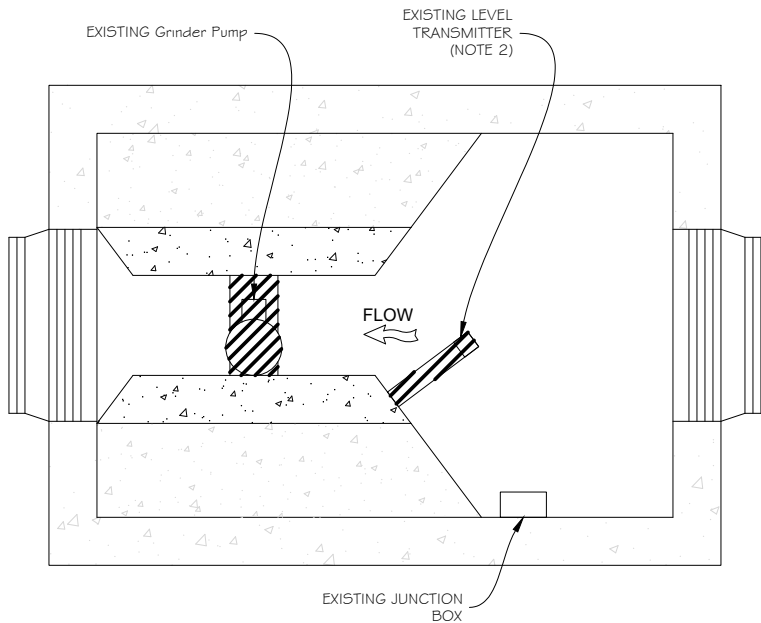
PREPARED UNDER THE SUPERVISION OF DESIGNED: RL DRAWN: RL CHECKED: SD	100% DESIGN PROJECT NO. 21-057.01	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226 	 City of Arvada 8101 Ralston Rd. Arvada CO 80002 (720) 898-7760	ALKIRE LIFT STATION IMPROVEMENTS		DATE 11/04/2022
		NO. A B C	DATE 8/2/2022 10/3/2022 10/31/2022	DESCRIPTION 60% DESIGN REVIEW 90% DESIGN REVIEW 100% DESIGN REVIEW	BY RL RL RL			LIFT STATION ELECTRICAL DEMOLITION PLAN		DRAWING NO. E3
										SHEET NO. 14 OF 22

PLOTTED: 11/2/2022 10:05:05 AM
 NAME: C:\USERS\LORENZ\ONEEDRIVE - MAGNA\1\141745\141745-8\10 DRAWINGS\03_WIPE4_GRINDER ELECTRICAL DEMOLITION PLAN_REVA.DWG



GRINDER VAULT: ELECTRICAL RACK DETAIL

SCALE: NTS



GRINDER VAULT: ELECTRICAL DEMOLITION PLAN

SCALE: 1/2" = 1'-0"

NOTES:

1. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING EQUIPMENT AS SHOWN.
2. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING LEVEL TRANSMITTER AND SUPPORT FOR RELOCATION ONCE THE VAULT CHANNEL IS MODIFIED.
3. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING GRINDER CONTROL PANEL ENCLOSURE IN ITS ENTIRETY. THE EXISTING EQUIPMENT RACK THE CONTROL PANEL IS MOUNTED & BURIED CONDUITS SHALL BE PROTECTED AND REMAIN FOR FUTURE INSTALLATION OF NEW GRINDER EQUIPMENT.

PREPARED UNDER THE SUPERVISION OF
DESIGNED: RL
DRAWN: RL
CHECKED: SD

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DESIGN

PROJECT NO. 21-057.01

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NO.	DATE	DESCRIPTION	BY	
A	8/2/2022	60% DESIGN REVIEW	RL	
B	10/3/2022	90% DESIGN REVIEW	RL	
C	10/31/2022	100% DESIGN REVIEW	RL	



City of Arvada

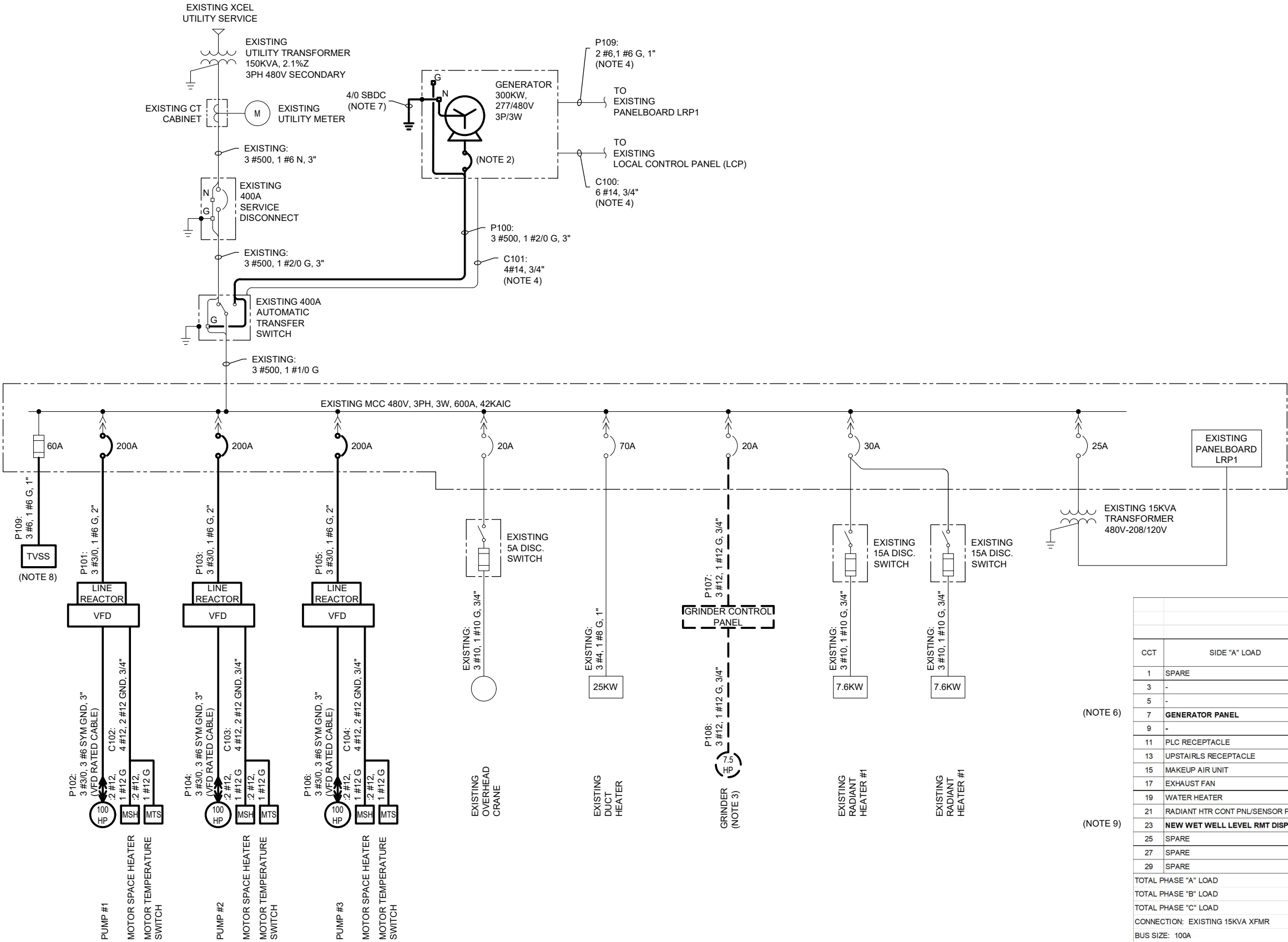
8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

GRINDER ELECTRICAL
DEMOLITION PLAN

DATE	11/04/2022
DRAWING NO.	E4
SHEET NO.	15 OF 22

PLOTTED: 11/2/2022 10:05:10 AM
 NAME: C:\USERS\LORENZONEDRIVE - MAGNA\1\4745\4745-8\10 DRAWINGS\03_WIPE5_ONE LINE DIAGRAM & PANEL SCHEDULE_REVA.DWG



- NOTES:
- CONTRACTOR SHALL PROVIDE AND INSTALL NEW EQUIPMENT AS SHOWN.
 - CIRCUIT BREAKER SIZED PER GENERATOR MANUFACTURE REQUIREMENTS.
 - GRINDER EQUIPMENT SHALL NOT BE INSTALLED AT THIS TIME AND IS SHOWN AS A FUTURE OPTION. THE NEED FOR THE GRINDER WILL BE BASED OFF THE NEW PUMP PERFORMANCE IN HANDLING SOLIDS AND RAGS.
 - CONTRACTOR SHALL INSTALL NEW CONDUIT AND CABLES AS SHOWN. THE POWER AND CONTROL CIRCUITS, NUMBER OF CONDUCTORS SHALL BE COORDINATED WITH THE GENERATOR MANUFACTURE REQUIREMENTS FOR A FULLY FUNCTIONAL SYSTEM.
 - CONTRACTOR SHALL COORDINATE COMMUNICATION REQUIREMENTS BETWEEN THE GENERATOR AND EXISTING ATS AND PROVIDE CABLE AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM.
 - CONTRACTOR SHALL PROVIDE AND INSTALL NEW COMPATIBLE CIRCUIT BREAKER AS SHOWN.
 - GENERATOR EQUIPMENT GROUND SHALL TIE INTO EXISTING GROUND GRID.
 - CONTRACTOR SHALL SUPPLY AND INSTALL A NEW SURGE PROTECTION DEVICE ABB TRANSGUARD TG3 SERIES 200KA MINIMUM OR APPROVED EQUAL WITH ETHERNET MODBUS TCP COMMUNICATION OPTION. CABLING TO THE SPD SHALL BE THE SHORTEST LENGTH WITH MINIMAL NUMBER OF BENDS AS POSSIBLE.
 - CONTRACTOR SHALL USED EXISTING SPARE CIRCUIT TO POWER NEW EQUIPMENT AS SHOWN.

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DRAWN: RL

CHECKED: SD

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NO.	DATE	DESCRIPTION	BY
A	8/2/2022	60% DESIGN REVIEW	RL
B	10/3/2022	90% DESIGN REVIEW	RL
C	10/31/2022	100% DESIGN REVIEW	RL

MULLER
ENGINEERING COMPANY
777 S. WADSWORTH BLVD. 4-100
LAKEWOOD, COLORADO 80226

MAGNA

CITY OF ARVADA

City of Arvada

8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

ONE-LINE DIAGRAM AND PANEL
SCHEDULE

DATE

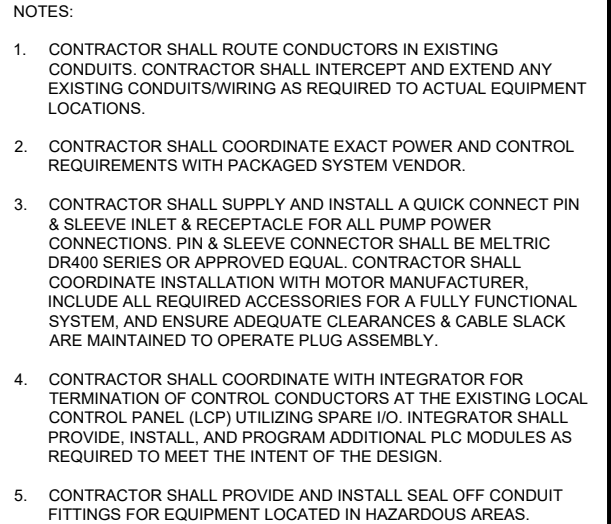
11/04/2022

DRAWING NO.

E5

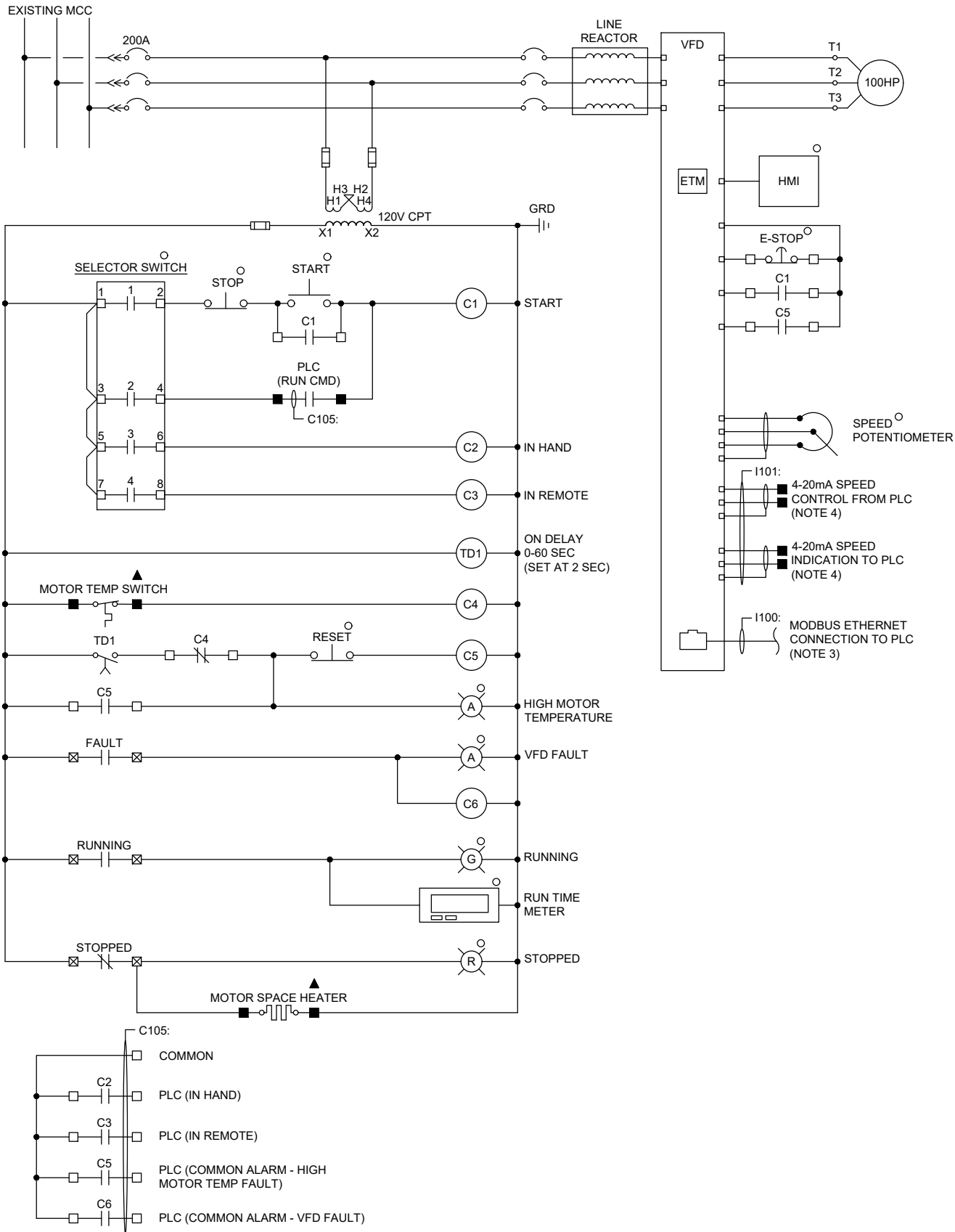
SHEET NO.

16 OF 22



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	DRAWN: RL								DRAWING NO. E6		
	CHECKED: SD								SHEET NO. 17 OF 22		

PLOTTED: 11/2/2022 10:05:22 AM
 NAME: C:\USERS\LORENZ\ONEEDRIVE - MAGNA VM4745\M4745-8\10 DRAWINGS\03_WIPE7_PUMP VFD SCHEMATIC_REVA.DWG



PUMP #1 SCHEMATIC
(TYPICAL FOR PUMP #2 & PUMP #3)

NOTES:

- UNLESS OTHERWISE INDICATED, ALL DEVICES ARE LOCATED WITHIN THE VFD CABINET. DEVICES LOCATED REMOTE FROM THE VFD CABINET ARE INDICATED WITH AN EXTERNAL CONNECTION SYMBOL.
- FURNISH INPUT AND OUTPUT CARDS TO CONTROL VFD AS SHOWN. WHEN C3 CONTACT IS CLOSED (IN REMOTE), SPEED CONTROL, SPEED FEEDBACK, DETERMINED BY 4-20mA INPUT FROM PLC. VFD FAULTS & GENERAL VFD OPERATIONAL SIGNALS SHALL BE COMMUNICATED OVER ETHERNET TO THE PLC. WHEN C3 CONTACT IS OPEN (IN HAND), SPEED CONTROL VIA HMI. C5 & PLC RUN COMMAND CONTACTS ARE PERMISSIVES FOR PUMP TO RUN. IF PUMP RUNNING AND C5 CONTACT CLOSES OR PLC RUN COMMAND IS LOST, PUMP SHALL STOP. ONCE C4 CONTACT OPENS BACK UP AND PLC RUN COMMAND IS INITIATED, PUMP SHALL BE PERMITTED TO RUN.
- CONTRACTOR SHALL COORDINATE WITH INTEGRATOR TO PROVIDE AND INSTALL A ETHERNET SWITCH CAPABLE OF ACCOMMODATING THE NEW ETHERNET CABLES FOR THE PUMP VFD'S.
- CONTRACTOR SHALL COORDINATE WITH INTEGRATOR TO PROVIDE AND INSTALL ANALOG INPUT & ANALOG OUTPUT PLC MODULES CAPABLE OF ACCOMMODATING THE SIGNALS FOR THE PUMP VFD'S.

LEGEND

- EXTERNAL CONNECTION
- INTERNAL CONNECTION
- TERMINAL IN VFD OR ELECTRONIC OVERLOAD
- CONNECTION POINT
- LOCATED NEAR MOTOR
- MOUNTED IN VFD ENCLOSURE DOOR

SELECTOR SWITCH						HAND	OFF	REMOTE
CONTACTS								
1	1	2	3	2	4	1		
						2		
5	3	6	7	4	8	3		
						4		

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CHECKED: SD

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NO.	DATE	DESCRIPTION	BY
A	8/2/2022	60% DESIGN REVIEW	RL
B	10/3/2022	90% DESIGN REVIEW	RL
C	10/31/2022	100% DESIGN REVIEW	RL



City of Arvada

8101 Ralston Rd.
Arvada CO 80002
(720) 898-7760

ALKIRE LIFT STATION IMPROVEMENTS

PUMP VFD SCHEMATIC

DATE

11/04/2022

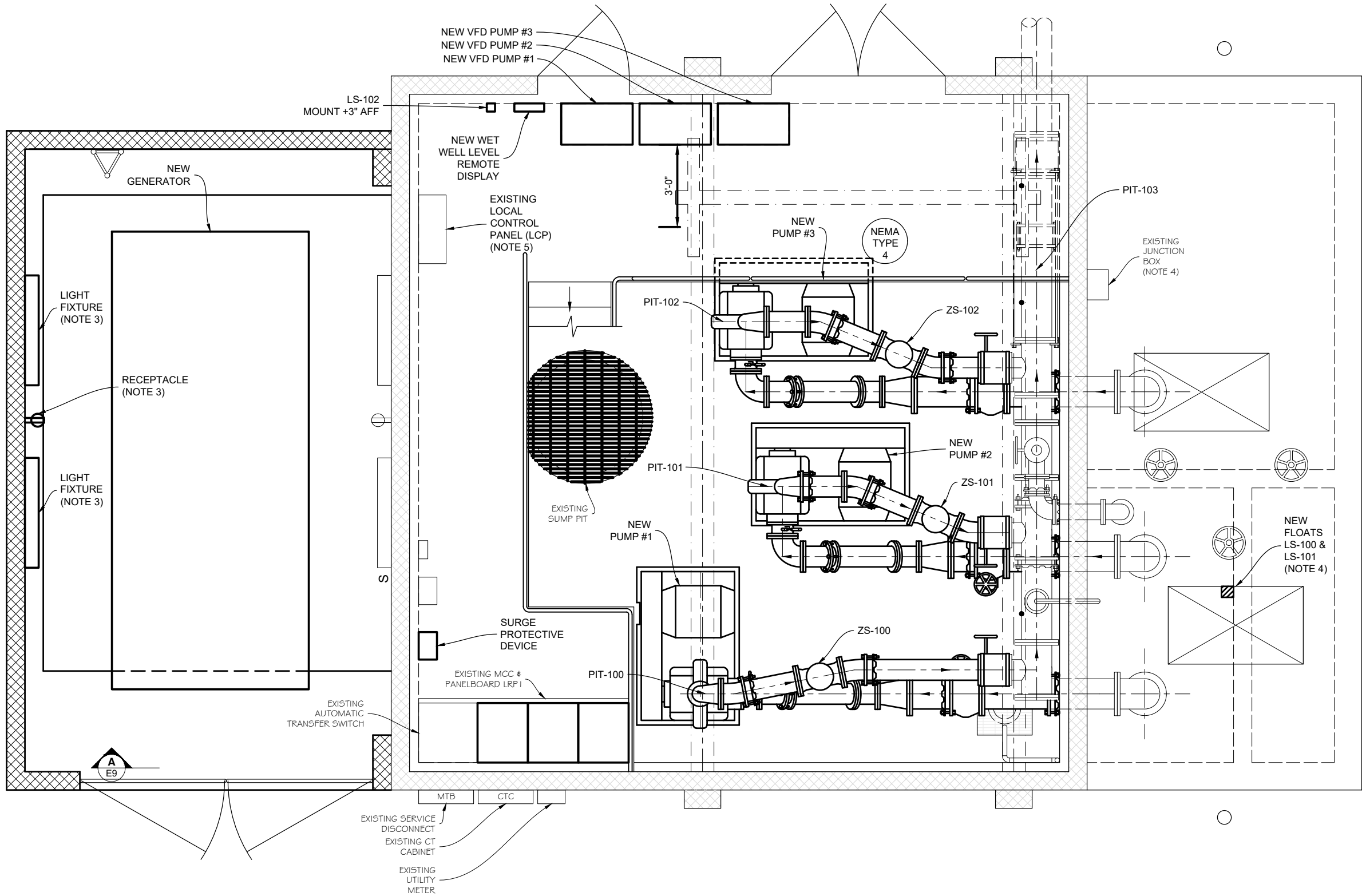
DRAWING NO.

E7

SHEET NO.

18 OF 22

PLOTTED: 11/2/2022 10:05:29 AM
 NAME: C:\USERS\LORENZ\ONEEDRIVE - MAGNA\11414745\11414745-8\10 DRAWINGS\03_WIPE8_LIFT STATION ELECTRICAL PLAN.DWG



- NOTES:
1. CONTRACTOR SHALL PROVIDE AND INSTALL NEW EQUIPMENT AS SHOWN.
 2. CONTRACTOR SHALL ROUTE CONDUITS TO BEST SUIT FIELD CONDITIONS. CONTRACTOR SHALL PROVIDE JUNCTION BOXES AS REQUIRED FOR A COMPLETE INSTALLATION.
 3. CONTRACTOR SHALL INTERCEPT AND EXTEND EXISTING CONDUIT AND CONDUCTORS FOR RELOCATING THE EXISTING LIGHT FIXTURES & RECEPTACLE AS SHOWN ON THE NEW WALL.
 4. CONTRACTOR SHALL INTERCEPT AND EXTEND EXISTING CONDUIT & CONDUCTORS FROM THE EXISTING JUNCTION BOX TO REFEED THE NEW WET WELL FLOATS. CONTRACTOR SHALL FIELD DETERMINE BEST ROUTING MEANS & METHOD. ALL CONDUITS ROUTED TO THE WET WELL SHALL BE INSTALLED WITH SEAL OFF FITTINGS.
 5. CONTRACTOR SHALL REFER TO THE EXISTING LOCAL CONTROL PANEL (LCP) ELEVATION DETAIL SHOWN ON SHEET E11 DETAIL #4 FOR EXISTING LCP MODIFICATIONS.
 6. CONDUITS ROUTED IN THIS AREA SHALL NOT OBSTRUCT BRIDGE CRANE TRAVEL OR OPERATION.
 7. CONTRACTOR SHALL PROVIDE AND INSTALL EQUIPMENT HOUSE KEEPING PAD FOR FREE STANDING VFD ENCLOSURES.

LIFT STATION: ELECTRICAL PLAN
SCALE: 1/2" = 1'-0"

PREPARED UNDER
THE SUPERVISION OF

DESIGNED:
RL

DRAWN:
RL

CHECKED:
SD

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DESIGN**

PROJECT NO. 21-057.01

SHEET REVISIONS				
NO.	DATE	DESCRIPTION	BY	
A	8/2/2022	60% DESIGN REVIEW	RL	
B	10/3/2022	90% DESIGN REVIEW	RL	
C	10/31/2022	100% DESIGN REVIEW	RL	

MULLER
ENGINEERING COMPANY
777 S. WADSWORTH BLVD. 4-100
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ALKIRE LIFT STATION IMPROVEMENTS

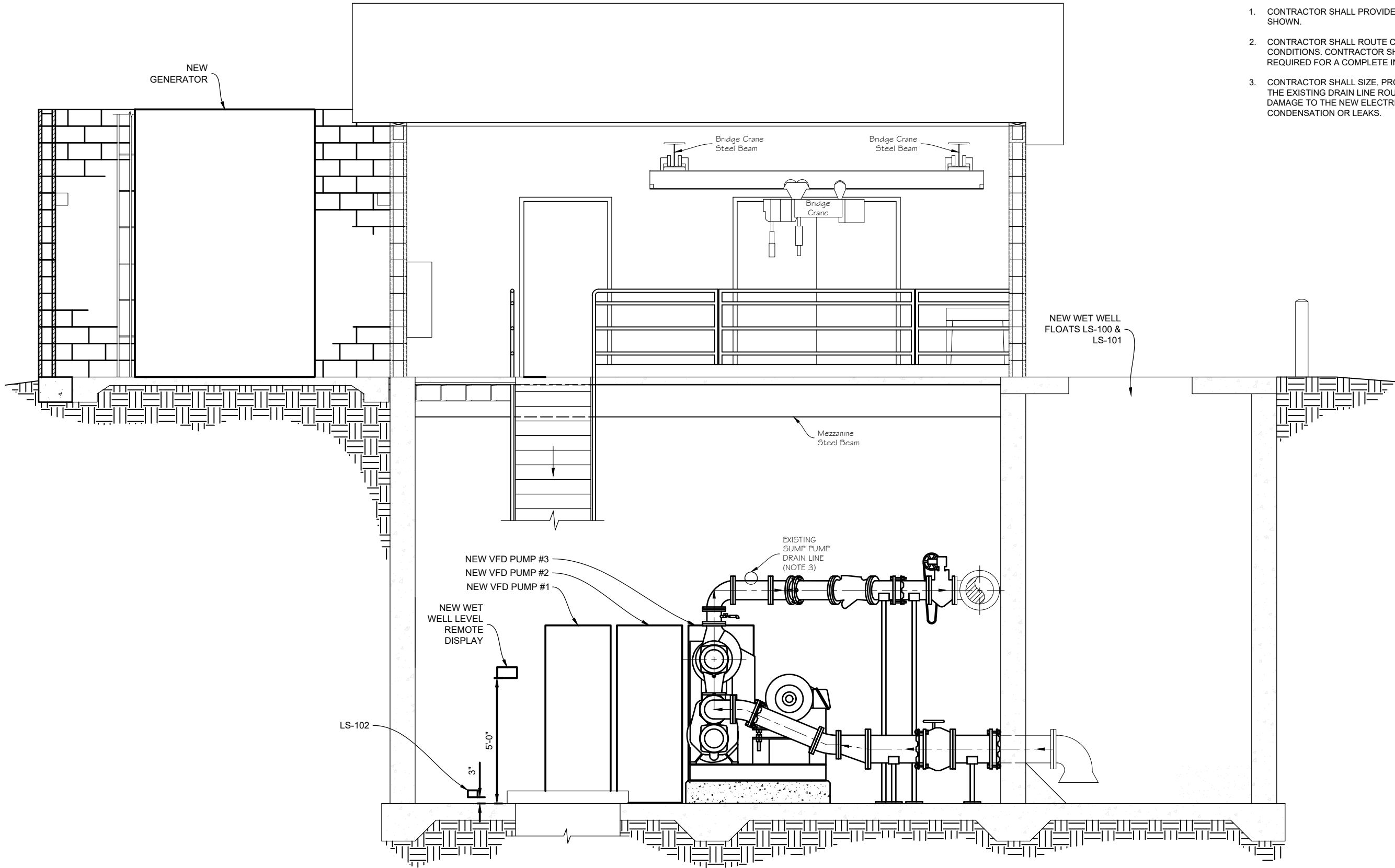
LIFT STATION ELECTRICAL PLAN

DATE
11/04/2022

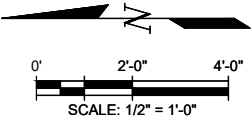
DRAWING NO.
E8

SHEET NO.
19 OF 22

PLOTTED: 11/2/2022 10:05:36 AM
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- NOTES:
1. CONTRACTOR SHALL PROVIDE AND INSTALL NEW EQUIPMENT AS SHOWN.
 2. CONTRACTOR SHALL ROUTE CONDUITS TO BEST SUIT FIELD CONDITIONS. CONTRACTOR SHALL PROVIDE JUNCTION BOXES AS REQUIRED FOR A COMPLETE INSTALLATION.
 3. CONTRACTOR SHALL SIZE, PROVIDE, AND INSTALL A DRIP PAN FOR THE EXISTING DRAIN LINE ROUTED IN THIS AREA TO PREVENT DAMAGE TO THE NEW ELECTRICAL EQUIPMENT FROM CONDENSATION OR LEAKS.



SECTION **A**
SCALE: 1/2" = 1'-0"
E9

PREPARED UNDER
THE SUPERVISION OF

DESIGNED:
RL

DRAWN:
RL

CHECKED:
SD

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DESIGN**

PROJECT NO. 21-057.01

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NO.	DATE	DESCRIPTION	BY
A	8/2/2022	60% DESIGN REVIEW	RL
B	10/3/2022	90% DESIGN REVIEW	RL
C	10/31/2022	100% DESIGN REVIEW	RL

MULLER
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777 S. WADSWORTH BLVD. 4-100
LAKEWOOD, COLORADO 80226

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**CITY OF
ARVADA**

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8101 Ralston Rd.
Arvada CO 80002
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ALKIRE LIFT STATION IMPROVEMENTS

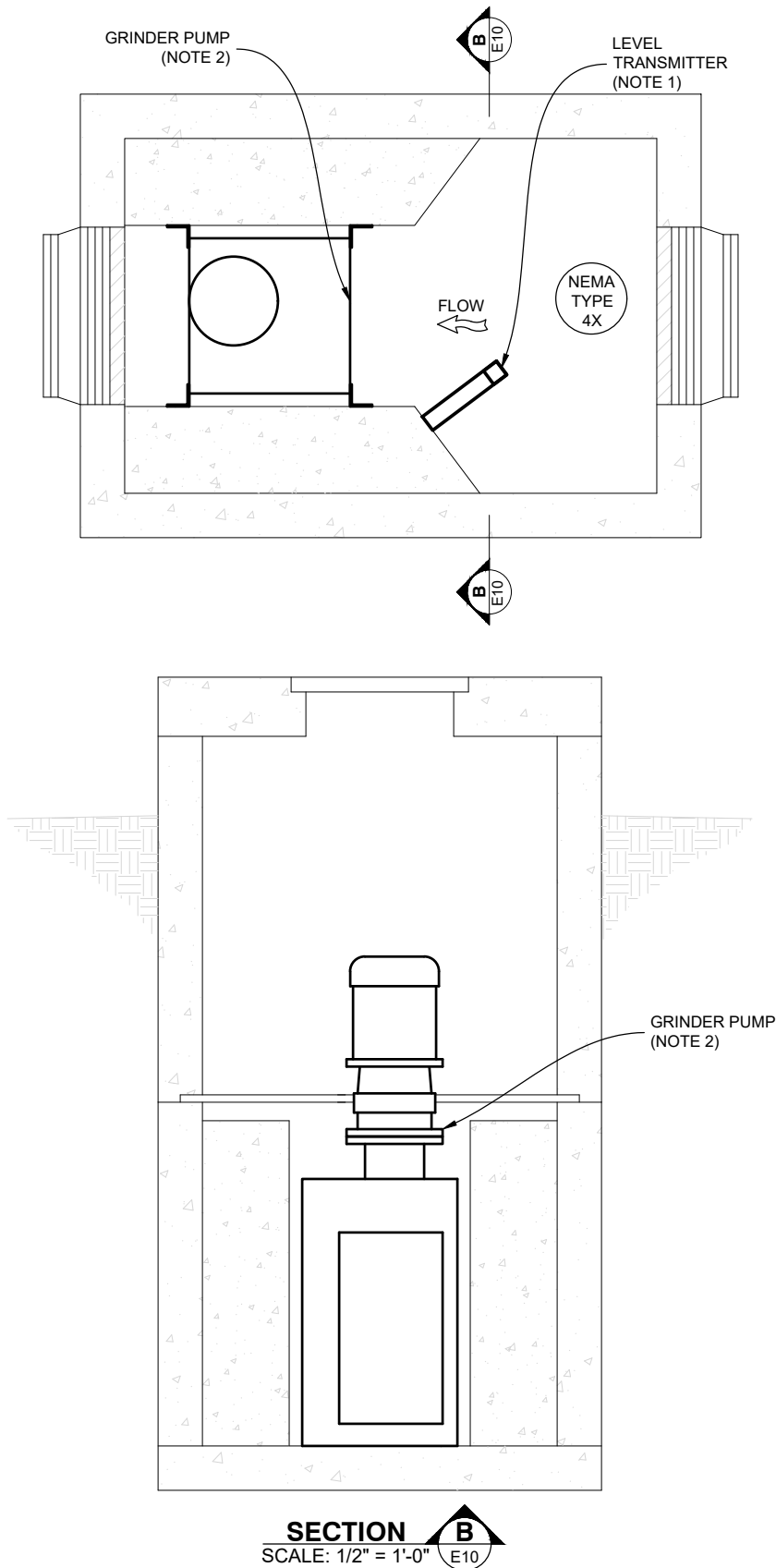
**LIFT STATION ELECTRICAL
ELEVATION**

DATE
11/04/2022

DRAWING NO.
E9

SHEET NO.
20 OF 22

PLOTTED: 11/2/2022 10:05:42 AM
 NAME: C:\USERS\LORENZO\DRIVE - MAGNA\1141745\1141745-8\10 DRAWINGS\03_WIPE10_GRINDER ELECTRICAL PLAN_REVA.DWG



GRINDER VAULT: PROPOSED PLAN
SCALE: 1/2" = 1'-0"

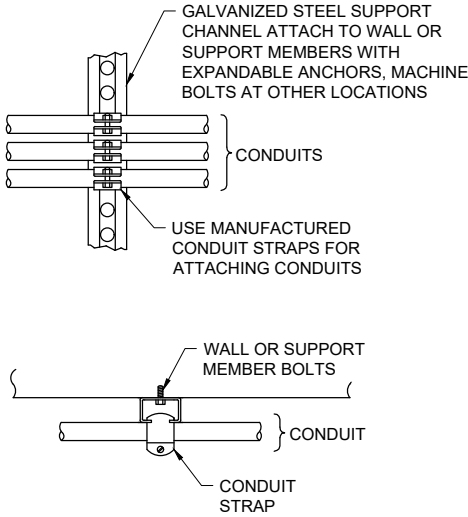
- NOTES:
1. CONTRACTOR SHALL INSTALL THE RELOCATED LEVEL TRANSMITTER AND MOUNTING BRACKET AS SHOWN.
 2. GRINDER EQUIPMENT SHALL NOT BE INSTALLED AT THIS TIME AND IS SHOWN AS A FUTURE OPTION. THE GRINDER CONTROL PANEL SHALL BE INSTALLED ON THE EXISTING EQUIPMENT RACK. CONTRACTOR SHALL MODIFY THE EXISTING RACK AS REQUIRED FOR INSTALLATION OF THE NEW CONTROL PANEL. THE NEED FOR THE GRINDER EQUIPMENT WILL BE BASED OFF THE NEW PUMP PERFORMANCE IN HANDLING SOLIDS AND RAGS.

PREPARED UNDER THE SUPERVISION OF	DESIGNED: RL	100% DESIGN PROJECT NO. 21-057.01	SHEET REVISIONS				 MULLER ENGINEERING COMPANY 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226  MAGNA	CITY OF ARVADA City of Arvada 8101 Ralston Rd. Arvada CO 80002 (720) 898-7760	ALKIRE LIFT STATION IMPROVEMENTS		DATE 11/04/2022
	DRAWN: RL		NO.	DATE	DESCRIPTION	BY			GRINDER ELECTRICAL PLAN		DRAWING NO. E10
	CHECKED: SD		A	8/2/2022	60% DESIGN REVIEW	RL					SHEET NO.
			B	10/3/2022	90% DESIGN REVIEW	RL					21 OF 22
			C	10/31/2022	100% DESIGN REVIEW	RL					



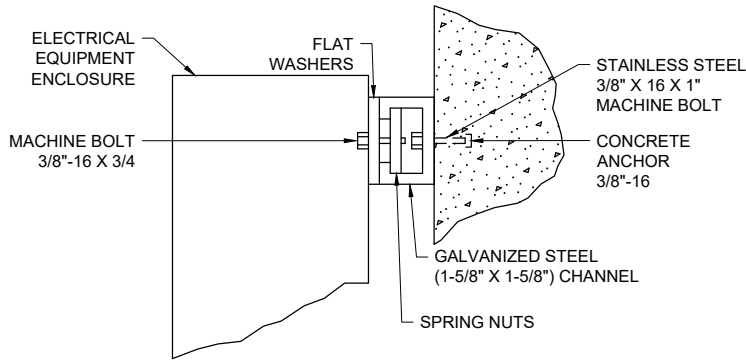
- NOTES:
1. CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING PUMP 1, 2, 3 MCC BUCKET COMPONENTS IN THEIR ENTIRETY. PUMP MCC BUCKETS SHALL BE REUSED TO FEED THE NEW PUMP VFD'S AS SHOWN ON DRAWING E6. ALL UNUSED BUCKET DOOR HOLES FROM REMOVED DEVICES SHALL BE SEALED.

