



City of Arvada

City Council Agenda

JANUARY 22, 2024
CITY COUNCIL CHAMBERS
Regular Business

Councilmembers:

Lauren Simpson, Mayor
Randy Moorman, Mayor Pro-Tem
Shawna Ambrose, District 2
Sharon Davis, At large
Lisa Feret, At large
Bob Fifer, District 4
John Marriott, District 3

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
Jessica Garner, Director of Community & Econ. Dev.
Bryan Archer, Director of Finance
Gabriella Bommer, Director of Human Resources
Rachael Kuroiwa, Director of Communications & Engagement
Kristen Rush, City Clerk

Info: 720-898-7550

THIRD FLOOR CONFERENCE ROOM

EXECUTIVE SESSION

5:00 P.M.

Legal Advice, Pursuant to CRS 24-6-402(4)(b) Relating to Broomfield's Withdrawal from JPPHA

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 Davis
3. Roll Call of Councilmembers
4. Approval of Minutes
 - A. January 8, 2024 City Council Meeting
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. R24-011, A Resolution Authorizing An Agreement By And Between The City Of Arvada And A-1 Chipseal Company For 2024 Surface Treatment Program, Project No. 24-ST-02, In An Amount Not To Exceed \$3,147,254.08
2. R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00
3. R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00.
4. R24-014, A Resolution Authorizing a Four Month Extension of Two Leases by and Between the City of Arvada and The United States Postal Service for Lease of The Building At 5885 Allison Street and For Lease of The Parking Lot At 5886 Ammons Street

B. Resolutions - None

C. Ordinances (First Reading) - None

9. Other

10. Public Hearings - 6:15 PM - None

11. Workshops

A. City Budget and Financial Resilience

B. City Council Policy - Arvada Budget & Fiscal Policy

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



SUMMARY OF MINUTES OF THE MEETING OF THE ARVADA CITY COUNCIL HELD JANUARY 8, 2023

1. Call to Order - 6:00 p.m.

This Arvada City Council meeting was a hybrid meeting using webinar technology. Mayor Simpson, Mayor Pro Tem Moorman, Councilmember Ambrose, Councilmember Davis, Councilmember Feret, Councilmember Fifer, Councilmember Marriott were all present in chambers.

Members of the public were given notice with instructions on how to participate with public comment.

2. Moment of Reflection and Pledge of Allegiance

3. Roll Call of Councilmembers

Those Present: Mayor Lauren Simpson, Mayor Pro Tem Randy Moorman, Councilmember Shawna Ambrose, Councilmember Sharon Davis, Councilmember Lisa Feret, Councilmember Bob Fifer, Councilmember John Marriott

Also Present: Lorie Gillis, City Manager; Rachel Morris, City Attorney; Linda Haley, Deputy City Manager; Don Wick, Deputy City Manager; Bryan Archer, Director of Finance; Jessica Garner, Director of Community and Economic Development; Rachael Kuroiwa, Director of Communications and Engagement; and Kristen Rush, City Clerk.

4. Approval of Minutes – December 18, 2023

The minutes stand approved.

5. Recognition and Communication –

A. Proclamation for National Radon Action Month - Presented by Councilmember Feret

Councilmember Feret read that Proclamation and said that January is proclaimed as Official National Radon Action Month in Arvada.

6. Presentations – None

7. Public Comment –

- A. Julie Hogan, Arvada resident, addressed council regarding the development project on McIntyre Street in unincorporated Jefferson County.
- B. Judy Dain, Arvada resident, addressed council regarding the development project on McIntyre Street in unincorporated Jefferson County
- C. Anne Laffoon, Unincorporated Jeffco resident, addressed council regarding the development project on McIntyre Street in unincorporated Jefferson County.

- D. Judy Douglas, Arvada resident, addressed council regarding extreme weather and homelessness.

8. New Business

A. Consent Agenda

1. R24-001 A Resolution Designating a Public Place for the Posting of Notice of Meetings for all Boards, Commissions, and Committees of the City Council of the City of Arvada for the Year 2024
2. R24-002 A Resolution Authorizing an Agreement by and between the City of Arvada and Garney Companies, Inc., for the Ralston 3.5MG Tank Baffling Project No. 23-WA-10, in an Amount Not to Exceed \$628,000.
3. R24-003 A Resolution Authorizing the Issuance of a Blanket Purchase Order in the Amount of \$950,000.00 to Senergy Petroleum, LLC for the Purchase of Fuel Used in City Vehicles and Equipment
4. R24-004 A Resolution Authorizing the Acceptance of a Donation in the Amount of \$443,541 from Pools for Kids, Inc. to the Meyers' Pool Replacement Facility

Councilmember Feret moved that R24-001, A Resolution Designating a Public Place for the Posting of Notice of Meetings for all Boards, Commissions, and Committees of the City Council of the City of Arvada for the Year 2024; R24-002, A Resolution Authorizing an Agreement by and between the City of Arvada and Garney Companies, Inc., for the Ralston 3.5MG Tank Baffling Project No. 23-WA-10, in an Amount Not to Exceed \$628,000; R24-003, A Resolution Authorizing the Issuance of a Blanket Purchase Order in the Amount of \$950,000.00 to Senergy Petroleum, LLC for the Purchase of Fuel Used in City Vehicles and Equipment; R24-004, A Resolution Authorizing the Acceptance of a Donation in the Amount of \$443,541 from Pools for Kids, Inc. to the Meyers' Pool Replacement Facility, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

B. Resolutions –

1. R24-005 A Resolution Authorizing Acceptance of the Triennial Determination for the Continuation of the Rocky Flats Stewardship Council (February 2024-2027) (Presenter: Laura Hemler)

Laura Hemler, Assistant City Attorney, reviewed this resolution with council.

Councilmember Moorman moved that R24-005, A Resolution Authorizing Acceptance of the Triennial Determination for the Continuation of the Rocky Flats Stewardship Council, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

2. R24-006 A Resolution Approving an Intergovernmental Agreement Between the City of Arvada and the Colorado Department of Local Affairs Division of Housing to Support Homelessness Services (Presenter: Carrie Espinosa)

Carrie Espinosa, Manager, Housing Preservation and Resources, reviewed this resolution with council.

Councilmember Feret moved that R24-006, A Resolution Approving an Intergovernmental Agreement Between the City of Arvada and the Colorado Department of Local Affairs Division of Housing to Support Homelessness Services, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

3. R24-007 A Resolution Authorizing an Intergovernmental Agreement By and Between the City of Arvada and the U.S. Department of Housing and Urban Development for Community Development Block Grant ("CDBG") Funding in the Amount of \$423,831 (Presenter: Carrie Espinosa)

Carrie Espinosa, Manager, Housing Preservation and Resources, reviewed this resolution with council.

Councilmember Feret moved that R24-007, A Resolution Authorizing an Intergovernmental Agreement By and Between the City of Arvada and the U.S. Department of Housing and Urban Development for Community Development Block Grant, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

C. Ordinances (First Reading) –

1. CB24-001 An Ordinance Amending Various Provisions of Arvada's Land Development Code Pertaining to Floodplain Regulation

Mayor Pro Tem Moorman moved that CB24-001, An Ordinance Amending Various Provisions of Arvada's Land Development Code Pertaining to Floodplain Regulation, be approved on first reading, ordered published in full, and a public hearing date to be set for February 12, 2024 at 6:15 p.m.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

9. Other – None

10. Public Hearings –

- A. Ratification and Approval of CP2023-0008 A resolution by the Planning Commission for the City of Arvada, Colorado to amend the 2014 Arvada Comprehensive Plan Land Use designation pertaining to Canyon Pines, Triangle Property (Annexation No.1) from Jefferson County Rural Residential to City of Arvada Low Density Residential, A Parcel Of Land Approximately Located At 52 Canyon Pines Drive in the County of Jefferson and State Of Colorado (Presenter: Rob Smetana)
- B. R24-008 A resolution setting forth certain findings of fact and conclusions as to the annexation of certain land into the city of Arvada, Colorado, Canyon Pines, Triangle property (Annexation No.1), a parcel of land generally located at 52 Canyon Pines Drive (Presenter: Rob Smetana)
- C. CB23-030 An Ordinance Annexing Certain Land into the City of Arvada for Canyon Pines, Triangle Property (Annexation No. 1), A Parcel of Land Approximately Located at 52 Canyon Pines Drive in the County of Jefferson and State of Colorado (Ordinance No. 4863) (Presenter: Rob Smetana)
- D. CB23-031 An Ordinance Rezoning Certain Land Within the City of Arvada, From Jefferson County A-1 (Agricultural-One) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Approximately Located at 52 Canyon Pines Drive, also Known As Canyon Pines, Triangle Property (Annexation No. 1) (Ordinance No. 4864) (Presenter: Rob Smetana)
- E. Ratification and Approval of CP2023-0009 A Resolution by the Planning Commission for the City of Arvada, Colorado to Amend The 2014 Arvada Comprehensive Plan Land Use Designation Pertaining to Canyon Pines, Debrouillarde (Annexation No. 2) From Jefferson County Rural Residential to City of Arvada Low Density Residential and Public/Quasi-Public, a Parcel of Land Approximately Located at 52 Canyon Pines Drive in the County of Jefferson and State of Colorado (Presenter: Rob Smetana)
- F. R24-009 A Resolution setting forth certain findings of fact and conclusions as to the annexation of certain land into the City of Arvada, Colorado, Canyon Pines, Debrouillarde Pump Station (Annexation No. 2), a parcel of land generally located at 52 Canyon Pines Drive (Presenter: Rob Smetana)
- G. CB23-032 An Ordinance Annexing Certain Land into the City of Arvada for Canyon Pines, Arvada's Debrouillarde Pump Station (Annexation No. 2) Approximately Located at 52 Canyon Pines Drive in the County of Jefferson and State of Colorado (Ordinance No. 4865) (Presenter: Rob Smetana)
- H. CB23-033 An Ordinance Rezoning Certain Land Within the City of Arvada, From Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and OS (Open Space) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Approximately Located at 52 Canyon Pines Drive, Also Known as Canyon Pines, Arvada's Debrouillarde Pump Station(Annexation No. 2) (Ordinance No. 4866) (Presenter: Rob Smetana)

I. Canyon Pines Filing No. 1 PUD Development Plan Amendment & Canyon Pines Filing No. 2, PUD Development Plan (Rob Smetana)

Mayor Simpson opened the public hearings on the Ratification and Approval of CP2023-0008 A resolution by the Planning Commission for the City of Arvada, Colorado to amend the 2014 Arvada Comprehensive Plan Land Use designation pertaining to Canyon Pines, Triangle Property R24-008, CB23-030, CB23-031, the Ratification and Approval of CP2023-0009 A Resolution by the Planning Commission for the City of Arvada, Colorado to Amend The 2014 Arvada Comprehensive Plan Land Use Designation Pertaining to Canyon Pines, Debrouillarde, R24-009, CB23-032, CB23-033, and Canyon Pines Filing No. 1 PUD Development Plan Amendment & Canyon Pines Filing No. 2, PUD Development Plan.

Rob Smetana, Planning Manager, reviewed this item with council and stated that the posting logs and mailing affidavit have been received and are in order. Mayor Simpson made them a part of the official record, along with the staff report.

Sworn Testimony: Chad Arlington, representing applicant

Mayor Simpson closed the public hearings.

Councilmember Fifer moved that the Ratification and Approval of CP2023-0008 A resolution by the Planning Commission for the City of Arvada, Colorado to amend the 2014 Arvada Comprehensive Plan Land Use designation pertaining to Canyon Pines, Triangle Property (Annexation No.1) from Jefferson County Rural Residential to City of Arvada Low Density Residential, A Parcel Of Land Approximately Located At 52 Canyon Pines Drive in the County of Jefferson and State Of Colorado, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that R24-008, A resolution setting forth certain findings of fact and conclusions as to the annexation of certain land into the city of Arvada, Colorado, Canyon Pines, Triangle property (Annexation No.1), a parcel of land generally located at 52 Canyon Pines Drive, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that CB23-030, An Ordinance Annexing Certain Land into the City of Arvada for Canyon Pines, Triangle Property (Annexation No. 1), A Parcel of Land Approximately Located at 52 Canyon Pines Drive in the County of Jefferson and State of Colorado, be approved on final reading, numbered 4863 and ordered published by title only.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that CB23-031, An Ordinance Rezoning Certain Land Within the City of Arvada, From Jefferson County A-1 (Agricultural-One) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Approximately Located at 52 Canyon Pines Drive, also Known As Canyon Pines, Triangle Property (Annexation No. 1), be approved on final reading, numbered 4864 and ordered published by title only.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that the Ratification and Approval of CP2023-0009 A Resolution by the Planning Commission for the City of Arvada, Colorado to Amend The 2014 Arvada Comprehensive Plan Land Use Designation Pertaining to Canyon Pines, Debrouillarde (Annexation No. 2) From Jefferson County Rural Residential to City of Arvada Low Density Residential and Public/Quasi-Public, a Parcel of Land Approximately Located at 52 Canyon Pines Drive in the County of Jefferson and State of Colorado, be approved. This motion is based on the findings of fact adopted by Planning Commission.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that R24-009, A Resolution setting forth certain findings of fact and conclusions as to the annexation of certain land into the City of Arvada, Colorado, Canyon Pines, Debrouillarde Pump Station (Annexation No. 2), a parcel of land generally located at 52 Canyon Pines Drive, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that CB23-032, An Ordinance Annexing Certain Land into the City of Arvada for Canyon Pines, Arvada's Debrouillarde Pump Station (Annexation No. 2) Approximately Located at 52 Canyon Pines Drive in the County of Jefferson and State of Colorado, be approved on final reading, numbered 4865 and ordered published by title only.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that CB23-033, An Ordinance Rezoning Certain Land Within the City of Arvada, From Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and OS (Open Space) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Approximately Located at 52 Canyon Pines Drive, Also Known as Canyon Pines, Arvada's Debrouillarde Pump Station(Annexation No. 2), be approved on final reading, numbered 4866 and ordered published by title only.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

Councilmember Fifer moved that the Canyon Pines Filing No. 1 PUD Development Plan Amendment & Canyon Pines Filing No. 2, PUD Development Plan, be approved. This motion is based on the Findings of Fact adopted by Planning Commission.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

- J. Public Hearing on a Substantial Amendment of the Consolidated Strategy and Plan Submission for Housing and Community Development Programs 2020-2024
1. R24-010 A Resolution Approving the Submission of a Substantial Amendment to the 2020- 2024 Consolidated Strategy Plan Submission for Housing and Community Development Programs (Presenter: Carrie Espinosa)

Mayor Simpson opened the public hearing on the Substantial Amendment of the Consolidated Strategy and Plan Submission for Housing and Community Development Programs 2020-2024 and R24-010.

Carrie Espinosa, Manager, Housing Preservation and Resources, reviewed these items with council.

No one wishing to speak for or against, the public hearing was closed.

Councilmember Feret moved that R24-010, A Resolution Approving the Submission of a Substantial Amendment to the 2020- 2024 Consolidated Strategy Plan Submission for Housing and Community Development Programs, be approved.

The following votes were cast on the Motion:

Those voting Yes: Simpson, Moorman, Ambrose, Davis, Feret, Fifer, Marriott
The Motion was Approved

11. Public Comment - Five Minute Limit – none
12. City Council Reports –
- A. Councilmember Fifer discussed a meeting held with McIntyre United last week.
 - B. Councilmember Fifer discussed a meeting he attended the Candelas Metro District.
 - C. Councilmember Moorman invited everyone to his rescheduled Coffee Chat on January 12 from 2-4 p.m.at Sweet Bloom Coffee Roasters, 7745 Wadsworth Blvd.
 - D. Councilmember Moorman invited everyone to a Community Forum on Homelessness that the Arvada Chamber is hosting on January 19.
 - E. Councilmember Davis noted the passing of former City Attorney Robert Sonheim.

13. City Manager Reports –
 - A. Lorie Gillis, City Manager, reviewed future workshops with council, and said that the Board and Commission Applications closed today and that we received about 150 applications.
14. City Attorney Reports – None
15. Adjournment at 7:15 p.m.

Lauren Simpson, Mayor

SEAL:

Kristen R. Rush, City Clerk



REPORT TO CITY COUNCIL

AGENDA ITEM
8.A.

TO: THE HONORABLE CITY COUNCIL

DATE: January 22, 2024

SUBJECT: Consent Agenda

Report in Brief

1. R24-011, A Resolution Authorizing An Agreement By And Between The City Of Arvada And A-1 Chipseal Company For 2024 Surface Treatment Program, Project No. 24-ST-02, In An Amount Not To Exceed \$3,147,254.08
2. R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00
3. R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00.
4. R24-014, A Resolution Authorizing a Four Month Extension of Two Leases by and Between the City of Arvada and The United States Postal Service for Lease of The Building At 5885 Allison Street and For Lease of The Parking Lot At 5886 Ammons Street

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: January 22, 2024

SUBJECT: R24-011, A Resolution Authorizing An Agreement By And Between The City Of Arvada And A-1 Chipseal Company For 2024 Surface Treatment Program, Project No. 24-ST-02, In An Amount Not To Exceed \$3,147,254.08

Report in Brief

Council action is requested in the attached resolution authorizing an agreement with A-1 Chipseal Co. for Construction of CSB-23-PW-095, 2024 Surface Treatments – Hot Chip, Slurry, Cape and Crack Seal Project Number 24-ST-02 in the amount of \$3,147,254.08

This project involves the use of asphalt treatments, which includes Hot Chip, Slurry, Cape and Crack Seal that will ultimately increase the overall quality and longevity of roadways in the City.

The Arvada team recommends that the City Council approve R24-011, A Resolution Authorizing An Agreement By And Between The City Of Arvada And A-1 Chipseal Company For 2024 Surface Treatment Program, Project No. 24-ST-02, In An Amount Not To Exceed \$3,147,254.08.

Financial Impact

Financial Impact:

This is a one-time request for the 2024 project construction cost.

Fund: Pavement Management Program Fund – Account 04.705014.53032

Background

Council action is requested on the attached resolution authorizing a Construction Contract Agreement with A-1 Chipseal Co. for Construction of The Arvada team recommends that the City Council approve R24-XXX, A Resolution Authorizing an Agreement By and Between the City of Arvada and A-1 Chipseal Company for Construction of CSB-23-PW-095, 2024 Surface Treatments – Hot Chip, Slurry, Cape and Crack Seal Project Number 24-ST-02 in an Amount Not to Exceed \$3,147,254.08.

This annual project involves the use of asphalt treatments, which includes Hot Chip, Slurry, Cape and Crack Seal that will ultimately increase the overall quality and longevity of roadways in the City.

Bids were opened November 16, 2023. One response was received. A-1 Chipseal Co. was selected because they offered the best value and most responsive bid substantiating they could meet service requirements.

Discussion

A-1 Chipseal was selected because they offered they best met the bid criteria and value, substantiating that they could meet the City's service requirements. They have previously completed asphalt surface treatment contracts which include Hot Chip, Slurry, Cape and Crack Seal throughout the City.

This year's program will include the following areas summarized below. Please note that these areas are also shown on a map

and a detailed list that is included in the agenda packet.

Slurry Seal Type II

- Alta Vista – Various Locations – See Map in Council Packet with details.
- W 78th Avenue – Kipling Street to Nelson Street
- W 73rd Place – Kipling Street West to End
- W 79th Place/Nelson Street – Newman Street to W 77th Place
- W 84th Avenue/Newcombe Street – Simms Street to W. 86th Parkway
- Candlelight – Various Locations – See Map in Council Packet with details.

Cape Seal

- Hackberry – Various Locations – See Map in Council Packet with details.

Crack Seal

- Westwoods Mesa – Various Locations – See Map in Council Packet with details.
- Ralston Ridge – Various Locations – See Map in Council Packet with details.
- Oak Street – W 80th Ave to End
- Woodrun and Pomona Lakes – Various Locations – See Map in Council Packet with details.
- Arbor Estates – Various Locations – See Map in Council Packet with details.
- W 82nd Avenue from W 82nd Place to Indiana Street
- W 80th Avenue – Indiana Street to roundabout (does not include roundabout)
- W 80th Avenue – roundabout (does not include roundabout) to end of jurisdiction

Crack Seal/Mastic/Patching

- Skyline Estates – Various Locations – See Map in Council Packet with details.

This work is expected to be completed 270 working days from the Notice to Proceed.

Public Contact

Posting of the City Council Agenda

Commission Recommendation

N/A

Strategic Alignment

The recommended action aligns with the Infrastructure Priority Area within the City Council Strategic Plan. Specifically, the recommended action is consistent with the following principle:

Maintains existing roads and transportation network in tandem with snow and ice control services to ensure swift and safe transportation modes for the community.

SUBJECT: R24-011, A Resolution Authorizing An Agreement By And Between The City Of Arvada And A-1 Chipseal Company For 2024 Surface Treatment Program, Project No. 24-ST-02, In An Amount Not To Exceed \$3,147,254.08

PAGE: 3
ITEM: 8.A.1.

This street maintenance project will improve the quality of infrastructure throughout the City of Arvada. It is a direct effort to move toward achieving the overall goal of the Pavement Management Plan - to keep City streets in good condition.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R24-011, A Resolution Authorizing An Agreement By And Between The City Of Arvada And A-1 Chipseal Company For 2024 Surface Treatment Program, Project No. 24-ST-02, In An Amount Not To Exceed \$3,147,254.08.

Suggested Motion:

I move that R24-011, A Resolution Authorizing An Agreement By And Between The City Of Arvada And A-1 Chipseal Company For 2024 Surface Treatment Program, Project No. 24-ST-02, In An Amount Not To Exceed \$3,147,254.08, be (approved) (rejected).

Prepared by:
Christine Biddle, Pavement Management Coordinator

Reviewed by:

Approved by:

Benjamin Sawaya, Pavement Manager	12/4/2023
Jenny Wolfschlag, City Engineer	12/4/2023
Jacqueline Rhoades, Public Works Director	12/12/2023
Bryan Archer, Director of Finance	12/21/2023
Tammy Hedlund, Legal Specialist	1/2/2024
Kelsy Sargent, Assistant City Attorney	1/2/2024
Rachel Morris, City Attorney	1/10/2024
Don Wick, Deputy City Manager	1/10/2024
Lorie Gillis, City Manager	1/11/2024

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO.24-011

A RESOLUTION AUTHORIZING AN AGREEMENT BY AND BETWEEN THE CITY OF ARVADA AND A-1 CHIPSEAL COMPANY FOR 2024 SURFACE TREATMENT PROGRAM, PROJECT NO. 24-ST-02, IN AN AMOUNT NOT TO EXCEED \$3,147,254.08

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, a Construction Contract Agreement, which is in substantially the same form as that attached hereto, by and between the City of Arvada and A-1 Chipseal Company in the amount of \$3,417,254.08 for the 2024 Surface Treatment Program, Project 24-ST-02.

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

APPROVED AND ADOPTED this 22nd day of January, 2024.

Lauren Simpson, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

**AN AGREEMENT BY AND BETWEEN THE CITY OF ARVADA AND
A-1 CHIPSEAL CO. FOR 2024 SURFACE TREATMENT PROGRAM,
PROJECT NO. 24-ST-02, IN AN AMOUNT NOT TO EXCEED \$3,147,254.08**

This Agreement made this _____ day of _____, 2024, by and between the City of Arvada, a home rule municipal corporation (“Arvada” and/or “City”) and A-1 Chipseal Co. (“Contractor”).

WITNESSETH: That for and in consideration of the covenants, promises, and payments hereinafter mentioned:

WITNESSETH:

WHEREAS, Arvada solicited proposals from interested construction professionals for the provision of construction services related to its Hot Chip, Slurry, Cape and Crack Seal - 2024 Surface Treatment Program, Project Number 24-ST-02, as described in the Contract Documents (the “Project” or the “Work”); and

WHEREAS, based on Contractor’s submissions, Arvada has selected Contractor for the Project; and

WHEREAS, Arvada and Contractor desire to enter into this Agreement regarding the construction of the Project; and

NOW, THEREFORE, for and in consideration of the covenants, promises, and payments hereinafter mentioned, the parties agree as follows:

ARTICLE 1. GENERAL DESCRIPTION OF SERVICES

- 1.1. **The Services.** Contractor agrees to furnish or arrange for the surface treatment and construction services set forth in the Contract Documents and required for the completion of the Project within the timeframe provided in the Contract Documents. Contractor represents that it is thoroughly familiar with, and understands, the requirements of the Project’s scope and is experienced in the implementation and construction of projects of the type and scope contemplated by the Contract Documents. Contractor represents to Arvada that Contractor has all necessary education, skill, knowledge, expertise and experience required for completion of the Project, and will maintain, at all times during the term of this Agreement, such personnel on its staff to provide the services contemplated hereby within the time periods required hereby. In addition, Contractor represents that it or Arvada-approved subcontractors or subconsultants performing services under this Agreement have all applicable licenses required by the State of Colorado to perform such services and all required insurance coverage as required by this Agreement and by law.
- 1.2. **Cooperation.** The Contractor shall endeavor to develop, implement and maintain, a spirit of cooperation, collegiality, and open communication with Arvada, Arvada’s Consultants,

and Arvada's residents so that the goals and objectives of each are clearly understood, potential problems are resolved promptly, and upon completion, the Project is deemed a success by all interested parties.

- 1.3. **Preparation/Sufficiency of Site.** Before commencing the Project, the Contractor shall (i) visit and thoroughly inspect the Project Site(s) and any structure(s) or other man-made features to be modified and become familiar with local conditions under which the Project will be installed and operated; (ii) familiarize itself with the survey, including the location of all existing buildings, utilities, conditions, streets, equipment, components and other attributes having or likely to have an impact on the Project; (iii) familiarize itself with Arvada's engineering and design requirements, design objectives, and budget for the Project; (iv) familiarize itself with pertinent Project dates and programming needs, including the Project schedule; (v) review and analyze all Project geotechnical, environmental, and construction materials tests, investigations and recommendations, (vi) review all specifications; and (vii) gather any other information necessary for a thorough understanding of the Project. Claims by Contractor resulting from Contractor's failure to familiarize itself with the Site or pertinent documents shall be deemed waived.
- 1.4. **Contract Documents.** The Contract Documents are incorporated herein by reference. The term "Contract Documents" means and includes the following:
 - A. Arvada's solicitation entitled CSB 23-PW-095: Hot Chip, Slurry, Cape and Crack Seal - 2024 Surface Treatment Program Project Number 24-ST-02 ("CSB"), including all General Conditions, Special Conditions, Special Provisions, Exhibits and/or addenda;
 - B. Contractor's Response to CSB 23-PW-095, Advertisement for Bid, Bid Proposal, Bid Schedule, Bid Bond ("Contractor's Response");
 - C. Notice of Award;
 - D. Performance and Payment Bond;
 - E. Notice(s) to Proceed;
 - F. Change Orders (if any);
 - G. City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements dated July 26, 2022;
 - H. Requests for Information and Responses (if any);
 - I. All supplementary requirements regarding wage rates, E.E.O., affirmative action and all other Federal-State requirements as outlined in the specifications (if applicable).
- 1.5. **Interpretation of Contract Documents.** In the event of conflicts or discrepancies among the Contract Documents, the documents shall govern in the following order: (1) the Agreement; (2) Arvada's solicitation CSB 23-PW-095; (3) City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements; (4) Contractor's Response; (5) Change Orders; (6) Requests for Information and Response.