D1 EXISTING MCC ELEVATION DETAIL
SCALE: NTS

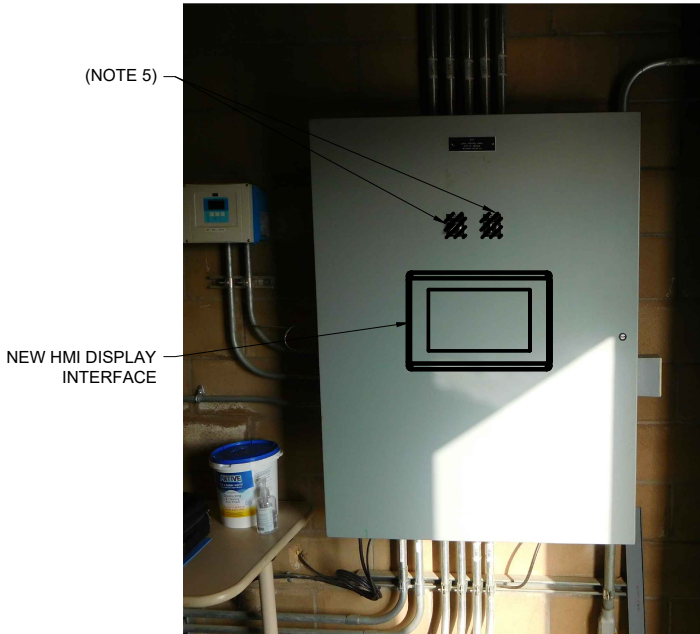


- NOTES:
1. CONDUITS SHALL BE MOUNTED TO BEST SUIT FIELD CONDITIONS.

D2 CONDUIT MOUNTING DETAIL
SCALE: NTS

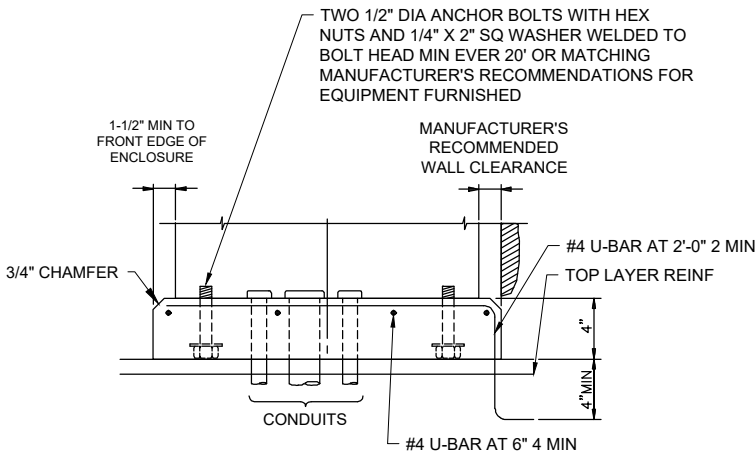


D3 ENCLOSURE MOUNTING DETAIL
SCALE: NTS



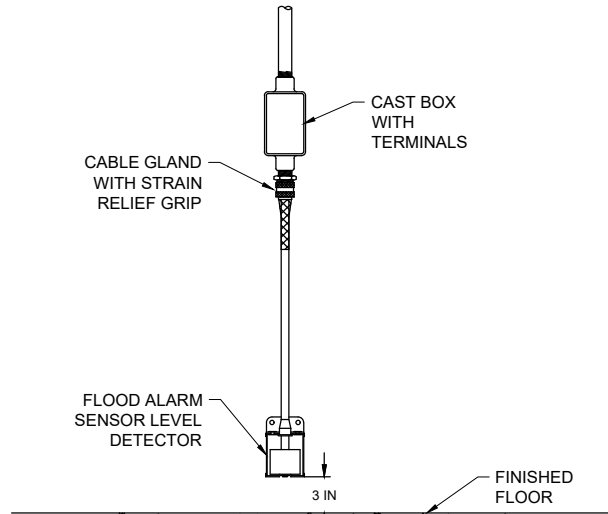
- NOTES:
1. CONTRACTOR SHALL COORDINATE WITH INTEGRATOR TO INSTALL A RED LION G3 SERIES HMI DISPLAY CAPABLE OF MODBUS OVER ETHERNET COMMUNICATION OR APPROVED EQUAL.
 2. INTEGRATOR SHALL MODIFY THE EXISTING CONTROL PANEL DOOR AS REQUIRED TO INSTALL THE HMI DISPLAY. ALL EXISTING INTERNAL COMPONENTS SHALL BE PROTECTED AGAINST DAMAGE WHILE HOLE IS CUT.
 3. INTEGRATOR SHALL PROGRAM HMI DISPLAY FOR LIFT STATION FUNCTIONALITY & OPERATIONAL VISIBILITY. ALL SCREENS, LAYOUT, & FEATURES SHALL BE COORDINATED WITH CITY OF ARVADA.
 4. INTEGRATOR SHALL ENSURE EXISTING 24VDC POWER SUPPLY HAS SPARE CAPACITY TO POWER THE HMI. IF THE EXISTING POWER SUPPLY IS UNDERSIZED A NEW ADEQUATELY SIZED UNIT SHALL BE PROVIDED & INSTALLED. INTEGRATOR SHALL BE RESPONSIBLE FOR ALL INTERNAL PANEL WIRING AND ANY ADDITIONAL COMPONENTS FOR A FULLY FUNCTIONAL SYSTEM.
 5. INTEGRATOR SHALL DISCONNECT AND REMOVE THE EXISTING LEAD/LAG CONTROL SWITCHES. WIRING SHALL BE REMOVED BACK TO POINT OF ORIGIN, ENCLOSURE PENETRATIONS SEALED, AND I/O SPARED. THE NEW LEAD/LAG FUNCTIONALITY SHALL BE INCORPORATED INTO THE HMI.

D4 EXISTING LOCAL CONTROL PANEL (LCP) ELEVATION/DETAIL
SCALE: NTS



- NOTES:
1. UNLESS OTHERWISE NOTED, ALL INDOOR FLOOR-MOUNTED ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH EQUIPMENT BASES.

D5 ELECTRICAL EQUIPMENT PAD DETAIL
SCALE: NTS



- NOTES:
1. FIELD VERIFY MOUNTING HEIGHT OF LEVEL DETECTORS WITH FIELD ENGINEER.
 2. FLOOD ALARM SENSOR SHALL BE GEMS LS-270 SERIES WITH SPLASH SHIELD, OR APPROVED EQUAL.

D6 FLOOD SENSOR MOUNTING DETAIL
SCALE: NTS

PLOTTED: 11/2/2022 10:05:49 AM
NAME: C:\USERS\LORENZ\ONEEDRIVE - MAGNA\MM4745M4745-8\10 DRAWINGS\03_WIPE11_ELECTRICAL DETAILS_REVA.DWG

PREPARED UNDER THE SUPERVISION OF	DESIGNED: RL	100% DESIGN PROJECT NO. 21-057.01	SHEET REVISIONS				 MULLER ENGINEERING COMPANY 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226  MAGNA	 CITY OF ARVADA City of Arvada 8101 Ralston Rd. Arvada CO 80002 (720) 898-7760	ALKIRE LIFT STATION IMPROVEMENTS		DATE 11/04/2022
	DRAWN: RL									DRAWING NO. E11	
	CHECKED: SD									SHEET NO. 22 OF 22	



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.3.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: R23-019, A Resolution Authorizing a License Agreement by and between the City of Arvada and the Church Ditch Water Authority pertaining to Construction and Maintenance of Improvements along W. 80th Avenue

Report in Brief

This license agreement with the Church Ditch Authority is to allow the City of Arvada and the Arvada Fiber Optics Network (AFON) project to bore under the existing Church Ditch located on the south side of W. 80th Avenue at Newman Street. This bore will complete the run of a 2 inch conduit from Kipling Street to Simms Street. Completing the bore will allow the AFON project to connect fiber to the traffic signal at Simms Street, to the Simms Tank site, and to Sierra Elementary School.

The Arvada team recommends that the City Council approve R23-019, A Resolution Authorizing a License Agreement from the Church Ditch Authority to the City of Arvada.

Financial Impact

\$1,500 License Agreement Fee
\$1,000 Review Fee
\$2,500 Total One-Time Cost

Funds are allocated for this action in the AFON Fiber budget available in Oracle Project 96002.

Background

The proposed action supports the 2015 City Council Strategic Result to complete the primary backbone of the fiber network as defined in the broadband master plan as the first step in building a city-wide communications network. Completion of the primary backbone will play a critical role in helping Arvada and its citizens address challenges in safety, mobility, economic vitality, and provide for future communications needs.

By approving this license agreement with the Church Ditch Authority, the agreement will give AFON four important assets that will have connectivity:

- (1) the supervisory control and data acquisition site at 80th and Simms Street;
- (2) security at the Simms Tank site;
- (3) the traffic signal at 80th and Simms Street;
- (4) connectivity to Sierra Elementary School.

The AFON Contractor, Frontier Environmental Services (FES) needs to bore under the Church Ditch at W. 80th Avenue and Newman Street to complete the conduit installed along W. 80th Avenue from Kipling Street west to Simms Street. This License Agreement will allow for FES to complete this part of the fiber backbone.

Discussion

The City of Arvada Ordinance allows the city to co-locate with other industries that are doing the same type of work (e.g. installing conduits). Over the past five years, the AFON project has used this ordinance for up to an estimated 50% cost savings

and less construction on our right-of-way. For this project, the city is working with MCI/Verizon to co-locate, eliminating two separate contractors doing work along 80th Avenue.

Public Contact

Church Ditch Authority

Commission Recommendation

N/A

Strategic Alignment

This action aligns with the Organizational Service Effectiveness (OSE) principle of leveraging technology to improve results, enhance service delivery, and maintain the highest level of security in support of the city's effectiveness now and into the future, and the Infrastructure principle to provide safe and efficient connections to modes of transportation, including transit, streets, sidewalks, and bikeways with a focus on enhanced technology at high-priority intersections. The work is consistent with the Action Initiative Plan to build out the fiber network to enable high speed/real-time connectivity to city facilities and assets to enhance city operations.

Alternative Courses of Action

Recommendation for Action

The Arvada team recommends that the City Council approve R23-019, A Resolution Accepting a License Agreement from the Church Ditch Authority to the City of Arvada (public entity)

Suggested Motion:

I move that R23-019, A Resolution Accepting a License Agreement from the Church Ditch Authority to the City of Arvada (public entity) be (approved on first reading, ordered published in full, and a public hearing set for DATE, at 6:15 p.m.).

Prepared by:
Tammy Hedlund, Legal Specialist

Reviewed by:

Approved by:

Mazedur Hossain, Traffic Engineering Manager	1/25/2023
Rick Assmus, Community Connectivity Manager	1/26/2023
Jacqueline Rhoades, Public Works Director	1/26/2023
Bryan Archer, Director of Finance	1/26/2023
Tammy Hedlund, Legal Specialist	1/27/2023
Kelsy Sargent, Assistant City Attorney	1/27/2023
Rachel Morris, City Attorney	1/31/2023
Don Wick, Deputy City Manager	2/1/2023

SUBJECT: R23-019, A Resolution Authorizing a License Agreement by and between the City of Arvada and the Church Ditch Water Authority pertaining to Construction and Maintenance of Improvements along W. 80th Avenue

PAGE: 3
ITEM: 8.A.3.

Lorie Gillis, City Manager

2/2/2023

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R23-019

A RESOLUTION AUTHORIZING A LICENSE AGREEMENT BY AND BETWEEN THE
CITY OF ARVADA AND THE CHURCH DITCH WATER AUTHORITY PERTAINING TO
CONSTRUCTION AND MAINTENANCE OF IMPROVEMENTS ALONG W. 80TH
AVENUE

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The Mayor or Mayor Pro Tem is authorized to sign and the City Clerk to attest, in from approved by the City Attorney, a license agreement by and between the City of Arvada and The Church Ditch Water Authority pertaining to boring under the Church Ditch to allow for construction and maintenance of improvements along W. 80th Avenue.

Section 2. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 13th day of February, 2023.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

CHURCH DITCH WATER AUTHORITY
LICENSE AGREEMENT

THIS LICENSE AGREEMENT (the "Agreement") is made and entered into this day of _____ 20__, by and between the CHURCH DITCH WATER AUTHORITY, a political subdivision of the State of Colorado (the "AUTHORITY") and THE CITY OF ARVADA (the "LICENSEE"), each a "Party" and collectively, the "Parties."

WITNESSETH:

WHEREAS, the AUTHORITY is the operator of that certain irrigation canal commonly known as the Church Ditch in Jefferson County, Colorado (the "Church Ditch");

WHEREAS, LICENSEE owns fee simple title to certain real property located in Jefferson County, Colorado along W. 80th Avenue that is adjacent to the Church Ditch, (the "Property");

WHEREAS, LICENSEE desires to construct and maintain certain facilities that require the grant of certain access rights from the AUTHORITY to enable the LICENSEE to cross the Church Ditch, as depicted on the drawings attached hereto as **Exhibit A** and incorporated herein by this reference (the "Property Access Crossing"). Exhibit A consists of 1 sheet; and

WHEREAS, the Parties are both public entities subject to restrictions against pledging their faith or credit to any other entity pursuant to Art. XI, Secs. 1 and 2, of the Colorado Constitution, and subject to the protections of the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, *et seq.*;

WHEREAS, the AUTHORITY is willing to grant such access rights in the form of a license subject to certain covenants.

NOW, THEREFORE, in consideration of the foregoing promises and covenants set forth below, the receipt and sufficiency of which are mutually acknowledged, the parties hereto agree as follows:

1. Grant of License. For the sum of One Thousand Five Hundred Dollars (\$1,500.00) paid to the AUTHORITY (the "License Fee"), and other good and valuable consideration, the AUTHORITY hereby grants to LICENSEE a license over, across, under and through the portions of the Church Ditch as depicted on Exhibit A to accommodate (i) LICENSEE's and its agents' construction and maintenance activities in the Property Access Crossing area and (ii) LICENSEE's and its guests' and agents' vehicular and pedestrian access to and from the Property (collectively, the "License").

2. Term. The License herein granted to LICENSEE is perpetual; however, this License shall terminate if LICENSEE discontinues the use of the facilities described on Exhibit A for a period of two consecutive years, breaches the terms of this Agreement and fails to cure such breach upon sixty (60) days written notice to LICENSEE given by

AUTHORITY, or if LICENSEE provides AUTHORITY notice of LICENSEE's specific intent to terminate this License.

3. Performance Deposit. In addition to the License Fee set forth above, LICENSEE shall provide a performance deposit in the amount of Five Thousand Dollars (\$5,000.00) (the "Performance Deposit"), prior to beginning of construction of any crossing over the Church Ditch.

4. Design Review Deposit. LICENSEE shall provide a design review deposit in the amount of One Thousand Dollars (\$1,000) to compensate the AUTHORITY for its professional service costs in reviewing LICENSEE's plans and specifications (the "Design Review Deposit"). The AUTHORITY shall document its actual professional service costs in reviewing and approving the License. The AUTHORITY may request additional Design Review Deposit amounts in One Thousand Dollar (\$1,000) increments as needed to reflect its actual professional service costs.

5. Pre-Construction.

a. The LICENSEE shall hold a pre-construction meeting on the job site with the AUTHORITY Manager of Ditch Maintenance (the "Manager") or designee(s) for the Church Ditch crossing or encroachment. The LICENSEE's agent(s), contractor and an official of the appropriate city or county (if construction is within a public right-of-way) shall also attend.

b. No construction of the ditch crossing shall be made without LICENSEE first providing five (5) business days' notice to the AUTHORITY and obtaining the consent and approval thereof of the Manager, which approval shall not be unreasonably withheld or delayed. The LICENSEE and its agent(s) shall provide for inspection of the Church Ditch crossing by the AUTHORITY and said inspection shall be completed within two (2) business days of the request for inspection by the LICENSEE. Failure by the LICENSEE or its agent(s) to provide an opportunity for inspection by the AUTHORITY may result, in the commercially reasonable discretion of the AUTHORITY, in the uncovering, at the sole cost of the LICENSEE, of any such construction so that the inspection can be made.

c. The LICENSEE or its agent(s) shall perform material or soil compaction testing as required by the Church Ditch Design Review Process and Design Criteria for Facilities, dated August 13, 2018 (the "Design Manual"), or as directed by the Manager. A copy of test results shall be provided to the AUTHORITY. Should any portion of the work fail said testing, the LICENSEE shall immediately cause the affected item(s) to be removed, redone, and retested until test results confirm such work is in compliance with the Design Manual.

6. Construction Activity.

a. The effectiveness of the License with respect to construction activities to occur within the Property Access Crossing area is conditioned upon the AUTHORITY'S

issuance of a "Notice to Proceed," following the AUTHORITY'S review and approval of the construction plans, specifications, and the construction calendar, such issuance not to be unreasonably withheld or delayed.

b. No work shall be performed in the Property Access Crossing area between April 1 and November 1 of any year without express prior written approval of the AUTHORITY, such approval not to be unreasonably withheld or delayed.

c. LICENSEE agrees to pay as liquidated damages, and not as a penalty, the sum of Five Hundred Dollars (\$500.00) for each calendar day delay in which completion time interferes with the ability of the AUTHORITY to convey water (the "Liquidated Damages"). The amount of liquidated damages is based on the determination by the AUTHORITY that the cost for running decreed water in the Church Ditch is a minimum of the amount set forth above, and LICENSEE agrees the amount is reasonable under the circumstances. The AUTHORITY may deduct Liquidated Damages from the Performance Deposit (as defined below).

7. Deficiency. If any failure to comply with construction plans, specifications, requirements of this Agreement, the Design Manual, or in the event that LICENSEE's construction activity in or over the Church Ditch creates a condition rendering the Church Ditch incapable of safely carrying water, or other deficiency, is noted by the AUTHORITY, it shall give LICENSEE written notice of said deficiency.

a. Corrective Action. LICENSEE shall initiate corrective actions within three (3) business days after receipt of the written notice, which corrective actions must be completed to the commercially reasonable satisfaction of AUTHORITY. If after the three (3) days from receipt of the written notice no corrective action has been initiated, the AUTHORITY may undertake and complete the corrective action on its own. All direct and reasonable costs incurred by the AUTHORITY in making the corrective actions shall be reimbursed by LICENSEE within ten (10) days from receipt of a billing invoice from the AUTHORITY. If LICENSEE fails to remit timely payment to the AUTHORITY for the AUTHORITY'S corrective actions, the AUTHORITY may deduct from the Performance Deposit all such direct and reasonable costs.

b. Certificate of Completion. Upon completion of the construction work in the Property Access Crossing area, LICENSEE shall contact the AUTHORITY for final inspection and shall furnish the AUTHORITY an "Affidavit of Installation of Ditch Crossing" in substantially the form attached hereto as **Exhibit B** (the "Affidavit"), signed and sealed by a Professional Engineer registered in the State of Colorado. The Affidavit shall state that the project on the Licensed Property was constructed in conformance with approved plans and specifications. Attached to the Affidavit shall be a set of project plans revised to accurately represent the "As-Built" configuration of the project. Upon acceptance of the as-built drawings and Affidavit, the AUTHORITY shall issue the Certificate of Completion. The AUTHORITY shall not be unreasonable in inspecting the construction or the execution of the Certificate of Completion.

8. Construction Warranty. LICENSEE shall require work performed pursuant to

this Agreement by any third-party contractor to be under warranty by such contractor for a minimum period of two (2) year following completion and shall cooperate with AUTHORITY during said warranty period to obtain repairs as necessary from such contractors.

9. Release of Deposits. The AUTHORITY shall release any unused portion of the Performance Deposit and the Design Review Deposit not more than thirty (30) days after the issuance of the Certificate of Completion.

10. Scope of AUTHORITY. It is understood that this instrument shall grant to LICENSEE only such rights as the AUTHORITY has the power to grant.

11. Non-Interference with Church Ditch Operations. In exercising the rights granted by this License, LICENSEE shall act in such manner as not to damage the Church Ditch or the embankments and/or the right-of-way thereof and so as not to interfere with or affect the flow of water in Church Ditch and/or laterals therefrom. LICENSEE agrees that it will at all times maintain its licensed facilities and repair all breaks, leaks and damages therein and thereto at its own expense. If, by reason of any break, leak or damage in and to the licensed facilities injury occurs to the properties of the AUTHORITY, then LICENSEE will reimburse the AUTHORITY for all work necessary to repair and replace such property of the AUTHORITY to the same condition as the property was in prior to such break, leak, or damage in and to the said licensed facilities, and will pay any and all monetary damages resulting from such break, leak or damage sustained or incurred by the AUTHORITY or its water users or to any one not a party to this Agreement, including water lost. LICENSEE further agrees that if at any time the LICENSEE or LICENSEE's act or acts causes any washing, settling or other change or damage in the Church Ditch embankments, the roads thereon, or any part of the ditch right-of-way, or any loss of water or of ditch capacity, it will, upon notification from the AUTHORITY, LICENSEE will reimburse the AUTHORITY for all necessary repairs.

12. Alterations. LICENSEE agrees that before any future alteration of said licensed facilities, it will notify the AUTHORITY of the proposed alteration and submit appropriate amendment documentation to the AUTHORITY for such alteration. If in the future, the AUTHORITY should determine in its commercially reasonable discretion that it is necessary to repair, restore, enlarge, deepen, or otherwise change or relocate said Church Ditch or laterals thereunder or to construct any other canal, ditch, or waterway on the Church Ditch right-of-way or to do any other thing incident to the operation of Church Ditch or laterals, then LICENSEE agrees to allow the AUTHORITY to temporarily remove LICENSEE's licensed facilities and reconstruct the same so as to comply with such plans and specifications the AUTHORITY may prescribe as being necessary to permit the proper maintenance and operation of the ditch, the costs of such relocation and/or reconstruction to be allocated equitably by agreement between the Parties. The right of the AUTHORITY to temporarily remove LICENSEE's licensed facilities is subject to the obligation of the AUTHORITY to first provide such temporary facilities as are necessary to ensure that AUTHORITY'S activities do not interrupt the operation of the LICENSEE's system of pipelines or otherwise create a hazard to public health or safety.

13. Immunity. The Parties understand and agree that the both Parties are relying on

and do not waive or intend to waive the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, *et seq.*, as from time to time amended, or otherwise available by law to the Parties.

14. No Multi-Year Fiscal Commitment. The Parties have budgeted the funds required to perform their obligations under the terms of this Agreement and assume that all expenses they are required to pay will be expended within the current calendar year unless otherwise stated. Financial obligations of the Parties payable after the current fiscal year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available. By execution of this Agreement, the Parties do not warrant that funds will be available to fund this Agreement beyond the current fiscal year.

15. Binding Effect. It is mutually understood and agreed that this agreement and all the terms and conditions hereof shall extend to and be binding upon the parties hereto, their successors, designees and assigns.

16. Board Approval. This Agreement is expressly contingent upon the approval by the Church Ditch Water Authority Board of Directors of all of the terms set forth herein. In the event this Agreement is not approved in its entirety by the Board, neither Party shall be bound to the terms of this Agreement.

17. Effective Date. The Effective Date of this Agreement shall be the date the resolution approving this Agreement is adopted by the Church Ditch Water Authority Board of Directors.

EXECUTED in duplicate the day and year first hereinabove written.

CHURCH DITCH WATER AUTHORITY:

Tamara Moon, President

ATTEST:

Nathan McCoy, General Manager

LICENSEE:

By:_____

Its:_____

ATTEST:

Title

EXHIBIT A

Depiction of Property Access Crossing

[Sheets Attached]

EXHIBIT B

Form of

AFFIDAVIT OF INSTALLATION OF DITCH CROSSING

This is to acknowledge that I, _____, am a Professional Engineer licensed by the State of Colorado (License # _____) and that to the best of my knowledge, installation of ditch crossing structures and appurtenances located at _____ and maintained by _____ meets the design criteria given to me by the Church Ditch Water Authority and other applicable codes of practice.

Dated this _____ day of _____, 20__.

By: _____
Professional Engineer

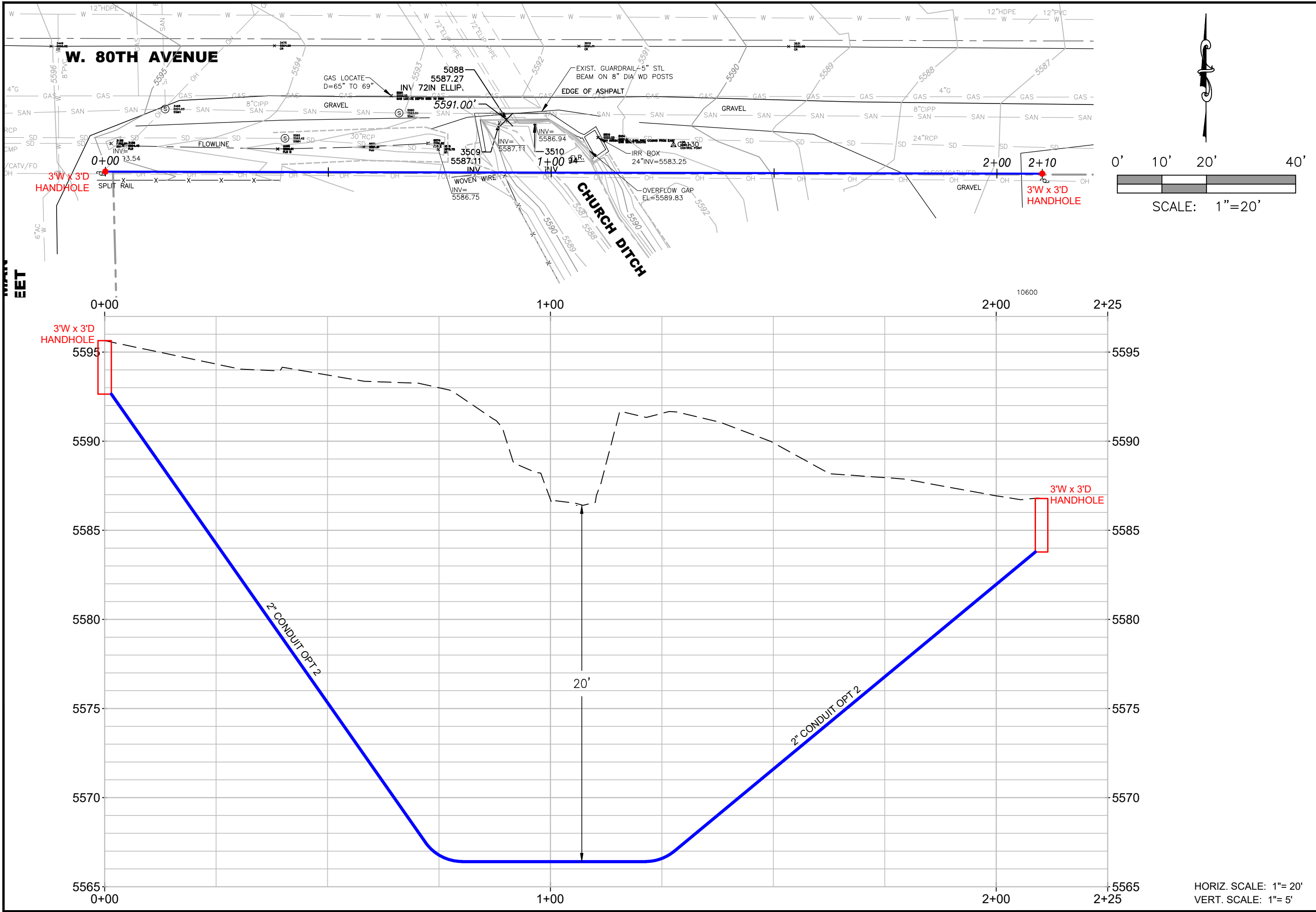
SEAL

Subscribed and sworn to before me this _____ day of _____, 20__.

Notary Public

My commission expires: _____

E:\COA\Rick A\22F001-80th At Church Ditch\22F001-80th At Church Ditch.dwg , Plot Date: 10/18/2022



REVISION		DATE	BY
1			
2			
3			
4			
5			

Public Works Department	
Engineering Division	
8101 Ralston Road	
Arvada, Colorado 80002	
Phone 720-898-7640	

PROJECT NO. 22F001	
CHURCH DITCH FIBER OPTIC	
W. 80TH AVENUE AT CHURCH DITCH	

ENGINEER	
DESIGN BY	
DRAWN BY	

SHT	1
OF	1



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.4.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: R23-020, A Resolution Authorizing An Agreement Between The City Of Arvada And Frontier Environmental Services, LLC For Goods And Services Relating To Boring Conduit And Fiber Pulling In An Amount Not To Exceed \$500,000.00

Report in Brief

Enabling city-wide connectivity has been a key initiative for a number of years and is consistent with the City Council direction associated with initiatives such as Smart Cities and the buildout of the AFON (Arvada Fiber Optics Network) network.

The ongoing objective to enable high-speed network connectivity to all City buildings, traffic signals, Supervisory Control and Data Acquisitions (SCADA) systems, and other City assets has already enabled high-speed network connectivity to many locations, which has enhanced services. The continued build-out will allow for further ability to enhance City operations.

The Arvada team recommends that the City Council approve R23-020, A Resolution Authorizing An Agreement Between The City Of Arvada And Frontier Environmental Services, LLC, For Goods And Services Relating To Boring Conduit And Fiber Pulling In An Amount Not To Exceed \$500,000.00.

Financial Impact

Funds are allocated for this action in the AFON Fiber budget available in Oracle Project 96002.

Background

Starting in 2013, the City commenced a collaborative effort to determine how to get high-speed communications to the new community stations being built. The effort involved the Public Works, Police, and Innovation and Technology Management departments. The solution was to expand from a single-threaded effort that the Traffic Division had been planning to connect their traffic signals, to one that involved looking at all City assets that would benefit from a high-speed network connection.

This led to the first major installation of city-owned fiber to connect to new buildings. This approach to connectivity has also had a significant return on investment. Connecting the two community substations has saved the City approximately \$600,000 over the past five years, based on cost estimates for having similar high-speed services provided by Comcast or CenturyLink/Lumen.

Since that time, the City has developed a fiber master plan (presented to Council April 2017); received voter approval to opt-out of SB152; collaborated with Arvada Fire and Jeffco Schools to complete fiber connectivity as well as their financial contribution of over \$500,000 to the build-out; connected both water treatment plants, numerous water tanks and Supervisory Control and Data Acquisitions (SCADA) systems; West Woods Golf Club; all radio towers; the new Whisper Creek community station; twelve Arvada Fire District buildings, and 90% of Jefferson County Schools in Arvada. The program reflects a coordinated AFON implementation effort between Public Works, which manages the physical infrastructure, and IT, which supports the operational aspects.

Approval of this resolution will continue the build-out effort, using Frontier Environmental LLC, which was selected through a competitive process in December of 2022.

Discussion

City infrastructure connected to the city's fiber network results in improved processes or services. Some examples include:

- Three public safety radio towers that now enable 99% coverage for police and fire services through the fiber network for communications.
- West Woods Golf Club improved security and enhanced golf and restaurant services.
- The water treatment plant improved security and helped improve the efficiency of the workforce due to the high-speed network.
- Connected 30 of the 32 Jefferson County Schools in Arvada.
- Connected all 12 of Arvada Fire's buildings, including the new fire station in Candelas, their headquarters, and the training center.
- The Whisper Creek Community Station opened on time with the same services as the other community stations due to the ability to connect to the previously built-out fiber network in that area.

As the network continues to get built out, it will play a vital role in connecting all city assets for safety and day-to-day work. There is funding for this continued effort from contributions from Jeffco Schools, Arvada Fire and budgeted City funds.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

This action aligns with the Organizational Service Effectiveness (OSE) principle of leveraging technology to improve results, enhance service delivery, and maintain the highest level of security in support of the city's effectiveness now and into the future, and the Infrastructure principle to provide safe and efficient connections to modes of transportation, including transit, streets, sidewalks, and bikeways with a focus on enhanced technology at high-priority intersections. The work is consistent with the Action Initiative Plan to build out the fiber network to enable high speed/real-time connectivity to city facilities and assets to enhance city operations.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R23-020, A Resolution Authorizing An Agreement Between The City Of Arvada And Frontier Environmental Services, LLC, For Goods And Services Relating To Boring Conduit And Fiber Pulling In An Amount Not To Exceed \$500,000.00.

Suggested Motion:

I move that R23-020, A Resolution Authorizing An Agreement Between The City Of Arvada And Frontier Environmental Services, LLC, For Goods And Services Relating To Boring Conduit And Fiber Pulling In An Amount Not To Exceed \$500,000.00 be (approved) (rejected).

Prepared by:

SUBJECT: R23-020, A Resolution Authorizing An Agreement Between The City Of Arvada And Frontier Environmental Services, LLC For Goods And Services Relating To Boring Conduit And Fiber Pulling In An Amount Not To Exceed \$500,000.00

PAGE: 3
ITEM: 8.A.4.

Tammy Hedlund, Legal Specialist

Reviewed by:

Approved by:

Rick Assmus, Community Connectivity Manager	1/26/2023
Mazedur Hossain, Traffic Engineering Manager	1/26/2023
Jacqueline Rhoades, Public Works Director	1/26/2023
Bryan Archer, Director of Finance	1/27/2023
Tammy Hedlund, Legal Specialist	1/27/2023
Kelsy Sargent, Assistant City Attorney	1/27/2023
Rachel Morris, City Attorney	1/31/2023
Don Wick, Deputy City Manager	2/1/2023
Lorie Gillis, City Manager	2/2/2023

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R23-020

A RESOLUTION AUTHORIZING AN AGREEMENT BETWEEN THE CITY OF ARVADA
AND FRONTIER ENVIRONMENTAL SERVICES, LLC FOR GOODS AND SERVICES
RELATING TO BORING CONDUIT AND FIBER PULLING IN AN AMOUNT NOT TO
EXCEED \$500,000.00

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The Mayor or Mayor Pro Tem is authorized to sign and the City Clerk to attest, in form approved by the City Attorney, an Agreement, which is in substantially the same form as that attached hereto, by and between the City of Arvada and Frontier Environmental Services, LLC for goods and services relating to boring conduit and fiber pulling in an amount not to exceed \$500,000.00.

Section 2. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 13th day of February, 2023.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

**AN AGREEMENT BETWEEN THE CITY OF ARVADA AND
FRONTIER ENVIRONMENTAL SERVICES, LLC FOR GOODS
AND SERVICES RELATING TO BORING CONDUIT AND
FIBER PULLING IN AN AMOUNT NOT TO EXCEED
\$500,000.00**

1. PARTIES. The Parties to this Agreement are the City of Arvada, a Colorado home rule municipal corporation, whose mailing address is 8101 Ralston Road, Arvada, CO 80002 (“Arvada” or the “City”) and Frontier Environmental Services, LLC, a foreign limited liability company whose place of business is located at 5350 Vivian Street, Unit B, Arvada, CO 80002 (“Contractor”). The Parties may be referred to individually as a “Party” and collectively as the “Parties.”

2. RECITALS AND PURPOSE.

- 2.1. Arvada requires a qualified entity to provide goods and services related to boring for conduit and pulling of fiber.
- 2.2. On or about October 25, 2022, Arvada issued a request for proposal (“RFP 22-PW-010”), seeking responses from qualified entities to provide goods and services as described in Sec. 2.1 (“the Work”).
- 2.3. Contractor has extensive experience in providing the types of goods and services needed. On or about November 10, 2022, Contractor submitted its submittal in response to Arvada’s RFP 22-PW-010 (“Response”).
- 2.4. Arvada has determined that Contractor has the requisite background, skill, expertise, and insurance to provide the requested goods and services and other related services, under the terms and conditions more fully set forth below.
- 2.5. Arvada and Contractor agree that Arvada contemplates using Contractor as a Contractor for the Work as described in the Contract Documents. However, Arvada and Contractor acknowledge and agree that Arvada may, at its sole discretion, use other Contractors to perform similar work, and that this Agreement in no way limits Arvada from hiring other contractors or constitutes a contract for exclusive services from Contractor.

3. CONTRACT DOCUMENTS AND EXHIBITS.

- 3.1. Contract Documents. The Contract Documents shall consist of this Agreement together with the following:

Exhibit A: Arvada’s RFP 22-PW-010 including General Terms and Conditions and A-1 Questions and Answers;

Exhibit B: Contractor’s Response.

All exhibits referred to in this Agreement are attached hereto and are, by reference, incorporated herein for all purposes.

- 3.2. Interpretation of Contract Documents. In the event any matter, term, provision, or condition that is the subject of this Agreement requires clarification or is in dispute, or is the subject of a difference of opinion, then the terms of this Agreement shall control, and then the terms of **Exhibit A**, and then **Exhibit B**, in that order.

- 3.2.1. In no event may any contradictory term or provision contained in **Exhibit B** supersede the provisions of this Agreement or **Exhibit A**. Any such contradictory term or provision shall be null and void.

4. **TERM AND TERMINATION.**

- 4.1. Effective date. This Agreement will become effective and binding on both Parties upon its execution by Arvada.

- 4.2. Term. The term of the Agreement shall remain in effect for one year from Arvada's execution of the Agreement as described in Sec. 4.1. unless otherwise agreed to in writing by the Parties, and subject to availability of funds.

- 4.2.1. Commencement of Work. Notwithstanding the term of this Agreement, the Parties anticipate Contractor will commence immediately after the Effective Date with completion of the each project to be determined by Arvada's Project Owner unless the Parties agree, in writing, to a different time frame.

- 4.2.1.1. Contractor will furnish all materials, supplies, tools, equipment, labor, transportation, testing, and other services necessary for the completion of the Work.

- 4.2.2. Termination. Notwithstanding the above, Arvada may terminate this Agreement with or without cause upon 30 days written notice and in accordance with the provisions of this Agreement and **Exhibit A**.

- 4.3. Force majeure. Any delays in or failure of performance by any party of its obligations under this Agreement shall be excused if such delays or failure are a result of acts of God, fires, floods, strikes, labor disputes, pandemics, accidents, regulations or orders of civil or military authorities, shortages of labor or materials, or other causes, similar or dissimilar, which are beyond the control of such party.

- 4.4. Renewal. If the Parties intend for the contract to be renewed, insert: This Agreement may be renewed by Arvada for no more than 4 consecutive one-year

renewal terms. Renewals will be automatic unless the Agreement is terminated.

5. COMPENSATION.

5.1. Payment. Arvada shall pay Contractor for the Work requested by Arvada and rendered by Contractor under this Agreement in an amount not to exceed **\$500,000.00**.

5.1.1 Contractor shall submit itemized monthly invoices to Arvada for actual goods and services that have been accepted by Arvada or performed by Contractor. Payment by Arvada will be due NET 30 days.

5.2 Additional Work. While Arvada has listed its major requirements for its solicitation in **Exhibit A**, Arvada may, during the term of this Agreement, wish to purchase other related services identified and offered by Contractor, based upon the pricing/fee contained in Contract Documents. Arvada reserves the right to award these ancillary items to Contractor or another top rated Bidder based upon the negotiated scope of work and fee structure. This option, if exercised, in no way obligates Arvada to pursue additional services with Contractor.

6. SCOPE OF SERVICES. Contractor shall perform the Work as described in the Contract Documents or as amended by the mutual consent of the Parties in writing. The Scope of Work is reflected in **Exhibit A**. Should the Parties agree in writing to a change in the scope of services or a change in a deadline provided in the Contract Documents, then the Parties will timely execute an amendment, which will address the amended scope of services, revisions to necessary start and end dates, any applicable deliverables and associated due dates, reporting requirements, documentation requirements, and any other matters that the Parties deem necessary.