ARTICLE 2. ARVADA'S DUTIES, OBLIGATIONS AND RESPONSIBILITIES

- 2.1. **Project Information.** Contractor acknowledges that Arvada has provided Contractor with information regarding Arvada's requirements for the Project as set forth in the Contract Documents, including Project Specifications.
- 2.2. **Arvada's Budget.** Arvada has established, and will update, an overall budget for the Project, including amounts allocated for construction, Arvada's other costs, and reasonable contingencies related to these costs as appropriate.
- 2.3. **Purpose of Arvada's Review.** Arvada's review, inspection, or approval of any work, Testing Documents, Applications for Payment, or other submittals shall be solely for the purpose of determining whether the same are generally consistent with Arvada's standards, policies and requirements. No review, inspection, or approval by Arvada of such work or documents shall relieve Contractor of its responsibility for the performance of its obligations under the Agreement or the accuracy, adequacy, fitness, suitability, or coordination of its construction services. Approval by any governmental or other regulatory agency or other governing body of any work, Testing Document, or the Construction Documents shall not relieve Contractor of responsibility for the performance of its obligations under this Agreement. Payment by Arvada pursuant to the Agreement shall not constitute waiver of any of Arvada's rights under the Agreement or at law, and Contractor expressly accepts the risk that defects in its performance, if any, may not be discovered until after payment, including final payment, is made by Arvada. Notwithstanding the foregoing, reasonable notice shall be given by Arvada to the Contractor if Arvada becomes aware of any fault or defect in the Project or non-conformance with the Contract Documents.

ARTICLE 3. CONSTRUCTION SERVICES REQUIREMENTS AND STANDARDS

- 3.1. **Quality of Construction Services.** Contractor shall be responsible for the quality, completeness, accuracy, and coordination of the Work. Contractor shall provide construction services that meet all industry standards, including all environmental and regulatory requirements. Arvada will provide and be responsible for all material testing and all other testing if needed.
- 3.2. **Arvada's Right to Carry Out the Work.** If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven calendar day period after written notice from Arvada to commence and continue correction of such default or neglect with diligence and promptness, Arvada may after such seven-day period, without prejudice to other remedies Arvada may have, correct such deficiencies. In such a case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for any consultant's additional services and expenses made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to Arvada within ten days of receipt of an invoice for such amounts from Arvada.

- 3.3. **Legal Standard.** Contractor shall furnish construction services in accordance with industry standards currently practiced by construction professionals on projects similar in size, complexity and cost to the Project.
- 3.4. **Surface Treatment & Construction Standards.** Contractor shall perform all services in accordance with requirements of governmental agencies having jurisdiction over the Project, City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements, and the construction standards and specifications set forth in the Contract Documents. In addition, the Contractor's work shall comply with all applicable building codes, accessibility laws and regulations, environmental regulations, and other applicable legal requirements in effect at the time of the work. To the extent Arvada's standards exceed applicable legal requirements, such standards shall be met unless Contractor obtains a variance from Arvada in writing.
- 3.5. **Permits.** Contractor shall be responsible for obtaining all necessary permits and other governmental approvals necessary for the development of the Project and shall obtain the same at the times necessary to meet the Project schedule. Contractor's responsibility includes providing environmental services and permitting coordination as further described in the Contract Documents.
- 3.6. **Notice of Non-Compliance.** Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Arvada, and shall at once report to Arvada any errors, inconsistencies or omissions discovered as well as any foreseeable constructability issues arising from the project specifications and/or site conditions. If the Contractor performs any construction activity knowing or should have known it involves an error, inconsistent, omission or constructability issue in the Contract Documents without such notice to Arvada, the Contractor shall assume full responsibility for such performance and shall bear the full costs for correction, including reimbursement for any delay caused to the Project.

ARTICLE 4. CHANGES TO THE WORK

- 4.1. **Minor Contract Revisions.** Miscellaneous modifications in the Work, ordered by Arvada in the form of a Field Order, will be considered a Minor Contract Revision. Payment for accepted work performed under this pay item "Minor Contract Revision" will be made in accordance with SC-A-6 of Arvada's CSB 23-PW-095.
- 4.2. **Field Orders.** An authorized representative of the Contractor shall acknowledge receipt of Field Orders by promptly signing all written field orders delivered to the job site. Verbal field orders given by Arvada will be recorded in writing in the municipal inspector's daily report that is to be signed by the Contractor's authorized representative.
- 4.3. **Field Engineered Changes.** Arvada may modify the construction plans including changing the slope and alignment of flow lines and appurtenances or modifying other improvements as necessary to accommodate construction around existing utilities or other field conditions. No additional compensation shall be made for minor costs and

inconveniences incurred while performing field engineering changes as directed by Arvada or its Consultant. No additional compensation shall be made for any down time encountered while Arvada determines what field engineered changes would be appropriate to accommodate construction around existing utilities or other field conditions. Reasonable time must be allowed for Arvada or its Consultant to design field engineered changes. Any additional costs for performing field engineered construction changes to accommodate existing utilities or other field conditions and for also allowing Arvada reasonable time to design field engineered changes as necessary to complete the work shall be considered a subsidiary obligation of the contract.

- 4.4. **Pre-Construction Meetings.** Contractor agrees to assist in the preparation for and to participate in any pre-construction meetings with Arvada.
- 4.5. **Arvada Change Orders.** Arvada may, by written order signed by Arvada, at any time, and without notice to any surety, and subject to all appropriate adjustments, make changes within the general scope of this Contract in any one or more of the following: (a) changes in scope of services; (b) completion date; (c) contract amount; (d) any applicable material modifications; and, (e) any other matters that the parties deem necessary.
- 4.6. **Contractor Requested Change Orders.** The Contractor may request a Change in the Work ("Requested Change Order"), including one or more of the following: (a) changes in scope of services; (b) completion date; (c) contract amount; (d) any applicable material modifications; and, (e) any other matters that the parties deem necessary.
- 4.7. **Change Order Contents.** Any Requested Change Order shall include (a) a detailed description of the requested change to the original contract; (b) itemized documentation of any subcontractor costs; (c) the total costs associated with the proposed change; (d) the impact on the project completion date, if any, associated with the proposed change; and (e) a statement of the contractual basis for the requested change.
- 4.8. **Basis for Change Order Requests.** The following may be considered a valid basis for requesting a Change Order: (a) Contract Document error or omission; (b) Arvada induced enhancement; (c) unforeseeable constructability issue; (d) unforeseeable geotechnical issue. The following will not be considered a valid basis for requesting a Change Order absent extraordinary circumstances: (a) utility relocation; (b) utility conflicts; (c) foreseeable geotechnical issue; (d) foreseeable constructability issue; (e) defective construction.
- 4.9. **Written Authorization Required.** The Contractor shall not proceed with any change in the Work without the appropriate written authorization.

ARTICLE 5. SUPERVISION AND CONSTRUCTION PROCEDURES

- 5.1. **Supervision.** The Contractor shall supervise and direct the Work using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for

coordinating all portions of the Work under this Contract, unless Contract Documents give other specific instructions concerning these matters.

- 5.2. **Acts and Omissions of Subcontractors and Agents.** The Contractor shall be responsible to Arvada for acts and omission of the Contractor's employees, Subcontractors, and their agents and employees, and other persons performing portions of the Work under a contract with the Contractor.
- 5.3. **Inspection and Subsequent Work.** The Contractor shall be responsible for inspection or portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

ARTICLE 6. COMPENSATION.

- 6.1. **Completion of Services.** Contractor will furnish all material, supplies, tools, equipment, labor, and other services necessary for the completion of the Work within Arvada's timeframe and monetary limitations set forth below:
 - 6.1.1. Contractor shall commence the Work required by the Contract Documents within seven calendar days after the date of the Notice to Proceed unless otherwise mutually agreed-upon by the Parties in writing; and
 - 6.1.2. This project is to be completed, including cleanup, within 270 working days after the date to be specified in the Notice to Proceed, unless the contract time is adjusted by change order. The Contractor shall agree to pay to Arvada, as liquidated damages, the sum of \$3,300.00 for each consecutive calendar day that the work exceeds the allotted contract time; and
 - 6.1.3. Compensation Amount. Contractor agrees to perform the Work for an amount not to exceed \$3,147,254.08.
- 6.2. **Term.** The term of the Agreement shall be for one year from Arvada's execution of the Agreement, unless otherwise agreed to in writing by the parties, subject to availability of funds, or Arvada's termination for convenience under the Contract Documents.
- 6.3. **Renewal.** This Agreement may be renewed by Arvada for two consecutive one-year terms provided, however, that the Bidder provided satisfactory performance during the previous contract period. Continuation of the contract beyond the initial period is a City prerogative and not a right of the Bidder and will be exercised only when such continuation is clearly in the best interest of the City. Any renewals shall be on the same terms as this Agreement, including the Compensation Amount, and automatic unless Arvada gives Contractor 30 calendar days' written notice to terminate the Agreement.
 - 6.3.1. The Parties may amend the Compensation Amount of any renewal term to reflect adjustments to Contractor's pricing structure in accordance with Section SC-A-13 of the Project Special Provisions in CSB 23-PW-095 to this Agreement as authorized by the Arvada City Council; and

- 6.3.2. During the option period, the City will consider an adjustment to the pricing structure if the successful Bidder can demonstrate, through documentation issued by material suppliers, that it was subject to a price adjustment. It shall be understood that such price adjustments shall not exceed the amount passed on to the successful Bidder by the supplier. Under these circumstances, the City may, in its best interest, negotiate a price adjustment with the successful Bidder; and
- 6.3.3. The successful Bidder is obligated to notify the City of such adjustments, either price reductions or price increases, within 14 calendar days after receiving said notification from the supplier. Pricing and specification changes, if any, shall be negotiated and agreed upon by both parties. The City reserves the right to reject any price adjustments submitted by the Bidder and/or to terminate the contract with the Bidder based on such price adjustments; and
- 6.3.4. Pricing and specification changes, if any, shall be negotiated and agreed upon by both parties. The City reserves the right to reject any price adjustments submitted by the Bidder and/or to terminate the contract with the Bidder based on such price adjustments.
- 6.4. **Locations and Summary of Approximate Quantities.** The map of proposed areas, street list and summary of approximate quantities are attached hereto and incorporated by reference. The City reserves the right to add, delete, or modify construction locations, priority order and portions of the work without change in the contract agreement prices. City of Arvada measurement and Payment will be based upon actual quantities performed.
- 6.5. **Additional Services.** While Arvada has listed its major requirements for its solicitation in the Contract Documents, Arvada may, during the term of this Agreement, wish to purchase other related services identified and offered by Contractor, based upon the Bid Schedule amounts contained in Contract Documents. Arvada reserves the right to award these ancillary items to Contractor. This option, if exercised, in no way obligates Arvada to pursue additional services with Contractor.
- 6.6. **Payment for Services.** At least twenty (20) calendar days before the date established for each monthly progress payment, the Contractor shall submit to Arvada an itemized Application for Payment for construction completed in accordance with the Bid Schedule. Such application shall be supported by such data substantiating the Contractor's right to payment as Arvada may require, such as copies of invoices or requisitions from subcontractors and material suppliers and reflecting retainage. Arvada shall pay NET 30 for services performed in accordance with the Bid Schedule and with this Agreement, but in no event shall the total Contract Amount exceed \$3,147,254.08 absent a properly executed Change Order. Measurement of the work performed and monthly payment shall be made in accordance with requirements of the Measurement and Payment Section in the Contract Documents unless otherwise specifically provided herein.
- 6.7. **Non-Conforming Materials or Construction.** Where materials installed or the finished product fails to meet minimum requirements of the Contract Documents, the basis of

determining final payment to the Contractor shall be determined in accordance with the applicable Colorado Department of Transportation Standard Specifications.

- 6.8. **Retainage Requirements.** Contractor agrees to submit monthly invoices together with any retainage requirements as prescribed by Colorado state statutes (*see e.g.*, C.R.S. § 24-91-101 *et seq.*). Payment from Arvada will be paid NET 30 days. Invoices will accurately reflect actual work completed by the Contractor and its subconsultants or subcontractors.

ARTICLE 7. MISCELLANEOUS.

- 7.1. **Waiver.** No provision of this Agreement may be waived except by written agreement of the parties. A waiver of any provision on one occasion shall not be deemed a waiver of that provision on any subsequent occasion, unless specifically stated in writing. A waiver of any provision shall not affect or alter the remaining provisions of this Agreement.
- 7.2. **Strict Compliance.** No failure of Arvada to insist upon strict compliance by the Contractor with any provision of the Contract Documents shall operate to release, discharge, modify, change or affect any of the Contractor's obligations.
- 7.3. **Successors and Assigns.** Arvada and Contractor, respectively, bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement and to the partners, successors and assigns of such other parties with respect to all covenants of this Agreement. Contractor shall not assign (whether partially or wholly) this Agreement whether by operation of law or otherwise, without the written consent of Arvada. If Contractor makes an assignment in accordance with this provision, Contractor shall nevertheless remain legally responsible for all obligations arising under the Agreement, unless otherwise agreed in writing by Arvada.
- 7.4. **Additional Documents.** The parties agree to execute any additional documents and to take any additional action that is necessary to carry out this Agreement.
- 7.5. **Binding Effect.** This Agreement shall inure to the benefit of, and be binding upon, the parties, their respective legal representatives, successors, heirs, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise expressly authorized herein. All provisions of this Agreement which contain continuing obligations shall survive its expiration or termination.
- 7.6. **Paragraph Captions.** The paragraph captions in this Agreement are set forth only for the convenience and reference of the parties and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.
- 7.7. **Integration, Amendment, and Severability.** This Agreement represents the entire agreement between the parties, and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties. If any other provision of this Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of

this Agreement shall continue in full force and effect if the essential terms and conditions of this Agreement for both parties remain valid, legal, and enforceable.

- 7.8. **Notices.** Any notice or notification required or permitted by the Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent electronically, or by certified mail or registered mail, postage and fees prepaid, addressed to the party to whom such notice is to be given at the address set forth on the signature page below, or at such other address as has been previously furnished in writing, to the other party or parties. Such notice or notification shall be deemed to have been given when electronically sent or when deposited in the United States mail.
- 7.9. **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.
- 7.10. **Preferences in Employment of Colorado Labor.** To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:
- 7.10.1. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- 7.10.2. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.
- 7.11. **Project Representatives.** Arvada designates Christine Biddle (cbiddle@arvada.org) as the City's representative authorized to act on Arvada's behalf with respect to the Project. Contractor designates Dennis Martinez (dennism@asphaltrepair.com) as the Contractor's representative authorized to act on Contractor's behalf with respect to the Project.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement which shall be deemed an original on the date first above written.

[signatures on next page]

DATED this _____ day of _____, 20____.

CITY OF ARVADA, a Colorado home
rule municipal corporation

Lauren Simpson, Mayor
8101 Ralston Road
Arvada, CO 80002

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris

By: _____

A-1 CHIPSEAL CO.

Daniel J. Gryzmala
President
dgryzmala@a-1chipseal.com

Exhibit A

An Agreement By And Between The City Of Arvada And
A-1 Chipseal Co. For 2024 Surface Treatment Program,
Project No. 24-ST-02, In An Amount Not To Exceed
\$3,147,254.08



COMPETITIVE SEALED BID

BID #: 23-PW-095

Title: Hot Chip, Slurry, Cape and Crack Seal - 2024 Surface Treatment Program
Project Number 24-ST-02

Issue Date: 10/23/2023

MANDATORY Pre-bid Meeting: 11/02/2023 - 9:00 am MT
Location: City Hall Anne Campbell Room – 1st Floor

Questions Deadline: 11/09/2023 2:00 pm MT
Submit questions on BidnetDirect.com. Responses will be posted via addendum.

Bid Due Date: 11/16/2023 -2:00 PM MT
Join Zoom Meeting: <https://us06web.zoom.us/j/88384143737?pwd=837gbCGYfvaDusZaxyC8UqQh9PwY0k.1>
Meeting ID: 883 8414 3737
Passcode: 715413

Bid Delivery address: Electronic Submissions must be submitted online at BidNetDirect.com by the above date and time.
Late responses will not be considered for award.

Project Delivery Date: TBD

Submit administrative questions NOT related to the project to: Cheryl Dye at cdye@arvada.org
Contact with the requesting department may result in vendor disqualification.

Documents included in this BID:

Cover Page	page 1
Advertisement for Bidders	page 2
General Terms and Conditions	page 3
Special Terms and Conditions for Bidders	page 5
Insurance Requirements	page 7
Project Special Provisions	page 9
Submittal Forms to be completed and returned	
• Bid Bond	page 36
• Bid Proposal	page 37
• Bid Schedule	page 38
• Required Contractor Submittal Forms	page 39
• Performance Measures Required Form	page 40
• Preview of Documents if Awarded	page 41
• Other Attachments	

ARVADA'S VISION MISSION AND VALUES

VISION: We dream big and deliver.

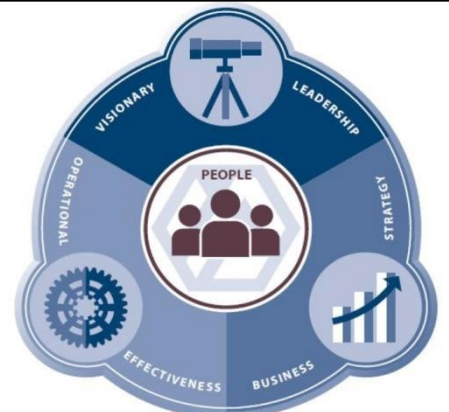
MISSION: We are dedicated to delivering superior services to enhance the lives of everyone in our community.

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.



ADVERTISEMENT FOR BIDS

Submit bids electronically on Bidnetdirect.com for the construction of City of Arvada, Project No. **24-ST-02** Project Title: 2024 Surface Treatments - Hot Chip, Slurry, Cape, and Crack Seal Program

The BID DOCUMENTS, consisting of Advertisement for Bids, General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, Addendum when issued, Bid Bond, Bid Proposal, Bid Schedule, Performance and Payment Bond, Submittal Checklist and References, Sample documents, and the Project Drawings may be examined at the following location: www.bidnetdirect.com

No cost bid documents may be obtained at www.bidnetdirect.com on or after 10/21/2023.

ESTIMATED QUANTITIES OF THE MAJOR ITEMS OF WORK ARE:

Slurry Seal Type II - 188,455 SY
Cape Seal - 72,343 SY
Crack Seal - 150,000 LBS
Patching - 5,000 SY

Miscellaneous items include citizen notification, traffic control, and other appurtenances.

Bidders, subcontractors and suppliers must be familiar with the current **City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements**, dated July 26, 2022, which will be combined with the Bid Documents to form the Contract Documents for the Project. A copy of the Standards may be obtained from the office of the City Engineer upon a non-refundable payment of \$50.00. Holders will be notified when supplemental revisions and additions are available as they are adopted. The Standards are also available at no cost on the City's web site at <https://www.arvadaco.gov/167/Engineering-Code>. Holders are responsible for keeping current their City of Arvada Engineering Code of Standards and Specifications.

Date: 10/23/23

CITY OF ARVADA


Jenny Wolfschlag

City Engineer
8101 Ralston Road
Arvada, Colorado 80002

GENERAL TERMS AND CONDITIONS

1. PAYMENTS TO CONSTITUTE CURRENT EXPENDITURES. Financial obligations of the City of Arvada, if any, after the current fiscal year are contingent on funds for that purpose being appropriated, budgeted and otherwise made available by the City Council for the City of Arvada. The City of 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 the City of Arvada within the meaning of Article X, Section 20 of the Colorado Constitution.

2. TAXES. The City of Arvada is not subject to taxation. Contractor shall not invoice Arvada for any state, federal or local taxes whatsoever. Upon written notification by the City of Arvada, Contractor shall reimburse the City of Arvada in a timely manner for any taxes erroneously paid by the City of Arvada. The Colorado Department of Revenue, Certification of Exemption for Colorado State Sales/Use Tax account number for the City of Arvada is 98-01789-0000. An exemption certificate will be provided, where applicable, upon request.

3. NO INDEMNIFICATION BY ARVADA. The City of Arvada is prohibited by Article XI, Section 1, Colorado Constitution, from indemnifying anyone. Therefore, notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, the City of Arvada does not indemnify Contractor or anyone else under this Agreement.

4. INDEMNIFICATION OF CITY.

A. Contractor: Notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, Contractor agrees to investigate, defend, indemnify and hold harmless Arvada, its elected officials, officers, employees, agents, insurers, and representatives from and against any claims, costs, losses, expenses, demands, actions, or causes of action, including reasonable attorney fees and other costs and expenses of litigation, which may be asserted against or incurred by Arvada or for which Arvada may be liable, arising from the negligence, willful misconduct, or other fault of Contractor or its employees, agents, or subcontractors in performance of the Agreement. Nothing herein is intended to constitute a covenant, promise, or agreement to indemnify and hold harmless Arvada from any liability or damages directly caused by or attributable to Arvada's own negligence. Nothing herein intended to be nor may be construed as a waiver of the immunities, protections, or limitations on damages provided to Arvada by the Colorado Governmental Immunity Act, C.R.S. §§ 24-10-101 *et seq.*, as it may from time to time be amended.

(or)

B. Architect, Engineer, Surveyor Services for Public Works Construction: Contractor agrees to hold harmless and indemnify Arvada, its officers and employees, from and against any liability or any claims, suits, or actions arising out of, made, or asserted for any damage to persons or property resulting from errors, omissions or fault of Contractor in connection with the performance by Contractor of obligations under this solicitation and any subsequent Agreement with Arvada. Nothing herein is intended to constitute a covenant, promise, or agreement to indemnify and hold harmless Arvada from any liability or damages directly caused by or attributable to Arvada's own negligence. Nothing herein is intended to be nor construed as a waiver of the immunities, protections, or limitations on damages provided to Arvada by the Colorado Governmental Immunity Act, C.R.S. §§24-10-101 *et seq.*, as it may from time to time be amended.

5. NO OPINION OF COUNSEL LETTERS. Pursuant to Section 8.1 of the Arvada City Charter, the City Attorney provides advice to the City Council and City Officials in matters relating to their official powers and duties, and will perform such other duties as City Council may prescribe by ordinance or resolution. The City Attorney will not issue opinion of counsel letters, memoranda or statements to third parties, including, but not limited to that any contract or lease is binding on the public entity, enforceable, etc.

6. CONFIDENTIAL DOCUMENTS. Contractors 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 Contractor 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 Contractor. By its submission of the Proposal/Response, Contractor 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, Contractor 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 Contractor's objection.

7. 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 the City of Arvada or others.

8. ASSIGNMENT. Contractor shall not assign the Agreement without the prior written consent of the City of Arvada, which will not be unreasonably withheld, conditioned, or delayed. Contractor may assign the Agreement to any successor to the business of the party by merger, consolidation, or sale of assets. No assignment shall be permitted that enlarges any duty, responsibility or obligation of the City of Arvada, or that limits, curtails, or diminishes any right or privilege of the City of Arvada without the City of Arvada's express written consent.

9. NO THIRD PARTY BENEFICIARIES. It is expressly understood and agreed that enforcement of the terms and conditions of the Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to Arvada and Contractor and nothing contained in the Agreement shall give or allow any such claim or right of action to any other third party on the Agreement. It is the express intention of Arvada and Contractor that any person other than Arvada or Contractor receiving services or benefits under the Agreement shall be deemed to be an incidental beneficiary only.

10. INDEPENDENT CONTRACTOR. Contractor and Arvada hereby represent that Contractor is an independent contractor for all purposes hereunder. As such, Contractor is not covered by any worker's compensation insurance, or any other insurance maintained by Arvada except as would apply to members of the general public. Contractor shall not create any indebtedness on behalf of Arvada.

11. SUBCONTRACTING. Contractor shall not award work to subcontractor(s) in excess of fifty percent of the total contract price without Arvada's prior written approval. Contractor shall be responsible for any failure by any subcontractor or subcontractor personnel to perform in accordance with the Agreement or to comply with any duties or obligations imposed on Contractor under the Agreement to the same extent as if such failure to perform or comply was committed by Contractor or Contractor's personnel. Contractor shall be Arvada's sole point of contact regarding the services, including with respect to payment.

12. NO WAIVER OF GOVERNMENTAL IMMUNITY. Nothing contained in this or any of the exhibits attached thereto shall be construed as a waiver of any of the immunities, limitations, privileges, rights, procedures, or requirements contained in the Colorado Governmental Immunity Act, C.R.S. §§24-10-101 *et seq.*

13. RIGHT TO TERMINATE. The City of 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 thereof. In the event of termination by the City of Arvada for convenience, Contractor will be paid for requested work performed up until the time of termination by the City of Arvada, not to exceed the total amount of the contract price agreed upon by the parties.

14. COMPLIANCE WITH ALL LAWS. All of the services performed under this Agreement by Contractor shall comply with all applicable laws, rules, regulations and codes of the United States and State of Colorado, and with the charter, ordinances, rules and regulations of the City of Arvada.

15. WAIVER OF BREACH. A waiver by any party to the Agreement or the breach of any term or provision of the Agreement shall not operate or be construed as a waiver of any subsequent breach by either party.

16. GOVERNING LAW AND VENUE. Notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, the Agreement shall be governed by the laws of the State of Colorado. Venue for any action arising under the Agreement or for the enforcement of the Agreement shall be in the appropriate court for Jefferson County, Colorado.

17. FORCE MAJEURE. Any delays in or failure of performance by any party of its obligations under the Agreement shall be excused if such delays or failure are a result of acts of God, fires, floods, strikes, labor disputes, 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.

18. BINDING ARBITRATION PROHIBITED. The City of Arvada does not agree to binding arbitration by any extra-judicial body or person. Any provision to the contrary in response to the solicitation, or incorporated by reference, shall be null and void.

19. EQUAL EMPLOYMENT OPPORTUNITY. Contractor shall not refuse to hire, discharge, promote or demote, or discriminate in matters of compensation against any person otherwise qualified solely because of race, creed, sex, color, national origin or ancestry, religion, disability, age, sexual orientation, gender identity, veteran status, or any other basis prohibited by federal, state, or local law.

20. 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, has been properly acknowledged by attestation, notary acknowledgment, or both, 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.

21. PREFERENCES IN EMPLOYMENT OF COLORADO LABOR. To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:

- a. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- b. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.

22. RETAINAGE REQUIREMENTS. Contractor agrees to submit monthly invoices together with any retainage requirements as prescribed by Colorado state statutes (see e.g., C.R.S. §§24-91-101 *et seq.*). Payment from Arvada will traditionally be paid NET (15) days but no later than NET thirty (30) days. Invoices will accurately reflect actual work completed by Contractor.

23. ACCESSIBILITY COMPLIANCE.

- 23.1 Arvada is obligated to comply with the Colorado Anti-Discrimination Act (C.R.S. §§24-34-300 *et seq.*) ("CADA"), which requires all digital and online platform and content providers to comply with the minimum *Accessibility Standards for Individuals with a Disability*, adopted by the Colorado Office of Information Technology ("OIT") under C.R.S §24-85-103(2.5). Contractor has been advised to familiarize itself with CADA.
- 23.2 To the extent the Work or any of Contractor's services provided under the Agreement involves digital, technological components, including but not limited to software, websites, applications, digital documents (the "Material"), all Material shall comply with the OIT's currently adopted minimum *Accessibility Standards for Individuals with a Disability* at all times.
- 23.3 Contractor shall indemnify, save, 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) incurred by any of the Indemnified Parties in relationship to Contractor's failure to comply with Section (23.2) above.
- 23.4 Upon Arvada's request, Contractor shall certify to Arvada that its service(s) and digital documents are compliant with Section (23.2) above. Arvada may require Contractor's compliance to the OIT's currently adopted minimum standards of accessibility to be determined by a third party selected by Arvada to attest to Contractor's compliance.

SPECIAL TERMS AND CONDITIONS FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS. Bids submitted electronically on the BidnetDirect.com website only become available to the City of Arvada after the bid closes. Bidder shall assume full responsibility for timely upload of bid to the BidnetDirect website. The City reserves the right, where its best interest will be served, to accept or reject any conditional or qualified bid.