7. TERMS AND CONDITIONS IN CONTRACT DOCUMENTS. Contractor affirms that it has read and is familiar with all of the Contract Documents including the General Terms and Conditions set forth in the City's solicitation or otherwise attached to this Agreement and agrees to be bound by those Terms and Conditions and the City's Engineering Code of Standards and Specifications.

8. PERFORMANCE MEASURES. The performance measures for this Agreement shall be those proposed by Contractor in its Response and accepted by Arvada.

9. PROJECT OWNERS. Arvada designates Rick Assmus as Arvada's Project Owner. Mr. Assmus (rick@arvada.org) will be Arvada's responsible staff member to provide direction to Contractor during the course of the Work. Arvada reserves the right to change the Project Owner(s) at its discretion and will promptly notify Contractor of any such change in writing. Contractor designates Brent Scarbrough as Contractor's Project Owner. Mr. Scarbrough (brent@frontiervenvironmental.net) will be Contractor's primary contact person during the course of this Agreement. Contractor may change the Project

Owner(s) with the Arvada's prior written approval.

10. **INSURANCE.** Contractor will be required to, at its own expense, keep in full force and effect during the term of the Agreement, and during the term of any extension or amendment of the Agreement, insurance reasonably sufficient to insure against the liability assumed by Contractor under the terms of the Contract Documents. Contractor's failure to secure and maintain sufficient insurance at any time during the pendency of this Agreement do not relieve Contractor of its obligations under this provision; Contractor's failure to fulfill the obligations of this section will make the Contractor the *per se* insurer.
11. **INTEGRATION, AMENDMENT, AND SEVERABILITY.** This Agreement represents the entire agreement between the Parties; there are no oral or collateral agreements or understandings. The Parties, by mutual agreement, may amend this Agreement at any time. Any amendments must be in writing and will be incorporated into and made a part of this Agreement. If any provision in this Agreement is held to be invalid or unenforceable, the remainder of this Agreement will be deemed severable, and as such, the remaining provisions will continue in full force and effect.
12. **NOTICES.** Any notice or notification required or permitted by the Agreement shall be in writing, and may be sent to the other Party by certified or registered mail, or by electronic mail, addressed to the that Party's project owner at such street address or email address as are set forth herein or subsequently designated by the Parties. Such notice or notification shall be deemed to have been given when deposited in the United States mail or, in the case of electronic mail, upon the sent date stamp contained in the electronic mail.
13. **ADDITIONAL DOCUMENTS OR ACTION.** The parties agree to execute any additional documents and to take any additional action that is necessary to carry out this Agreement.
14. **BINDING AUTHORITY.** Contractor represents and affirms that the signature page hereof accurately states the full legal name of Contractor (whether as a corporation, partnership, limited liability company, sole proprietorship, or other), contains all requisite signature(s) on behalf of Contractor, and in all other respects is effective to bind Contractor, in accordance with all applicable statutes, regulations, resolutions, rules, bylaws, agreements, or similar sources of authority or limitation. This Agreement may be executed in counterpart(s), each of which shall be deemed to be an original, and all of which, taken together, shall constitute one instrument.

DATED this _____ day of _____, 2023.

CITY OF ARVADA, a Colorado home
rule municipal corporation

Marc Williams. Mayor
8101 Ralston Road
Arvada, CO 80002

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris

By: _____

**FRONTIER ENVIRONMENTAL
SERVICES, LLC**

Brent Scarbrough, Partner
Brent@frontierenvironmental.net

Exhibit A

**AN AGREEMENT BETWEEN THE CITY OF ARVADA
AND FRONTIER ENVIRONMENTAL SERVICES, LLC FOR
GOODS AND SERVICES RELATING TO BORING
CONDUIT AND FIBER PULLING IN AN AMOUNT NOT
TO EXCEED \$500,000.00**



REQUEST FOR PROPOSAL

Proposal #: 22-PW-010

Title: Fiber Cable, Installation, Splicing, Boring & Ongoing repairs

RFP Issued: 10/25/2022

Question Deadline: 11/3/2022 - 12:00 Noon MT
Questions and responses will be posted on BidnetDirect.com. This is the ONLY VALID source for postings regarding this solicitation.

Proposals Due By: 11/10/2022 - 10:00 a.m. MT

Electronic Submissions must be submitted as (1) PDF online at BidNetDirect.com.
Your company name must be the first word naming the pdf file.
Late responses will not be considered for award.

Projected Start Date: January 2023

Submit administrative questions NOT related to the scope to: Cheryl Dye, Sr. Procurement Specialist at cdye@arvada.org
Direct contact with the requesting department may result in vendor disqualification.

Arvada Vision: We dream big and deliver.

Mission: We are dedicated to delivering superior services to enhance the lives of everyone in our community.

Values:

Innovation – We excel in creativity, flexibility and the use of best practices while valuing diverse backgrounds, ideas and perspectives.

Passion – We are a high performing, inclusive team inspiring each other to pursue excellence.

Opportunity – We value our diversity, embrace possibilities, face challenges, persevere and take action to deliver quality results.

Documents included in this Request:

General Terms and Conditions	page 2-4
Special Terms and Conditions	page 5-6
Insurance Requirements	page 7
Administrative instructions and Evaluation Criteria	page 8-9
Scope of Work	page 9
Submittal Forms, submittal checklist	page 10-11
Attachments/Exhibits, including Performance Measures for services	

**EXHIBIT
A**

GENERAL TERMS AND CONDITIONS

- NO MULTI-YEAR FISCAL OBLIGATION.** Financial obligations of Arvada payable after the current fiscal year are contingent on funds for that purpose being appropriated, budgeted, and otherwise made available by the City Council for Arvada.

Arvada's obligations under the Agreement shall be from year to year only and shall not constitute a multiple-fiscal year direct or indirect debt or other financial obligation of Arvada within the meaning of Article X, Section 20 of the Colorado Constitution (TABOR).

2. **TAXES.** Arvada shall not be liable for the payment of any excise, sales, or use taxes. Arvada is exempt from federal excise taxes under I.R.C. Chapter 32 (26 U.S.C., Subtitle D, Ch. 32) and from State and local government sales and use taxes under §§39-26-704(1), *et seq.*, C.R.S. (Colorado Sales Tax Exemption Identification Number 98-01789). Contractor shall not invoice Arvada for any state, federal or local taxes. Upon written notification by Arvada, Contractor shall reimburse Arvada in a timely manner for any taxes erroneously paid by Arvada.
3. **NO INDEMNIFICATION BY ARVADA.** Arvada is prohibited under Article XI, Section 1 of the Colorado Constitution from indemnifying anyone. Despite any provision in any contract document to the contrary, Arvada does not indemnify Contractor or anyone else under the Agreement.
4. **INDEMNIFICATION OF ARVADA.** Contractor shall indemnify, defend, and hold harmless Arvada, its employees, agents and assignees (the "Indemnified Parties"), against any and all costs, expenses, claims, damages, liabilities, court awards, and other amounts (including attorneys' fees and related costs) arising from or related to any act or omission by Contractor, or its employees, agents, Subcontractors, or assignees in connection with the Agreement.
 - 4.1. **Confidential Information Indemnification.** Disclosure or use of Arvada Confidential Information by Contractor may be cause for legal action by third parties against Contractor, Arvada, or their respective agents. Contractor shall indemnify, defend, and hold harmless the Indemnified Parties, against any and all claims, damages, liabilities, losses, costs, expenses (including attorneys' fees and costs) incurred by Arvada in relation to any act or omission by Contractor, or its employees, agents, assigns, or subcontractors.
 - 4.2. **Intellectual Property Indemnification.** Contractor shall indemnify, save, and hold harmless the Indemnified Parties, against any and all costs, expenses, claims, damages, liabilities, and other amounts (including attorneys' fees and costs) incurred by the Indemnified Parties in relation to any claim that any Deliverable, Good or Service, software, or Work provided by Contractor under the Agreement (collectively, "IP Deliverables"), or the use thereof, infringes a patent, copyright, trademark, trade secret, or any other intellectual property right. Contractor's obligations shall not extend to the combination of any IP Deliverables provided by Contractor with any other product, system, or method, unless the other product, system, or method is (a) provided by Contractor or Contractor's subsidiaries or affiliates; (b) specified by Contractor to work with the IP Deliverables; (c) reasonably required in order to use the IP Deliverables in its intended manner and the infringement could not have been avoided by substituting another reasonably available product, system, or method capable of performing the same function; or (d) is reasonably expected to be used in combination with the IP Deliverables.
5. **GOVERNMENTAL IMMUNITY.** Liability for claims for injuries to persons or property arising from the negligence of Arvada, its departments, boards, commissions, committees, bureaus, offices, employees and officials shall be governed by the provisions of the Colorado Governmental Immunity Act, §§24-10-101, *et seq.*, C.R.S. (CGIA). No term or condition of the Agreement shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections, or other provisions contained in the CGIA.
6. **OPEN RECORD REQUESTS.** Arvada is obligated to comply with the Colorado Open Records Act (C.R.S. §§24-72-200.1 *et seq.*)(CORA), which may require Arvada to disclose all or a portion of communications relating to the Agreement, any transaction under the Agreement, and other related matters. Contractor has been advised to familiarize itself with CORA. Any confidentiality provisions in any contract documents are subject to the provisions of CORA.
7. **PROTECTION OF PERSONAL IDENTIFYING INFORMATION.** In the event the Agreement includes or requires Arvada to disclose to Contractor any Personal Identifying Information as defined in C.R.S. § 24-73-101, Contractor shall comply with the applicable requirements of C.R.S. §§ 24-73-101, *et seq.*, relating to third-party service providers.
8. **NO THIRD PARTY BENEFICIARIES.** The Agreement does not and is not intended to confer any rights or remedies upon any person or entity other than Arvada and Contractor. Enforcement of the Agreement and all related rights and obligations are reserved solely to Arvada and Contractor. Any services or benefits which third parties receive as a result of the Agreement are incidental and do not create any rights for such third parties.
9. **ASSIGNMENT.** Contractor's rights and obligations under the Agreement are personal and may not be transferred or assigned without the prior, written consent of Arvada. Any attempt at assignment or transfer without such consent shall be void. Any assignment or transfer of Contractor's rights and obligations approved by Arvada shall be subject to the provisions of the Agreement. Any provision of an assignment that enlarges any duty, responsibility, or obligation of Arvada, or that limits, curtails, or diminishes any right or privilege of Arvada, without Arvada's express written consent, shall be void.
10. **BINDING EFFECT.** This Agreement shall inure to the benefit of, and be binding upon, the parties, their respective legal representatives, successors, heirs, and assigns.

11. **SURVIVAL.** Any provision of the Agreement that imposes an obligation on a party after the Agreement's termination or expiration shall survive the termination or expiration and shall be enforceable by the other party.
12. **SUBCONTRACTS.** Contractor shall not subcontract any of its responsibilities without Arvada's prior written approval, which will not be unreasonably withheld. Contractor shall submit to Arvada a copy of each such subcontract upon Arvada's request. All subcontracts Contractor enters into in connection with the Agreement shall comply with all applicable federal, state, and local laws and regulations, shall provide that they are governed by the laws of the State of Colorado, and shall be subject to all provisions of the Agreement. Contractor agrees it is fully responsible for subcontractors performing services under the Agreement. Contractor shall be Arvada's sole point of contact regarding the services, including with respect to payment.
13. **INDEPENDENT CONTRACTOR.** Contractor shall perform its duties under the Agreement as an independent contractor and not as an employee. Neither Contractor nor any agent or employee of Contractor shall be deemed to be an agent or employee of Arvada. Contractor shall not have authorization, express or implied, to bind Arvada to any agreement, liability, or understanding, except as expressly set forth herein. **Contractor and its employees and agents are not entitled to unemployment insurance or workers compensation benefits through Arvada and Arvada shall not pay for or otherwise provide such coverage for Contractor or any of its agents or employees. Contractor shall pay when due all applicable employment taxes and income taxes and local head taxes incurred pursuant to the Agreement. Contractor shall: (i) provide and keep in force workers' compensation and unemployment compensation insurance in the amounts required by law; (ii) provide proof thereof when requested by Arvada; and (iii) be solely responsible for its acts and those of its employees and agents.**
14. **LICENSES, PERMITS, AND OTHER AUTHORIZATIONS.** Contractor shall secure, prior to the effective date, and maintain at all times during the term of the Agreement, at its sole expense, all licenses, certifications, permits, and other authorizations required to perform its obligations under the Agreement, and shall ensure that all employees, agents and subcontractors secure and maintain at all times during the term of their employment, agency or subcontract, all license, certifications, permits and other authorizations required to perform their obligations in relation to the Agreement.
15. **STANDARD AND MANNER OF PERFORMANCE.** Contractor shall perform its obligations under the Agreement in accordance with the highest standards of care, skill, and diligence in Contractor's industry, trade, or profession.
16. **TIME OF THE ESSENCE.** Contractor acknowledges and agrees that time is of the essence for this Agreement and that it is an essential term of this Agreement that Contractor maintain a rate of progress in the Services that will result in completion of the Services in accordance with this Agreement. To that end, Contractor agrees to proceed with all due diligence to complete the Services in a timely manner in accordance with this Agreement, and further agrees that failure to complete any of the Services during the Term of this Agreement, or as may be more specifically set forth in an attachment, exhibit, or modification, shall be deemed a breach.
17. **WAIVER OF BREACH.** A waiver by any party to the Agreement of a breach of any Agreement term shall not operate or be construed as a waiver of any subsequent breach by either party.
18. **RIGHT TO TERMINATE.** Arvada shall have the right to terminate, without cause, the Agreement. Any such termination shall not be considered a breach of the Agreement or any extension. In the event Arvada terminates for convenience, Arvada will pay Contractor for requested work performed up until the time of termination, not to exceed the total amount of the contract price agreed upon by Arvada and Contractor.
19. **EXTERNAL TERMS AND CONDITIONS.** Notwithstanding anything to the contrary, Arvada shall not be subject to any provision included in any terms, conditions, or agreements appearing on Contractor's or a subcontractor's website or any provision incorporated into any click-through or online agreements related to the Work unless that provision is specifically referenced in the Agreement.
20. **PROHIBITED TERMS.** Any term included in the Agreement that requires Arvada to indemnify or hold Contractor harmless; requires Arvada to agree to binding arbitration; limits Contractor's liability for damages resulting from death, bodily injury, or damage to tangible property; or that conflicts with this provision in any way shall be void ab initio. Any term included in the Agreement that limits Contractor's liability that is not void under this section shall apply only in excess of any insurance to be maintained under the Agreement, and no insurance policy shall be interpreted as being subject to any limitations of liability of the Agreement.

21. **COMPLIANCE WITH ALL LAWS.** Contractor shall comply with all applicable federal, Colorado and Arvada laws, rules, regulations, policies and procedures in effect or hereafter established, including, without limitation, laws applicable to discrimination and unfair employment practices.
22. **BINDING ARBITRATION PROHIBITED.** Arvada does not agree to binding arbitration by any extra-judicial body or person. Any provision to the contrary shall be null and void.
23. **GOVERNING LAW AND VENUE.** Colorado law, rules, and regulations shall be applied in the interpretation, execution, and enforcement of the Agreement. Any provision included or incorporated herein by reference which conflicts with said laws, rules, and regulations shall be null and void. All suits or actions related to the Agreement shall be filed and proceedings held in the State of Colorado and exclusive venue shall be in Jefferson County.
24. **OWNERSHIP OF WORK PRODUCT.** The originals of all plans, reports, studies, data, or other materials or information relating to the Work that are produced by Contractor shall be delivered to and become the property of Arvada. Contractor may retain copies of any originals; however, no plans, reports, studies, data, or other materials or information relating to the Work shall be released to any person or entity without the prior written consent of Arvada. Nothing in this clause is intended to affect Contractor's right to use generic know-how learned in the course of providing services under the Agreement for the future benefit of Arvada or others.
25. **SOFTWARE PIRACY PROHIBITION.** Arvada or other public funds payable under the Agreement shall not be used for the acquisition, operation, or maintenance of computer software in violation of federal copyright laws or applicable licensing restrictions. Contractor hereby certifies and warrants that, during the term of the Agreement and any extensions, Contractor has and shall maintain in place appropriate systems and controls to prevent such improper use of public funds. If Arvada determines that Contractor is in violation of this provision, Arvada may exercise any remedy available at law or in equity or under the Agreement, including, without limitation, immediate termination of the Agreement and any remedy consistent with federal copyright laws or applicable licensing restrictions.

SPECIAL TERMS AND CONDITIONS

1. PRICES FIXED AND FIRM FOR THE TERM OF THE CONTRACT:

Prices proposed by the vendor shall remain fixed and firm during the term of the contract; however, the vendor may offer incentive discounts from the fixed price. This contract shall commence upon the date specified in the Contract or Purchase Order and shall remain in effect until such time as all items/services purchased in conjunction with this solicitation have been delivered and accepted by the City's authorized representative. It shall be understood and agreed that any warranty period which exceeds this term shall remain in full force for the duration of the warranty period.

2. OPTION TO RENEW FOR SUBSEQUENT YEARS

The prices or discounts quoted in this Solicitation shall prevail for one year from the effective date of the contract, at which time the City shall have the option to renew the contract for 4 additional one year periods; provided that the vendor provided satisfactory performance during the contract period. Continuation of the contract beyond the initial period is a City prerogative and not a right of the vendor. Unless otherwise notified in writing, the option period shall become automatic at the end of the original period.

During the option period, the City will consider an adjustment to the pricing structure. For consideration, the vendor must document that it was subject to a price adjustment by the product manufacturer or a direct wholesale supplier. Any price adjustments shall not exceed the amount being passed on.

3. CONTENTS OF OFFER. Vendors are required to submit offers with the following conditions:

- 1) Vendors shall make all investigations necessary to inform themselves of the facilities affected by the delivery of products and services required by the Solicitation.
- 2) Any official interpretation of the Solicitation may only be issued by an authorized agent of the City. The City shall not be responsible for other interpretations offered by employees not authorized.
- 3) The City shall issue Addenda if substantial changes are required which may impact the content and submission of Offers. A copy of such addenda will be publicly posted with the original RFP posting.
- 4) The apparent silence or omissions within this Solicitation regarding a detailed description of the materials or services shall be interpreted to mean that only the best commercial practices are to prevail and that only materials and workmanship of first quality are to be provided.

4. CLARIFICATION AND MODIFICATIONS. The contract resulting from this solicitation will be subject to the Solicitation materials, City Ordinance, State and Federal Statutes. When conflicts occur, the highest authority shall prevail. Vendors are required to indicate any variances to the terms, conditions, requirements and specifications of this Solicitation; no matter how slight. If variations are not stated in the vendor's Offer, it shall be agreed that the vendor's Offer fully complies with all conditions identified in this Solicitation.

5. ELIGIBILITY OF VENDORS: MUST BE ENGAGED IN SUPPLYING PRODUCTS OR SERVICES RENDERED.

Offers will only be considered from firms which have been engaged in the business of manufacturing or distributing the goods and/or performing services described in this Solicitation. Vendors must be able to produce evidence that they have an established satisfactory

record of performance for at least two (2) years and have sufficient finances and structure to ensure that they can satisfactorily execute the Contract requirements, as determined by authorities of the City. The City reserves the right, before awarding the contract, to require a vendor to submit evidence of its qualifications including, but not limited to, financial, technical and other qualifications, as well as past performance with the City, for consideration in making the award in the best interest of the City.

6. CONFIDENTIAL DOCUMENTS

Vendors may designate specific pages or sections within their submission as trade secret or confidential commercial information or as otherwise protected by law ("Confidential Information"). Documents and data that are considered Confidential Information shall be clearly marked as such and separated from the rest of the solicitation submission documents. Comingling is not acceptable. The City does not favor blanket assertions of Confidential Information. Please note that blanket assertions that merely classify and/or broadly claim information is confidential are insufficient as a matter of law. See, *International Brotherhood of Electrical Workers Local 68 v. Denver Metropolitan Major League Baseball Stadium District*, 880 P.2d 160 (Colo.App. 1994). Any information that will be included in any resulting contract cannot be considered Confidential. Under no circumstances may submission pricing information be considered Confidential. In the event a formal contract is entered into with the City and a portion of the Proposal/Response carries a designation indicating the Vendor believes it is Confidential Information, then the City agrees that it will use its best efforts to forward any request for the disclosure of the Confidential Information to the Vendor. By its submission of the Proposal/Response, Vendor agrees to promptly respond to the request for disclosure with any objections and reasons therefor in accordance with the Colorado Open Records Act C.R.S. §§24-72-101 *et seq.* and any other applicable law. Further, Vendor agrees to assume the obligation to defend, hold harmless, and indemnify the City in any legal proceeding that arises from non-disclosure of documents or data pursuant to the Vendor's objection.

7. COOPERATIVE PURCHASING

The City of Arvada encourages and participates in cooperative purchasing endeavors undertaken by or on behalf of other governmental agencies including the Multiple Assembly of Procurement Officials (MAPO) and the Cooperative Educational Purchasing Council (CEPC).

We hereby request that any member of MAPO/CEPC be permitted to avail itself of this contract and purchase, as specified by the contract resulting from this RFP, at the contract prices established therein. Each governmental entity would establish its own contract, issue its own orders, be invoiced directly, make its own payments and issue its own exemption certificates as required. It is understood and agreed that the City of Arvada is not a legally binding party to any contractual agreement made between another governmental entity and the successful vendor as a result of this solicitation. The City shall not be liable for any costs or damages incurred by any other entity.

8. MODIFICATIONS TO EXISTING CONTRACT

Terms and conditions may be added, modified, and deleted upon mutual agreement between authorized agents of the City and the vendor provided that such terms and conditions remain within the scope and original intent of the Solicitation. Said terms and conditions may include, but are not limited to, additions or deletions of service levels and/or commodities, and increases or decreases in the time limits for an existing contract. Any and all modifications must be signed by authorized agents of the City and the vendor prior to the enactment of such modifications.

9. DELIVERY

Quoted prices and deliveries are to be FOB Destination freight prepaid and shall require inside delivery unless otherwise specified in the Special Conditions of this Solicitation. Title and risk of loss shall pass to the City upon inspection and acceptance by the City at its designated point of delivery; unless otherwise specified in the Special Conditions.

10. CONDITION OF MATERIALS AND PACKAGING

All materials and products supplied by the vendor in conjunction with this solicitation shall be new (unless otherwise specified in the Special Conditions), warranted, free from defects, and consistent with industry standards.

The Solicitation price shall include commercial packaging. The materials and products shall be delivered to the City in excellent condition for inspection by City representatives. If the product(s) is damaged or a number of items or components are missing during shipment, the vendor shall either replace the damaged items (if shipped by the vendor) or be responsible for filing, processing and collecting all damage claims (if shipped by a contractor of the shipper). In the event that any of the materials and products supplied to the City by the vendor are found to be defective or do not conform to the specifications, the City reserves the right to return the product to the vendor at no cost to the City; either as an exchange for suitable merchandise or for full credit.

INSURANCE REQUIREMENTS

The following listed insurance requirements shall be carried by the selected vendor for the entirety of the contract. Applicable requirements for this solicitation are identified by completed check boxes.

1. ☒ **Commercial General Liability**, written on an occurrence form, for limits not less than \$1,000,000 for bodily injury and property damage for each occurrence and not less than \$2,000,000 aggregate. Coverage shall include premises and operations liability, blanket contractual, broad form property damage, products and completed operations and personal injury endorsements.
2. ☒ **Workers' Compensation and Employers Liability** as required by statute. Employers Liability coverage is to be carried for a minimum limit of \$1,000,000 each accident/disease and \$2,000,000 aggregate.
3. ☒ **Automobile Liability** for limits not less than \$1,000,000 combined single limit for bodily injury and property damage for each occurrence. Coverage shall include owned, non-owned and hired automobiles.

4. ☐ **Umbrella Liability** of \$, following form to the Commercial General Liability.
5. ☐ **Builders Risk or Course of Construction** Purchased by contractor to cover physical damage to property in construction or rehab. Contractors will ensure that City and subcontractors will be covered as additional insureds, excluding their own machinery, tools and equipment.
6. ☐ **Professional Liability** Professional Liability insurance in an amount of not less than One Million Dollars and No cents (\$1,000,000.00) per occurrence, covering the professional work contemplated under this proposal. The coverage shall have an extended reporting period of three (3) years following the date of substantial completion of the work for reporting of claims.
7. ☐ **Pollution Legal Liability Insurance** for limits not less than \$1,000,000 per occurrence (or claims made) and not less than \$1,000,000 aggregate for bodily Injury, personal Injury and property Damage.
8. ☐ **Privacy/Network/Cyber Liability Insurance** for limits not less than \$1,000,000 for any firm providing product or services associated with IT, software, communication, or network.

Additional Insurance Requirements:

- Contractor will be required to, at its own expense, keep in full force and effect during the term of the Agreement, and during the term of any extension or amendment of the Agreement, insurance reasonably sufficient to insure against the liability assumed by Contractor pursuant to the provisions of the solicitation sent by the City of Arvada or as determined by the City of Arvada Risk Manager.
- Issuance of a Purchase Order/Contract is contingent upon the receipt of the insurance documents. Work shall not commence before this requirement is met. If the vendor fails to submit the required insurance documents within fifteen (15) calendar days after notice to submit such policies is given to the vendor by a City representative, the vendor may be in default of the Award.
- Except for Workers Compensation, Employer's Liability insurance, Automobile Liability and Professional Liability insurance, the City of Arvada must be endorsed as an additional insured on a Certificate of Insurance.
- All coverage must be written with carriers holding a minimum A.M. Best rating of A-VII, and authorized to do business in Colorado. Coverage shall be primary, and any insurance held by the City of Arvada is excess and non-contributory.
- The City, through its Risk Manager, reserves the right to require additional insurance coverage and other requirements.

ADMINISTRATIVE INFORMATION

1. PURPOSE - TO OBTAIN PROPOSALS:

The purpose of this Solicitation is to provide qualified vendors with sufficient information regarding the City's needs in order to adequately prepare and submit a Proposal.

Proposals must be received by the date and time established in this solicitation. Once the deadline has passed, the Proposals will not be accepted and will be returned to the vendor.

Proposals are proprietary working documents offered by prospective vendors and, as such, are not subject to public inspections until an official award is made.

2. PREPARATION AND SUBMISSION

Offers will be prepared as follow:

- 1) A blank shall be construed as "No Bid/not offered". Where there is a discrepancy between the unit price and the extension of prices, the unit price shall prevail.
- 2) Vendors will not knowingly participate in solicitations where there exists a conflict of interest with their firm and a member of City staff or their immediate family.
- 3) Solicitations and addenda are available at WWW.BIDNETDIRECT.COM. Registration is available to receive email notification of new solicitations, addenda and communications.

4) Vendors who qualify their Offers by requiring alternate contractual terms and conditions as a stipulation for contract award, must include such alternate terms and conditions in its Offer. The City reserves the right to declare the vendor's Offer as non-responsive if any of these alternate terms and conditions are in conflict with the City's terms and conditions, or its best interest. Once Offers have been opened, the City shall not consider any subsequent submissions of alternate terms and conditions.

3. MODIFICATION OR WITHDRAWAL OF OFFERS

Modifications to Offers- Changes to the Offer after the submission deadline shall be allowed only when the vendor can show convincing evidence that an unintentional factual mistake was made. Modification requests must be made in writing. Any modification submitted to the City must have the vendor's name, address, Solicitation Number and title included.

Withdrawal of Offers- Offers may not be withdrawn after the deadline for the Solicitation for a period of ninety (90) calendar days. If an Offer is withdrawn by the vendor during this ninety (90) day period, the City may, at its option, suspend the vendor and may not accept any Offer from the vendor for a six (6) month period following the withdrawal.

REJECTION OF OFFERS

- A. The City may reject an offer, in whole or in part, for reasons including, but not be limited to:
 - 1) The vendor misstates or conceals any material fact in its Proposal;
 - 2) The vendor's Offer does not strictly conform to the law or requirements of the Solicitation;
 - 3) The Offer expressly requires or implies a conditional award that conflicts with the method of award stipulated in the Special Conditions;
 - 4) The Offer does not include documents which are required for submission with the Offer; or
 - 5) The Offer has not been executed by the vendor through an authorized signature.
- B. The City may, at its sole and absolute discretion:
 - 1) Reject all or parts of Offers submitted by prospective vendors;
 - 2) Re-advertise this Solicitation;
 - 3) Postpone or cancel the Solicitation;
 - 4) An Offer may not be accepted from, nor any contract be awarded to, any person or firm which
 - a) is in arrears to the City for any debt or Contract, or is a defaulter as surety for any obligation to the City.
 - b) has failed to perform faithfully any previous contract with the City, State or Federal governmental for a minimum period of one (1) year after this previous Contract was terminated for cause.
 - c) has pending litigation against the City on the date and time that the Solicitation is due.

BEST VALUE AGENCY

The City of Arvada is a best value agency. The intent of this solicitation is to award to the lowest responsive, responsible proposer that meets or exceeds the specifications and requirements incorporated in these solicitation documents. It is solely incumbent on the staff of the City of Arvada to conduct due diligence to determine best value prior to award.

METHOD OF AWARD - BEST EVALUATIVE SCORE BASED ON WRITTEN PROPOSAL:

It is the intent of the City to award a contract to the vendor(s) who receives the highest score from the City's RFP Evaluation Committee.

The Committee will score written Proposals by reviewing documentation submitted by the vendors. Evaluation will be based on the following criteria:

- 1) Firm Capabilities
- 2) Project Team Experience
- 2) Project Approach
- 3) Implementation, or installation, plan
- 4) Pricing per all 4 scopes, and total cost of ownership to support best value for services and/or products provided.
- 5) Proposal based on all 4 scopes of work
- 6) Performance Measures included in the proposal.

Exceptions to specifications or terms and conditions may result in submission being deemed non-responsive.

PRESENTATIONS:

A second phase MAY be incorporated, in which the Committee will invite a limited number of vendors who received high scores during phase one, to provide an oral presentation. The evaluative score from the oral presentations will determine the top rated vendor(s).

Overall Scope

The scope of work for this project is broken up into four (4) separate projects. The qualified vendors are invited to respond to all four projects or a combination of projects. Please be sure to identify which project you are responding to. The first scope given is for the purchase of **Fiber cable and accessories**. The second scope is for the **Installation of the Fiber cable** that is being purchased. The third scope listed is for **Splicing services and ongoing repairs** of the fiber cable once it has been purchased and pulled. The fourth and final scope listed is for **Fiber Conduit Boring**.

I. SCOPE OF WORK: Fiber Purchase

A. PURPOSE - TO OBTAIN PROPOSALS:

The purpose of this Solicitation is to provide qualified vendors with sufficient information regarding the City's needs in order to adequately prepare and submit a Proposal for Outside Plant (OSP) fiber cable and accessories.

B. BACKGROUND:

The City is seeking to contract with a qualified Fiber Cable Supplier to provide fiber optic cable, conduit and related accessories (Splice Trays, Vaults, Fan Out Kits, Splice Closures, Patch Panels, etc.) for the City's build out of an Outside Plant (OSP) city wide communications network. This network will play a critical role in helping Arvada and its citizens address challenges in safety, mobility, economic vitality, and provide for future communications needs. As currently planned the network will require over 60 miles of various strand counts of fiber cables and will be deployed over a number of years. The City of Arvada is also collaborating with the Jefferson County School District and the Arvada Fire Protection District on this build out, so there's the opportunity of supplying a great quantity of fiber cable. Currently all cable will be installed/pulled through 2" conduit.

C. REQUIREMENTS:

Please include an overview of how your firm can meet and the list of specifications list below:

1. Only qualified personnel familiar with installation of (OSP& ISP) fiber optic cabling will perform the work.
2. Fiber optic cabling will be handled according to the procedures specified in the manufacturers or other relevant documents.
3. Reels of fiber optic cable will be handled using appropriate lifting equipment and trailers.
4. Fiber optic cable will only be pulled by the strength members built into the cable.
5. Cable will not be pulled by the jacket unless approved by the cable manufacturer.
6. Proper equipment will be used to prevent cable twisting during the pull, such as swivel and a quadrant block.
7. Maximum pulling tension will not be exceeded 600 PSI or cable manufacture spec. Must use a Tugger/Puller with PSI gauge for pulling of fiber.
8. Lubricants used will meet the guidelines of the cable manufacture.
9. Bend radius of the fiber optic cable will not be exceeded.
10. Slack coils will be created without violating the minimum recommended slack coil diameter per industry standard or cable manufacturer spec.
11. Contractor will have the ability to install using different methods where necessary - Single pull, Back-feed, Forward Feed or intermediate assist.
12. Contractor will assist with pre-installation planning.
13. Contractor will have process of acquiring appropriate permits.
14. Be able to troubleshoot & proof (rod and rope) existing conduit that has been bored into or has couplings that prevent the fiber from being pulled.

Standard	Designation	Description
ITU-T	G.652D/G.657A1	extended wavelength band
IEC 60793-2-50	B1.3	extended wavelength band
TIA-492-CAAB	Type IVa	dispersion-unshifted with reduced water peak

- The Optical Fiber shall be referenced in the national and international standards for applications utilizing single-mode fiber described in the table below.

Standard	Designation	Description
IEEE 802.3	Ethernet for Subscriber Access Networks. (Includes both PON and point to point applications)	IEC 60793-2-50 B1.3
ITU-G.983.3	Broadband Passive Optical Network (BPON)	ITU-T G.652D
ITU-G.984.2	Gigabit Capable Passive Optical Network (GPON)	ITU-T G.652D

Temperature

- Temperature ranges for cables must meet paragraph 1.1.3 of ANSI/ICEA S-87-640, Standard for Optical Fiber Outside Plant Communications Cable

Tensile rating

- Indicate the standard installation tensile rating for each cable

Length Markings

- Each length of cable shall be continuously and sequentially numbered with length

Packaging, Packing, and Package Marking

- Cable may be in coils, wound on reels, or supplied in other suitable Configurations.
- Each package shall contain only one continuous length of cable.
- Coils and other non-reeled packaging configurations may be individually wrapped in protective wrappers, or packed in a carton.
- Cable packaging shall be wrapped or in a carton that is appropriately protected during shipping and storage.
- When cable is shipped on reels, the reels shall be constructed to prevent damage to the cable during shipment, storage, and installation.
- The diameter of the reel drum shall be large enough to prevent any damage to the cable during reeling or unreeling and shall be equal to or greater than the minimum bending diameter of the cable to be wound upon it.
- The inner and outer end of cable on reels shall be securely fastened to prevent the cable from coming loose in transit.
- If on-reel testing is required, there shall be agreement between the manufacturer and the user as to the length and configuration of the inner cable end.
- Each reel shall be marked to indicate the direction in which it should be rolled to prevent loosening of the cable on the reel.

Cable is fully color coded

- Each fiber needs to be distinguishable from every other fiber. Colored tubes, binders, threads, strippings, or markings need to provide fiber group identification.
 - Follow **TIA-598-C** Optical Fiber Cable Color Coding

Testing

- Unless otherwise specified, testing shall be performed at the standard conditions defined in TIA/EIA-455

Water Protection

- Cable must provide protection from water or moisture

The Optical Fiber in finished cable form shall meet the transmission specifications in all wavelength bands listed in the tables below.

Attenuation

The fiber shall be classified as a “zero water peak” fiber, meeting the attenuation specifications below:

Wavelength (nm)	Attenuation (dB/km)
	Maximum
1310	0.35
1383	0.31
1490	0.27
1550	0.25
1625	0.27

Attenuation vs. Wavelength Uniformity

Range (nm)	Reference (nm) I	a
1285-1330	1310	0.03
1360-1480	1385	0.04
1525-1575	1550	0.02
1460-1625	1550	0.04

- The attenuation in a given wavelength range does not exceed the attenuation of the reference wavelength (I) by more than the value a. This data is in fiber form

Change in Attenuation at Water Peak

- The optical fiber attenuation coefficient at the OH- absorption peak (1383 + 3nm) after exposure to hydrogen shall be <0.31 dB/km and <0.29 dB/km typically. This test simulates long-term hydrogen aging in installed cables. The test shall be performed in fiber form.

Optical Fiber (not in a cable) Macrobending Attenuation:

Deployment Condition	Wavelength	Induced Attenuation
1 turn, 10 mm radius mandrel	1550 nm	≤ 0.075 dB
	1625 nm	≤ 1.5 dB
10 turns on a 15 mm radius mandrel	1550 nm	≤ 0.25 dB
	1625 nm	≤ 1.0 dB
100 turns, 30 mm radius mandrel	1550 nm	≤ 0.05 dB
	1625 nm	≤ 0.05 dB

Point Discontinuities in Cable

- No attenuation discontinuities greater than 0.10 dB at 1310 nm or 1550 nm shall be present in the finished cable

Chromatic Dispersion:

Zero dispersion wavelength (λ_0)	1302-1322 nm
The maximum dispersion slope (S_0) at λ_0	0.090 ps/nm ² -km
Typical dispersion slope	0.087 ps/nm ² -km
Dispersion Max at 1310 nm	3.5 ps/nm ² -km
Dispersion Max at 1550 nm	18 ps/nm ² -km
Dispersion Max at 1625 nm	22 ps/nm ² -km

Mode Field Diameter (MFD):

at 1310 nm	9.2 $\pm$ 0.4 μ m
at 1550 nm	10.4 $\pm$ 0.5 μ m

Cable Cutoff Wavelength

Cable cutoff wavelength (λ_c)	≤ 1260 nm
---	----------------

Geometry

Glass Geometry	
Cladding Diameter	125.0 $\pm$ 0.7 mm
Core/Clad Concentricity Error	≤ 0.5 mm, <0.2 mm typically
Cladding Non-circularity	$\leq 0.70\%$
Typical Splice Loss (profile alignment)	<0.02 dB
Coating Geometry	
Coating Diameter (colored)	245 – 260 mm
Coating/Cladding Concentricity Error	≤ 12 mm

Polarization Mode Dispersion (PMD)

Fiber PMD Link Design Value (LDV) ²	≤ 0.1 ps/(km) ^{1/2}
Maximum Individual Fiber	≤ 0.1 ps/(km) ^{1/2}
Typical Fiber LMC PMD	≤ 0.02 ps/(km) ^{1/2}

Below is a suggested but not exhaustive list of Fiber and accessory products this City may use, please list what you're able to provide along with pricing rates/discounts. (list discounts based on quantity if applicable)

1. List of Single Mode Fiber cables available in configurations from 12 to 432 strands Patch Panels
2. Splice trays
3. Fan out kits
4. Jumper cables
5. Etc.

II. SCOPE OF WORK: Fiber Pulling

A. PURPOSE - TO OBTAIN PROPOSALS:

The purpose of this Solicitation is to provide qualified vendors with sufficient information regarding the City's (AFON) needs in order to adequately prepare and submit a Proposal for Outside Plant (OSP) fiber cable installation.

B. BACKGROUND:

The City (AFON) is seeking to contract with a qualified vendor to pull fiber through underground conduit for the City's build out of an Outside Plant (OSP) city wide communications network. This network will play a critical role in helping Arvada and its citizens address challenges in safety, mobility, economic vitality, and provide for future communications needs. As currently planned the network will be require about 60+ miles of fiber cable and will be deployed over a number of years. The City of Arvada is also collaborating with the Jefferson County School District and the Arvada Fire Protection District on this build out, so there's the opportunity of installing a significantly greater amount of fiber cable. Currently all cable will be pulled primarily through 2" conduit with vaults located about every 800 feet but in some places 1000'.

Since this is a long term multi-year project, various cable pulls and lengths will be needed over time. The city is looking for a long term partner to provide pricing rates for outside plant (OSP) cable pulls for the duration of this project or 5 years.

C. REQUIREMENTS:

Please include an overview of how your firm can meet and the list of specifications list below:

1. Only qualified personnel familiar with installation of (OSP) fiber optic cabling will perform the work.
2. Fiber optic cabling will be handled according to the procedures specified by the manufacturers or other relevant documents.
3. Spools of fiber optic cable will be handled using appropriate lifting equipment.
4. Fiber optic cable will only be pulled by the designed strength members built into the cable. Cable will not be pulled by the jacket unless approved by the cable manufacturer.
5. Proper equipment will be used to prevent cable twisting during the pull.
6. Maximum pulling tension will not be exceeded. Recommend use of automated puller with tension control.
7. Lubricants used will meet the guidelines of the cable manufacture.
8. Bend radius of the fiber optic cable will not be exceeded.
9. Slack coils will be created without violating the minimum recommended slack coil diameter.
10. Ability to install using different methods where necessary Single pull, Backfeed, Forward Feed or intermediate assist.
11. Assist with pre-installation planning
12. Process of acquiring appropriate permits
13. Be able to troubleshoot conduit that has been bored into or has couplings that prevent the fiber from being pulled

Please provide pricing for list below, if applicable:

1. Labor – include labor to perform required installation.
2. Travel/Mobilization – Travel/Mobilization
3. Expenses – daily per diem, etc.
4. Miscellaneous expenses

III. SCOPE OF WORK: Fiber Splicing & Repair

A. PURPOSE - TO OBTAIN PROPOSALS:

The purpose of this Solicitation is to provide qualified vendors with sufficient information regarding the City's needs in order to adequately prepare and submit a Proposal for Fiber Cable Splicing and Maintenance Break/Fix.

B. BACKGROUND:

The City is seeking to contract with a qualified vendor that can provide ongoing Fiber Cable Splicing and Maintenance Break/Fix services for our Outside Plant (OSP) city wide fiber communications network. This network plays a critical role in helping Arvada and its citizens address challenges in safety, mobility, economic vitality, and provide for future communications needs. When the network is completed we will have about 60+ miles of Single Mode fiber cable of various configurations. After the completion of the fiber network the City will also need long term Break/Fix service.

Other pertinent information: This network is being built with collaboration from the Jefferson County School District and the Arvada Fire Protection District and they may have future needs as well. Currently all cable will be pulled through 2" conduits with vaults locate about every 800 feet.

C. REQUIREMENTS:

Please include an overview of how your firm would plan on handling fiber splicing, maintenance and repair practices including but not limited to:

1. Routine maintenance and inspection
2. Coordinating scheduled maintenance windows and scheduling practices for planned outages.
3. Handling of unscheduled outages - Night Cuts, Emergency Restoration
4. Provide details of your different service level agreement and what alternative service levels may be available at additional cost
5. What agreements your firm may already have in place with applicable utilities and utility contractors or other agencies for emergency restoration and how that may impact services for the City of Arvada
6. Process for repair of fiber breaks
7. Process for replacement of damaged fiber
8. Process for helping notify customer regarding maintenance and repair time frames
9. Requirements for splicing in the field, splicing in building
10. Requirements the city should be aware of for Mid-Sheath splicing of various cable types - Loose tube, Mircofiber, etc.
11. Describe the type of fiber optic splicing services that can be provided for (Single fiber and/or Ribbon Splicing, Ribbon in Loose tube cable)
12. Details of warranty for the work performed
13. Other services that your firm provides that may be of value to the City in terms of its OSP build out.
14. List staff and years of experience and qualifications and familiarity with BICSI, EIA, TIA or NEC standards

D. Pricing

- (a) Labor – include labor to perform splicing services that include testing and documentation
- (b) After hours/weekend work
- (c) Travel/Mobilization – Travel/Mobilization
- (d) Expenses – daily per diem, etc.
- (e) OTDR, attenuation test

IV. SCOPE OF WORK: Fiber Boring

A. BACKGROUND

The City of Arvada completed a Conduit Master plan in early 2017. The Master Plan identified approximately 55 miles of conduit along with an additional 11 miles to connect anchor institutions such as schools and fire stations.

The city has been working on this project for the last 5 years with about 12 miles still to complete on the Master plan. Also the city will be looking to complete redundancy routes along with laterals to numerous city assets.

B. SCOPE OF WORK

The contractor will handle all aspects of underground outside plant (OSP) construction. This includes but is not limited to directional boring, potholing, trenching, conduit installation for the GAP locations identified by the city.

Other work may include repairing existing conduit if necessary, installation of pull boxes both new and replacement if found undersized or damaged. Distance between Vaults not to exceed over 1000' unless approved by the City of Arvada.

C. PERMITS

The contractor shall pull city permits, however there is no fee for permits in City ROW's & utility easements but Potholing & Traffic Control Plan where needed.

Contractor shall pull appropriate permits for work done in CDOT or Railroad Right-Of-Way's.

Contractor shall provide for the furnishing of materials.

D. CONDUIT

Conduit shall be HDPE (High-Density Polyethylene), specially constructed for the purpose of placing and enclosing fiber optic cable.

1. Minimum size shall be a 2" pipe.
2. All conduits or pipes terminating in buildings, vaults, handholes, or manholes shall be sealed around the outside of the pipe.

E. HANDHOLES/VAULTS

- All handholes shall be constructed of reinforced fiberglass polymer material
- The spacing between handholes shall not exceed 1,000 unless approved by

- the City of Arvada.
- All handholes must have the "City of Arvada" placard/stamp on the handhole lid
- Bottom of handholes will be covered with chicken wire to keep rodents out
- and then filled with 6 inches of pea gravel.
- 20K rated Hand-hole/Vault w/2 security bolts
- Type/Size: 18"d X 36 X 24 or 18"d X 48" X 30"
- Mule tape, locate wire.
- Contractor shall provide a cost breakdown for all materials.

REQUIRED VENDOR SUBMITTAL FORM

SUBMITTED BY:

Company Name: _____

Contact Names: Sales/Customer Service _____

Address: _____

Phone: (_____) _____ Email(s): _____

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the vendor;
- He/she has read all Terms and Conditions and technical specifications made available in conjunction with this solicitation and fully accepts and acknowledges this offer is consistent with the specifications and terms and conditions, unless specific variations have been clearly and expressly listed in the offer.
- The Offer is in all respects fair, without outside collusion or otherwise illegal action.

By: _____
Signature of Authorized Agent Date FEIN

Typed/Printed Name of Agent Title of Agent Agent email

Typed/Printed Name of Witness Title of Witness Witness email

PAYMENT TERMS: If the vendor does not accept a percentage discount, the City standard is net thirty (30) days after the date that the City receives an accurate invoice and has accepted the product or service. Payment is the date of the check mailing or date of the credit card transaction.

Discount: ____% ____ Days, Net: 30 Days, Accept Visa without additional fee? _____

VARIATIONS: The vendor shall identify all variations and exceptions to any RFP documents. Submittal of a Vendor Contract is considered excessive in Variations and may be cause for determining that the Bid/Offer is non-responsive and ineligible for award. For each variation listed, reference the applicable section of the solicitation document as per the example below. If no variations are listed here, it is understood that the vendor's Offer fully complies with all terms and conditions. Attach additional Variation sheets in the same format as below after starting the first three on this page.

Page #: _____ Item # or Section: _____

Variance _____

Page #: _____ Item # or Section: _____

Variance _____

Page #: _____ Item # or Section: _____

Variance _____

SUBMITTAL INSTRUCTIONS:

Proposals shall be submitted in the order listed below with each section clearly identified.

- ☐ Submit ON-LINE at BidnetDirect.com
- ☐ Cover & Executive Summary.
- ☐ Detail Firm's and employees' Capabilities, Experience, Licensing, and Compliance Status.
- ☐ Details of Proposal – Proposed products & services, implementation timeline and warranties.
- ☐ Completed City Submittal Forms including this sheet and all other attachments specifically requested.
- ☐ Pricing – All fee and costs associated with the proposal.
- ☐ Performance Measures Form, when an applicable service.
- ☐ Insurance – Checking this box accepts that the insurance requirements listed by the City are acceptable unless listed in the variations on the previous page.
- ☐ CONFIDENTIAL information, if any, MUST be stamped as such on each page and submitted separately.
- ☐ Please initial to acknowledge Addenda, if any, have been considered in your proposal:
#1 _____ #2 _____ #3 _____

REFERENCES:

- ☐ Check here if Firm's standard reference sheet is attached, otherwise, use the space below.

Name: _____ Contact Person: _____

Address: _____

Telephone No: _____ Email: _____

Describe type of work/service performed or items supplied: _____

Name: _____ Contact Person: _____

Address: _____

Telephone No: _____ Email: _____

Describe type of work/service performed or items supplied: _____

Name: _____ Contact Person: _____

Address: _____

Telephone No: _____ Email: _____

Describe type of work/service performed or items supplied: _____

PERFORMANCE MEASURES FORM INSTRUCTIONS:

The City has incorporated Performance Management into its organizational culture. When vendors submit offers to the

City in response to solicitations for **Services** (not associated with the primary purchase of goods, supplies, or software), they shall identify the methods and goals by which they will monitor and report their performance providing those services to the City. Vendor's performance shall be documented as to (a) Price/Cost, (b) Punctuality/Responsiveness (c) Quality/Reliability, and (d) Sustainability/or Innovation.

1. Vendor will define 1-2 measures for (a) Price/Cost, (b) Punctuality/Responsiveness (c) Quality/Reliability, and (d) Sustainability/or Innovation, that follow S.M.A.R.T goals: Specific, Measurable, Achievable, Relevant, and Timely, per category.

2. The awarded vendor will self-score their defined metrics within a score card emailed from purchasing 2 months prior to contract renewal. The department will review the vendor's self-scored measures.

SERVICES means: the furnishing of labor, time, effort, maintenance, etc., by a vendor/contractor/consultant, with an initial contract amount of more than \$15,000.

(a) Price/Cost

Example Measure: Consultant will submit detailed invoices substantiating amounts requested.

1. _____
2. _____

(b) Punctuality/Responsiveness

Example Measure: Reporting of project status will occur monthly with the City and consultant's Project Manager.

1. _____
2. _____

(c) Quality/Reliability

Example Measure: Revisions are drafted within two weeks, and no more than 3 revisions prior to final draft.

1. _____
2. _____

(d) Sustainability and/or Innovation

Example Measure: Digital reports delivered to the City 95% of the time will to reduce the use of paper.

1. _____
2. _____

Performance measures will be queried for every year of the contract. Performance measures reporting will partially inform re-contracting with or renewing a contract with a vendor.

Questions & Answers - 1

Solicitation

22-PW-010 - Telecommunications Fiber conduit boring, pull, splice and repairs

Buying Organization

City of Arvada

No	Question/Answer	Question Date
Q5	Question: On Reel Testing The 8th bullet states: "If on-reel testing is required,". Please clarify if on-reel testing is required by the vendor. Answer: Yes, the city requires that all reels of fiber purchased by the city to be tested.	11/02/2022
Q7	Question: Clarify quantity Permits Please clarify the quantity of permits required and how the City will reimburse vendor for payment of non-City permit fees (county, CDOT, agricultural ditch, etc.). Should vendor pay the permit fees and invoice the City a cost + % fee? Or will City pay fee directly to the permitting jurisdiction? Answer: Any job will require a city permit, the process is very easy as long as all your paperwork is up to date. These are no cost to the contractor. If a permit needs to be pulled through CDOT or the county we ask that the cost of the permit be on the invoice for that specific job. The same for a TCP, materials used etc.	11/02/2022
Q8	Question: New Routes Who will design the new routes to be constructed? Answer: The Community Connectivity Manager (CCM) chooses the routes that still need to be constructed. He usually supplies a map with direction of bores, handhold locations and what utilities need to be potholed. The CCM also will work with the vendor/contractor on what path might work better. We do have flexibility and also look at what other city assets in the area that we might be able to connect to.	11/02/2022
Q9	Question: Clarification of Quantities Please clarify the approximate quantity of new 2" conduit that will be constructed. Answer: For 2023, we hope to install just over two miles of conduit.	11/02/2022
Q11	Question: Sample Contract Please submit a sample agreement that the awarded vendor will execute. Our legal department must review and approve or submit alternate legal terms and conditions with the proposal. Answer: The City has determined that we should not include sample contracts with RFP's because the contract terms (other than our general terms and conditions) may change as the parties negotiate so the final contract ends up looking much different than what was included with the RFP. Again, the General Terms and Conditions are included in the RFP. If alternatives are submitted with the proposal, then that will effect your score for evaluation and award.	11/07/2022
Q12	Question: Bid Bond requirment Is a bid bond required with the proposal? Answer: A Bid bond is not required.	11/07/2022

No	Question/Answer	Question Date
Q13	Question: Performance & Payment Bond Requirement Is a performance & Payment bond required by the awarded vendor? Answer: P&P bonds are not required for the RFP.	11/07/2022
Q14	Question: Contract award for a # of years The statement "As currently planned the network will require over 60 miles of various strand count of fiber cables and will be deployed over a number of years" conflicts with language in the Special Terms and Conditions, items 1 and 2, which states that "prices proposed by the vendor shall remain fixed and firm during the term of the contract" and "shall prevail for one year from the effective date of the contract". Please resolve this contradiction and clarify how the vendor is to price work in years 2, 3, 4, etc. Answer: The pricing submitted for this proposal should be for a 1 year contract, with the option of 4 annual renewals. Any changes can be discussed upon contract renewal time - around 60-90 days prior to expiration of initial contract.	11/07/2022
Q15	Question: extend due date? The bid release date says 10/25, however it was not officially released on BidNet until 11/01. Would the City consider extending the deadline by one week? Answer: At this time we will not be extending the deadline. The Bid was released and posted to BidNet on 10/25/22. However, the supplier account on BidNet for this vendor was not active at that time/date. The account was renewed and then the vendor received the notice on 11/1/2022.	11/07/2022

Exhibit B

**AN AGREEMENT BETWEEN THE CITY OF ARVADA
AND FRONTIER ENVIRONMENTAL SERVICES, LLC FOR
GOODS AND SERVICES RELATING TO BORING
CONDUIT AND FIBER PULLING IN AN AMOUNT NOT
TO EXCEED \$500,000.00**



FRONTIER

ENVIRONMENTAL SERVICES

5350 Vivian Street, Unit B, Arvada, CO 80002 • 303.234.9350 • frontierenvironmental.net

November 10, 2022

Ms. Cheryl Dye, Sr. Procurement Specialist
City of Arvada
8101 Ralston Road
Arvada, CO 80002

**RE: REQUEST FOR PROPOSAL for the FIBER CABLE, INSTALLATION, SPLICING, BORING & ONGOING REPAIRS
PROPOSAL #: 22-PW-010**

Dear Ms. Dye,

Frontier Environmental Services (Frontier) appreciates this opportunity to provide the City of Arvada with our RFP Submittal. Frontier has read, understood, and accepted the terms and conditions of this RFP and have no exceptions.

Frontier is uniquely qualified to provide the City of Arvada with our services because of the following strengths:

- A Project Manager with over 25 years of experience in Heavy Civil Construction in Colorado.
- A Project Supervisor who has over 20 years of Horizontal Directional Drilling experience.
- A company who has completed HDD projects in telecommunications, electrical, water, sanitary sewer, storm sewer and gas pipe installation, utilizing directional boring ranging in size from 1/2 inch up to 24 inch pipe.
- Extensive experience throughout the Rocky Mountain Region.
- Experienced construction crews who have logged thousands of hours.
- A demonstrated sensitivity to our clients' needs and value returned to our client for money spent.

Frontier project staff identified in this submittal are prepared and committed to providing our superior level of client service to the staff of the City of Arvada, as well of the residents of Arvada.

Thank you for the opportunity to present our qualifications and we look forward to the possibility of continuing our relationship with the City of Arvada. If you have any questions or require additional information, please feel free to contact me at 303-489-7740 or brent@frontierenvironmental.net.

Sincerely,

Brent A. Scarbrough, P.E.
Partner

**EXHIBIT
B**

EXECUTIVE SUMMARY

Frontier Environmental Services (Frontier) was incorporated in September, 1996 for the purpose of providing specialized design, engineering, construction, remedial and management services for industry as well as the environmental and safety regulated community. Frontier provides design-build services specifically formatted for environmentally sensitive natural stream restoration, bank stabilization, urban drainageway, stormwater infrastructure, reclamation, utilities, and heavy civil projects.

Our Horizontal Directional Drilling (HDD) division was established in 2017. Our division leader brings over 20 years of utility construction knowledge to every job, including experience in every geography and soil type throughout Colorado. Our knowledgeable crew has installed telecommunications & power cable conduits, water lines, sewer lines, gas lines, and product pipelines, completing projects as small as 100-foot street crossings up to an 80,000-foot gas main and service relocation project. We have installed pipe utilizing directional boring ranging in size from 1/2 inch up to 24-inch pipe. Frontier provides a full range of HDD services including traffic control, potholing, and pipe fusing.

Frontier Environmental Services has a sister company that is headquartered in Lincoln, NE named K2 Construction. The two companies are bound by common ownership and the same commitment to excellence. K2 Construction has been in the wireless telecommunication and underground utility industries since its formation in 2002. Since then, K2 has added a geothermal division, concrete structure division, bridge division, flatwork and paving division. The majority of the work that K2 has performed has been in Eastern Nebraska, but has ranged as far as New Mexico and Montana.

Frontier has a strong bonding capacity for construction, an established risk management program, and a partnership arrangement of experienced, multi-disciplinary professionals. Our approach is based on flexibility and adaptability to our client's needs and the requirements of a changing market. Our mission in differentiating Frontier as an environmental solutions company is to provide:

- SENSITIVITY to our clients' needs
- RESPONSIVENESS to all parties involved in the process
- Breadth and depth of technical/management EXPERTISE
- Practical, cost-effective, and innovative SOLUTIONS
- VALUE returned to the client for the money spent

At Frontier, our business philosophy is founded on the principal of providing excellent service to our clients using innovative solutions in design, engineering, construction, remediation, and management services that are specifically tailored to each individual project's success and to each individual client's goals.

PROJECT TEAM

Brent Scarbrough, P.E.

Project Manager

Mr. Scarbrough serves as a Partner of Frontier and will be the project manager. He holds a master's degree in Civil Engineering from the University of Colorado and is a certified Professional Engineer in the State of Colorado, license # 42221. With over twenty years of experience in environmental design and construction, Mr. Scarbrough has been with Frontier since 1999 and has overseen all of the construction divisions since 2004.

Sam Foco

Construction Superintendent

Mr. Foco has been in the HDD industry for 20 years. As a Superintendent Mr. Foco manages the day to day activities of the Horizontal Directional Drilling division, including water mains, on grade sewer, pipe bursts, power lines, communications. Additionally, he supervises the daily operations of 20 employees while maintaining a great working relationship with clients and fellow contractors. Mr. Foco holds certifications in Hazardous Materials, Confined Spaces, and Ground Disturbances, always keeping safety his number one priority.

John Sandoval

Safety Officer

Mr. Sandoval has over 15 years of experience in safety compliance, standards and procedures. Mr. Sandoval specializes in identifying potential hazards early in the planning process, thus creating mitigation and response plans that reduce the likelihood of accidents. He is responsible for all state and federal safety standard requirements and provides continuous training to our team on all safety topics required by the Occupational Safety and Health Administration.

Joseph Davis

Locator

Mr. Davis has over 15 years' experience in the directional boring industry. Mr. Davis utilizes our Digitrak F5 locator and digital tracking system to assist our directional bore operator in guiding the drill to ensure that the bore safely avoids utilities and other underground facilities. He is critical in assuring that we do not damage equipment or infrastructure and that our bores meet the project specifications. He coordinates with utility locators to ensure all utilities locates for the work area are complete.

EQUIPMENT AND MACHINERY

Frontier has two directional boring rigs and two truck mounted hydro-excavators that are dedicated to the trenchless division of the company. In addition, our assets also include:

John Deere 410K Backhoe Loader
CAT D6k Crawler Dozer
CAT 430F Backhoe
CAT 325D Excavator
CAT 938K Loader
John Deere 135D RTS

Finn T120GN Hydroseeder
Bobcat E85-R Excavator
John Deere 245G LC
Vermeer D23x30 S3 Drill
Vermeer D16x20 S2 Drill
Digitrak F2 and F5 Locators

Vermeer MX125 Mix System
John Deere 35D Mini-Excavator
Inrock Air Hammer
Cat 950K Loader

Weiss Double Barrel Trailer
Weiss Single Barrel Trailer
Fiber Optic Cable Puller
Larsen Cable Reel Trailers

FAMILIARITY WITH CITY OF ARVADA AND STATE REGULATIONS

Frontier has performed work across the entire State of Colorado since 1996. Our staff and personnel are familiar with the variable ground conditions found throughout the state. We have both traditional excavating experience as well as horizontal drilling. We would expect ground conditions to range from sandy/clay loams to cobbles and boulders. We own an Inrock Air Hammer to drill the hardest substrates. Our drill crews are used to working within jurisdictional easements and right of ways in and around the City of Arvada. We have bored under numerous jurisdictional crossings including ditches and railways. We understand the additional permitting, coordination, and insurance riders that are often required for these tasks. Our Project Managers apply for dozens of stormwater, dewatering, and GESC permits each year. Our commitment to compliance starts at the top, and our staff and crews understand the importance of BMPs. We maintain a surplus of erosion and sediment control supplies at our yard so that our crews can adapt to the needs of any project site.

WORKLOAD CAPACITY

Frontier currently has the workload capacity to perform the anticipated scope of work. Team members assigned to this project would be committed to performing the work in the allotted time frames by concentrating 100% of their time to complete the tasks as required. Frontier staff would need approximately 2 weeks' notice to plan, permit, clear utilities and verify bore paths prior to mobilizing drill rigs to a site. Frontier understands that time is of the essence and we will work closely with City of Arvada Staff to ensure a successful project.

SAFETY RECORD

Ensuring the health and safety of the Frontier team, third parties, and local population is our top priority when performing construction work. Frontier is also sensitive to the importance of safety to the City of Arvada and Jefferson County. The objectives of the Frontier approach to health and safety are to:

- Provide a safe and healthy work environment;
- Minimize the risk of human and economic losses resulting from preventable accidents;
- Comply with all safety and health laws, regulations, and Project Safety Guidelines;
- Efficiently and safely perform tasks;
- Protect the environment from degradation; and
- Satisfy the specific project goals and needs.

To meet these goals, Frontier Environmental Services has developed a complete, detailed Corporate Health and Safety Program specifically for construction and remediation activities associated with hazardous substances and wastes. Frontier's Corporate Health and Safety Program contain all the elements necessary to provide guidelines for the full compliance of operational issues in accordance with OSHA 29 CFR 1910 and

MSHA requirements. The plan addresses safe work practices and procedural guidelines including, but not limited to:

- Confined Space Entry
- Hot Work Procedures
- Lock Out/Tag Out
- Electrical Safety
- Respiratory Protection
- Personal Protective Equipment Selection
- Hand and Power Tools
- Materials Handling
- Hazards Communication Rule Procedures for Potential Hazardous Materials Contact
- Fall Protection
- Rigging
- Excavation and Trenching
- Emergency Action Plans

SCOPE #2 FIBER PULLING

Fiber Count	Cost Per Foot
12	\$ 1.10
24	\$ 1.25
48	\$ 1.35
96	\$ 1.45
144	\$ 1.65
216	\$ 1.75
288	\$ 1.85
432	\$ 2.00

*Traffic Control costs are excluded from the above pricing and will be priced on a work order specific basis.

** Proofing existing conduit not installed by Frontier excluded from the above pricing. Can be negotiated on a work order specific basis.

SCOPE #4 FIBER BORING

DESCRIPTION	UNITS	22-PW-010 RATE
Single 2" Bores	LF	\$ 15.00
24" x 36" HH, install	EA	\$ 750.00
48" x 36" HH, install	EA	\$ 1,485.00
Pea Gravel, Chicken Wire, Sealant per Handhole	EA	\$ 175.00
Single 4" Bore	LF	\$ 22.00
Double 4" Bore	LF	\$ 28.00
Tracerwire	LF	\$ 0.30
MHT	EA	\$ 200.00
HDPE Pipe Quoted on request		

*Traffic Control costs are excluded from the above pricing and will be priced on a work order specific basis.

** Proofing existing conduit not installed by Frontier excluded from the above pricing. Can be negotiated on a work order specific basis.

Proposals shall be submitted in the order listed below with each section clearly identified.

- ☒ Submit ON-LINE at BidnetDirect.com
- ☒ Cover & Executive Summary.
- ☒ Detail Firm's and employees' Capabilities, Experience, Licensing, and Compliance Status.
- ☒ Details of Proposal – Proposed products & services, implementation timeline and warranties.
- ☒ Completed City Submittal Forms including this sheet and all other attachments specifically requested.
- ☒ Pricing – All fee and costs associated with the proposal.
- ☒ Performance Measures Form, when an applicable service.
- ☒ Insurance – Checking this box accepts that the insurance requirements listed by the City are acceptable unless listed in the variations on the previous page.
- ☐ CONFIDENTIAL information, if any, MUST be stamped as such on each page and submitted separately.
- ☒ Please initial to acknowledge Addenda, if any, have been considered in your proposal:
#1 BS #2 #3

REFERENCES:

- ☐ Check here if Firm's standard reference sheet is attached, otherwise, use the space below.

Name: City of Arvada Contact Person: Rick Assmus

Address: 8101 Ralston Road, Arvada, CO 80002

Telephone No: 720-898-7523 Email: rick@arvada.org

Describe type of work/service performed or items supplied: Horizontal Directional Drilling for City Fiber Install

Name: Pauley Construction Contact Person: Carl Hobel

Address: 2021 W Melinda Lane, Phoenix, AZ 85027

Telephone No: 719-640-9906 Email: chobel@pauleyc.com

Describe type of work/service performed or items supplied: Horizontal Directional Drilling and Fiber pulling
on various projects throughout the Front Range, Western Slope, and South Dakota

Name: Q3 Contracting Contact Person: Craig Park

Address: 18000 E 22nd Ave, Aurora, CO 80011

Telephone No: 720-648-1768 Email: cpark@prim.com

Describe type of work/service performed or items supplied: Horizontal Directional Drilling and installation
on various projects throughout the Front Range,

PERFORMANCE MEASURES FORM INSTRUCTIONS:

The City has incorporated Performance Management into its organizational culture. When vendors submit offers to the

City in response to solicitations for **Services** (not associated with the primary purchase of goods, supplies, or software), they shall identify the methods and goals by which they will monitor and report their performance providing those services to the City. Vendor's performance shall be documented as to (a) Price/Cost, (b) Punctuality/Responsiveness (c) Quality/Reliability, and (d) Sustainability/or Innovation.

1. Vendor will define 1-2 measures for (a) Price/Cost, (b) Punctuality/Responsiveness (c) Quality/Reliability, and (d) Sustainability/or Innovation, that follow S.M.A.R.T goals: Specific, Measurable, Achievable, Relevant, and Timely, per category.

2. The awarded vendor will self-score their defined metrics within a score card emailed from purchasing 2 months prior to contract renewal. The department will review the vendor's self-scored measures.

SERVICES means: the furnishing of labor, time, effort, maintenance, etc., by a vendor/contractor/consultant, with an initial contract amount of more than \$15,000.

(a) Price/Cost

Example Measure: Consultant will submit detailed invoices substantiating amounts requested.

1. Contractor will submit detailed invoices based on proposed costs

- 2.

(b) Punctuality/Responsiveness

Example Measure: Reporting of project status will occur monthly with the City and consultant's Project Manager.

1. Contractor will be in constant contact and communication with the City throughout the duration of the contract. Reports will be provided at the request of the City.

- 2.

(c) Quality/Reliability

Example Measure: Revisions are drafted within two weeks, and no more than 3 revisions prior to final draft.

1. Revisions are up to the City. The contractor will work with the City on any and all revisions to ensure safety and satisfaction of the project.

- 2.

(d) Sustainability and/or Innovation

Example Measure: Digital reports delivered to the City 95% of the time will to reduce the use of paper.

1. Digital reports, invoicing, and communication will occur 100% of the time.

- 2.

Performance measures will be queried for every year of the contract. Performance measures reporting will partially inform re-contracting with or renewing a contract with a vendor.



REPORT TO CITY COUNCIL RESOLUTION

**AGENDA ITEM
8.B.1.**

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: R23-021, A Resolution Revising and Adopting Bylaws for the Arvada Human Services Advisory Committee

Report in Brief

This agenda item includes consideration of a resolution that details the revision and adoption of bylaws for the Human Services Advisory Committee. Per Section 6, Resolution No. R98-071, City Council must approve all changes to the operational guidelines governing the Human Services Advisory Committee.

The Arvada team recommends City Council approve R23-021, A Resolution Revising and Adopting Bylaws for the Arvada Human Services Advisory Committee.

Financial Impact

There is no financial impact associated with the adoption of revised bylaws for the Human Services Advisory Committee.

Background

The City established the Human Services Advisory Committee in 1998 for the purpose of advising City Council on the allocation of funding from the Human Services funding pool, as well as the funding for public services from the Community Development Block Grant. The Human Services Advisory Committee reviews applications from area non-profits for the Human Services Funding Pool, and provides recommendations to the City Council for the annual allocation of the Human Services Funding Pool.

The city team was unable to find current Committee bylaws and determined it would be an opportune time to create updated bylaws that reflect the process and requirements of the Human Services Advisory Committee. The city team drafted updated bylaws to reflect best practices. Per Section 6, Resolution No. R98-071, City Council must approve all changes to the operational guidelines governing the Human Services Advisory Committee.

The Arvada team recommends City Council approve R23-021, A Resolution Revising and Adopting Bylaws for the Arvada Human Services Advisory Committee.

Discussion

The recommended action facilitates the adoption of revised bylaws for the Human Services Advisory Committee.

Public Contact

This item was posted to the City Council meeting agenda.

Commission Recommendation

N/A

Strategic Alignment

The recommended action facilitates the adoption of revised bylaws that guide the Human Services Advisory Committee in supporting community and human service programs. Therefore, this action aligns with the Vibrant Community and Neighborhoods Priority Area of the City Council Strategic Plan, specifically the following Principle:

Improves access to quality housing that is affordable to a broad range of income levels and provides resources, housing, and neighborhood assistance services for Arvada residents, neighborhoods, property owners, and stakeholders.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends City Council approve R23-021, A Resolution Revising and Adopting Bylaws for the Arvada Human Services Advisory Committee.

Suggested Motion:

I move that R23-021, A Resolution Revising and Adopting Bylaws for the Arvada Human Services Advisory Committee, be (approved) (rejected).

Prepared by:
Nicholas Ashmore, Community Development Block Grant Coordinator

Reviewed by:

Approved by:

Carrie Espinosa, Manager of Housing Preservation and Resources	1/24/2023
Josie Suk, Development Systems and Administrative Manager	1/25/2023
Ryan Stachelski, Director of Community and Economic Development	1/25/2023
Gail Walker, Legal Specialist-Contracts	1/26/2023
Emily Grogg, Senior Assistant City Attorney	1/26/2023
Rachel Morris, City Attorney	1/31/2023
Linda Haley, Deputy City Manager	1/31/2023
Lorie Gillis, City Manager	2/1/2023

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R23-021

A RESOLUTION REVISING AND ADOPTING BYLAWS FOR THE ARVADA
HUMAN SERVICES ADVISORY COMMITTEE

WHEREAS, on March 16, 1998 (Resolution No. R98-071), Arvada created the Human Services Advisory Committee for the purpose of advising City Council on the allocation of funding from the Human Services funding pool, as well as the funding for public services from the Community Development Block Grant; and

WHEREAS, per Section 6, Resolution No. R98-071, City Council must approve all changes to the operational guidelines governing the Human Services Advisory Committee.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Pursuant to Section 6, Resolution No. R98-071, the Arvada City Council hereby adopts the attached revised bylaws governing the operation of the Arvada Human Services Advisory Committee.

Section 2. This Resolution shall be effective upon its approval by the Arvada City Council.

APPROVED AND ADOPTED this 13th day of February, 2023.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

**BYLAWS AND RULES OF PROCEDURE OF THE
HUMAN SERVICES ADVISORY COMMITTEE OF THE CITY OF ARVADA,
COLORADO**

ARTICLE I - NAME AND PURPOSE

Section 1. These bylaws and rules of procedure have been adopted by the Human Services Advisory Committee and approved by the City Council.

Section 2. This committee shall be known as the Human Services Advisory Committee of the City of Arvada (the "Committee") as established by resolution (Resolution No. R98-071) of the Arvada City Council ("City Council").

Section 3. The purpose of the Committee as established by the City Council shall be as follows:

- a) Provide funding recommendations to City Council for area nonprofits that serve low to moderate income Arvada residents and whose services are in alignment with City Council Strategies.

Section 4. The Committee shall perform its duties until the Committee is terminated by City Council.

ARTICLE II - DUTIES

Section 1. The duties of the Committee include:

- a) Participate in evaluation of Human Services Funding grant applications;
- b) Determine Human Services Funding grant awards funding recommendations;
- c) Communicate Committee grant award recommendations on an annual basis with the Arvada City Council;
- d) Provide recommendations for the Human Services Funding application and review processes.

ARTICLE III - MEMBERSHIP

Section 1. Eligibility of Membership

- a) The Committee shall be composed of nine regular members who shall serve without compensation. The Committee members shall be appointed and confirmed by the Arvada City Council.
- b) All Committee members must act in accordance with the city's mission, vision and values and applicable City of Arvada policies of employee conduct.

- c) Committee members shall not discriminate on the basis of race, color, religion (creed), gender, gender identity or expression, age, national origin (ancestry), mental or physical disability, political belief or affiliation, marital status, sexual orientation, or veteran status in any of its activities or operations.
- d) Committee members shall consist of representatives from the following categories:
 - i. Arvada Resident Advocate for Human Services
 - ii. Arvada resident who has benefitted from human services programs or grant funding
 - iii. Member or Volunteer from a non-profit human services agency
 - iv. Member or Volunteer from a municipal human services agency
 - v. Arvada resident senior citizen

Section 2. Term of Members.

- a) The appointed Committee members shall serve three-year terms and may be appointed for no more than four terms.

Section 3. Vacancies and Removal

- a) Any Committee member may resign by giving written notice to the Chair or Co-Chair of the Committee, who shall notify the staff liaison of the resignation. Such resignation shall take effect at the time specified therein. The acceptance of such resignation shall not be necessary to make it effective. Any vacancy occurring on the Committee by resignation or removal shall be filled, if necessary, by appointment of the City Council.
- b) All members of the Committee shall serve at the pleasure of City Council and may be removed at any time pursuant to Section 2-78(b) of the Arvada City Code which states "All other members of Committees, commissions, and committees, except as set forth in subsection (e) of this section, serve on such Committees, commissions, and committees at the pleasure of the city council, and may be removed by a vote of the City Council at any time."

Section 4. Attendance

- a) It is the official policy and expectation of the Committee to have its members regularly attend Committee meetings. Regular attendance is vital to conduct the business of the Committee, to have a quorum of the Committee, to have informed Committee members and quality participation, and to respect the time and interest of the public.
- b) If any member of the Committee is absent from any regular meeting, such member shall give the reason for the absence to the Committee Chair and the staff liaison of the

Committee. The staff liaison shall keep records of Committee member attendance and whether each absence is excused or unexcused.

- c) Any absence from a Committee meeting due to sickness of a Committee member, the death of a member of the member's family, court subpoena, or absence from the City, shall be considered an excused absence. Other absences may be deemed excused at the discretion of the Chair. All other absences shall be considered unexcused.
- d) If an appointed Committee member has two unexcused absences in a calendar year, such Committee member may be excused from the Committee by the Chair. A replacement representative will be appointed by the City Council as appropriate to fill the Committee member's position.

Section 5. Conflicts of Interest

- a) Participation and voting in Committee business by members of the Committee shall be subject to the requirements and limitations of the City's Code of Ethics, in accordance with the Arvada City Code, Chapter 2, Article VIII, Division 2.

ARTICLE IV - MEETINGS

Section 1. A regular bi-annual meeting of the Committee shall be held at a regularly scheduled date and time at a site designated by affirmative vote of the Committee and posted on the Division of Housing Preservation and Resources website. The agenda of such meeting shall be sent via email to all Committee members and posted on the Division of Housing Preservations and Resources website at least 24 hours prior to the date of each meeting.

The Chair, absent objection by any member, may cancel meetings for cause, including absence of a quorum, lack of business to conduct or other unforeseeable circumstances. Notice of such cancellation shall be given to the Committee members at least twenty-four hours in advance of the time of the meeting, if possible.

Section 2. The Chair of the Committee will preside over Committee meetings, and will be voted into this position every year by the other Committee members.

Section 3. Special meetings of the Committee may be held at any time. A call for such meetings shall be issued by the Chair or by the written request of not less than 5 members of the Committee for the purpose of transacting business specifically stated in such call. The notice of the special meeting may be issued by email, by telephone or by mail; but in any event, the purpose of the special meeting shall be stated to each member. No business other than that set forth in the call for the special meeting shall be transacted at the special meeting. A special meeting must be called at least 48 hours prior to the holding of the special meeting.

Section 4. The meetings are open to the public and the committee may invite any director, officer, employee, outside advisor or other individual who is not a Committee member to attend

Committee meetings or meet with Committee members, but such persons will not have voting power and will not be held out as Committee members.

Section 5. Committee approvals will require a vote of a majority of the Committee members present at a meeting at which a quorum is present. A quorum for the transaction of business shall consist of 6 Committee members. It shall be the responsibility of the staff liaison, or in the staff liaison's absence the Chair, to determine whether there is a quorum at each meeting. A representative attending a meeting on a Committee member's behalf shall not count towards a quorum. No official action may be taken by the Committee unless a quorum is present. However, if a quorum is not present, the meeting may still be conducted for the purposes of status reporting and discussion of items.

Section 6. The Chair, Vice Chair, or staff liaison shall establish the agenda for each meeting.

Section 7. Any Committee member who has a personal or financial interest in any matter before the Committee shall disqualify themselves from the consideration of, discussion of, or voting upon such matter. Any such disqualification shall be noted in the official Minutes of the meeting.