2. QUANTITY AND NATURE OF THE WORK. Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including Addendum. After Bids have been submitted the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

3. CONTENTS OF BID. Contractors are required to submit Bids with the following conditions:

- 1) Contractors shall make all investigations necessary to inform themselves of the sites affected and the work 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 Bids. A copy of such addenda will be publicly posted with the original CSB 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. BID SECURITY. Each Bid must be accompanied by a PHOTO of the Bid Bond, on the form attached to these contract documents, payable to the City for five (5) percent of the total amount of the Bid. As soon as the bid Prices have been compared, the City will issue intent to award on the Bidnetdirect.com web site. The vendor who is named as the intent to award Contractor must submit the physical Bid Bond within 10 days or the intent to award may be revoked. The Bid Bond of the successful Bidder will be retained until the Payment and Performance Bond has been executed and approved after which it will be returned. A certified check may be used in lieu of a Bid Bond.

5. POWER OF ATTORNEY. Attorneys-in-fact who sign Bid Bonds or Payment and Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

6. QUALIFICATION OF BIDDER. The City may make such investigation as it deems necessary to determine the ability of the Bidder to perform the work. The City reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the City that such Bidder is properly qualified to carry out the obligation of the Contract Agreement and to complete the work contemplated therein. The City reserves the right, before awarding the contract, to require a Contractor 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.

7. AWARD OF CONTRACT. Bids shall be awarded to the lowest-priced responsible and most responsive bidder whose bid meets the requirements and criteria set forth in the CSB within the limits of funds available and that best serves the City's interest. The City, within seven (7) calendar days of receipt of acceptable Contract Security and the Contract Agreement, signed by the Bidder to whom the Contract was awarded, shall sign the Contract Agreement and return to the Bidder an executed copy of the Contract Agreement. Should the City not execute the Contract Agreement within such period, the Bidder may, by written notice,

withdraw their signed Contract Agreement. Such notice of withdrawal shall be effective upon receipt of the written notice by the City.

8. NOTICE OF AWARD AND FAILURE TO ENTER INTO CONTRACT. The party to whom the Contract is to be awarded will be required to execute the Contract Agreement, obtain Certificates of Insurance and a Performance and Payment Bond, as Contract security, within five (5) calendar days from the date the Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the Contract Agreement and the necessary Performance and Payment Bond forms. In case of failure of the bidder to execute the Contract Agreement and provide satisfactory Insurance and Contract Security, the City may at its option, consider the Bidder in default, in which case the Bid Bond accompanying the Proposal shall become the property of the City.

9. CONTRACT DOCUMENTS. The Contract Documents consisting of the Bid Documents, which include the Advertisement for Bids, Information for Bidders, General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, Addendum, Bid Bond, Bid Proposal, Bid Schedule, Vendor Submittal Form, Construction Drawings, Supplemental Specifications and the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", dated July 26, 2022, which include the Measurement and Payment specifications, and the attached Notice of Award form, Contract Agreement form, Performance and Payment Bond form, Notice to Proceed form, and Change Order form, when combined, contain the provisions required for the construction of the Project. Information obtained from an agent or employee of the City or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the contract.

10. TERM OF CONTRACT. This contract shall commence on the date of the purchase order or contract execution and shall remain in effect until such time as the commodities, equipment and/or services acquired in conjunction with this Bid have been accepted by the City's authorized representative. Any required warranty period which exceeds this term shall remain in full force for the duration of the warranty period.

11. PRICING SHALL BE FIXED AND FIRM. The prices offered by the Contractor shall remain fixed and firm for at least 90 ninety days. No changes in the Bid shall be allowed after the date and time of the Bid deadline due to error by the Contractor.

12. CONTRACT SECURITY. A Performance and Payment Bond, on the form attached to these contract documents, in the amount of 100% of the Contract price, with a corporate surety approved by the City, will be required for the faithful performance of the Contract.

13. NOTICE TO PROCEED. The Notice to Proceed shall be issued within seven (7) calendar days of the execution of the Contract Agreement by the City. Should there be reason why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the City and the Contractor. In the event the Notice to Proceed has not been issued within the seven day period or within the period mutually agreed upon the Contractor may terminate the Contract Agreement without further liability on the part of either party.

14. MODIFICATION OR WITHDRAWAL OF BIDS BY CONTRACTOR.

Modifications to Bids- Changes to the Bid after the submission deadline shall be allowed only when the Contractor 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 Contractor's name, address, Solicitation Number and title included.

Withdrawal of Bids- If a Bid is withdrawn by Contractor after the Bid Opening, the City may, at its option, suspend the Contractor for a six (6) month period following the withdrawal. Withdrawal of the Bid after the Bid Opening will result in the Contractor forfeiting the provided Bid Bond.

15. REJECTION OF OFFERS BY CITY.

- A. The City may reject a Bid, in whole or in part, for reasons including, but not be limited to:
 - 1) The Contractor misstates or conceals any material fact in its Bid;
 - 2) The Contractor's Bid does not strictly conform to the law or requirements of the Solicitation;
 - 3) The Bid expressly requires or implies a conditional award that conflicts with the method of award stipulated in the Special Conditions;
 - 4) The Bid does not include documents which are required for submission with the Bid; or
 - 5) The Bid has not been executed by the Contractor through an authorized signature.
- B. The City may, at its sole and absolute discretion:
 - 1) Reject all or parts of Bids submitted by prospective Contractors;
 - 2) Re-advertise this Solicitation;
 - 3) Postpone or cancel the Solicitation;
 - 4) A Bid 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 government 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.

16. 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. Contractors 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 Contractor's Bid, it shall be agreed that the Contractor's Bid fully complies with all conditions identified in this Solicitation.

17. ELECTRONIC PAYMENT METHODS - CITY OF ARVADA SINGLE USE ACCOUNT.

Contractors are encouraged to consider the following method of payment.

Single Use Account: The City incorporates the use of Single User Accounts as an option to seamlessly process payment of larger dollar purchase orders and contracts to vendors/contractors/providers. A secure, one-time payment transaction account processes to pay invoices via the Contractor's merchant bank. Invoice payments have an enhanced speed-of-pay cycle that can significantly benefit cash flow.

18. CONDITIONS OF WORK AND OBLIGATION OF BIDDER. Each Bidder is responsible for independently inspecting the site and for reading and being thoroughly familiar with the Contract Documents and for providing the names of major suppliers and sub-contractors in the space provided on the Bid Proposal form. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve the Bidder from any obligation in respect to their Bid Proposal.

19. CONTRACTOR LICENSE. The Contractor to whom the contract is awarded, and any subcontractors employed by the Contractor must have or acquire the appropriate Contractor's license issued by the City of Arvada Engineering Division, including submittal of license bond, necessary insurance certificate, and license fee before initiating any work. The Contractor and any subcontractors will also be required to obtain a no charge Public Improvements Permit from the City of Arvada Engineering Division prior to initiating any and all work on this project.

20. PERFORMANCE MEASUREMENTS FOR SERVICES MORE THAN \$15,000.

The City has incorporated Performance Management into its organizational culture. The City will monitor and report on the following performance measures. These measures will determine, in part, renewals and eligibility for future awards. Measures include: (a) safety as defined by observation and OSHA reportable injuries, (b) quality of contracted work, (c) work completed within required schedule, (d) administration and coordination of estimates, RFIs, ASIs, change orders, pay requests and close out documents, (e) fair and justifiable change orders, (f) responsiveness and follow through on requests.

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.

21. PREPARATION AND SUBMISSION.

Bids 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) Contractors 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) The only authorized version of this Bid is posted on WWW.BIDNETDIRECT.COM. Registration is available to receive email notification of new solicitations, addenda, and communications.

INSURANCE REQUIREMENTS

The following listed insurance requirements shall be carried by the selected Contractor 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 \$5,000,00.00 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 \$1,000,000 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.
- 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.
- 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 Contractor fails to submit the required insurance documents within 15 calendar days after notice to submit such policies is given to the Contractor by a City representative, the Contractor 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.
- The City, through its Risk Manager, reserves the right to require additional insurance coverage and other requirements.

SPECIAL PROVISIONS

City of Arvada Project No. 24-ST-02, Project Title: 2024 Surface Treatments - Hot Chip, Slurry, Cape, and Crack Seal Program

Conditions peculiar, but essential, to the successful performance and acceptance of the work on this project are itemized below. As such, they shall take precedence over the City of Arvada Engineering Code of Standards and Specifications (latest edition).

All material, equipment, installation, or construction shall be in accordance with the latest editions of the Colorado Department of Transportation's Standard Specifications for Road and Bridge Construction, the Arvada Engineering Code of Standards and Specifications for the design and Construction of Public Improvements ("City Engineering Code") and the Metropolitan Government Pavement Engineers Council (MGPEC). In case of discrepancies, the more restrictive shall apply unless otherwise approved by the City. Copies of the City of Arvada "Design and Construction Standards" can be viewed and/or printed on the City's web site at:

<https://library.municode.com/co/arvada/munidocs/munidocs?nodeId=633ed8dc0663b>

The Contractor shall have one (1) copy of the PROJECT PLANS AND SPECIFICATIONS approved by the City of Arvada, one copy of the appropriate STANDARDS AND SPECIFICATIONS, and one (1) copy of all necessary permits at the job site at all times.

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 workmanship that does not conform to the above Standards and Specifications.

All contractors bidding on this project are responsible for acquainting themselves thoroughly with all applicable specifications prior to submitting their bid. The successful bidder is responsible for thoroughly acquainting all the personnel the contractor intends to use on this project with all the applicable specifications prior to the commencement of any construction.

A. GENERAL TERMS AND CONDITIONS

SC-A-1 CONTRACT TIME AND LIQUIDATED DAMAGES: This project is to be completed, including cleanup, within 270 working days after the date to be specified in the Notice to Proceed, unless the contract time is adjusted by change order. The Contractor shall agree to pay to the Owner, as liquidated damages, the sum of \$3,300.00 for each consecutive calendar day that the work exceeds the allotted contract time.

SC-A-2 MEASUREMENT AND PAYMENT: Measurement of the work performed and payment, at the unit or lump sum price quoted in the Bid Schedule, shall be made in accordance with requirements of the Measurement and Payment Section of the Contract Documents or as hereinafter stated in the Special Conditions.

SC-A-3 NON CONFORMITY OF MATERIAL OR FINISHED PRODUCT: Where materials installed or the finished product fails to meet the minimum requirements of these Contract Documents, the basis of determining final payment to the Contractor shall be determined in accordance with the current revised Section 105.03 of the Colorado Department of Transportation Standard Specifications.

SC-A-4 OSHA REQUIREMENTS: Observing the rules and regulations required by the Occupational Health and Safety Administration (OSHA) is the responsibility of the Contractor on this project.

SC-A-5 CITY HOLIDAYS: The Contractor, when performing work on a city holiday, Saturday, Sunday, or in excess of ten (10) hours on a weekday, in accordance with the Overtime Permit Agreement, and the Fee Schedule for Rights of Way Work Permits and Services as pursuant to Chapter 78, Public Improvements, of the Arvada City Code Effective January 1, 2023, Contractor agrees to reimburse the Owner for the inspector's time at the following rate:

First 2 hours - 2 hour minimum: \$106.00/hr

Each additional hour or fraction thereof: \$106.00/hr

Payment shall be made payable to the City of Arvada within ten days of the date of invoice from the Owner.

SC-A-6 MINOR CONTRACT REVISIONS: Miscellaneous modifications in the work, ordered by the Project Engineer or Manager in the form of a field order, will be considered a minor contract revision. Payment for accepted work performed under this pay item "Minor Contract Revision" will be made in accordance with General Conditions and 2.16 and 2.17 of the Arvada Engineering Code of Standards and Specifications. If the contractor feels that a field order issued by the Project Engineer or Manager entitles the contractor to a change in the total contract price or time, or both, (i.e. the contractor feels that the field order involves costs over and above the amount available in the Minor Contract Revisions bid item) then the Contractor shall notify the Project Engineer or Manager, in writing, within 15 days after receipt of the field order.

The Contractor shall not execute any such field order changes ordered by the Project Engineer or Manager pending the receipt of a written Change Order document executed either by the City Manager or Mayor authorizing an increase in the total contract price. Any such work completed by the contractor prior to receipt of an executed Change Order will be at the contractor's risk and be subject to removal by the contractor should a Change Order not be approved and executed by the City Manager or Mayor for such work.

SC-A-7 FIELD ORDERS: An authorized representative of the contractor shall acknowledge receipt of field orders by promptly signing all written field orders delivered to the job site. Verbal field orders given by the Project Engineer or Manager will be recorded in writing in the municipal inspector's daily report that is to be signed by the contractor's authorized representative.

SC-A-8 PROJECT STATUS MEETINGS: Project status meetings will be held as necessary for scheduling, communication, and problem solving throughout the duration of the project. Contractor shall ensure that the project manager, superintendent or foreman is present and prepared to furnish the City with the schedule of work operations at each of these meetings as requested by the Project Engineer or Manager throughout the project.

SC-A-9 CHANGE OF METHOD: Any cost due to a change in construction method will be the responsibility of the contractor

SC-A-10 CONSTRUCTION WATER: All construction water will be provided by the City free of charge through existing City owned fire hydrants. Contractor will be required to obtain a hydrant meter from the City Utilities division which will require a \$2,000 refundable meter deposit upon return of the meter in acceptable working condition.

SC-A-11 STORMWATER CONSTRUCTION PERMIT: As a subsidiary obligation of the contract, the Contractor shall obtain a Stormwater Discharge Construction Permit from the Colorado Department of Public Health and Environment, Water Quality Control Division, Permit Enforcement Section, prior to clearing, grading, or excavating a site of one (1) acre or more. A copy of the approved permit must be submitted to the City of Arvada Engineering Division prior to the start of clearing, grading or excavating of the site. A copy of the approved permit must also be available on the project site at all times during construction. Contractor shall also obtain a Colorado State Construction Dewatering Discharge Permit from the Colorado Department of Public Health and Environment for all areas where trench dewatering is required and water is discharged into a storm sewer, channel, irrigation ditch or any waters of the United States. A copy of the approved permit must be submitted to the Project Engineer or Manager prior to the start of any dewatering. All requirements for the dewatering permit must be specifically followed for any dewater operations. A copy of the approved permit must also be available on the project site at all times during construction.