ARTICLE V - OFFICERS

Section 1. Positions include: Chair, Vice-Chair, and regular committee members. At the first regular meeting after May 1st each year, a Chair and Vice-Chair shall be elected by majority vote of the Committee. That meeting shall be designated as the Committee's annual meeting.

Section 2. The Chair shall preside at all meetings of the Committee. In the event of the absence of the Chair, the Vice-Chair shall preside.

Section 3. The Chair shall present award recommendations to the City Council for approval.

Section 4. A vacancy in the office of Chair shall be filled automatically by the Vice-Chair, and a new Vice-Chair shall be elected at the next regular meeting of the Committee from among the regular members. A vacancy in the office of Vice-Chair shall be filled at the next regular meeting of the Committee by election from among the regular members. The officers so elected shall serve until the next annual meeting.

Section 5. The Executive Director of the Housing Authority or the Executive Director's designee shall be the Committee's staff liaison. The staff liaison shall keep the minutes of each Committee meeting, shall conduct all official correspondence with the City Manager and City Council, and will generally supervise the clerical and technical work of the Committee. Meeting minutes will be sent to the City Manager, City Council, and Department Director following each Committee meeting.

ARTICLE VI - PARLIAMENTARY PROCEDURES

Section 1. Questions of parliamentary procedure not covered by these Bylaws shall be governed by Roberts Rules of Order, Revised Edition.

ARTICLE VII - AMENDMENTS

Section 1. These bylaws may only be amended or modified through a resolution approved by a majority vote of the Arvada City Council.



REPORT TO CITY COUNCIL WORKSHOP

AGENDA ITEM
11.A.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: Community Survey

Report in Brief

In 2022, the City of Arvada hired Probolsky Research to conduct a Community Survey. The survey was sent to all residents via the Arvada Report. Additional methods of communication were also used in order to solicit the largest possible response. Adam Probolsky will present the Community Survey methodology and findings.

Key findings are that most residents say that the city is heading in the right direction but there is room for improvement. Quality of Life is ranked as high. Key concerns are crime, homelessness, and the pace of growth.

Background

The City has conducted a random sample survey of approximately 1,200 citizens every other year, starting in 1997, with its last bi-annual survey in 2019. The City did not conduct its 2021 survey due to the Covid -19 pandemic. The Community Survey results are used by the City Council and City team to help ensure that the City Council's strategic plan and the City's operation plans are aligned with the community (voice of the customer). This methodology is a best practice as seen in the Baldrige framework.

Strategic Alignment

*****A brief statement regarding the alignment of the recommended action with the City Council Strategic Plan, Department Business Plan and/or other policy document such as the Comprehensive Plan. This statement should be specific whenever possible, such as stating a specific Strategic Result.

Next Steps

The City team will use this information to support the City Council strategic planning retreat scheduled for March 3rd, 2023.

Prepared by:

Josie Suk, Development Systems and Administrative Manager

Reviewed by:

Approved by:

Ryan Stachelski, Director of Community and Economic Development 1/20/2023

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1/23/2023

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1/23/2023

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2/1/2023

Enclosure, exhibits & attachments required to support the report

City of Arvada Community Survey 2022 Results Presentation

December 2022



**Opinion Research on
Elections and Public Policy**



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City of Arvada– Community Survey 2022

Survey Methodology*

	Survey Details
Mode	Phone (landline and mobile) Online (email and text to web) Direct mail Targeted social media Arvada Report
Language	English and Spanish
Length	20 minutes (online) 23 minutes (phone)
Target Respondents	City of Arvada residents
Survey Fielding	October 1 st to November 2 nd , 2022
Survey Participants	1,200

Sample

The sample was secured through consumer data and online recruitment. We called, emailed, texted and mailed residents in order to accurately match the demographics of City of Arvada residents.

The sample of 1,200 residents was robust and yielded a +/-3% margin of error at a 95% level of confidence. The sample size was sufficient for statistically reliable comparisons among subgroups of residents (e.g., by demographic and geographic variables).

Data Collection Explained

Interviews were conducted by phone (5%), an online link (55%), through the mail (8%), and online through the QR code from the Arvada Report (32%). Phone interviews were conducted via landline (34%) and mobile (66%).

Respondents in all modes chose their preferred language, English (98%) and Spanish (2%).

The online survey was accessible by computer, tablet, and smart phone.

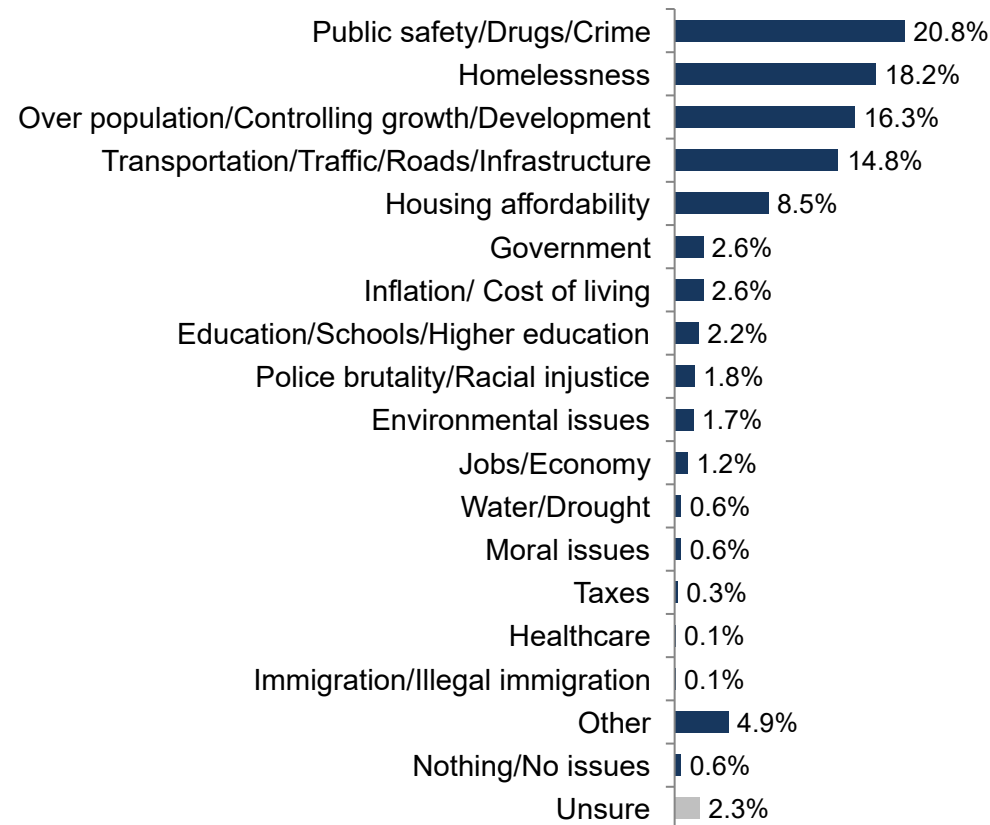
Security measures precluded individuals from completing the survey more than once.

Probolsky Research in a Latina- and woman-owned market and opinion research firm with corporate, election, government, and non-profit clients.

**Due to rounding, totals shown on charts may not add up to 100%*

21% say public safety/crime is the most important issue facing Arvada

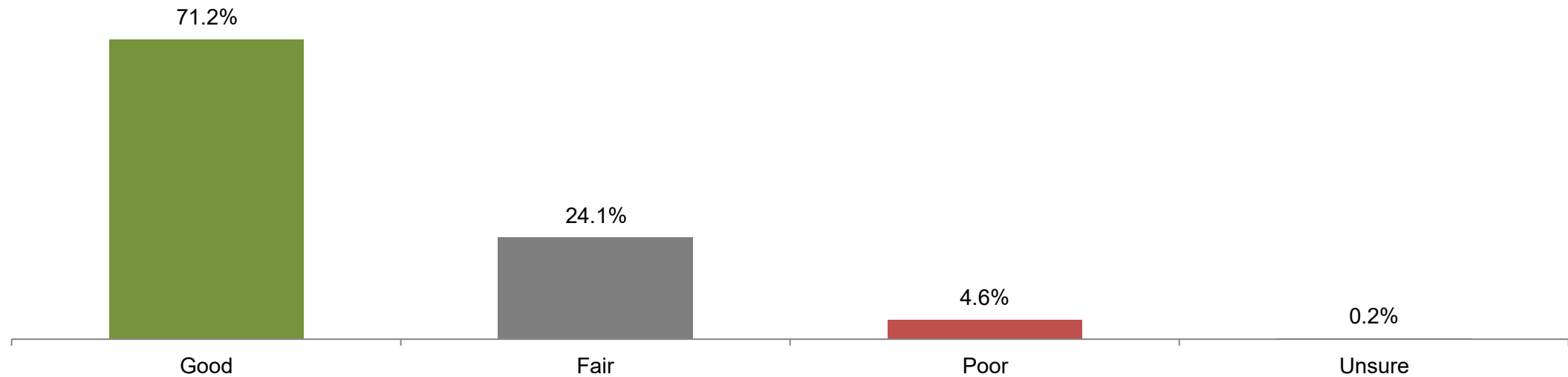
Question 1: In your own words, what do you feel is the most important issue facing Arvada today?



While public safety was the top issue for all groups, housing affordability ranked higher for those making under \$35,000.

71% of residents rate the overall quality of life in Arvada as good

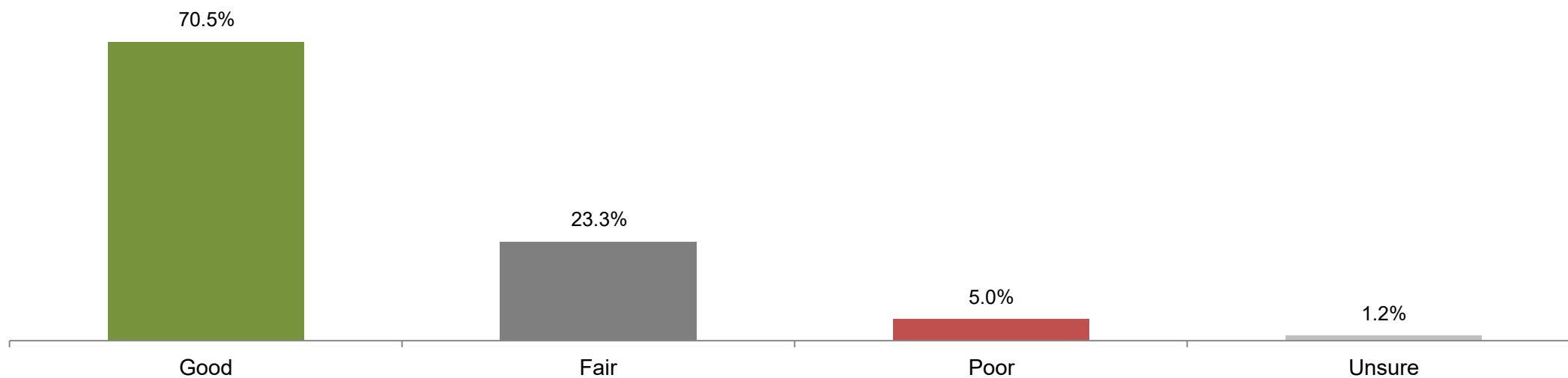
Question 4: How would you rate the overall quality of life in Arvada?



71% rate Arvada as a good place to live compared to other cities and towns

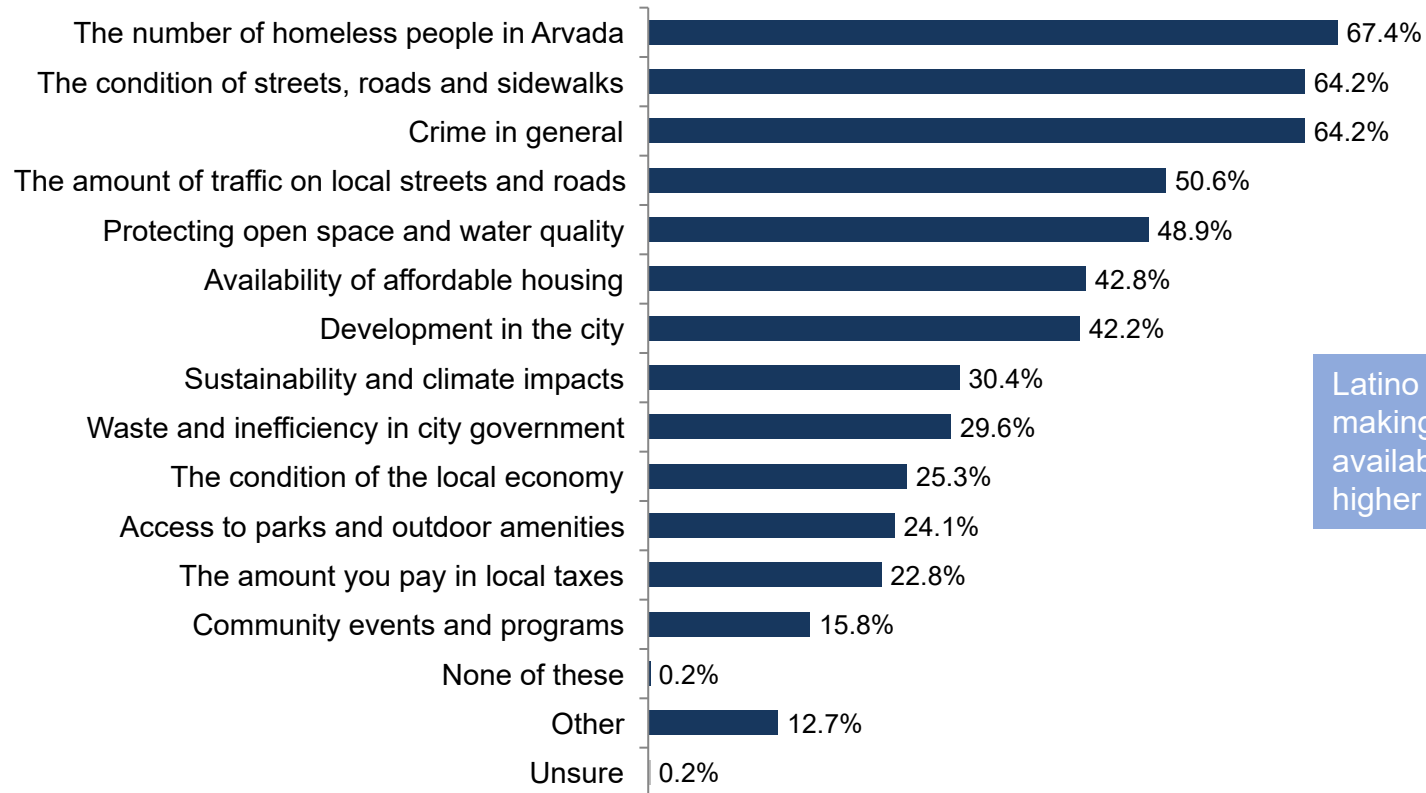
Question 5: Compared with other cities and towns, how would you rate Arvada as a place to live?

Younger residents and residents who have lived in Arvada less than 5 years rate Arvada the highest compared to other cities and towns.



Homelessness, condition of streets, and crime are the top issues important to residents

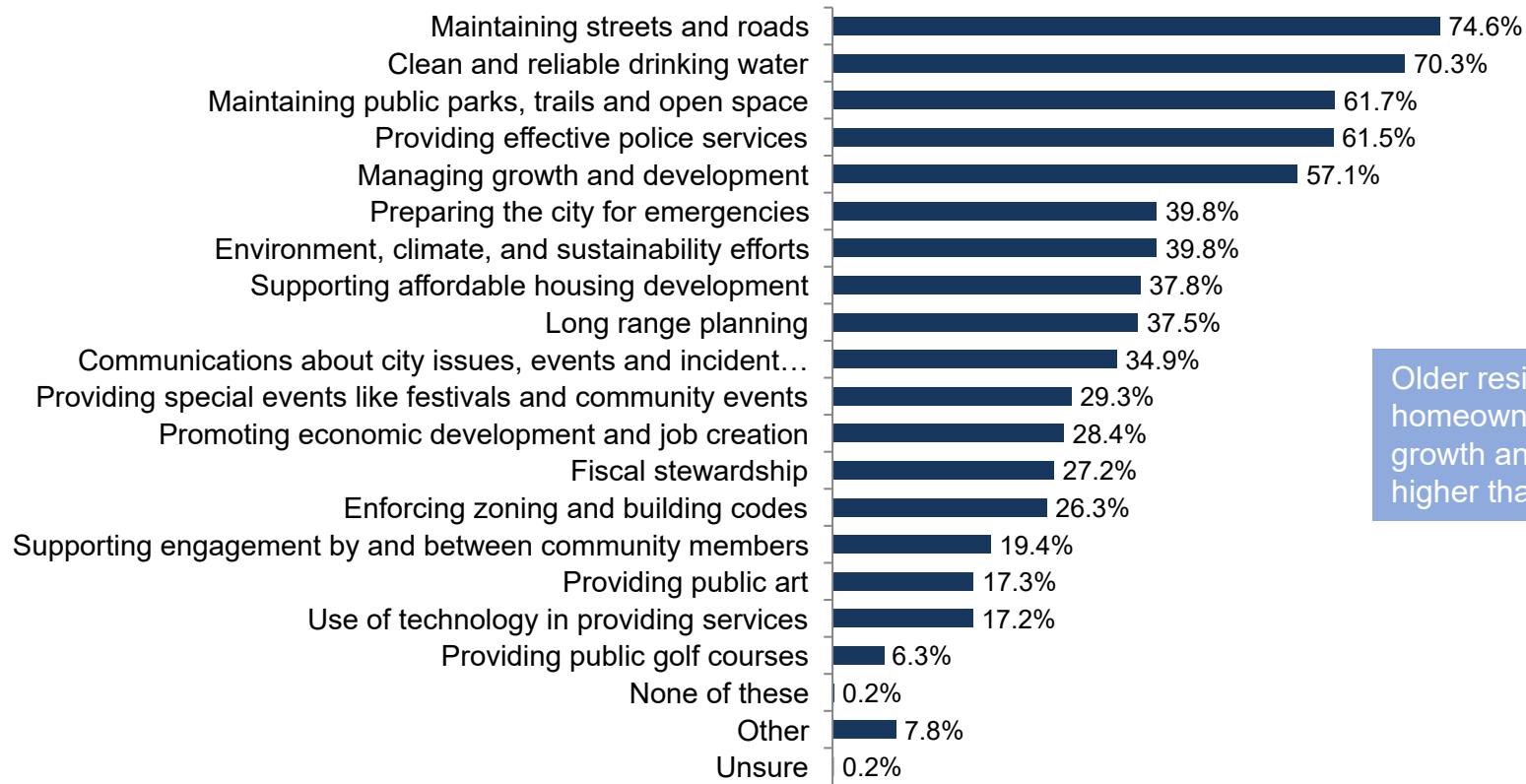
Question 7: Now we have a list of **issues** people in the City of Arvada may be concerned about. Please indicate which issues are very important to you personally.



Latino residents and those making less than \$35K rank the availability of affordable housing higher than other residents.

Maintaining streets and clean drinking water are the most important service to residents

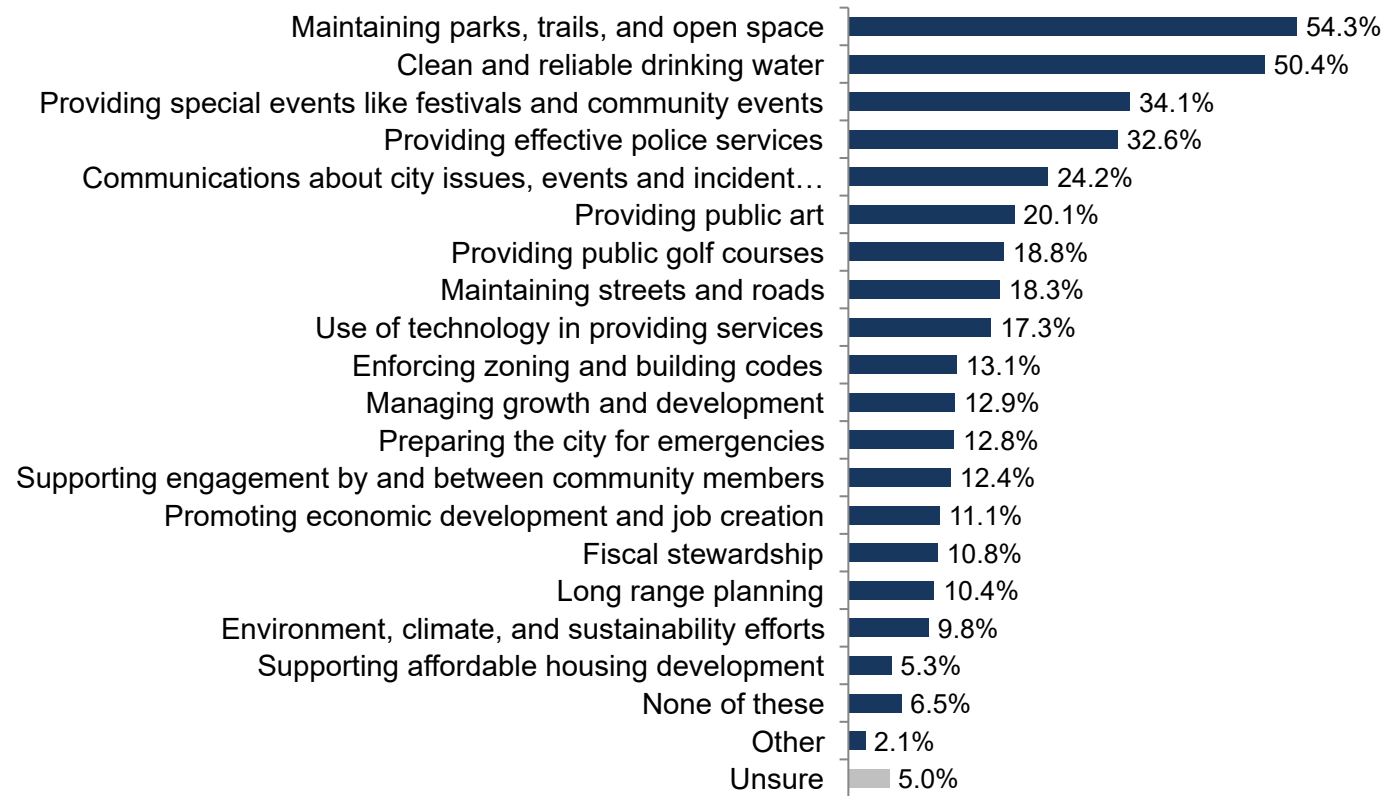
Question 8: Now we have a list of **services** provided by the City of Arvada, please indicate which services you think are very important to you personally.



Older residents and homeowners rank managing growth and development higher than other residents.

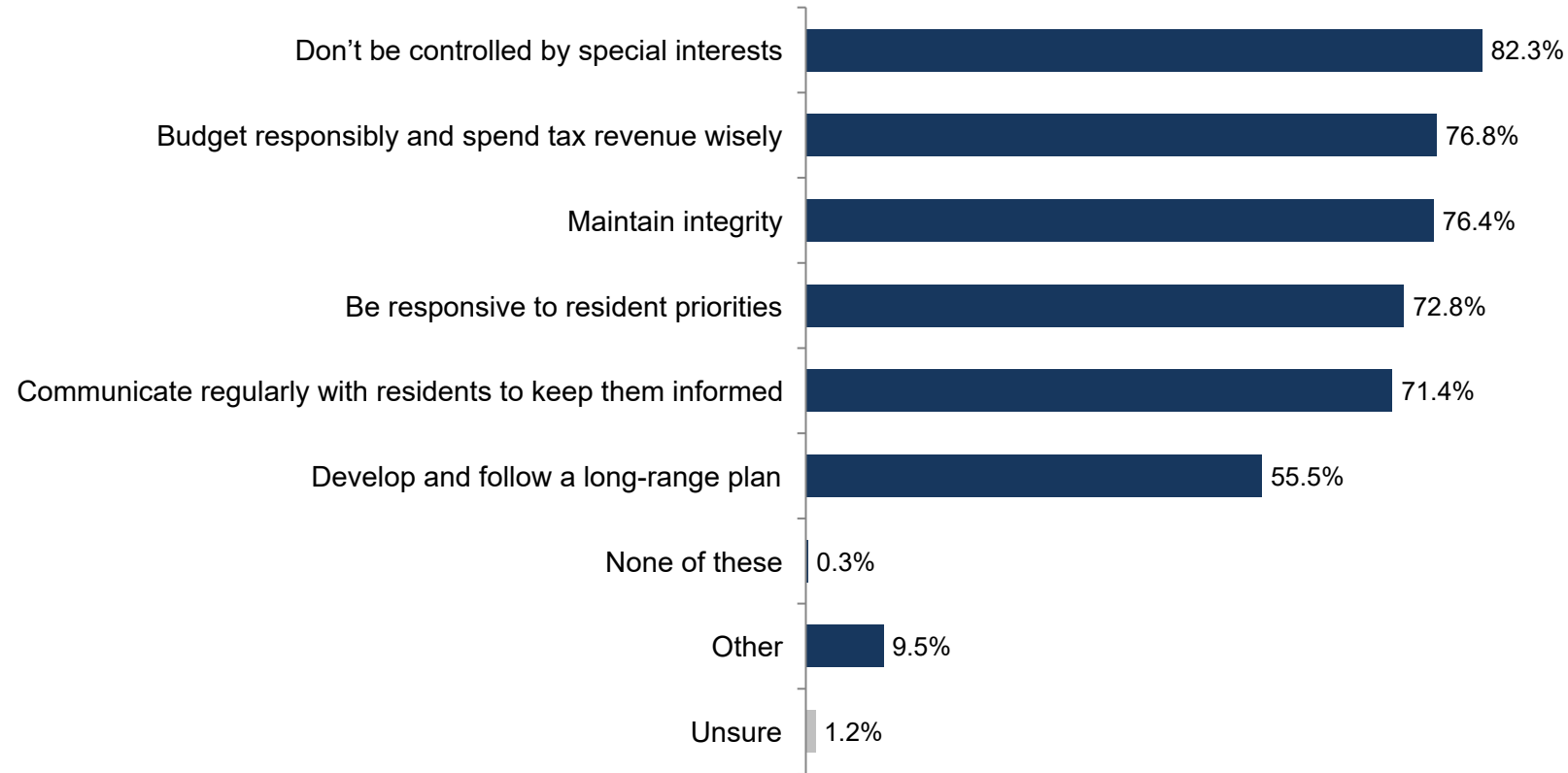
Maintaining parks and trails and clean drinking water are the services that score the highest satisfaction

Question 9: Thinking of the same list of **services** provided by the City of Arvada, please indicate which services you are personally **satisfied** with.



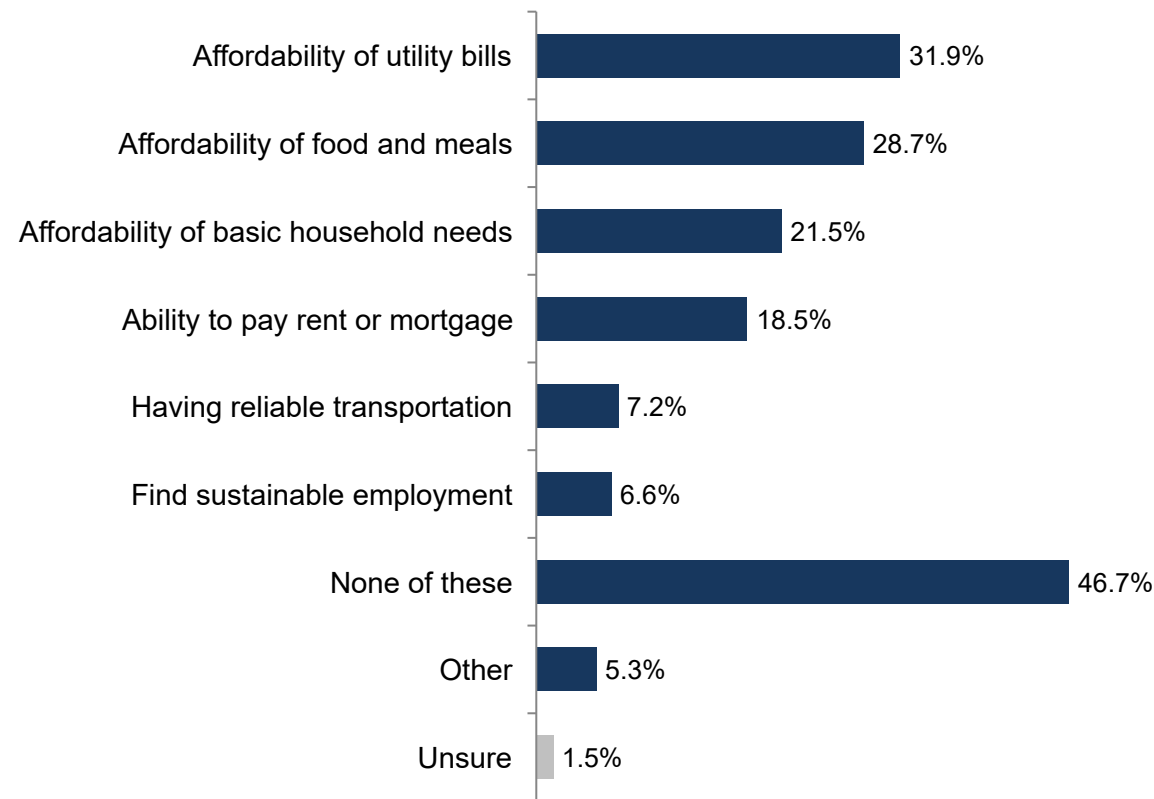
82% of residents expect that their City Council should not be controlled by special interests

Question 10: What do you expect from the Arvada City Council? Select all that apply.



Affordability of utility bills and food were the highest economic instability issues experienced by residents

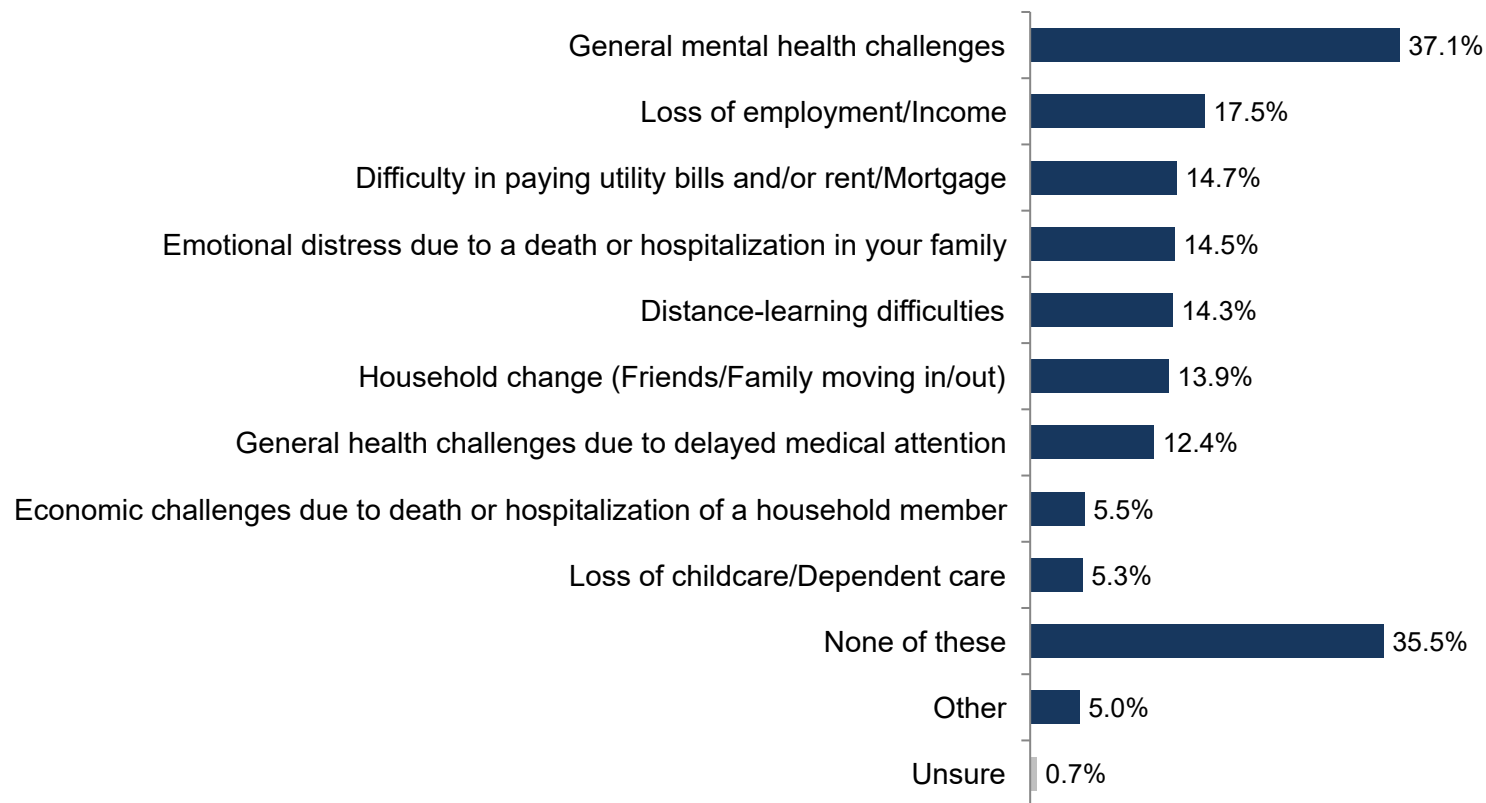
Question 11: What, if any, of the following economic instability issues is your household currently experiencing?



Latino and younger residents are more likely to experience issues with paying their rent or mortgage.

General mental health challenges were experienced the most during COVID

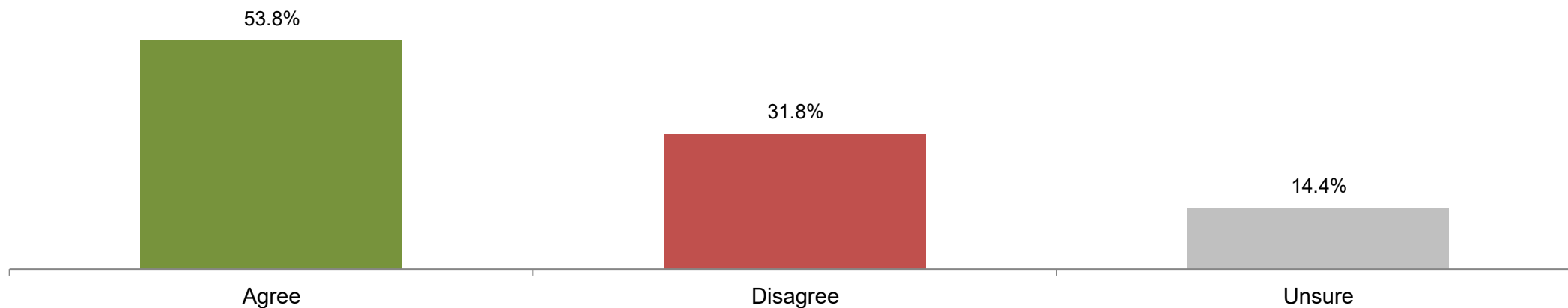
Question 12: Which, if any, of the following setbacks have you or your family experienced during the COVID-19 pandemic?



54% of residents agree that the City is responsive to the priorities of residents

Question 13: Agree or disagree: The City of Arvada is responsive to the priorities of residents.

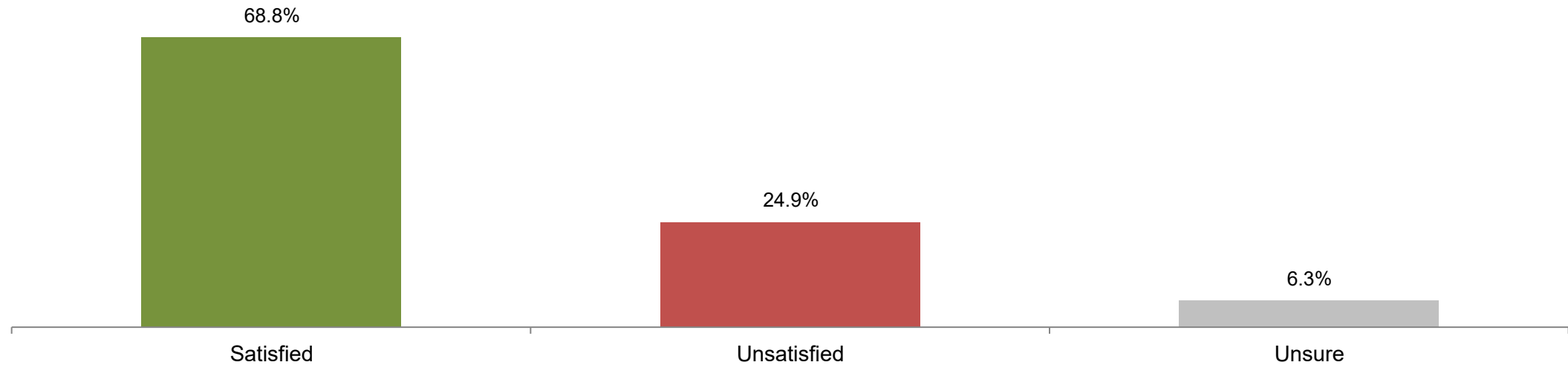
College-educated residents are more likely to find the City responsive to their priorities.



69% of residents are satisfied with City services in general

Question 14: In general, are you satisfied or dissatisfied with the services provided by the City of Arvada?

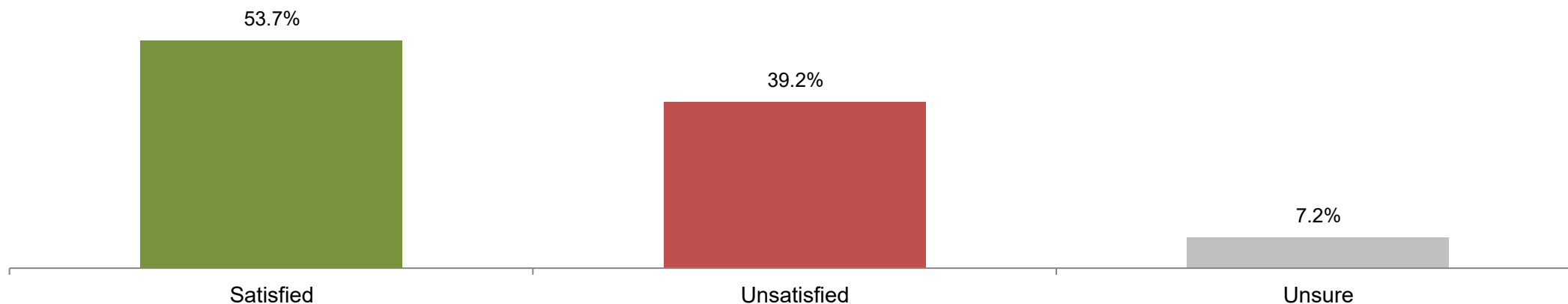
Residents who have lived in Arvada 5 years or less are more satisfied with the City services than long-term residents.