In addition, the Contractor shall be required to obtain a City of Arvada Site Development Permit from the Arvada Stormwater Utility Division. For permit requirements go to Arvada.org/services and click on Building/Development. Contractor shall implement best management practices that include, where required, concrete washout control measures, perimeter control measures, inlet protection for all inlets affected by the work as well as stockpile perimeter protection in order to control runoff from stockpiles. Installation of vehicle tracking control measures may also be required, as well as daily street sweeping to limit tracking from the work site. Uncontrolled releases of dirt or silt from the project into drainage ways, which includes the gutter or stormwater inlets, constitutes a violation of Arvada Ordinance punishable by up to \$999 per day per incident. No additional payment will be made for obtaining a City of Arvada Site Development Permit and implementing best management practices/control measures required to prevent uncontrolled releases of dirt or silt from the project.

SC-A-12 WORK WITHIN UNION PACIFIC RAILROAD RIGHT-OF-WAY AND CITY OF ARVADA PERMIT REQUIREMENTS:

The Contractor will be required to prepare and apply for UPRR permits (if required) where work will occur on or adjacent to Railroad Right-of-Way. The City of Arvada will be indicated as the permittee on the permit applications. The Contractor shall apply for UPRR permits (if required) far enough in advance of the work so as not to delay the project.

UPRR permit (if required) will not be paid for separately but shall be included in the cost of Traffic Control. The successful bidder who is awarded this project shall obtain or be currently licensed with the City of Arvada, Engineering Division with a Class MC-B Contractor license. A City of Arvada no-charge permit for this project shall be obtained prior to issuance of the Notice to Proceed.

SC-A-13 OPTION TO RENEW FOR SUBSEQUENT YEARS (WITH PRICE ADJUSTMENTS ALLOWED): The City shall have the option to renew the contract for an additional two (2) one-year periods; provided, however, that the Bidder provided satisfactory performance during the previous contract period. Continuation of the contract beyond the initial period is a City prerogative and not a right of the Bidder and will be exercised only when such continuation is clearly in the best interest of the City.

During the option period, the City will consider an adjustment to the pricing structure if the successful Bidder can demonstrate, through documentation issued by material suppliers, that it was subject to a price adjustment. It shall be understood that such price adjustments shall not exceed the amount passed on to the successful Bidder by the supplier. Under these circumstances, the City may, in its best interest, negotiate a price adjustment with the successful Bidder.

The successful Bidder is obligated to notify the City of such adjustments, either price reductions or price increases, within 14 calendar days after receiving said notification from the supplier.

Pricing and specification changes, if any, shall be negotiated and agreed upon by both parties. The City reserves the right to reject any price adjustments submitted by the Bidder and/or to terminate the contract with the Bidder based on such price adjustments.

SC-A-14 PROJECT WARRANTY PERIOD: The warranty period for this project shall be two (2) years in accordance with Section 224 of the Standard Specifications. The Performance and Payment Bond shall remain in full force and effect throughout the two (2) year guarantee and warranty period.

B. CONSTRUCTION CONSIDERATIONS

WORK DESCRIPTION:

Work for this contract shall consist of street surface preparation to include a clean and dry surface free of vegetation and debris prior to the application of Hot Chip, Slurry, Cape and Crack Seal in accordance with the Arvada Engineering Code of Standards and Specifications for the design and Construction of Public Improvements ("City Engineering Code"), the Metropolitan Government Pavement Engineers Council (MGPEC), CDOT Standards and Specifications and the Special Conditions herein. The Contractor shall furnish all labor, equipment, material, and incidentals necessary to complete the Surface Treatment application specified at locations designated on the Project Street Schedule and Project Location Map.

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 workmanship that does not conform to the above Standards and Specifications.

The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavating or grading is planned in the area of underground utility facilities. The Contractor shall notify all affected utilities at least two (2) business days, not including the actual day of notice, prior to commencing such operations. The contractor shall contact the Utility Notification Center of Colorado (UNCC) at 811, to have locations of UNCC registered lines marked by member companies. All other underground facilities shall be located by contacting the respective owner. Utility service laterals shall also be located prior to beginning excavation or grading. The Contractor shall locate non-member utilities, such storm sewer and ditch facilities as necessary to prevent damage.

SC-B-1 LOCATIONS AND SUMMARY OF APPROXIMATE QUANTITIES: The map of proposed areas, street list and summary of approximate quantities are attached hereto and incorporated by reference. The City reserves the right to add, delete, or modify construction locations, priority order and portions of the work without change in the contract agreement prices.

SC-B-2 PRE-CONSTRUCTION AND SCHEDULING: A pre-construction meeting will be scheduled prior to the start of work. Attendance by the contractor's project manager and/or construction superintendent will be required. A construction schedule shall be submitted by the contractor to the project manager at least three (3) days prior to the pre-construction meeting. The schedule shall be in bar chart form and shall at a minimum indicate the start and completion dates of work at each construction location. The contractor shall also provide the City with an after-hours emergency contact phone number at the pre-construction meeting.

SC-B-3 MINIMIZING WORK ZONE DAMAGES: During all phases of construction including cleanup, contractor shall operate all equipment and utilize personnel so as to minimize or prevent damages to public or private property. Contractor shall limit operation of heavy equipment to safe prudent speeds and minimize operation of equipment over concrete sidewalks, curbs and gutters. Contractors shall also conduct operations to avoid dings, nicks, gouges, scrapes, etc., on streets and concrete curb, gutter and sidewalks as well as other facilities in the construction area. Should contractors' operations cause damages, the contractor shall be fully responsible for repairs at no cost to the City.

All public or private property damaged during the construction process must be repaired within two weeks of street and right-of-way clean-up. Should repair items not be completed within two weeks, the City may initiate and complete the repair work; deducting costs to complete the work from the total contract.

SC-B-4 WORK ELEMENTS SCHEDULE AND ORDER OF WORK: Prior to Hot Chip, Slurry or Cape Seal application on any street location for this project, HMA patching and crack sealing on the streets listed in the Project Street Schedule will be completed. The Contractor may work on streets in the contract schedule at their discretion and streets adjacent to, or within close proximity to a location where Contractor is currently working, but in no case will Contractor be allowed to leave one location or area until the current location is completed, including cleanup to the satisfaction of the City. The City reserves the right to coordinate performance of any part of the work under this contract as circumstances warrant with respect to weather, traffic access, other City projects, or for other reasons deemed necessary by the City.

Weather and Seasonal Limitations: All materials for CRS-2P Emulsion and Chip Seal shall be applied only when the ambient air and surface temperature of the pavement is 65° F. and rising. No materials shall be applied when there are threats of rain, periods of abnormally high humidity, wet pavement with standing water, and other conditions that could affect the performance of material placement. Under no circumstance shall chip, slurry seal or cape seal be applied between September 30th and May 31st of the paving season.

SC-B-5 TRAFFIC CONTROL AND STREET RESTRICTIONS: Traffic control methods shall conform to Arvada Engineering Code of Standards and Specifications and the FHA Manual for Uniform Traffic Control Devices and Colorado Supplement thereto. When working in State Highway right-of-way, traffic control methods shall meet the requirements of the Colorado Department of Transportation (CDOT). Contractor's traffic control plan is subject to CDOT approval prior to commencing work on State Highway right-of-way. No hand painted traffic control devices will be permitted. After award of the contract and prior to the start of construction, the contractor shall submit two copies of the traffic control plans for approval encompassing all locations of the project. The contractor shall modify the installation to meet requirements of the City of Arvada Traffic Department, if so required.

The Contractor shall furnish all the necessary barricading, coning, flagmen, incidentals, etc. to properly control traffic in accordance with the Section 700 of the City Engineering Code and the latest edition of the FHA Manual for Uniform Traffic Control Devices and Colorado Supplement ("MUTCD"). When working in the State of Colorado right of way traffic control methods must meet the requirements of the Colorado Department of Transportation. Hand-painted signs are not permitted.

The Contractor is responsible for installing and maintaining all traffic control devices to insure safety and accessibility to the public and workers throughout construction. "Public" shall include, but not be limited to drivers, bicyclists and pedestrians. If accessibility cannot be met, the contractor shall provide the proper road, sidewalk, bike lane closures, etc. and detour router per the City's Engineering Code and MUTCD.

The Contractor shall furnish standard traffic control including advance-warning signs at the beginning and end of each phase of the work as it progresses and at intermediate locations as required by the City of Arvada, including but not limited to "**Fresh Oil**", "**Loose Rock**", and "**Fines Doubled**" signs. Application of CRS-2P emulsion and chip seal placement shall proceed in such a manner so as to minimize traffic interruption and hazards. Placement of advance-warning signs shall be approved by the City's Traffic section as a part of the Traffic Control Plan for each location.

The Contractor shall furnish the City's Traffic Division with two copies of a traffic control plan for review and approval for all work sites and shall not proceed with any work until approval of the site-specific traffic control plan has been received. The plan must be submitted at least **five (5)** business days in advance of the work at that location. If during construction the Traffic Division determines that the traffic control plan needs to be adjusted to better meet actual field conditions, the contractor shall immediately make said adjustments at no additional cost to the City. **The contractor is responsible for determining the probable requirements with the City's Traffic Division prior to the bid opening.** The Contractor is directed to Section 50 of the Arvada *Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements* for more specific information on traffic control.

The contractor shall notify the Arvada Traffic Division (720-898-7740) of all closures, either partial or complete, of any public street, road, highway or alley per Section 700 of Arvada's Engineering Code of Standards and Specifications. Notification shall be made a minimum of 24 hours in advance of the actual closure; except on commercial, parkway, and collector streets, where a minimum three (3) day advance notice will be required. All streets in the project will be considered for closure to thru traffic (local traffic only allowed) except for the following:

1. Garrison Street - 2 Lane Arterial
2. W 82nd Avenue - 2 Lane Arterial
3. W 80th Avenue - 2 Lane Arterial
4. W 72nd Avenue - 2 Lane Arterial
5. W 64th Avenue - 2 Lane Arterial
6. W 80th Avenue - 4 Lane Arterial
7. Independence Street - Collector
8. W. 59th Place - Collector
9. Brooks Drive - Collector
10. W 82nd Avenue - Collector
11. Hoyt Way - Collector
12. Garrison Street - Collector
13. W 84th Avenue - Collector
14. Club Crest Drive - Collector
15. Oak Street - Collector
16. Chase Drive - Collector
17. Pierce Street - Collector
18. Lamar Street - Collector
19. W 76th Avenue - Collector
20. Rensselaer Drive - Collector
21. Carr Street - Collector
22. W 64th Avenue - Collector
23. W 57th Avenue - Collector

The above streets are classified as arterial and collector streets. All other streets in the project are classified as local streets. Work hours shall be as outlined below

MEASUREMENT: The traffic control shall be a lump sum item for all aspects of the traffic control plan. Payment for traffic control shall be full compensation for the traffic control and labor, equipment and materials required to implement the traffic control plan,

PAYMENT: Prorated payment of the contract amount bid for traffic control will be made monthly. The percentage paid shall be equal to the percentage of the total contract dollar amount completed that month. In no case shall payment be more than 100% of the amount bid for Traffic Control.

The Contractor shall notify the Traffic Division (720-898-7740) a minimum of one business day in advance of all closures including temporary lane closures on public roads, private accesses, and business accesses.

Traffic Control Supervisor

The contractor shall designate an individual, other than the superintendent, to be the Traffic Control Supervisor. The Traffic Control Supervisor shall be certified as a worksite traffic supervisor by either the American Traffic Safety Association (ATSSA) or the Colorado Contractors Association (CCA). The responsibilities and duties of the Traffic Control Supervisor shall be as stated in Section 630.11 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, 2017 edition.

SC-B-6 STREET CLOSURE RESTRICTIONS: Lane closures in various street classifications are as follows:

ARTERIAL STREETS:	Lane closures 8:30 am – 3:30 pm only Construction activities: 8:30 am – 3:30 pm only Must maintain one lane each way at all times
COLLECTOR STREETS:	Lane closures 8:30 am – 3:30 pm only Construction activities: 7:00 am – 7:00 pm only Must maintain one lane with adequate flagging at all times
LOCAL STREETS:	Lane closures 7:00 am – 7:00 pm only Construction activities: 7:00 am – 7:00 pm only May be closed to thru traffic unless otherwise noted (during working hours)

If contractor violates these working time limitations without prior authorization from the Engineer, Engineer may give written notice to stop work on the project at the beginning of the next day's work and work may not resume until contractor provides written explanation for the violation and assurance to the City that there will not be a reoccurrence of the violation. If subsequent working time violations occur, the Engineer or Project Manager will notify the contractor in writing that there will be a price reduction for each incidence of unauthorized violation in accordance with this specification. Price reduction will not be imposed where changed contract conditions are encountered during the specific period or the violation in question was a result of circumstances beyond contractor or subcontractor's control. The price reduction will not constitute a penalty but will be considered a failure to perform traffic control in accordance with the contract.

An incident is any violation up to 30 minutes in duration. Each 30 minutes or increment thereof will be considered an incident. A price reduction will be assessed for each successive or cumulative 30-minute period in violation of the working time limitations, as determined by the Engineer. The price reduction for each incident will increase at a progressive rate starting with \$150 for the second incident and increasing to \$600 for the fourth and subsequent incidents in accordance with the following schedule. A 15-minute grace period will be allowed at the beginning of the second incident on the project before the price reduction is applied. The 15-minute grace period applies only to the second incident. The number of incident charges will be accumulated throughout the duration of the contract.