54% of residents say they are satisfied and getting their money's worth from their tax dollars

Question 15: In general, are you satisfied or dissatisfied that you are getting your money's worth for your tax dollar?

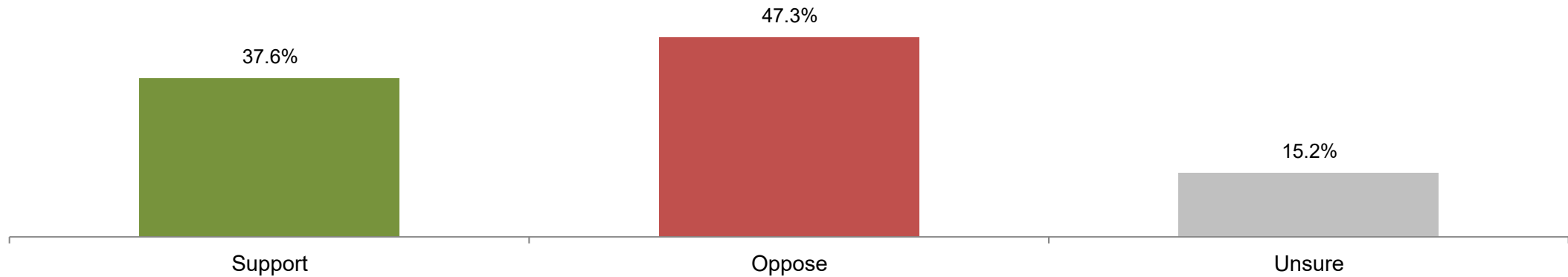
Older residents (65+) are more satisfied with getting their money's worth from their tax dollar.



47% of residents oppose raising local taxes to improve service levels

Question 16: Would you support or oppose raising local taxes to pay for resident priorities or to improve or increase service levels?

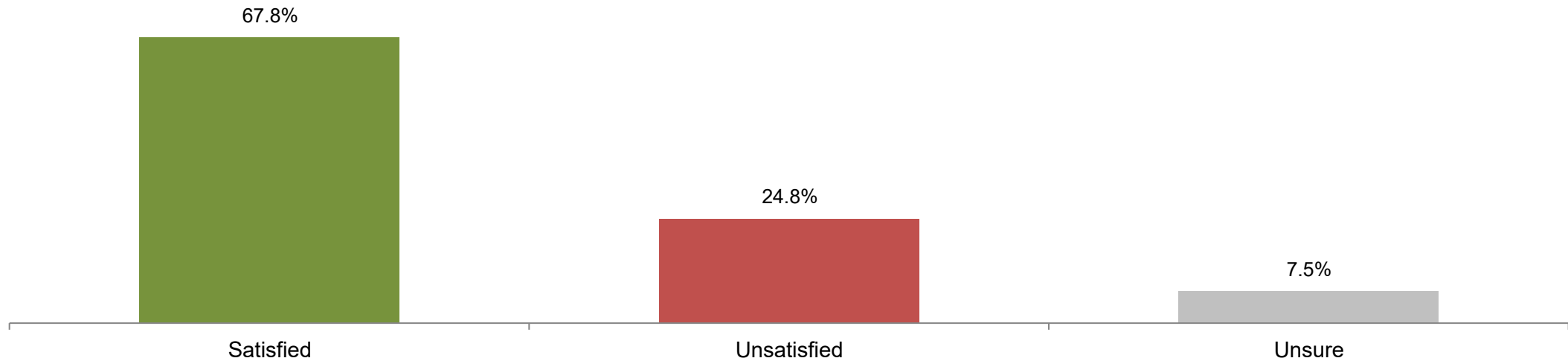
Residents aged 30-50 are more likely to support raising local taxes than younger or older residents.



68% of residents are satisfied with how the City provides police services

Question 18: Are you satisfied or unsatisfied with how the City provides police services?

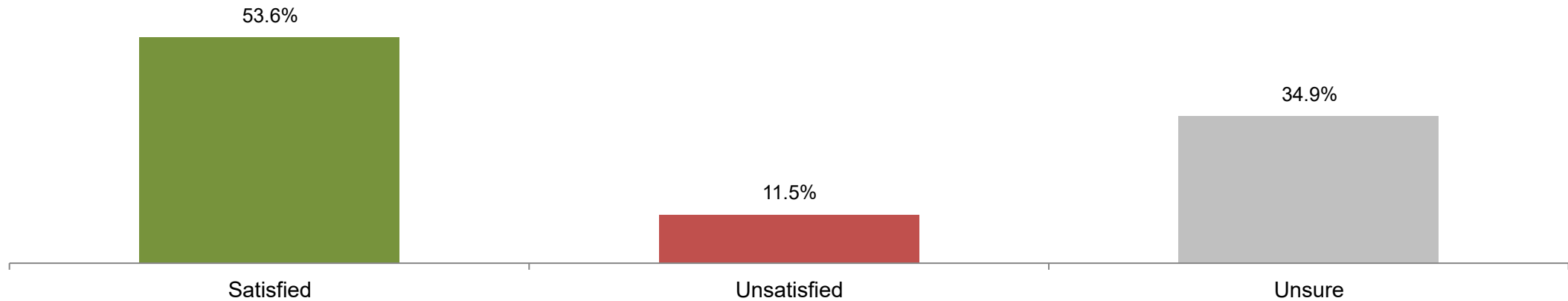
Satisfaction with police services increases with respondent age with ages 18-29 being the least satisfied and ages 65+ as the most satisfied.



54% of residents are satisfied with how the City prepares for emergencies

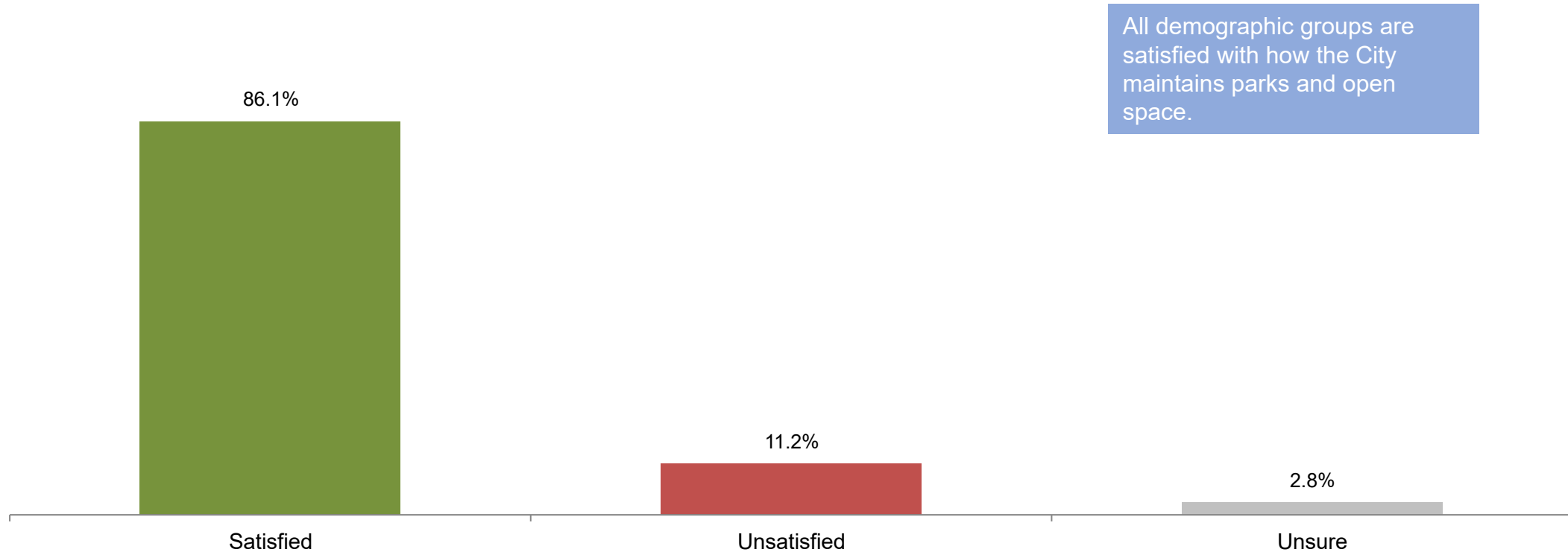
Question 19: Are you satisfied or unsatisfied with how the City prepares for emergencies?

Newer residents (5 years or less) are less satisfied with how the City prepares for emergencies than long-term residents.



86% of residents are satisfied with how the City maintains public parks

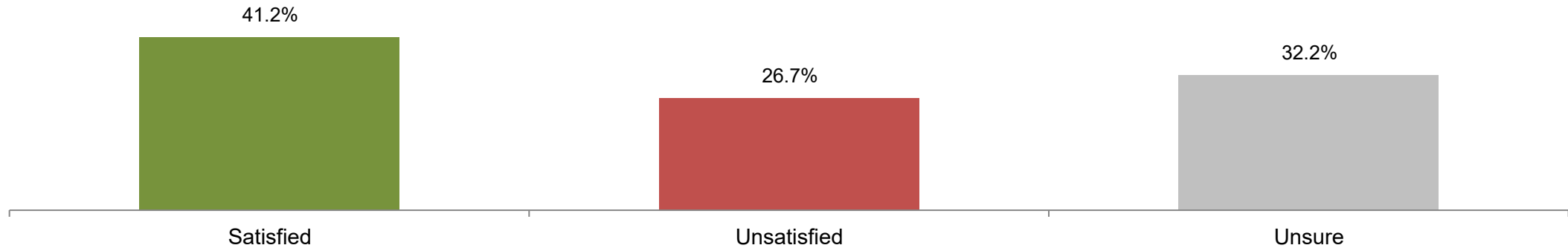
Question 20: Are you satisfied or unsatisfied with how the City maintains public parks, open space, and trails?



41% of residents are satisfied with how the City promotes economic development

Question 21: Are you satisfied or unsatisfied with how the City promotes economic development and job creation?

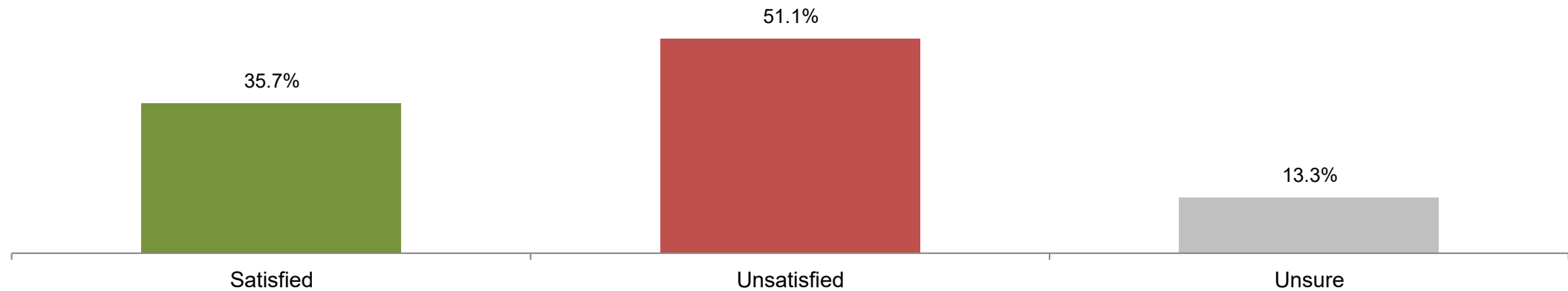
Parents and college-educated residents are more satisfied with economic development than other residents.



51% of residents are unsatisfied with how the City manages growth and development

Question 22: Are you satisfied or unsatisfied with how the City manages growth and development?

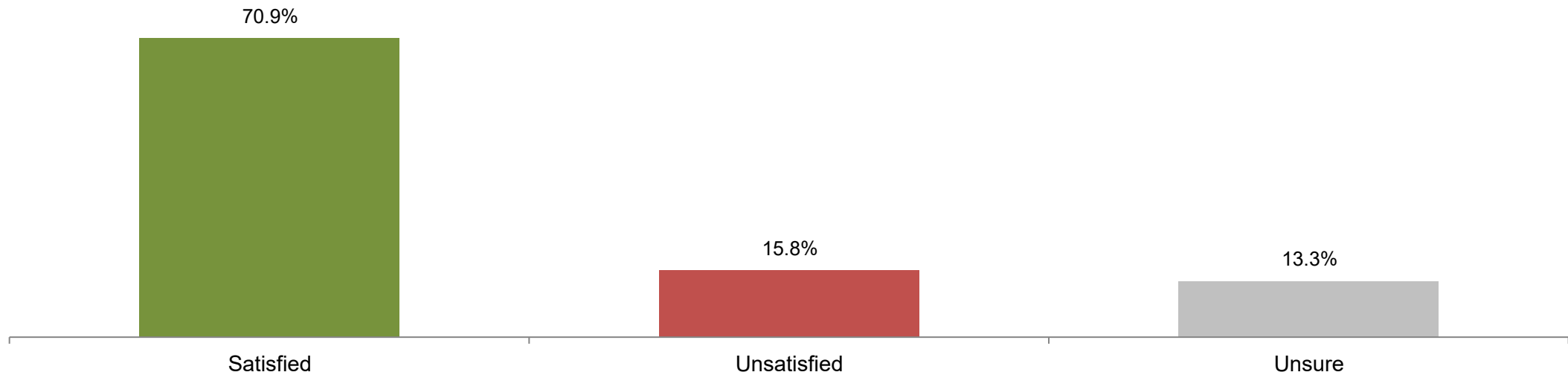
A large gap in satisfaction with growth and development appears between newer residents (<5 years) and older residents (20+ years). Renters are also more likely to be satisfied than homeowners.



71% of residents are satisfied with how the City provides festivals and community events

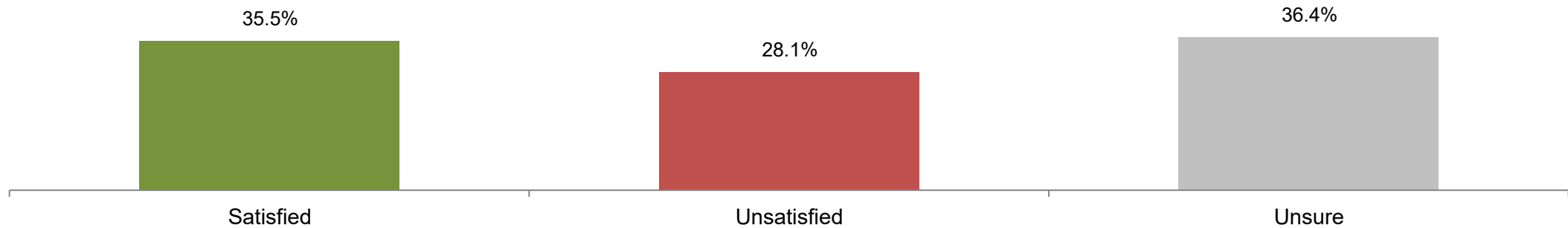
Question 23: Are you satisfied or unsatisfied with how the City provides festivals and community events?

College-educated residents are more likely to be satisfied with festivals and community events provided by the City.



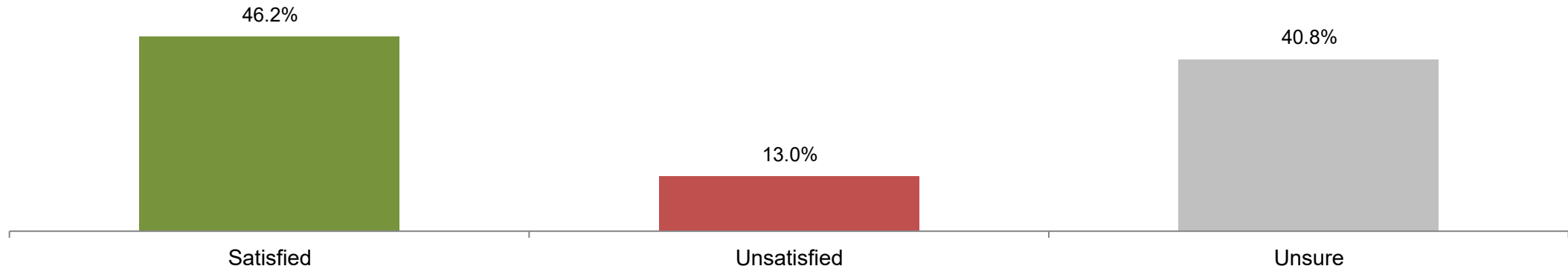
36% of residents are satisfied with how the City enforces zoning and building codes

Question 24: Are you satisfied or unsatisfied with how the City enforces zoning and building codes?



46% of residents are satisfied with how the City uses technology to provide services

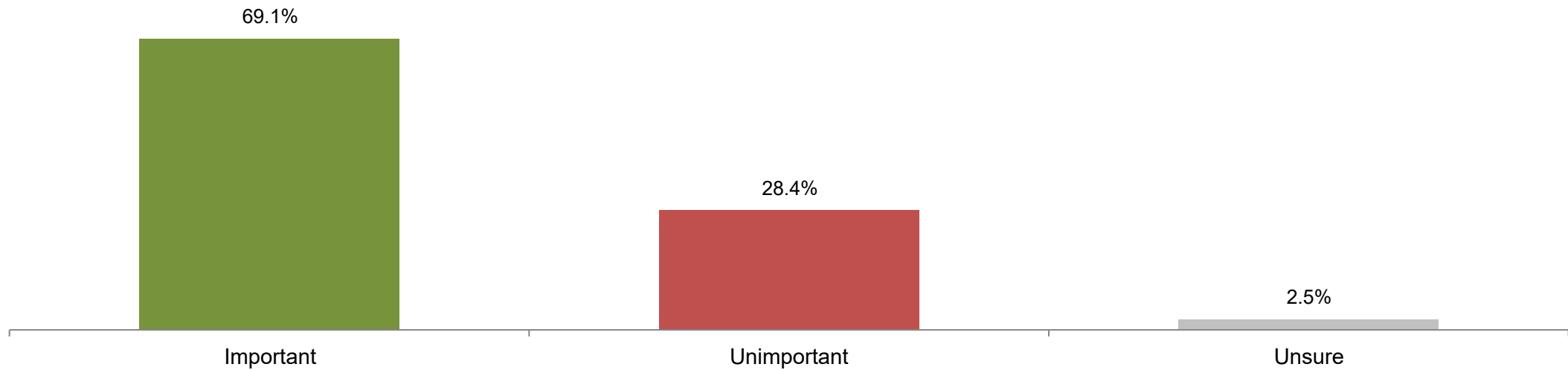
Question 25: Are you satisfied or unsatisfied with how the City uses technology to provide services like applying for building permits, reporting concerns or accessing important information?



69% of residents say it is important for the City to promote affordable housing

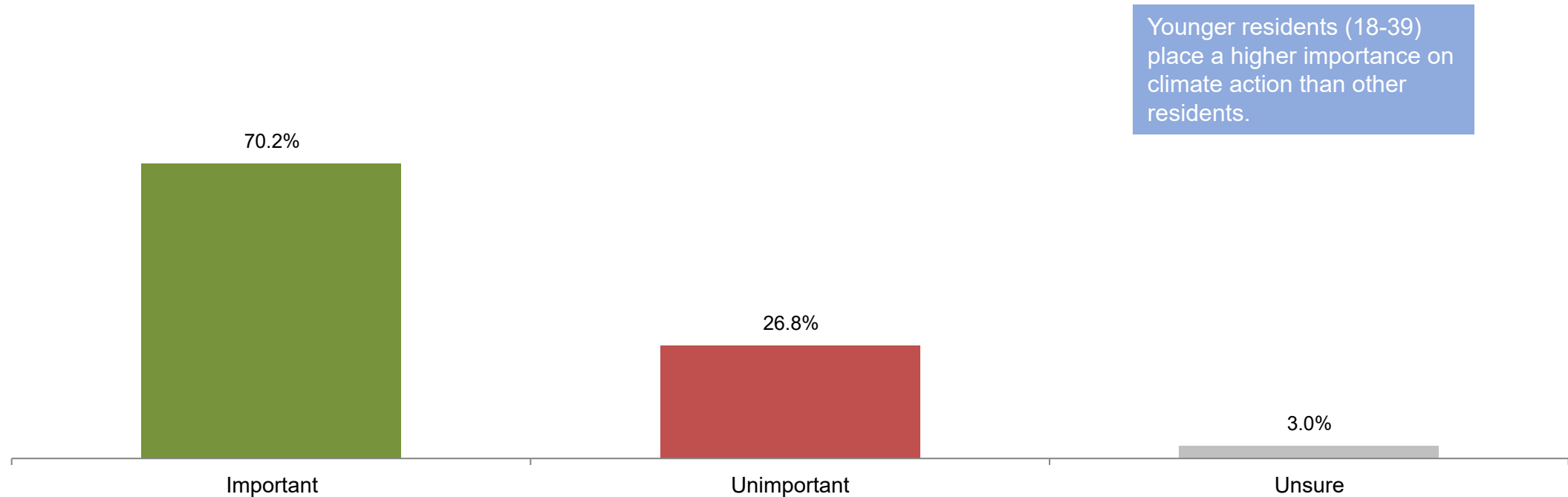
Question 27: How important is it to you that the City promotes affordable housing?

Latinos and low-income residents rate promoting affordable housing higher than other residents.



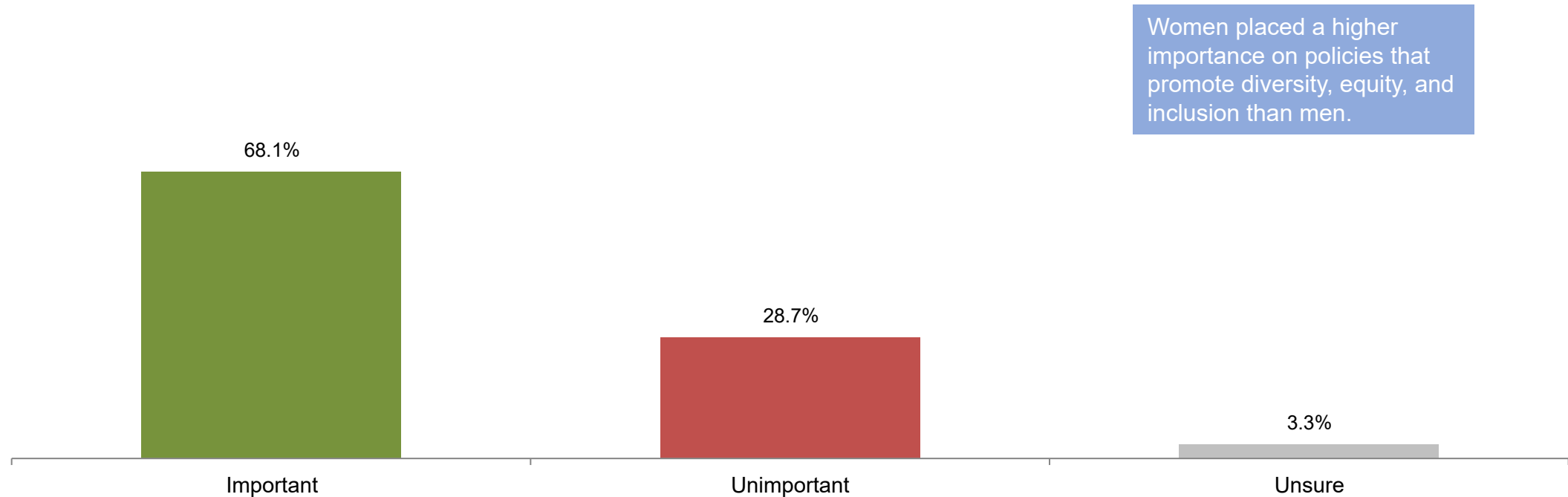
70% of residents say it is important for the City to promote sustainability and climate action

Question 28: How important is it to you that the City promotes sustainability and climate action?



68% of residents say it is important that the City has policies that promote diversity, equity, and inclusion

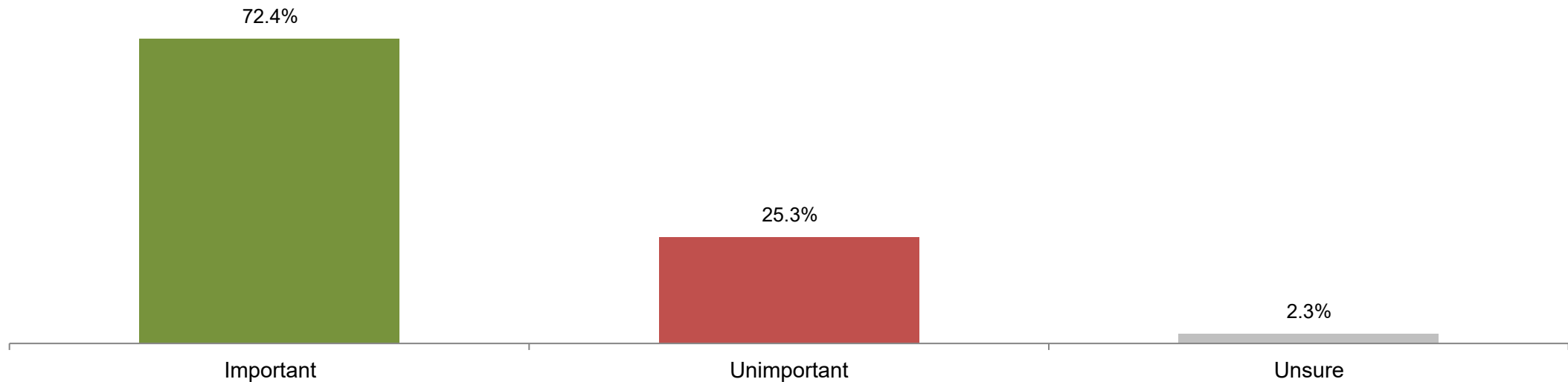
Question 29: How important is it to you that the City has policies that promote diversity, equity, and inclusion?



72% of residents say it is important that the City builds new parks and outdoor spaces

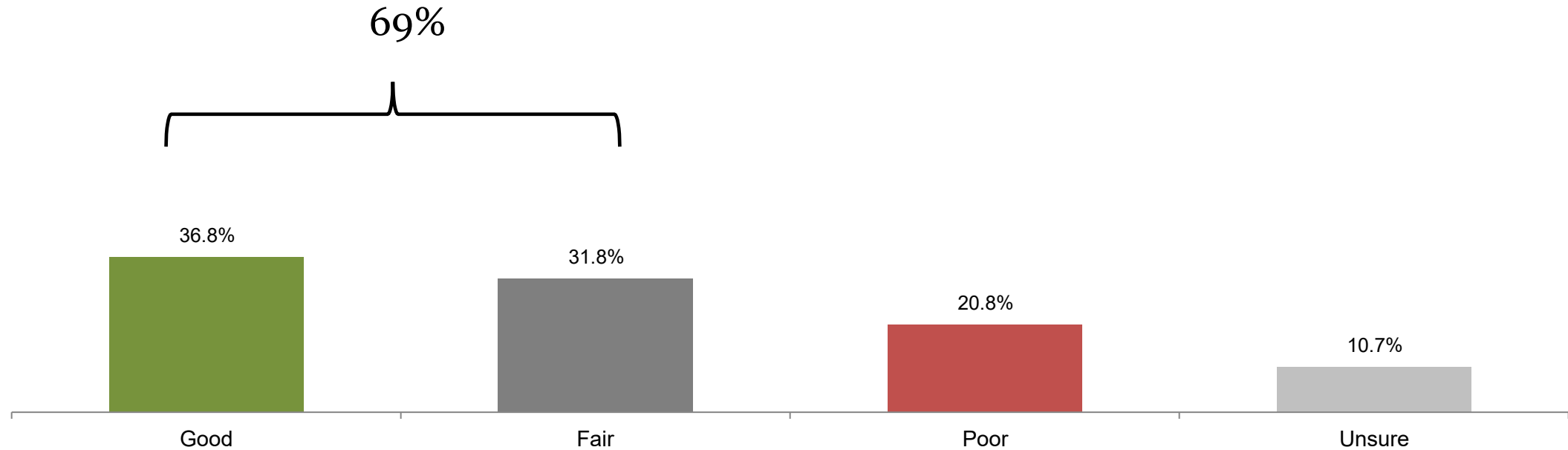
Question 30: How important is it to you that the City of Arvada builds new parks and outdoor amenity spaces?

College-educated residents rank building new parks higher than others.



69% of residents rate the City's efforts to solicit public input as good or fair

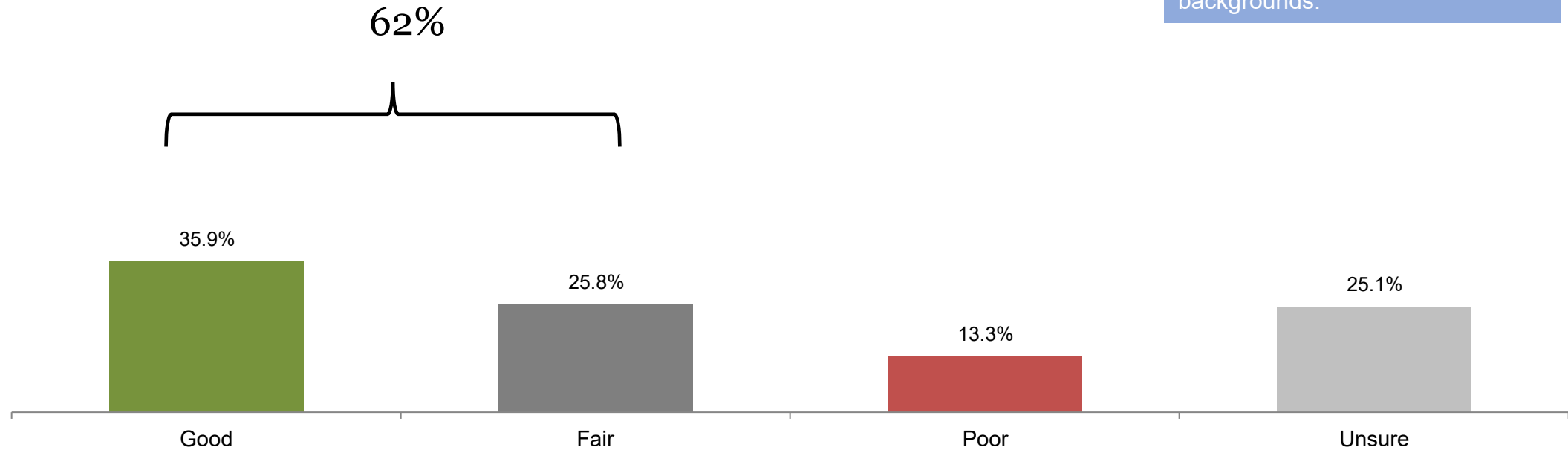
Question 31: How would you rate the City's efforts to solicit public input and engage residents in policy and programs?



62% of residents rate the City's efforts of inclusion as good or fair

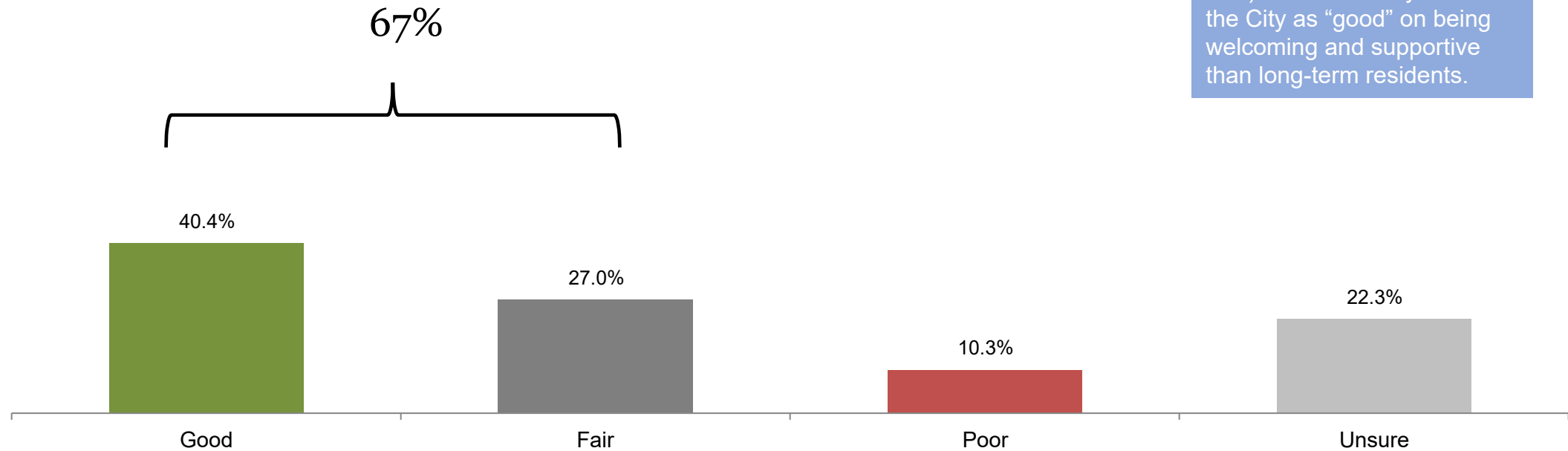
Question 32: How would you rate the City on including residents of all abilities, cultures, ages, and backgrounds?

Latino residents are more likely to rate the City as "good" on including residents of all cultures, ages, and backgrounds.



67% of residents rate the City's efforts on being welcoming and supportive as good or fair

Question 33: How would you rate the City on being welcoming and supportive and demonstrating caring for people through its services?

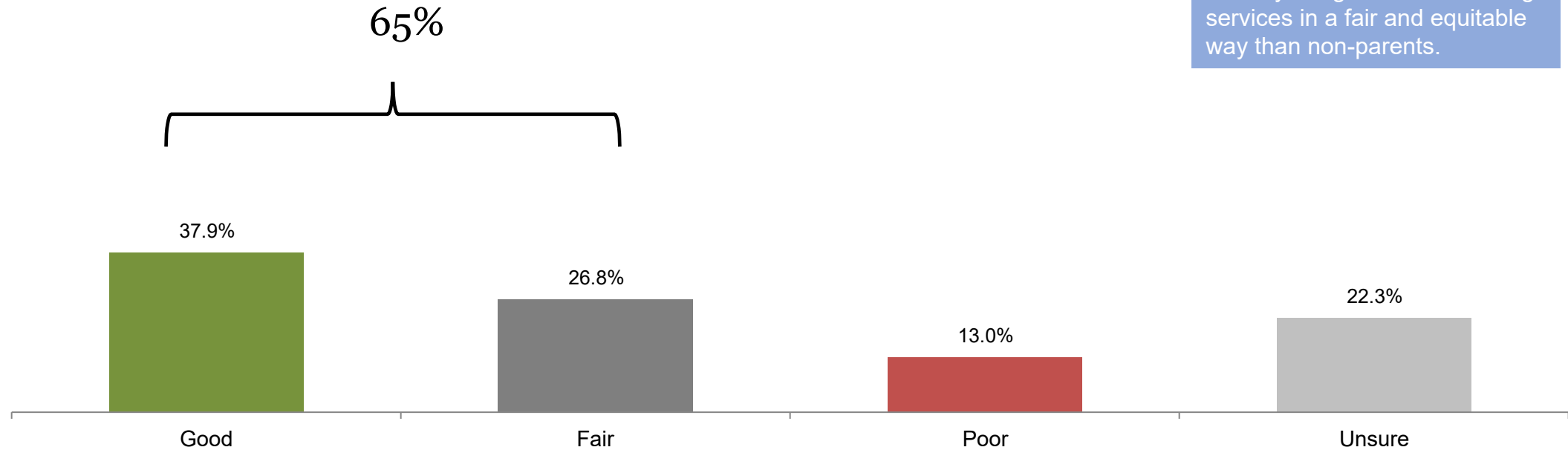


Newer residents (5 years or less) are more likely to rate the City as "good" on being welcoming and supportive than long-term residents.

65% of residents rate the City's efforts on delivering services in an equitable way as good or fair

Question 34: How would you rate the City on delivering services to its residents in a fair and equitable way?

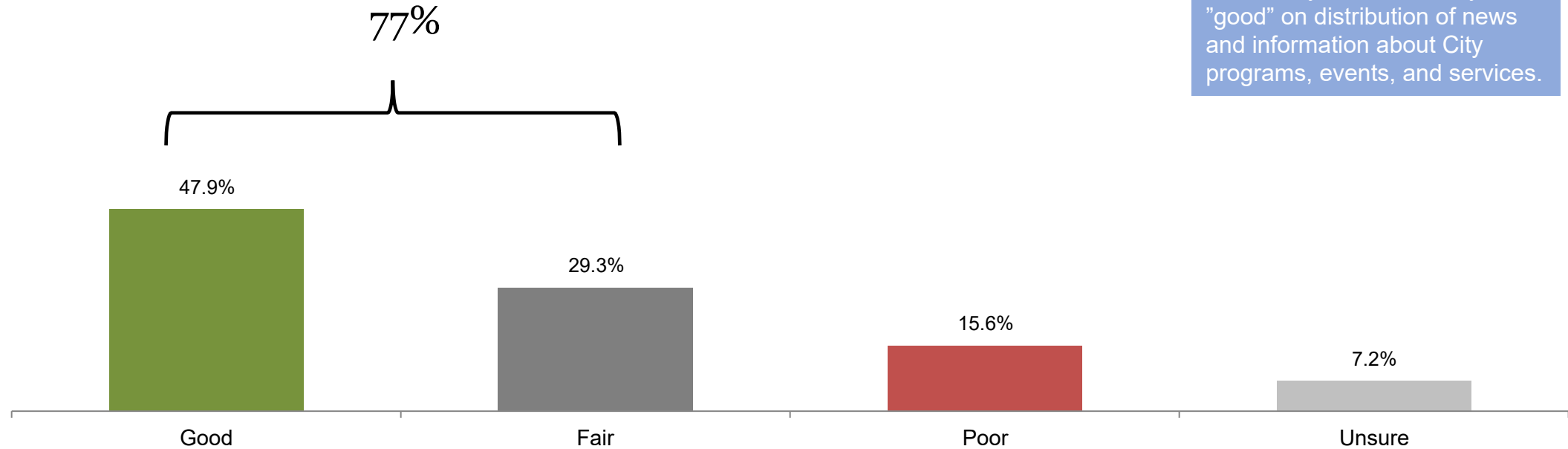
Parents were more likely to rate the City as "good" on delivering services in a fair and equitable way than non-parents.



77% of residents rate the City's distribution of information about programs as good or fair

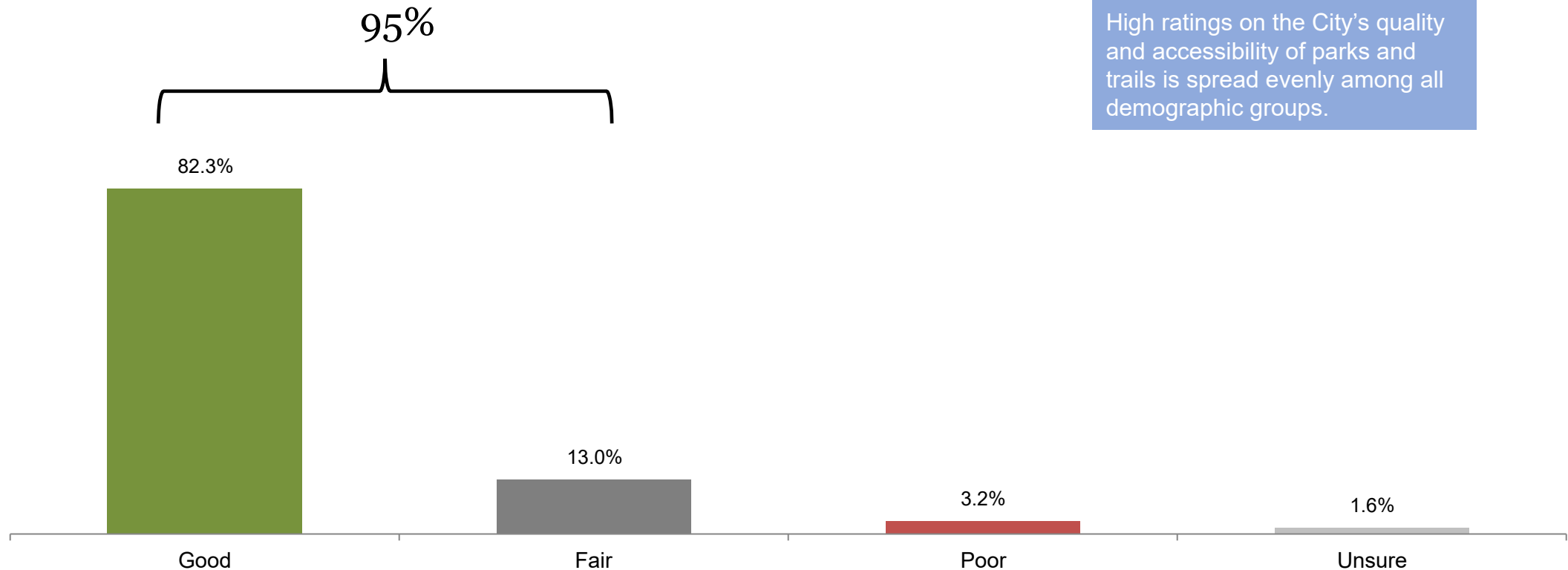
Question 35: How would you rate the City's distribution of news and information about City programs, events, and services?

College-educated residents are more likely to rate the City as "good" on distribution of news and information about City programs, events, and services.



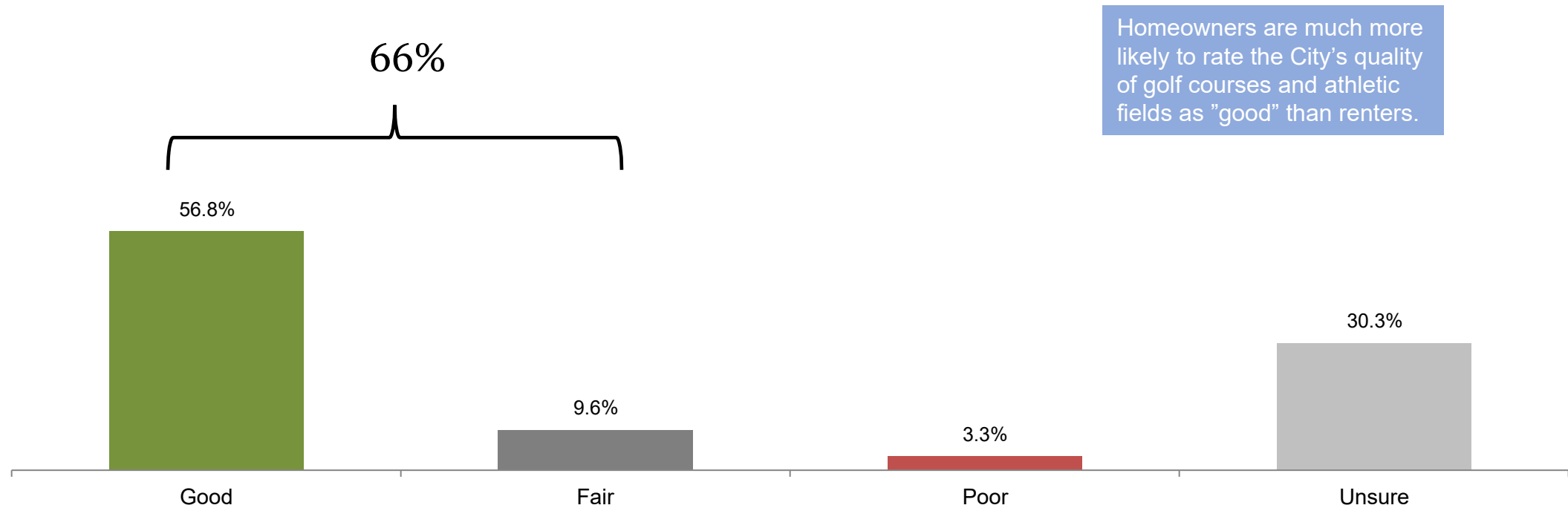
95% of residents rate the City's quality and accessibility of parks and trails as good or fair

Question 36: How would you rate the quality and accessibility of parks, open spaces, and trails in Arvada?



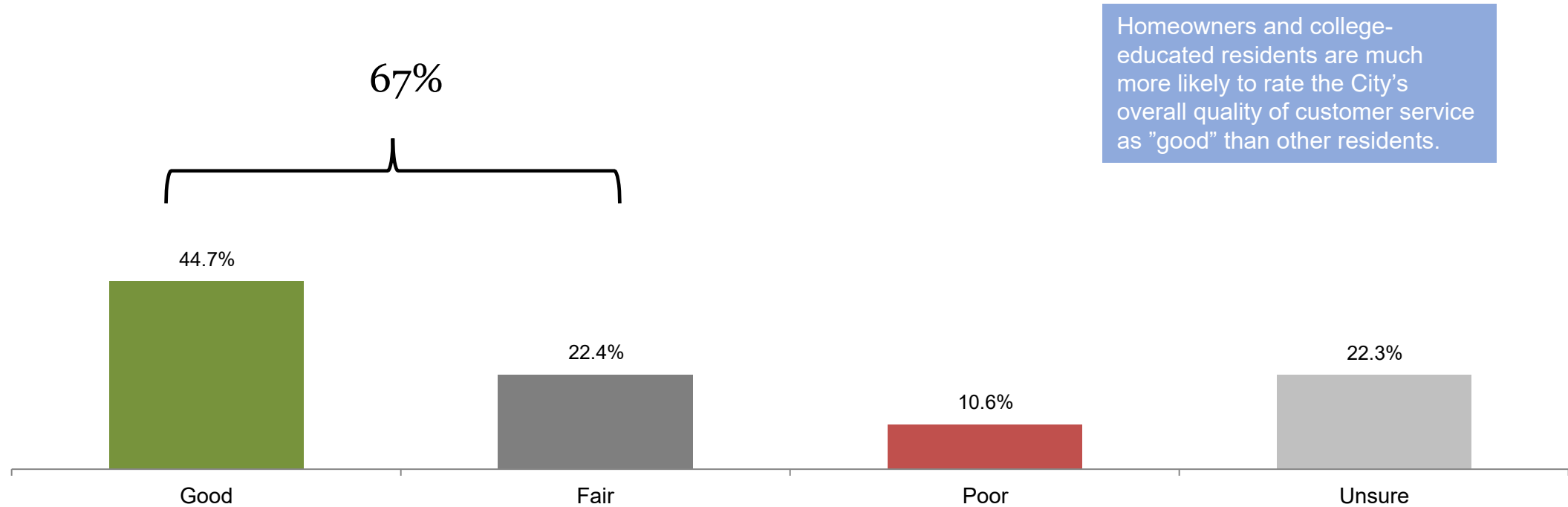
66% of residents rate the City's quality of golf courses and athletic fields as good or fair

Question 37: How would you rate the quality and accessibility of our golf courses and athletic fields in Arvada?



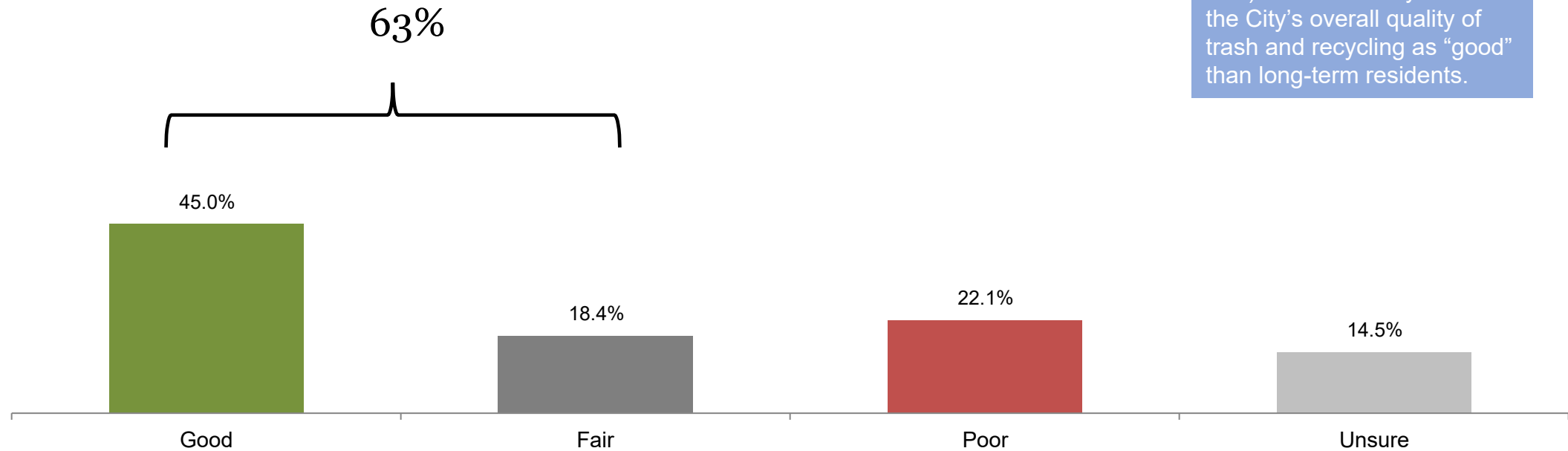
67% of residents rate the City's overall quality of customer service as good or fair

Question 38: How would you rate the overall quality of customer service that you have experienced when dealing with the Arvada City government?



63% of residents rate the City's overall quality of trash and recycling services as good or fair

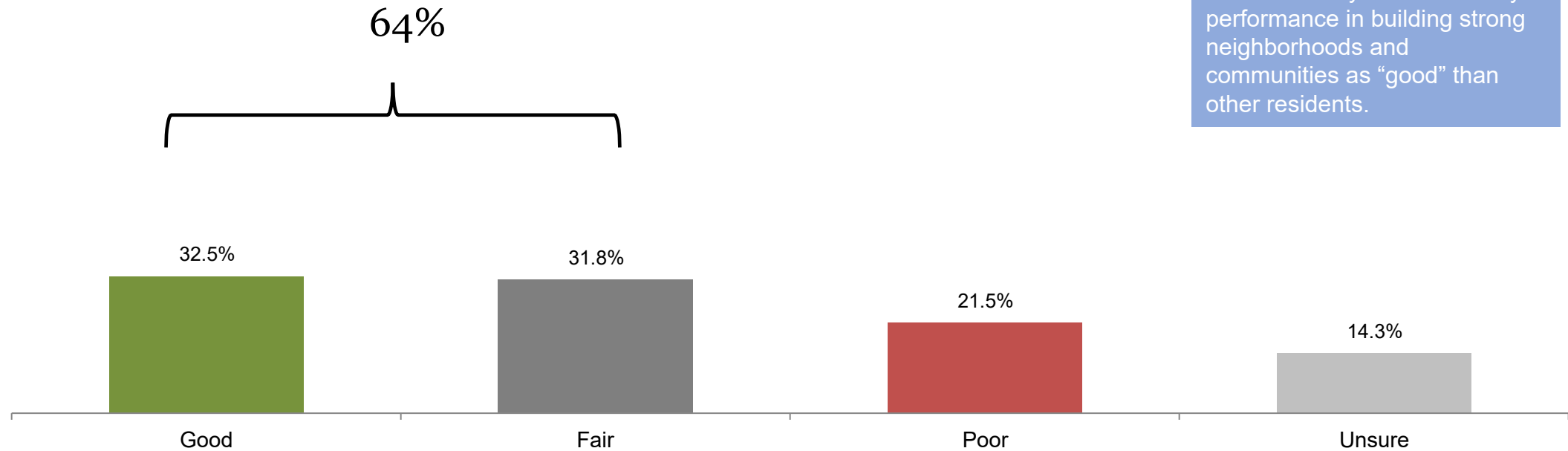
Question 39: How would you rate the overall quality of trash and recycling collection services provided by the City?



Newer residents (5 years or less) are more likely to rate the City's overall quality of trash and recycling as "good" than long-term residents.

64% of residents rate the City's performance in building strong neighborhoods as good or fair

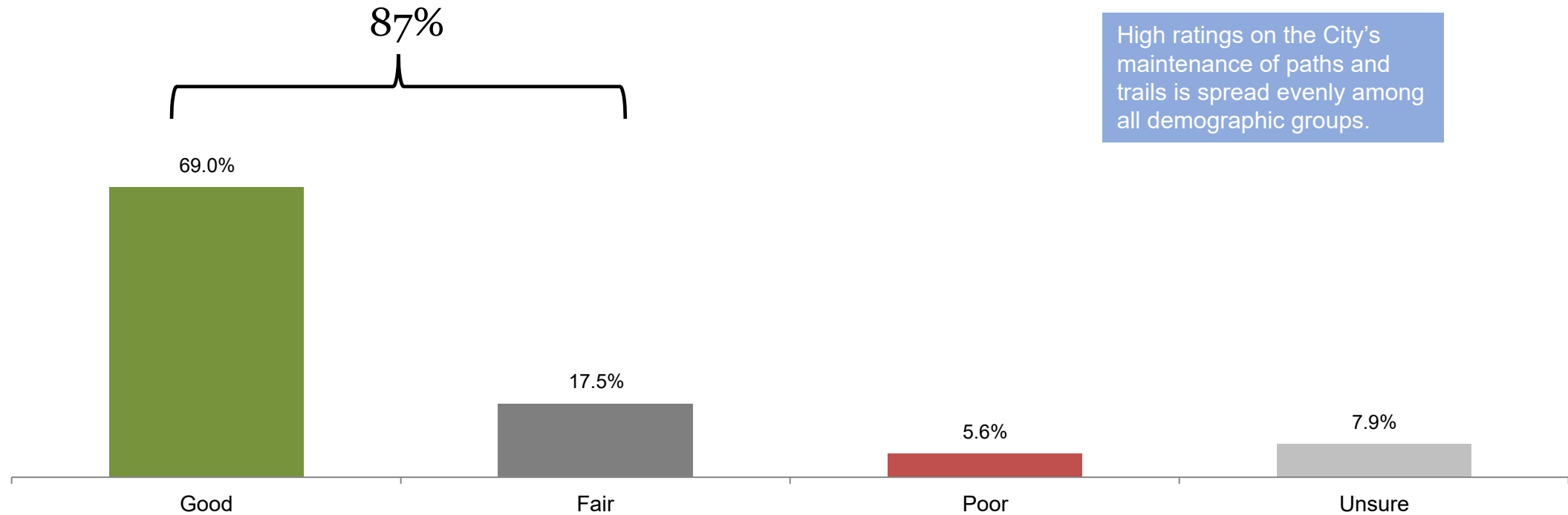
Question 40: How would you rate the City's performance in building strong neighborhoods and communities?



Younger residents and Latinos are more likely to rate the City's performance in building strong neighborhoods and communities as "good" than other residents.

87% of residents rate the City's maintenance of paths and trails as good or fair

Question 41: How would you rate the maintenance of paths and trails in the City of Arvada?

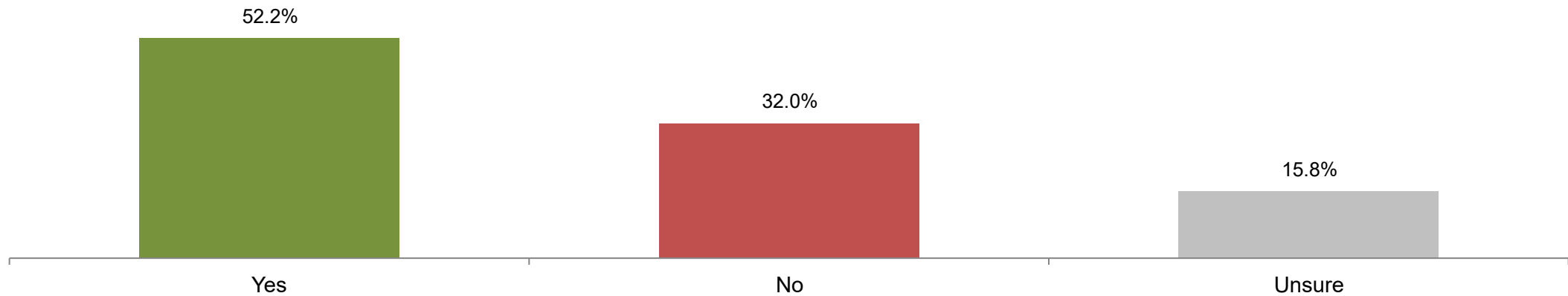


High ratings on the City's maintenance of paths and trails is spread evenly among all demographic groups.

52% of residents say Arvada is a pedestrian friendly city

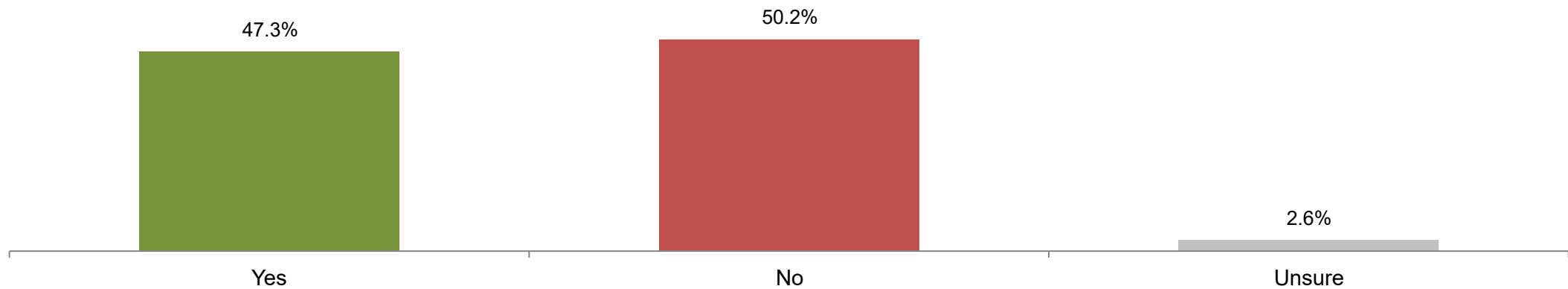
Question 42: Is Arvada a pedestrian friendly City?

Younger residents (18-39) are more likely to rate the City as a pedestrian friendly.



47% of residents have been in contact with the City over the past 12 months

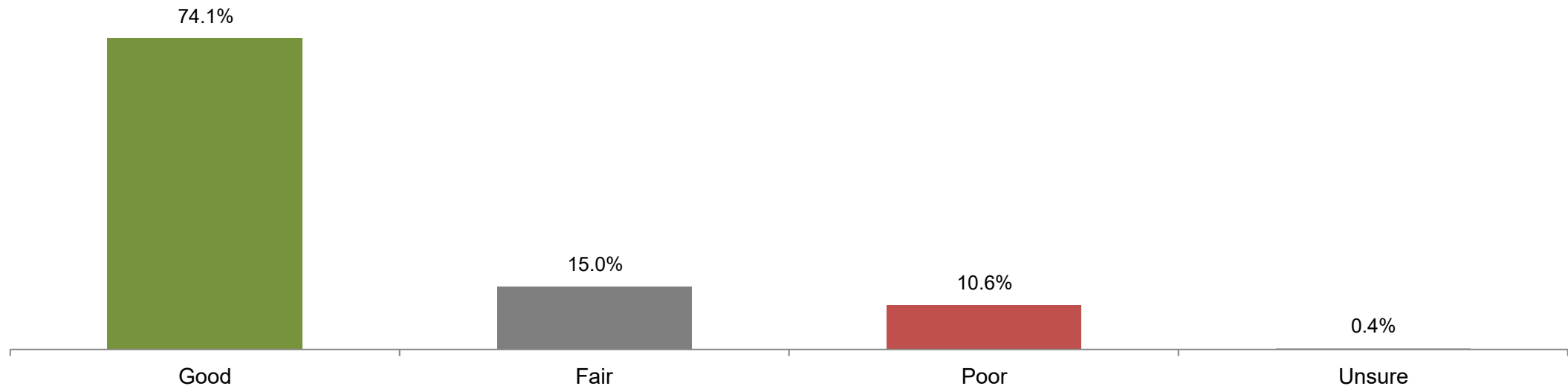
Question 46: In the past 12 months, have you been in contact with any City of Arvada employees?



Among those who have been in contact, 74% rate the interaction as good

Question 47: How would you rate your interaction with that City of Arvada employee?

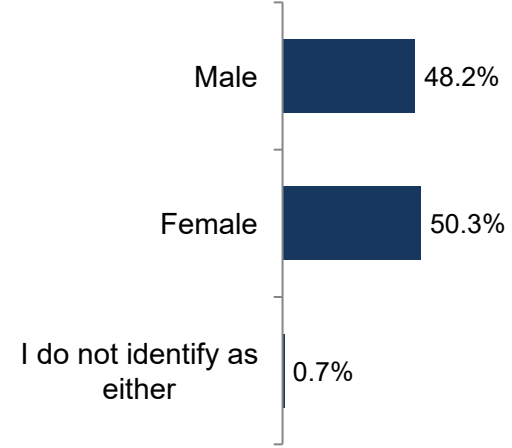
[IF ANSWERED YES TO Q46 – HAD CONTACT WITH CITY EMPLOYEE]



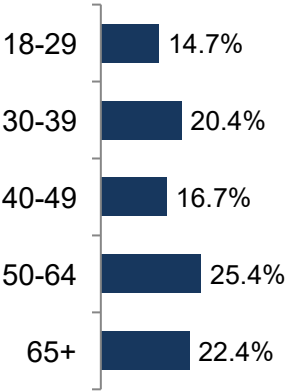
Demographics

Respondent demographics by gender, age group, ethnicity, household income, survey language, and survey mode

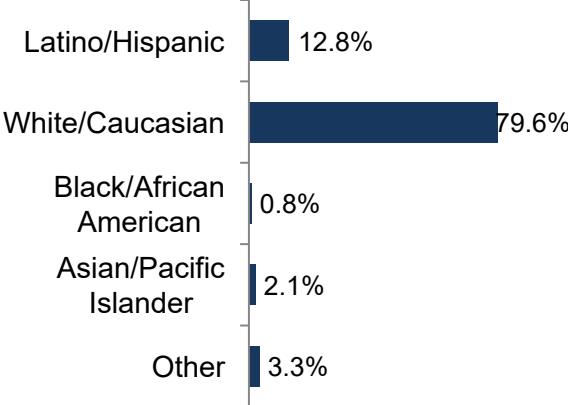
Gender



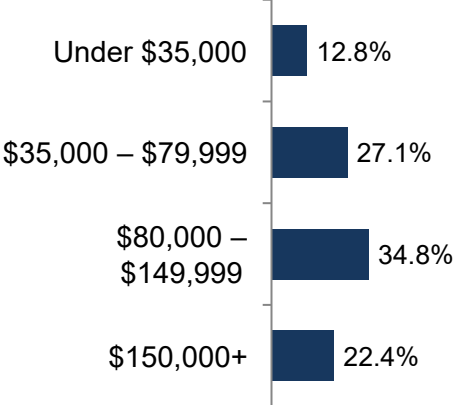
Age Group



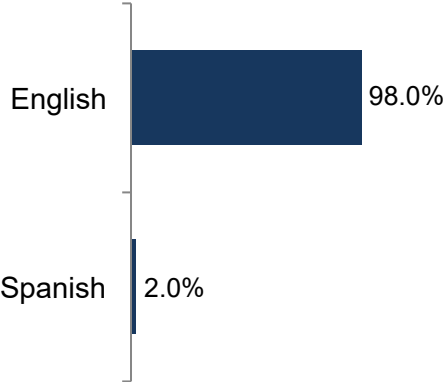
Ethnicity



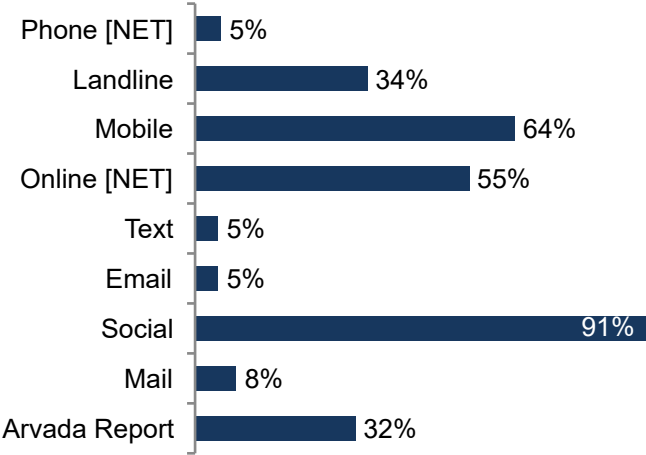
Household Income



Survey Language

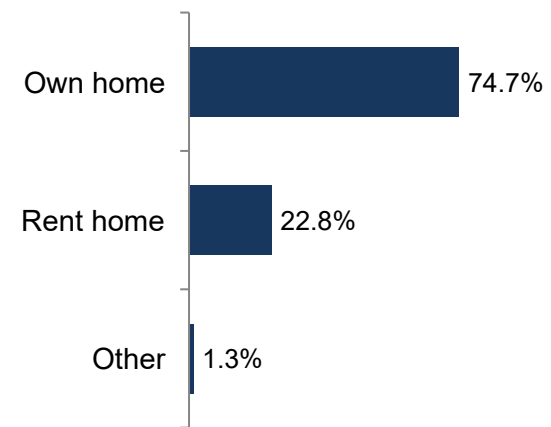


Survey Mode

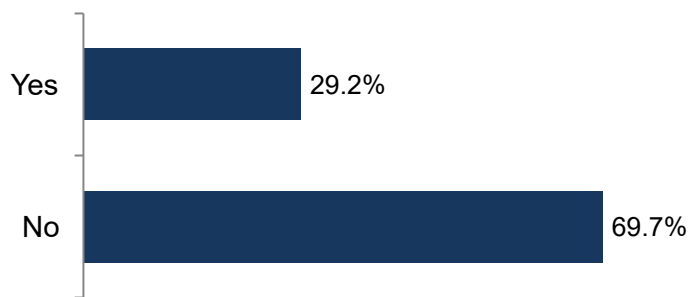


Respondent demographics by household type, city, level of education, and length of residency

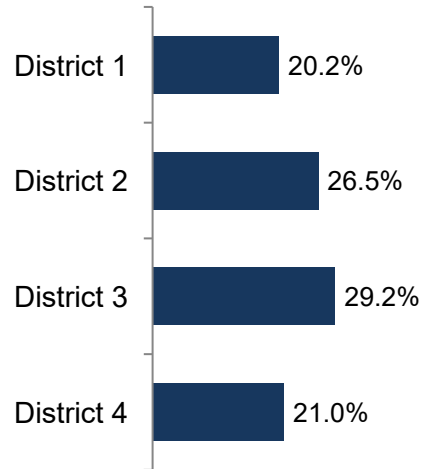
Household Type



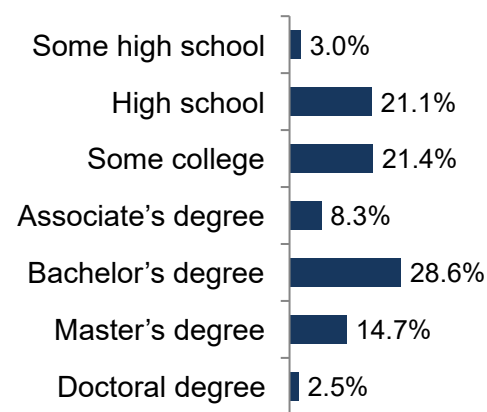
Child in Household



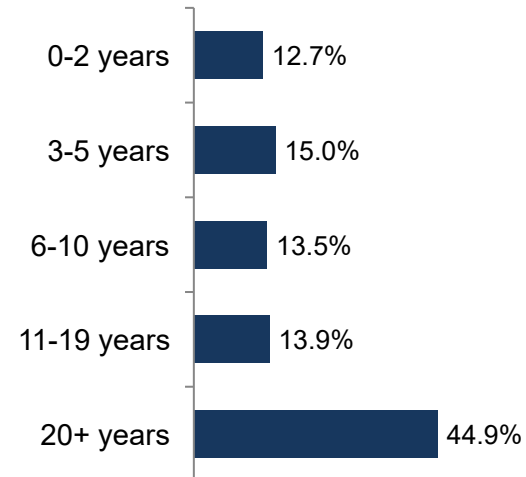
Geography



Level of Education



Length of Residency



Questions?

Adam Probolsky, President

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E: adamp@probolskyresearch.com

Joshua Emeneger, Senior Research Analyst

O: 949-855-6400



Opinion Research on
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REPORT TO CITY COUNCIL WORKSHOP

AGENDA ITEM
11.B.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: Lake Arbor Golf Course Master Planning and Course Improvements

Report in Brief

The Arvada Golf team will present historical background, data, and potential strategies for addressing the current and future reinvestment needs of the Lake Arbor Golf Course.

The policy question at hand is: *At what level will the City of Arvada recommit to developing a successful golf service model within the city's existing golf course footprint?*

The Arvada Golf team will be looking for direction from the City Council to determine what level of reinvestment shall be made to improve the customer and community experience of this community asset.

Background

Lake Arbor Golf Course, located at 86th and Wadsworth in northeast Arvada, is currently the oldest city owned and operated golf course in Arvada. Designed in 1973, and measuring 5,900 yards in length, Lake Arbor Golf Course is an approachable, walkable, traditionally designed 18 hole course that features some of the best quality greens in the metro area. With a quick pace of play, around 4 hours, Lake Arbor Golf Course is consistently regarded as one of the best values in the region.

The primary mission of municipal golf courses is to provide reasonably priced outdoor recreation for local residents. In addition to recreation benefits, municipal courses like Lake Arbor provide valuable open space for established pockets of a community. A focus on promoting healthy outdoor activity in an accessible, family-friendly environment, regardless of physical abilities, distinguishes municipal golf courses from semi-private and exclusive private golf courses.

With over 95 acres of open space, Lake Arbor is also an important environmental asset for vegetation and wildlife. Preserving the many amenities Lake Arbor has to offer, while investing in innovative opportunities for growth and improved community and customer experience, will require a strategic approach. This will include financial contributions in order to achieve long-term objectives which address environmental, demographic, and societal needs and challenges.

In 2019, the United States Golf Association (USGA) conducted an on-site visit to the Lake Arbor Golf Course to conduct an agronomy study. Following that study, the Arvada Golf team partnered with three architectural firms to develop a series of possible redesign scenarios for the course. Each design concept considered emerging trends in the golf industry (including efforts to accommodate changing demographics) as well as ways to improve the experience of both community members and players.

In February 2022, the Arvada Golf Advisory Committee reviewed the design proposals with staff and selected a favorite. Those preliminary designs and recommendations were shared with the Arvada City Council during a workshop on May 9, 2022.

Additionally, beginning in August 2022, the Arvada Golf leadership team completed an assessment of the playability of Lake Arbor Golf Course and developed a course improvement plan. The leadership team consists of subject matter experts with over 60 years of experience managing and maintaining Lake Arbor Golf Course. The leadership team outlined a path forward for Lake Arbor by developing a set of criteria for systematizing course improvements, which include: the frequency of misplaced

tee shots, proximity of shots to out-of-bounds, cost effectiveness of construction, and overall aesthetics. The leadership team scored each hole based on the outlined criteria to determine a prioritization for hole improvements using existing financial resources.

The Arvada Golf team completed the improvement plan in November 2022 and will begin implementing the recommended improvements in priority order using previously-approved CIP dollars starting in the spring of 2023.

Strategic Alignment

This work supports the Vibrant Community and Neighborhoods Priority Area of the City Council Strategic Plan and the following Strategic Result:

"By 12/23, complete strategic investments and initiatives to ensure parks, trails, open space and amenities are in alignment with our diverse, changing and growing community."

"By 12/22 complete updates to the Lake Arbor Golf Course Master Plan."

This work also supports the following Principle within the VCN Priority Area:

"Operates sustainable premier golf programs and facilities focusing on exceptional service and value to the community with the conservation of the natural environment under economically sound and socially responsible management."

Next Steps

We are seeking City Council's policy direction related to future reinvestment in the Lake Arbor Golf Course.

Prepared by:

Enessa Janes, Director of Vibrant Community and Neighborhoods

Reviewed by:

Approved by:

Enessa Janes, Director of Vibrant Community and Neighborhoods 1/24/2023

Bryan Archer, Director of Finance 1/24/2023

Rachel Morris, City Attorney 1/31/2023

Don Wick, Deputy City Manager 2/2/2023

Lorie Gillis, City Manager 2/2/2023

Enclosure, exhibits & attachments required to support the report



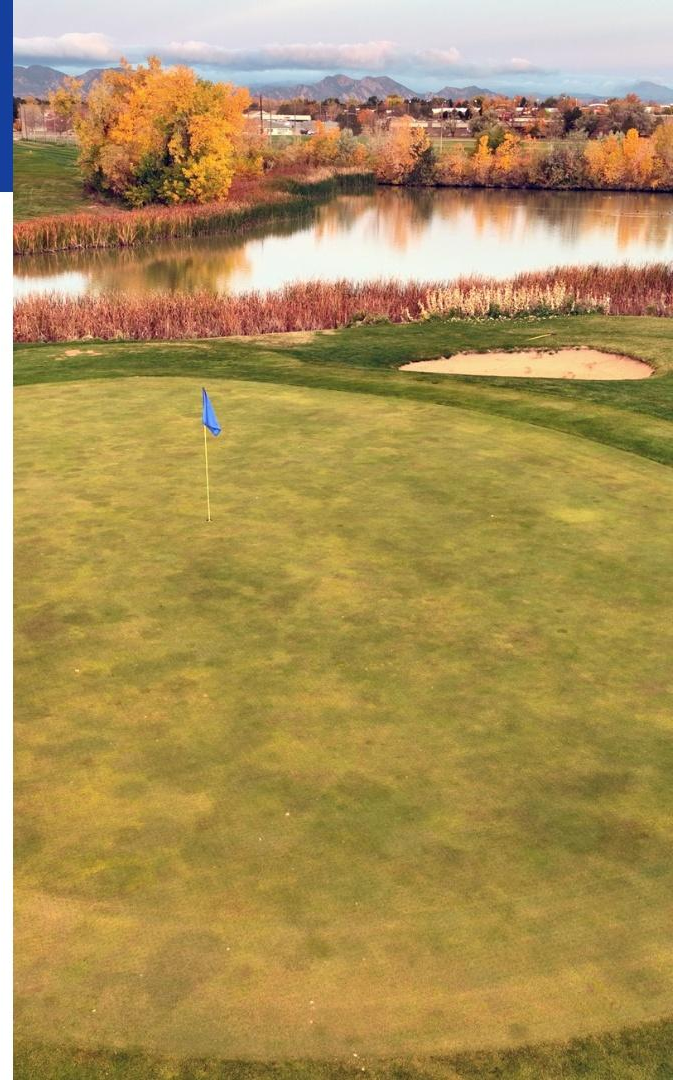
LAKE ARBOR GOLF COURSE

MASTER PLANNING AND COURSE IMPROVEMENTS

City Council Workshop
February 13, 2023

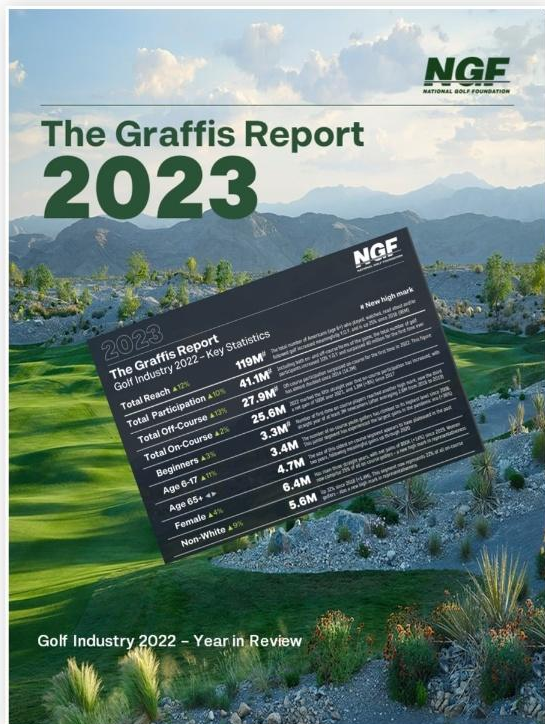
WORKSHOP OBJECTIVES

- Explore history, industry trends, data related to the Lake Arbor Golf Course
- Explore current and emerging challenges
- Explore potential strategies for addressing those challenges
- Receive policy direction from City Council related to improvements and future planning



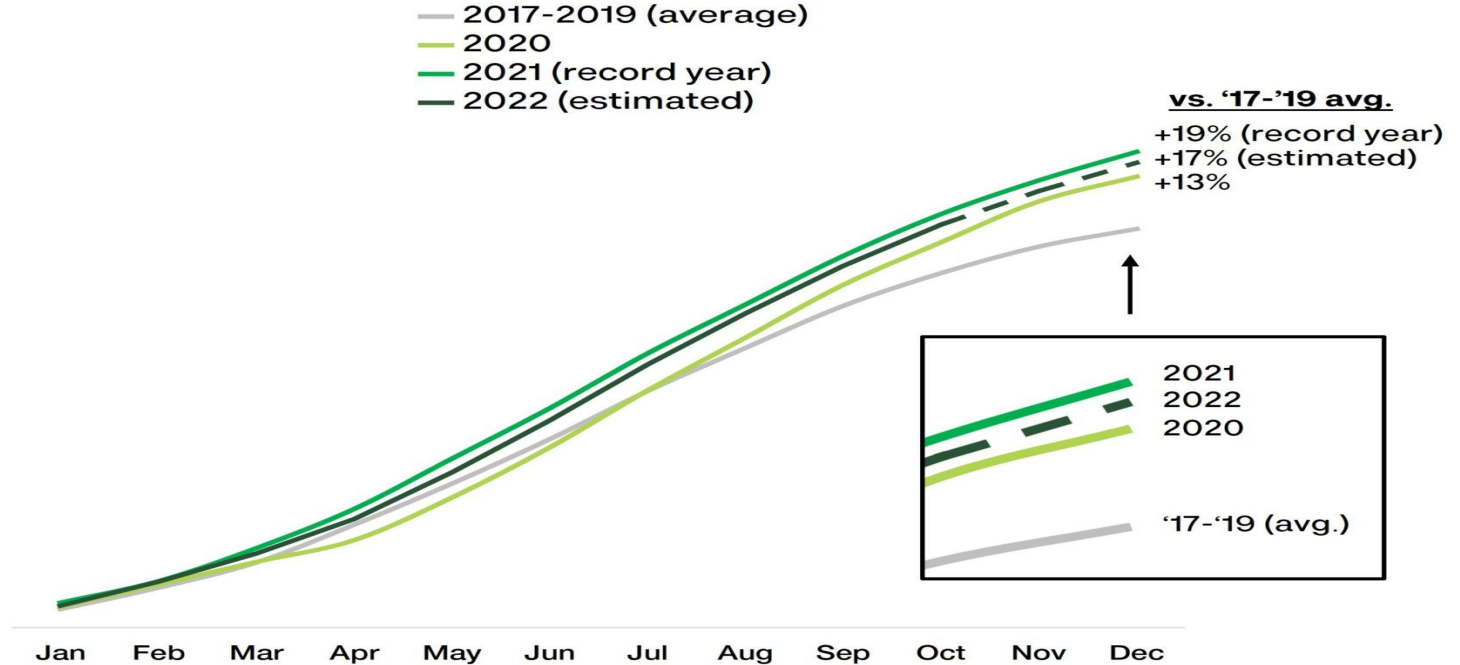
TO SUPPORT A VIBRANT COMMUNITY AND NEIGHBORHOODS, THE CITY OF ARVADA:

Operates sustainable premier golf programs and facilities focusing on exceptional **service and value** to the community with the **conservation of natural environment** under **economically sound** and **socially responsible** management.