PRICE REDUCTION SCHEDULE

<u>INCIDENT</u>	<u>INCIDENT RATE</u>	<u>TOTAL PRICE REDUCTION</u>
1 st	Notice to Stop Work	\$0
2 nd	\$150	\$150
3 rd	\$300	\$450
4 th	\$600	\$1,050
5 th	\$600	\$1,650
6 th	\$600	\$2,250
ETC.	\$600	\$2,850

Traffic Control Management (TCM): TCM shall be paid by the day in which the Contractor works on some portion of the project for at least 2 hours and traffic control devices are required. The City will pay no more than 1 TCM day for each working day, even if multiple operations are occurring at one time in different locations which could possibly require more than one person supervising traffic control. The TCS or a designated representative shall check the traffic control devices on non-working days. The TCS will not be paid for checking traffic control devices on days when no work is being performed. This work shall be considered incidental to other work times.

Flagging:

Flagging shall be paid for by the hour for each hour worked by each flagger. Flagging hours will be paid for only when flaggers are directing traffic as agreed to by a City representative. Daily traffic control reports detailing the number of flaggers and flagger hours each day submitted to the Project Manager daily will be the basis of payment.

Additional Arrow boards / Message boards shall be paid by the day for each day they are in place at the direction of the Project Manager.

All other items required for adequate traffic control including, but not limited to, signs, cones, panels, barricades, and other traffic control devices, and the preparation and implementation of the traffic control plan for all operations, will not be paid for separately, but shall be included in the cost of the work items.

SC-B-7 UNIFORMED TRAFFIC CONTROL AND UNIFORMED TRAFFIC CONTROL (VEHICLE): Uniformed Traffic Control (UTC) and Uniformed Traffic Control Vehicle (UTCV) shall be used only at signalized intersections and when required by the Project Engineer or Manager. UTC and UTCV shall be provided in accordance with the current Colorado Department of Transportation Standard Specifications for Road and Bridge Construction Section 630 except as revised for this project as follows:

Section 700 shall include the following:

This work includes furnishing a uniformed police agency officer to perform uniformed traffic control. The officer shall have completed "The Safe and Effective Use of Law Enforcement Personnel in Work Zones" training course. The Contractor shall provide copies of documentation certifying the officer's successful completion of this course.

This work includes furnishing a vehicle for the officer to use in performing uniformed traffic control.

Traffic Control Vehicles:

When called for on the plans, and/or as authorized by the Project Engineer or Manager, the Contractor shall furnish full-sized, late model, white sedans, or a police agency's patrol vehicle to be used by uniformed police agency officers in the performance of Uniformed Traffic Control duties. The Contractor shall be responsible for licensing, insuring, servicing, and fueling the vehicle.

For each traffic control vehicle furnished by the Contractor, the Contractor shall furnish Class 1 SAE certified light bar and control panel for exclusive use by uniformed police agency officers while performing Uniformed Traffic Control. The light bar shall have the following configuration:

1. Minimum of 44 inches in length and shall be either permanently or temporarily attached to the top of the vehicle.
2. Flash red on the driver side and blue on the passenger side.
3. Equipped with an amber-colored directional device in the rear of the bar.
4. Have alley and takedown lights.
5. The control panel shall be capable of controlling the front of the bar and the rear of the bar separately.
6. The traffic advisor shall be controlled separately.

The light bars shall be mounted on traffic control vehicles and shall be maintained in good operating condition at all times. The Contractor shall obtain a permit from the Police Department, as appropriate, for the use of the light bars. The Contractor shall keep the light bars covered at all times when the traffic control vehicle is being used by someone other than the authorized uniform police agency officer.

MEASUREMENT AND PAYMENT

Uniformed Traffic Control (UTC) shall be measured by the total number of hours that are required for a uniformed traffic control officer including minimum shift hours required by the agency. The accepted number of hours of Uniformed Traffic Control shall be paid for at the contract unit price per hour.

Uniformed Traffic Control (Vehicle) shall be measured as the contract unit price per hour for the uniformed traffic control officer and traffic control vehicle. No separate payment shall be made for the Contractor furnishing a Traffic Control Vehicle with light bars and other equipment, licensing, insuring, servicing, and fueling a Traffic Control Vehicle but shall be included in the work.

Hours of Uniformed Traffic Control or Uniformed Traffic Control (Vehicle) that are not authorized or approved will not be paid for. Scheduling of traffic control will not be measured and paid for separately but shall be included in the work.

SC-B-8 CITIZEN NOTIFICATION: Residents and businesses along project streets shall be notified by the Contractor at least 24 hours in advance of the work by means of informational flyers prepared by the Contractor, or by means of personal contact with businesses. At least 24 hours in advance of the beginning of the surface seal operation, the Contractor shall then notify the residents and businesses by distributing informational "door hangers" provided by the Contractor. It shall be the Contractor's responsibility to keep a written log of communication with business owners and their representatives should questions arise regarding proper advance notification. The door hangers shall be distributed a minimum 24 hours in advance of the work and at the time "No Parking" signs are set on the street prior to beginning any phase of the contract work. A reduction in payment or stoppage of work will be issued if this procedure is not strictly followed.

Payment for "Citizen Notification" shall be paid as a percentage of the lump sum bid item for the contract amount earned and paid with each progress payment. Payment for "Citizen Notification" shall include all labor, materials, and incidentals required for each notification and during each phase of the contract work. No additional compensation shall be made for additional notification due to weather delays, equipment breakdowns, etc.

SC-B-9 MATERIALS AND MIX DESIGN SUBMITTALS: All materials used on this Project shall meet the requirements of Section 900 of the City Engineering Code, and Items 25 and 26 and 27 of the Metropolitan Government Pavement Engineers Council (MGPEC) Specifications, and supplements thereto. However, where these Special Conditions vary from the Standard Specifications, the Special Conditions shall take precedence.

Mix Design Submittals: Two copies of the mix design for each material used on the project shall be submitted at least two weeks prior to start of work. A qualified independent testing laboratory shall prepare the mix design at the Contractor's expense. The mix design(s) shall include sources of all materials and testing data by a qualified laboratory, verifying conformance with these Specifications. Field changes to the mix design(s) must be reviewed and approved by the Project Engineer or Manager before incorporation into the Project.

SLURRY SEAL:

This work shall consist of the application of a Type II Slurry Seal that meets the requirements of Section 900 of the City Engineering Code and Item 26 of the MGPEC specifications. The emulsified asphalt shall be a quick setting, cationic type conforming to the requirements of ASTM specification for CQS-1hL (latex polymer modified) emulsion. Polymer modified asphalt emulsion shall contain 1.0%, by weight, of styrene-butadiene rubber (SBR) polymer solids by weight of residual asphalt. Residual asphalt shall range between 7.5 and 13.5 percent by weight to dry aggregate.

Tack coat shall be CSS-1h emulsified asphalt thinned to a mixture of one-part emulsified asphalt and three parts potable water.

Screening of aggregate shall be required at the stockpile prior to delivery to the paving machine. Presence of oversized granular material shall be grounds to stop work on the project until compliance with these Specifications is demonstrated to the Engineer.

Aggregate shall be free of clay lumps and other deleterious material. Presence of clay lumps in the aggregate shall be grounds to suspend operations until compliance with these Specifications is demonstrated to the Engineer.

Mineral fillers such as Portland cement, limestone dust, lime fly ash and others shall be considered as part of the blended aggregate and shall be used in the minimum amount required by the mix design. Mineral filler limits shall be 0.50% to 3% of dry weight of the aggregate. Mineral fillers shall be manufactured in the same year as the project.

Mineral fillers shall be used for the following purposes:

- A. To improve the gradation of the aggregate.
- B. To control the time of break and the set time of the emulsion.
- C. To provide improved stability and workability.
- D. To increase the durability

The aggregate shall be manufactured 100 percent crushed stone such as granite, slag, limestone, chert, or other high quality aggregate, or combination thereof. All aggregates shall have at least two fractured faces.

Test	Quality Specification
AASHTO T176*	Sand Equivalent 55 Min.
AASHTO T104	Soundness 15% Max. using NA2 SO4 Or 25% Max. using MgSO4
AASHTO T96	Abrasion Resistance 25% Max. Grading D

*Moisture condition sample at least 24 hours prior to running test.

Aggregates shall have the following gradation and application rate:

Sieve Size	Percent Passing	Job Tolerance
½"	100	±0
No. 4	90-100	±4
No. 8	65-90	±4
No. 16	45-70	±3
No. 30	30-50	±3
No. 50	18-30	±3
No. 100	10-21	±3
No. 200	5-15	±2
APP. RATE	17-19 LBS/SY	

CHIP SEAL:

This work shall consist of placing Type I or Type II Chip Seal that meets the requirements of section 12 of the City Engineering Code and Item 25 of the MGPEC Specifications.

A polymerized cationic rapid set emulsified asphalt (CRS-2P) shall be used on this Project and shall consist of an emulsified blend of polymerized asphalt, water, emulsifiers, and polymer. The asphalt cement shall be polymer modified prior to emulsification and shall contain a minimum of 3% styrene-butadiene-styrene (SBS) block copolymer by weight of asphalt cement. The emulsion, standing undisturbed for a minimum of 24 hours, shall show no milky white separation, but shall be smooth and homogeneous throughout. The emulsion shall be pumpable and suitable for application through a distributor. Aggregates shall be hard, durable, clean, and be free of any coatings or deleterious material. The aggregates shall have 100% fractured faces. The aggregate shall have a maximum loss of 20 percent when tested using the LA Abrasion procedure as defined by AASHTO T 96. Only one type of aggregate shall be used and substitutions shall not be allowed. When tested using AASHTO T 182, the aggregate shall retain at least 95 percent of the emulsion. When tested by the boiling water stripping test method ASTM D 3625, the aggregate shall retain at least 80 percent emulsion. The aggregate shall conform to the following gradation:

Sieve Size	Type 1	Type II
¾"	100	100
½"	100	100
⅜"	100	90-100
No. 4	90-100	5-30
No. 8	5-30	0-3.0
No. 200	0-1.0	0-1.0
APP. RATE	20-25 LBS/SY	23-28 LBS/SY

HOT CHIP SEAL:

The Hot Chip Seal shall consist of placing a standard Type II or Type III Chip Seal, as specified followed by an application of an additional cover coat material.

Hot Chip Seal shall be in accordance with Section 900 of the City Engineering Code, and Item 25 of the Metropolitan Government Pavement Engineers Council (MGPEC) Specifications.

Asphalt material shall be AC 20 and asphalt content shall be 5.0% to 5.5%.

Aggregates shall be hard, durable, clean, and be free of any coatings or deleterious material. The aggregates shall have 100% fractured faces. The aggregate shall have a maximum loss of 20 percent when tested using the LA Abrasion procedure as defined by AASHTO T 96. Only one type of aggregate shall be used and substitutions shall not be allowed. When tested using AASHTO T 182, the aggregate shall retain at least 95 percent of the emulsion. When tested by the boiling water stripping test method ASTM D 3625, the aggregate shall retain at least 80 percent emulsion. The aggregate shall conform to the following gradation:

Sieve Size	Hot Cover Coat
1/2"	90-100
3/8"	60-90
No. 4	25-35
No. 8	15-25
No. 200	3-8
APP. RATE	60-80 LBS/SY

CAPE SEAL:

The Contractor shall furnish all labor, equipment, material, supplies, environmental protection, no parks, raised markers, signage, traffic control, secondary sweeping, and other incidentals necessary to provide an application of polymerized emulsified asphalt, cover coat aggregate, followed by a polymerized Slurry Seal to an existing roadway surface. This two-step process is called Cape Seal.

Materials: Polymer Pre-Modified Base Emulsion: Polymer Modified Cationic Rapid Set emulsion (CRS-2P) shall be an emulsified blend of polymer modified asphalt, water and emulsifiers. The emulsion shall contain a minimum of three percent (3.0%) styrene-butadiene (SB) or styrene-butadiene-styrene (SBS) polymer by weight of asphalt cement. The asphalt cement shall be polymer modified prior to emulsification using a block SB or SBS co-polymer. The emulsion standing undisturbed for a minimum of 24 hours shall show no white, milky separation but shall be smooth and homogeneous throughout. The emulsion shall be pumpable and suitable for application through a distributor.

Tests on CRS-2P Emulsion	Minimum	Maximum	Test Method
Viscosity, Saybolt Furol, 50°C sec,(a)	50	450	ASTM D 244
Storage Stability, 24-hr, % (a)		1.0	ASTM D 6930
Demulsibility, 35 ML, 0.8% Dioctyl Sodium Sulfosuccinate, %	40		ASTM D 6936
Particle Charge	Positive		ASTM D 244
Sieve, % (a)		0.1	ASTM D 6933
Distillation: (b)			AASHTO T 59
Oil Distillate by Volume of Emulsion, %		3.2	AASHTO T 59
Residue, %	65		AASHTO T 59
Tests on Residue (b)			
Penetration, 25 °C, 100g, 5s, dmm	70	150	ASTM D 5
Solubility in Trichloroethylene, % (c)	97.5		ASTM D 2042
Toughness, in-lb	70		ASTM D 5801
Tenacity, in-lb	45		ASTM D 5801

The specification for CRS-2P is in accordance with the material properties and test methods specified by ASTM, AASHTO, and CDOT

- (a) This Test requirement on representative samples is waived if successful application of the material has been achieved in the field
- (b) Residue by evaporation is intended to provide rapid determination of the percent residue and to provide material for tests on residue. If the percent residue or any test on the residue fails to meet specifications, the tests will be repeated using the distillation test specified by AASHTO T 59. For polymer modified emulsions, the distillation and evaporation tests will be modified to include 400F maximum temperature to be held for 15 minutes.
- (c) If the solubility of the residue is less than 97.58%, the base asphalt binder for the emulsion shall be tested. The solubility of the base asphalt binder shall be greater than 99 percent.
- (d)

Emulsified Asphalt Material - The liquid emulsion shall be water-based emulsified asphalt comprised of straight-run vacuum lower tower bottoms, synthetic SBR latex polymer, and emulsification agents. The SBR polymer shall be co-milled during the emulsification process such that a bicontinuous polymer-asphalt network is formed upon curing of the finished emulsion. The emulsion shall be pumpable and suitable for use in a Slurry Seal machine.