- Increase in the total number of golf participants nationwide
- Increasing interest in golf from women; women are 40% of off-course golfers
- 1/3 of golfers in the US are now millennials
- Significant push to move to shorter rounds of golf
- Juniors (6-17) and young adults (18-34) make up 35% of all on-course golfers
- Progressing technology (design of clubs, balls, sensors, GPS)

Cumulative U.S. Rounds Played 2020-2022 vs. Pre-Pandemic Average



Source: Golf Datatech (National Golf Foundation data support and analysis)
December 2022

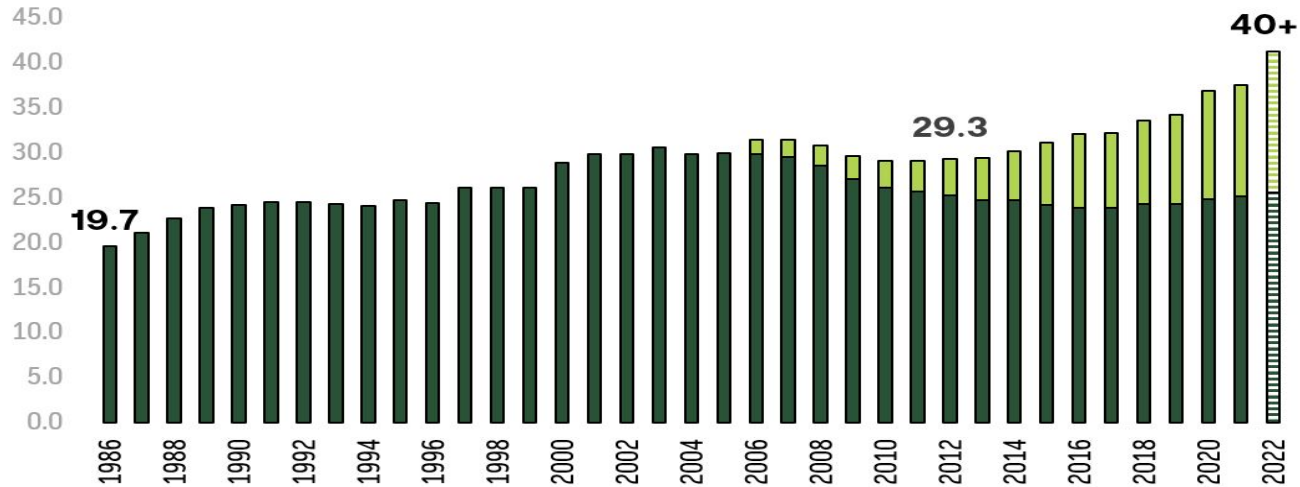
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NGF

Total U.S. Golf Participation

Includes On- and Off-Course Play
(in millions of golfers age 6+)

■ On-course ■ Off-course only



Source(s): Physical Activity Council (PAC) activity survey and NGF's Participation and Engagement Survey (PES)
October 2022

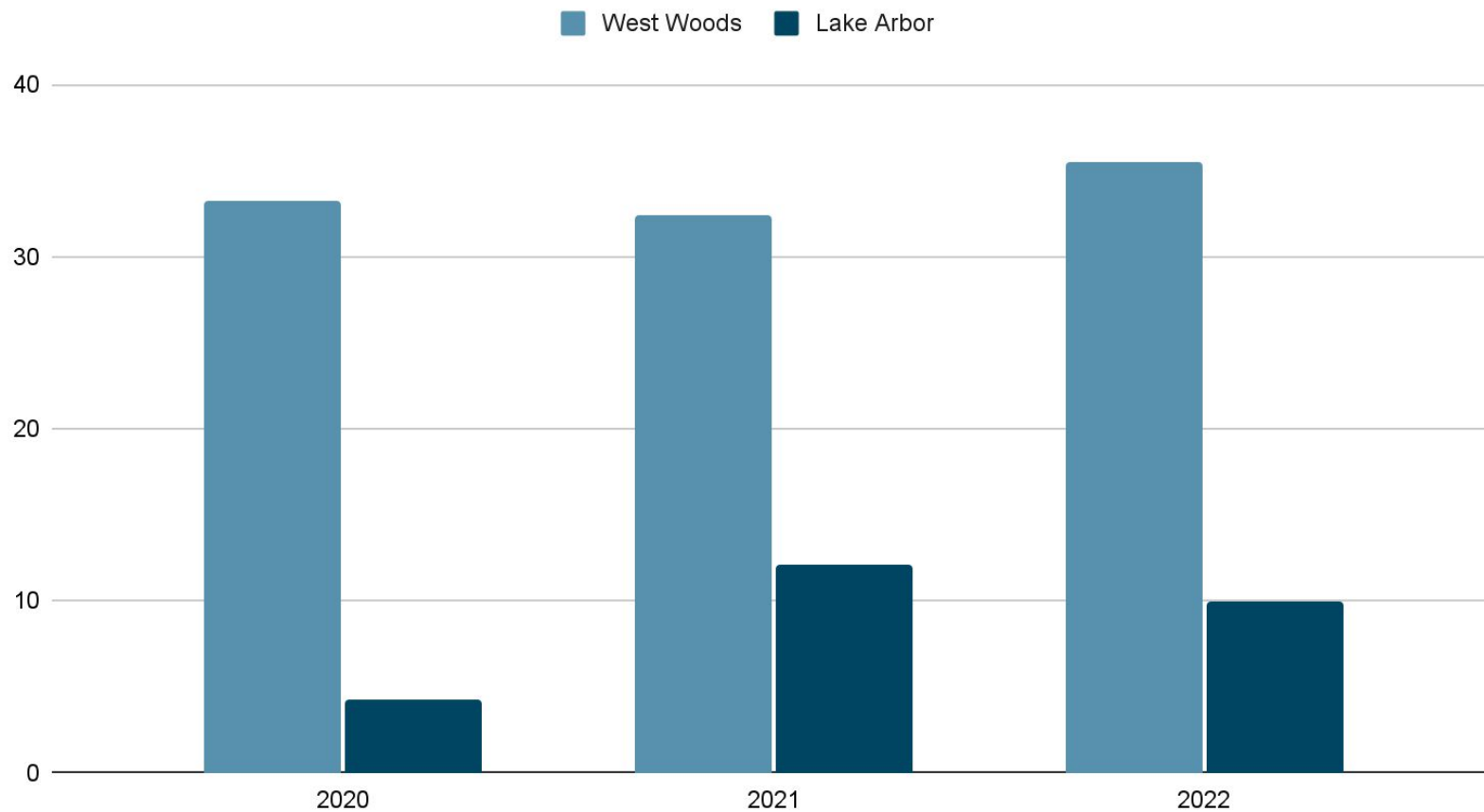
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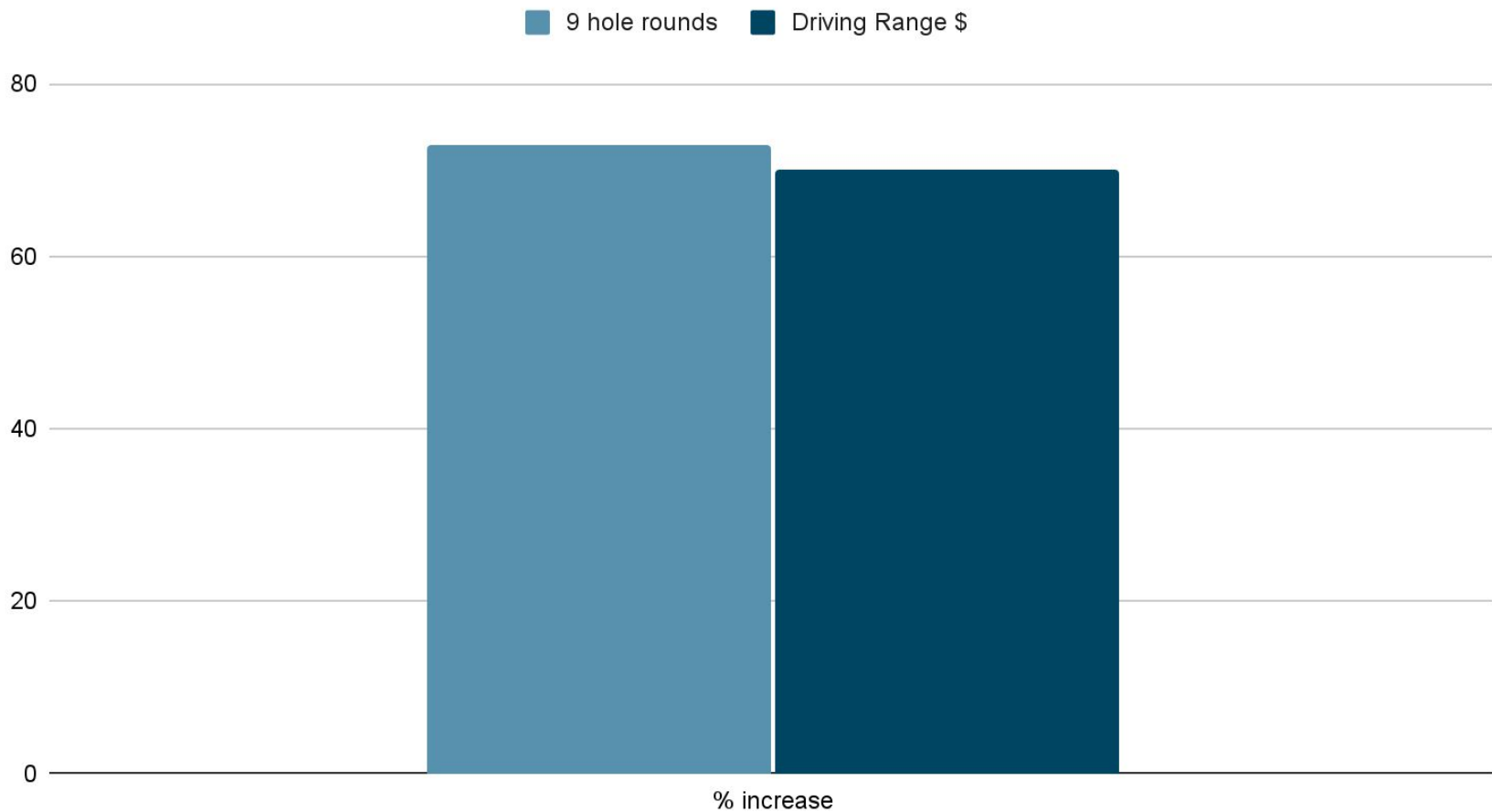


- Surge in golf locally:
 - 10% increase in rounds at Lake Arbor
 - 32% increase in rounds at West Woods
- Emerging local competitors (Top Golf)
- Range (off-course) sales trends at LA vs WW
- Homeowners more likely to rate the quality of the city's courses as "good" than renters (2022 Arvada Community Survey)

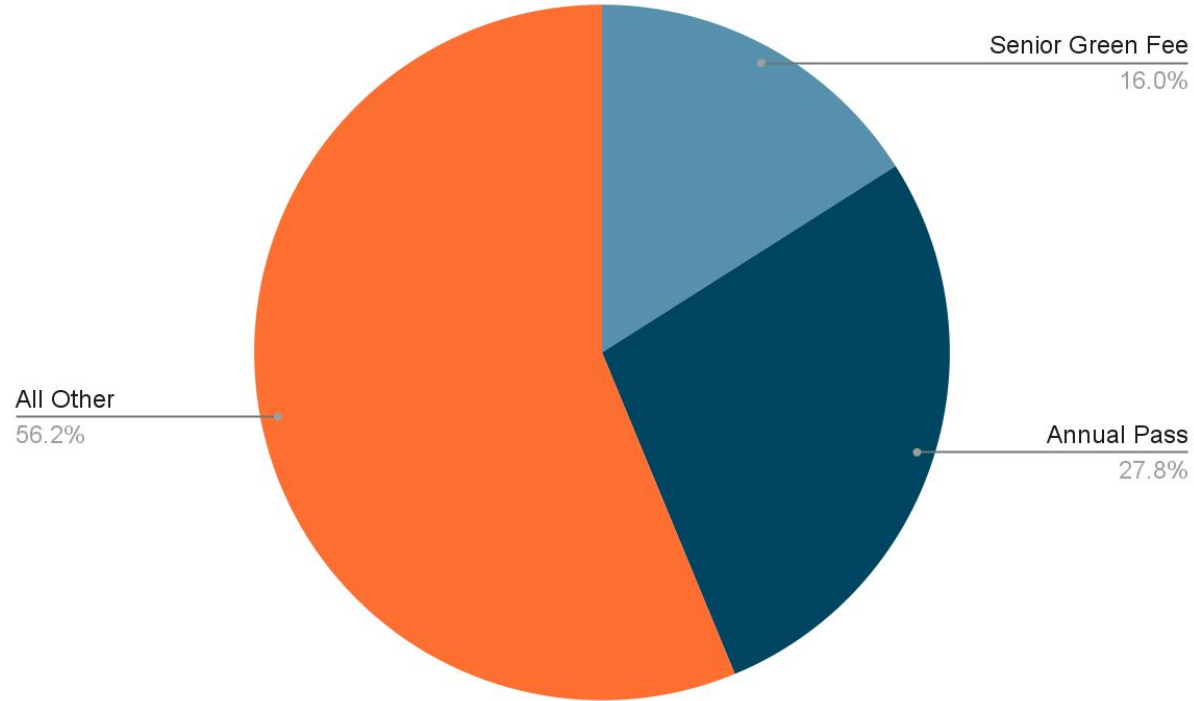
% change in rounds 2019 to 2020, 2021, 2022



% increase 2019 to 2022 West Woods 9 hole Rounds and Driving Range

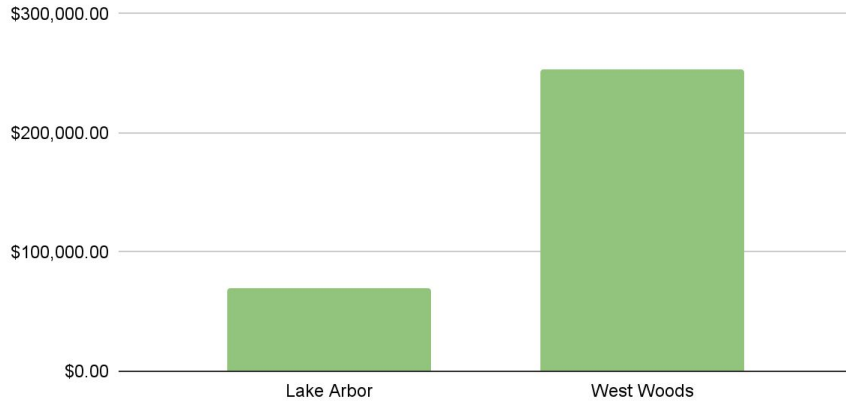


Lake Arbor GC - Total Rounds in 2022 = 35,674



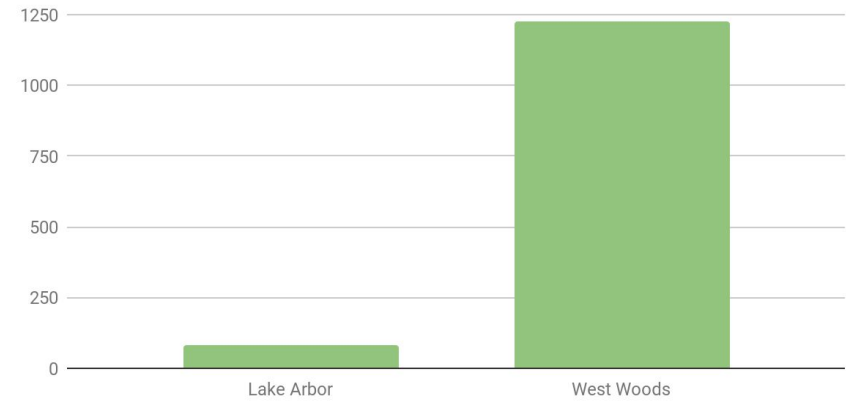
Practice Facility Comparison - WW vs. LA

2022 Range Sales



Total 2022 Range Sales

2022 Organized Group Instructional Programs Visits

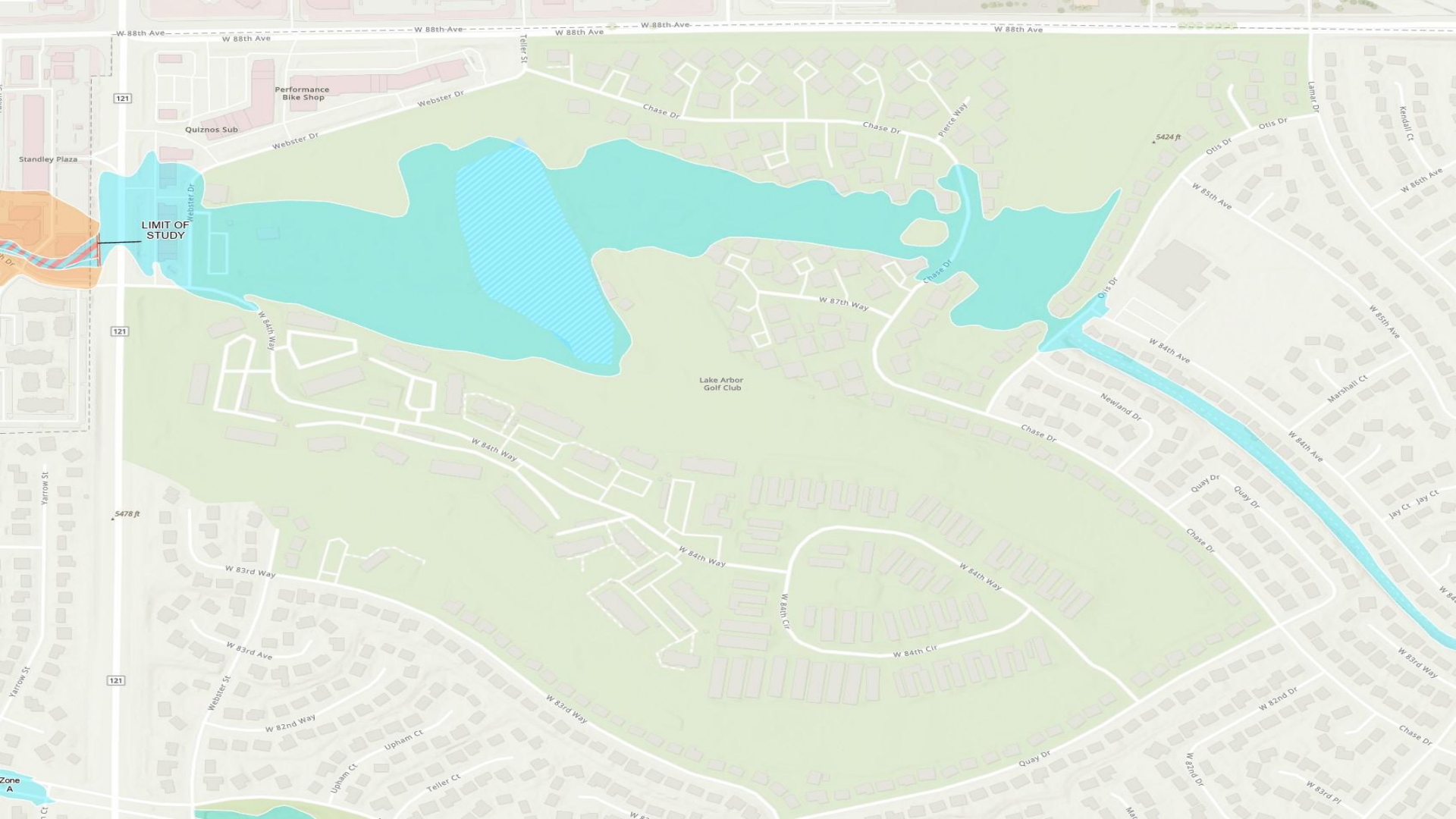


LA=Chipsters,HS Practice WW=Chipsters,Fam.,Night, Girls Golf,GIS Field Trip,GGR



- Built in 1973, city took ownership in 1975
- Purchased using Jeffco Open Space funds
- Example of a 'master planned' community
- Certified Audubon Cooperative Sanctuary
- Course Improvements
 - Irrigation systems
 - Netting and fencing
 - New tee boxes

History of the Lake Arbor Golf Course













- Fund 43 operates as an Enterprise Fund
- Municipal golf courses provide reasonably priced outdoor recreation for local residents
- Provides a valuable open space for an established community on the east side of Arvada
- Ecosystem services, environmental stewardship, water conservation



CHALLENGES: AGING INFRASTRUCTURE

- Netting and fence repair
- Cart path repair
- Renovation of bunkers, tees, greens
- Maintenance building is the City's oldest operating facility

NGF

Golf Participation in the U.S.

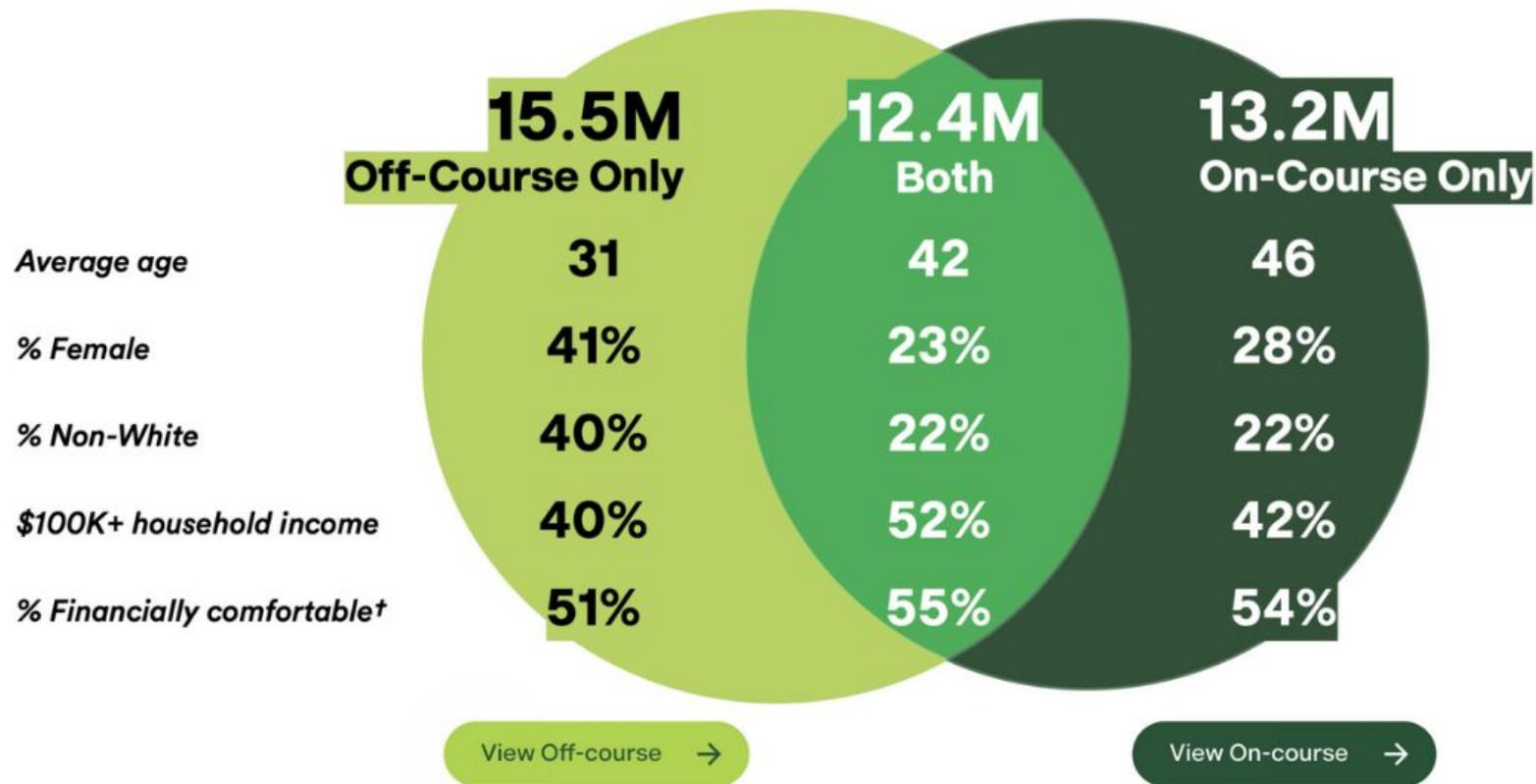
2022



- 1/3 of golfers in the US are now millennials
- Number of golfers age 65+ have plateaued since 2020
- Increasing interest in golf from women; women are 40% of off-course golfers
- Changes to playing style and preferences
- Desire for off-course play / amenities / practice areas

Challenges: Shifting Demographics

U.S. Golf Participation
Demographic Profiles, by Participant Group
41.1 million total participants



Source: National Golf Foundation

Data comes from two sources: Physical Activity Council (PAC) activity survey and NGF's Participation and Engagement Survey (PES)

† Q. How would you describe your financial situation? (Percentages reflect the proportion who answered "Very comfortable – finances are not a concern" or "Comfortable – finances are not a source of stress")

Total U.S. Golf Participation

Millions (age 6+)

■ On-course ■ Off-course



Source: National Golf Foundation

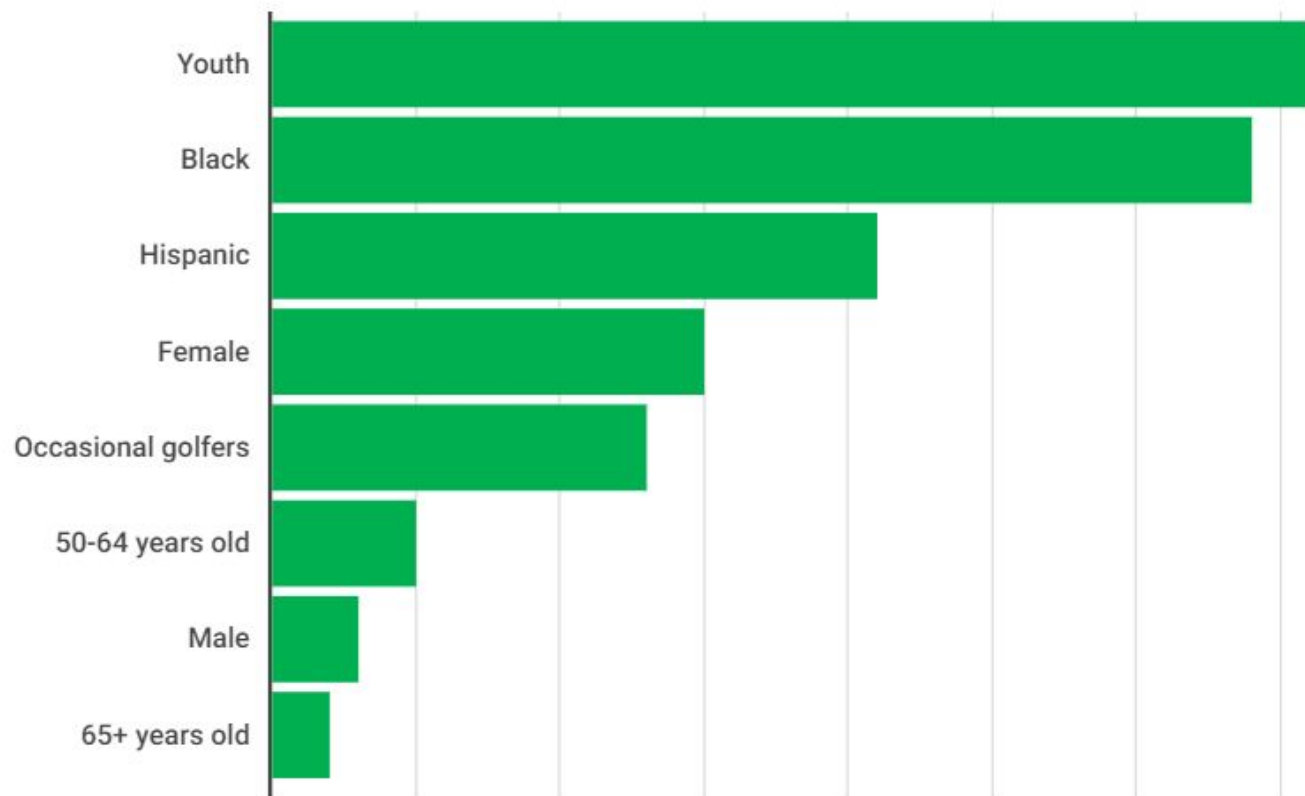
Data comes from two sources: Physical Activity Council (PAC) activity survey and NGF's Participation and Engagement Survey (PES)

Groups above are not mutually exclusive

On-Course Growth Segments

Volume Growth

Past 3 years



- Playability concerns
- Errant Shots
 - Inherent risk and privacy
- Balancing aesthetics
 - Maintenance improvements
 - Expansive views

Challenges: Player and Resident Concerns







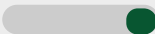






- Market and Feasibility Study
 - Condition of property and facilities assessment
 - Market area demand analysis
 - Evaluation of future viability and profitability
 - Conceptual designs and financial plans
- Implementation of Course Improvement Plan
 - Phase I - Holes #2 and #7
 - Netting on Hole #4
 - \$81,000 one-time funds

2023 PROJECT PLAN

	Q1			Q2			Q3			Q4		
	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
Golf Course Tours with City Council												
Council Workshop												
Market and Feasibility Study												
On-Course Education												
Course Improvements												
Council and Community Engagement												

- Challenges and opportunities abound at the Lake Arbor Golf Course
- Facility provides recreational, environmental, and quality of life benefits to the community at large
- Recommendation:
 - Complete feasibility study
 - Complete Phase I of Course Improvement Plan
 - Continue on-course education
 - Report back to City Council and Community in 4Q 2023

Recommendations and Council Discussion





REPORT FROM CITY COUNCIL

AGENDA ITEM
13.A.

DATE: February 13, 2023

SUBJECT: Council Committee Reports

Report in Brief

City Council members are appointed to various committees and boards as set out on the attached listing. As meetings are held, individual council members will report back to the full City Council any relevant discussions and issues that occurred.

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Enclosure, exhibits & attachments required to support the report

Council Member	Committee
Marc Williams	Arvada Municipal Court/Judicial Committee Arvada City Attorney Committee Arvada Urban Renewal Authority E-470 Authority (alternate) Jefferson Parkway Public Highway Authority Northwest Parkway Authority (Associate Member) (alternate) Urban Drainage and Flood Control District West Connect Coalition *Metro Mayors Caucus
Bob Fifer	Adams County Regional Economic Partnership (ACREP) Apex Coordinating Committee Arvada City Attorney Committee Arvada Transportation Committee Denver Regional Council of Governments (Alternate) Jefferson County R-1 Schools Coordinating Committee Jeffco Transportation Action & Advisory Group (JEFFTAAG) Smart City Advisory Committee
David Jones	E-470 Authority (alternate) Jefferson County Community Corrections Board Jefferson County R-1 Schools Coordinating Committee Jefferson Economic Development Council (JEDC) Jefferson Parkway Public Highway Authority Northwest Parkway Authority (Associate Member) (alternate) West Connect Coalition (alternate)
John Marriott	Adams County Regional Economic Partnership (ACREP) (alternate) Apex Coordinating Committee Arvada Economic Development Association Board Arvada Municipal Court/Judicial Committee Arvada Parks Advisory Committee Arvada Visitors Center Committee (alternate) CML Policy Committee Olde Town Business Improvement (BID) District Rocky Mountain Metropolitan Airport Community Noise Roundtable
Randy Moorman	Arvada Audit Committee Arvada Sustainability Advisory Committee CML Policy Committee Rocky Flats Stewardship Council
Lauren Simpson	Arvada Audit Committee Arvada Center for the Arts and Humanities Arvada Fire Protection District Coordinating Committee Arvada Visitors Center Committee Olde Town Business Improvement (BID) District (alternate)
Lisa Smith	Arvada Chamber of Commerce Government Affairs Committee Arvada Fire Protection District Coordinating Committee Denver Regional Council of Governments Jefferson County Community Corrections Board (alternate) Jeffco Transportation Action & Advisory Group (JEFFTAAG) (alternate) Smart City Advisory Committee

*Asterisked committees are not appointed by Council

City Clerk Team Drive: Council appointed committees



REPORT TO CITY COUNCIL

AGENDA ITEM
14.A.

TO: THE HONORABLE CITY COUNCIL

DATE: February 13, 2023

SUBJECT: Review of Future Workshops and Presentations

Report in Brief

The City Manager's Office maintains a list of upcoming workshops and presentations to be scheduled for City Council meetings. During City Manager Reports, at the end of City Council business meetings, City Manager, Lorie Gillis, will review with City Council the tentative schedule and make any adjustments necessary.

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Rachel Morris, City Attorney 1/23/2023

Lorie Gillis, City Manager 2/1/2023

Enclosure, exhibits & attachments required to support the report

2022/2023 CITY COUNCIL WORKSHOPS, STUDY SESSIONS, PRESENTATIONS AND RETREATS (TENTATIVE)

WORKSHOPS	Date	Lead
Lake Arbor Golf Course @ Business Meeting	Feb 13	
Community Survey @ Business Meeting	Feb 13	
No meeting – Board and Commission Interviews	Feb 27	
Bond Project Update	Mar 13	PW
Communication and Engagement Update	Mar 13	CMO
Cancelled - NLC	Mar 27	
Sub-area Plans	April 10	CED
Pocket Neighborhoods	April 10	CED
	April 24	
	May 8	
	May 22	
Bond Project Update	Jun 12	PW
Bond Project Update	Sept 25	PW
Bond Project Update	Dec 11	PW
STUDY SESSIONS		
Sustainability	TBD	
Workshop TBD's		
Budget and Fiscal Policy Update	TBD	
Tour of Pavement Operations	TBD	
Financial resiliency recommendations Provide City Council an update on the OSE's SR9: By 12/2024 based on long-term financial projections and updated master plans, develop financial resiliency recommendations to ensure adequate and ongoing investment in city infrastructure and core services. This workshop will present the summary of long range unfunded needs by work systems. Next Steps will be [M9B] By 12/2023 develop a city-wide consolidated level of service summary. [M9C] By 12/2023 prepare an exhaustive list of funding source opportunities for closing identified infrastructure and core service funding gaps.	TBD	Fin
Neighborhood Engagement and Marketing Updates	TBD	CMO
Total Rewards Philosophy and Strategy Update	TBD	HR
Athletic Field Programming	TBD-2023	VCN
Regional Homelessness	TBD	CMO
Fleet Electrification	TBD	Utilities
Council Retreat Update	TBD	CMO
Pre-Sentencing/One Small Step	TBD	Courts
Meyers Pool Provide City Council an update on the VCN's SR3: By 12/2025 develop a maintenance and reinvestment plan to ensure a sustainable, resilient and beautiful community of parks, trails, open space and medians in alignment with our diverse, changing and growing community. and VCN's SR3 Milestone [M3H] By 7/2024 replace Meyer's Pool with a new 50 meter natatorium.	TBD	CMO
City Marketing Plan	TBD	CMO

Financial Scenarios for Street Maintenance Deficit/Options for Increasing Maintenance Funds Engage City Council in a discussion around the current street maintenance needs and how the City might fund them. This will include revenue enhancements, future allocations and expenditure realignments.	TBD	PW/Fin/ CMO
Fiber Master Plan The Fiber Master Plan which is also called Arvada Fiber Optic Network (AFON), was first presented to City Council 4/10/2017. City Councils had set a strategic goal to build a fiber network to enable high speed/real-time connectivity to city facilities and assets in order to enhance city operations. This workshop is intended to brief City Council as to the progress of the AFON build out. Updates are intended to cover conduit installation progress, fiber installation progress, current co-locate opportunities, IGA member updates, and connections to current assets (city buildings, traffic, signals, utilities, radio, etc.).	TBD	PW
Community Survey Update The purpose of this item is to continue a discussion with Council about the Community Survey results and what the City team is doing to apply what is learned. Discussion will include an update on action plans targeting key drivers of the City's 5-star rating as well as how Worksystems are targeting specific measures.	TBD	CMO
Problem Properties	TBD	P.D.
Activation of Historical Assets	TBD	VCN
Customer Service Philosophy	TBD	CMO
Ask Arvada Update	TBD	CMO
APAC	TBD	VCN
Golf Course	TBD	VCN
COUNCIL JOINT MEETINGS/DINNERS:		
Denver Water Board Apex Board AURA Board Arvada Center Board–Per Coop Agreement - Annually after October 1 of each year Jefferson Parkway Meeting with Jeffco and Broomfield Council Annual Retreat		