The emulsified asphalt shall conform to the requirements of ASTM specification for quick set CQS with revisions as indicated in the table below. In addition, the emulsion shall contain 3% minimum SBR latex solids based on weight of asphalt cement. The slurry seal mixture shall contain an emulsion content of 10 - 20% by weight of asphalt cement.

The slurry seal mixture shall contain an emulsion content of 10 - 20% by weight of dry aggregate which shall be determined in the laboratory by an approved mix design process. The residual asphalt content shall be 5 - 15% based on weight of dry aggregate.

Tests on CQS Emulsion	Minimum	Maximum	Test Method
Viscosity, Saybolt Furol, 50°C sec, (a)	15	100	ASTM D 244
Storage Stability, 24-hr, % max ¹	1	1	AASHTO T 59
Particle Charge Test	Positive		ASTM D 244
Sieve Test, % (a)		0.1	ASTM D 6933
Distillation: (b)			AASHTO T 59
Residue, %	62		AASHTO T 59
Polymer:			
Polymer Solids Based on Weight of Asphalt, %	3		Supplier Cert
Polymer Type:	SBR Latex		Supplier Cert
Tests on Residue (b)			
Penetration, 25°C, 100g, 5s	40	150	ASTM D 5
Ductility, 25°C, 5 cm/min, cm	50		ASTM D 113
Solubility in Trichloroethylene, %	97.5		ASTM D 2042
Elastic Recover, 77 F, 10CM,1h,%	40		ASTM D 5976

The specification for Slurry Emulsion is in accordance with the material properties and test methods as specified by ISSA, ASTM, AASHTO, and CDOT.

- (a) This test requirement on representative samples is waived if successful application of the material has been achieved in the field.
- (b) Residue by evaporation is intended to provide rapid determination of the percent residue and to provide material for tests on residue. If the percent residue or any test on the residue fails to meet specifications, the tests will be repeated using the distillation test specified by AASHTO T59. For polymer modified emulsions, the distillation and evaporation tests will be modified to include 400F maximum temperature to be held for 15 minutes.
- (c) If the solubility of the residue is less than 97.5%, the base asphalt binder for the emulsion shall be tested.

Cover Coat Material: The chip or cover coat and slurry aggregate shall be washed, hard, durable, clean rock and free from coatings or deleterious material. All of the aggregate shall be crushed gray granite with 100 percent fractured faces. The aggregate shall have a maximum loss of 20 percent when tested with the LA Abrasion procedure as defined by AASHTO T 96 using grade C or D.

The maximum amount of flat and elongated aggregate with a ratio of 3:1 shall not exceed 12% as determined by ASTM D4791. Only one source of aggregate shall be used and shall conform to the following gradations.

Gradation Table - Cover Coat Aggregate (percent passing)

Sieve Size	3/8" Chip	1/4" Chip
1/2"	100	100
3/8"	95-100	100
1/4"	0-35	95-100
No. 8	0-3	0-3
No. 200	0-1.0	0-1.0

Gradation Table - Slurry Aggregate (percent passing)

Sieve Size	Type II % Passing	Type III % Passing	Stockpile Tolerance
3/8"	100	100	+or-5%
No. 4	90-100	70-90	+or-5%
No. 8	65-90	45-70	+or-5%
No. 16	45-70	28-50	+or-5%
No. 30	30-50	19-34	+or-5%
No. 50	18-36	12-25	+or-4%
No. 100	10-24	7-18	+or-3%
No. 200	5-15	5-15	+or-2%

Asphalt Rejuvenating Agent:

This work consists of preparing and treating an existing surface with asphalt material, and blotter material if required per CDOT Section 407 and Section 702 Standards and Specifications.

Asphalt Material: The asphalt material for all coatings shall meet the applicable requirements of Section 702 of CDOT Standards and Specifications.

Blotter Material: Blotter material for rejuvenating agent shall consist of dry, gritty sand conforming to the fine aggregate gradation pursuant to CDOT Table 703-2.

SC-B-10 CONSTRUCTION REQUIREMENTS:

Construction practices for this Project shall meet the minimum requirements of Sections 900 of the City Engineering Code and Items 25 and 26 of the Metropolitan Government Pavement Engineers Council (MGPEC) Specifications. However, where these Special Conditions vary from the Standard Specifications, the Special Conditions shall take precedence.

CAPE SEAL:

Surface Preparation: Immediately prior to beginning each phase of the work, the Contractor shall be responsible for providing a clean, dry pavement surface by sweeping, removal of vegetation, grease and/or oil spots, dirt and loose debris. The Contractor shall notify the City prior to any materials application for an inspection and approval of the pavement surface condition made by the City before any cover coat material can be applied.

Equipment: The size and condition of all equipment shall be approved prior to construction. Should equipment be unsatisfactory for whatever cause, the Contractor shall remove and replace the equipment without delay or cost. The equipment shall conform to the following minimum requirements.

Bituminous Distributor: A minimum of two like distributors shall be used on this project. The distributors shall be self-powered and capable of providing a uniform application rate of emulsion varying from .05-1.00 gallons per square yard over a variable width up to 20 feet in a single pass. The uniformity of the distributors shall not vary by more than two-hundredths gallons per square yard. The distributors shall be equipped with a variable power unit for the pump and full circulation spray bars, which are adjustable laterally and vertically. The nozzle angle and bar height shall be set to provide one hundred percent of double coverage in a single pass. Where multiple passes will be required to complete the full width, the four inches adjacent to the second pass may be left with 50 percent coverage so that the next pass will complete the full application rate specified. Distributors shall be self-powered and include a computerized application control, a tachometer, pressure gauges, accurate volume devices, calibrated tank, and a thermometer for measuring temperatures of the emulsion in the tank.

Aggregate Spreader: The aggregate spreader shall be self-propelled and supported by at least four tires on two axles capable of providing a uniform application rate of aggregate from five to fifty pounds per square yard over a variable width up to 20 feet in a single pass. The uniformity of this machine shall not vary by more than one pound per square yard. The aggregate spreader shall be equipped with the means of applying the cover coat material to the surface with computerized application controls so that the required amount of material will be deposited uniformly over the full width of the bituminous material. A computer rate controlled aggregate spreader shall be required.

Rollers: A minimum of two self-propelled pneumatic tired rollers shall be used on the project unless otherwise requested by the Project Manager. The rubber-tired rollers shall have a gross load adjustable to apply 200-250 pounds per inch of rolling width. Tire pressure shall be specified for the pneumatic tire rollers and shall not vary more than plus or minus 5.0 psi. The smooth drum roller shall be a single drum roller with a loaded rate of five tons. Depending on the speed of the Chip Seal operation and the width of coverage, additional rollers may be required. At no time shall the rollers travel more than 10 miles per hour.

Mixing Slurry Machine: The Slurry course shall be mixed in a self-propelled mixing machine equipped with a continuous flow pug mill capable of accurately delivering and automatically proportioning the aggregate, emulsified asphalt, water and admixtures to a double shafted, multi-blade pugmill mixer capable of minimum speeds of 200 revolutions per minute.

A minimum of two mixing machines of 12 cubic yards or larger shall be utilized on the project. The Slurry course retention time in the pugmill shall be less than three seconds. The mixing machine shall have sufficient storage capacity of aggregate, emulsified asphalt, and water to maintain an adequate supply to the proportioning controls.

The mixing machine shall be equipped with hydraulic controls for proportioning the material by volume to the mix. Each material control device shall be calibrated, property marked, preset. The mixing machine shall be equipped with a water pressure system and nozzle type spray bars to provide water spray immediately ahead of the spreader box.

The mixing machine shall be equipped with an approved fines feeder that provides a uniform, positive, accurately metered, predetermined amount of a mineral filler at the same time and location that the aggregate is fed.

The Slurry mixture shall be uniformly spread by means of a controlled spreader box capable of spreading a traffic lane width and shall have strips of flexible rubber belting or similar material on each side of the box. The rear flexible strike-off blade shall make close contact with the pavement and shall be capable of being adjusted to the various crown shapes to apply a uniform layer of material. Slurry mixture, to be spread in areas inaccessible to the controlled spreader box, may be spread by other approved methods.

Each mixing unit shall be used in performance of the Slurry work shall be calibrated prior to construction at a minimum of once per year. Calibration documentation covering the exact materials to be used may be acceptable, provided they were made during the calendar year. The documentation shall include an individual calibration of each material at various settings, which can be related to the machine's metering devices. No machine will be allowed to work on the project until the calibration has been completed and accepted.

Sweepers: A minimum of two vacuum designed sweepers having only negative air pressure at the road surface capable of removing excess aggregate and debris material shall be used on this project. The body hoppers of the vacuum sweepers shall be a minimum capacity of ten cubic yards, and the negative air pressure at the intake shall be rated at 46 inches of negative water pressure. Sweepers shall meet applicable U.S. Environmental Protection Agency Standards. No mechanical pick-up brooms will be allowed on the project. Any areas adjacent to the project where a vacuum broom cannot access, shall be removed by the use of a blow pack. No mechanical pick-up brooms will be used.

MATERIAL APPLICATION RATES

Material	⅜" Cape Seal	¼" Cape Seal
CRS-2P Chip Seal	.34-.38 Gal/SY	.30-.36 Gal/SY
Cover Coat Aggregate	17-20 lbs/SY	15-18 lbs/SY
Slurry Aggregate - Dry	18 lbs/SY Minimum	16 lbs/SY Minimum

The specific size of aggregate used shall be determined using factors such as surface temperature, traffic volume, existing road condition, and time of year. The contractor may alter the application rate at any time during the course of the construction upon approval by the Project Manager.

Water: All water used in making the Slurry shall be potable. The effect of moisture content on the specific weight of the aggregate, and the moisture content of the aggregate being used, shall be taken into account in calibrating the machine to deliver asphalt in the correct proportion.

Process

Surface Preparation: Immediately prior to beginning each phase of the work, the Contractor shall be responsible for providing a clean, dry pavement surface by sweeping, removal of vegetation, grease and/or oil spots, dirt and loose debris. The Contractor shall notify the City prior to any materials application for an inspection and approval of the pavement surface condition made by the City before any cover coat material can be applied.

Application of Bituminous Material (Chip Seal): The application of the emulsion shall be performed by means of a pressure distributor in a manner to achieve a uniform and continuous spread over the asphalt surface. The temperature of the emulsion shall be a minimum of 160 F. The quantity of emulsion per square yard shall be as specified herein and agreed upon by the Project Manager. The distributor shall be moving forward at proper application speed at the time the spray bar is opened. If at any time a nozzle becomes clogged or not spraying a proper pattern, the operation shall be immediately suspended until repairs are made. Repairs shall be made immediately after deficiencies are noted and prior to the aggregate spreader at all time during construction. The width of the spread shall be no greater than the width of the aggregate spreader except where additional passes are required the emulsion shall be four inches beyond the aggregate spread at fifty percent application rate. At no time shall the emulsion be allowed to break, chill, setup, harden, or otherwise impair the aggregate retention before the aggregate has been properly applied and rolled.

Application of Cover Coat Aggregate (Chip Seal): The aggregate shall be applied immediately following the emulsion application by the approved aggregate spreader. The quantity of cover coat aggregate per square yard shall be specified herein and agreed upon by the Project Manager. The Contractor, prior to start of work, shall calibrate the aggregate spreader to achieve the design application rate of the cover coat aggregate. Spreading shall be accomplished in such a manner that the tires of the trucks and aggregate spreader never contact the newly applied bituminous material. The width of the aggregate spreader shall be equal to the width of the emulsion spread, except where additional passes are required. Areas which are deficient in aggregate, shall be covered immediately with additional material.

Rolling (Chip Seal): Initial rolling shall begin immediately after the application of cover coat aggregate. Rollers shall work in tandem and complete a minimum of three passes with a sufficient overlap. Should the rolling operation be delayed, the aggregate and emulsion spreading shall be halted until the operation regains proper sequencing and timing. The maximum speed of the rolling operations shall be ten miles per hour.

Sweeping (Chip Seal): Within the first 24 hours after the Chip Seal is applied, the initial sweep will begin and all loose aggregates will be removed from the street surface and surrounding areas.

Application of Material (Slurry): Within 48 hours of the Chip Seal application the Slurry course will be applied. The surface shall be fogged with water directly preceding the spreader. The Slurry mixtures shall be of the desired consistency, based on the submitted mix design, as it leaves the mixer with additional approved additive if required. A sufficient amount of Slurry shall be carried in all parts of the spreader at all times so that complete coverage is obtained.

No lumping, balling, or unmixed aggregates shall be permitted. No segregation of the emulsion and aggregate fines from the coarse aggregate will be permitted. No excessive breaking of the emulsion will be allowed in the spreader box. Rippling of the finished pavement is undesirable and shall be minimized.

No excessive build-up or unsightly appearance shall be permitted on longitudinal or transverse joints. The use of burlap drags or other types of drags shall be used so that joints will be straight and have a neat appearance. Squeegees shall be used to spread Slurry in areas not accessible to the Slurry mixer. Care shall be exercised to leave a good appearance. Care shall be taken to insure straight lines along curbs, shoulders and joints. Lines at intersections will be kept straight to provide a good appearance.

Slurry treated areas shall be allowed to cure until such time as traffic will not damage the finished product. Contractor will be responsible for monitoring roadways treated to ensure sufficient cure time is allowed before allowing traffic over the treated areas.

Method of Measurement and Payment: The Cape Seal shall be measured and paid for by the square yard sealed and accepted by the City. Payment shall be full compensation for the Cape Seal work completed in accordance with the above specifications.

SLURRY SEAL:

Surface Preparation: Immediately prior to beginning each phase of the work, the Contractor shall be responsible for providing a clean, dry pavement surface by sweeping, removal of vegetation, grease and/or oil spots, dirt and loose debris. The Contractor shall notify the City prior to any materials application for an inspection and approval of the pavement surface condition made by the City before any cover coat material can be applied.

Equipment: All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working order at all times. Descriptive information on the mixing and applying equipment to be used shall be submitted for approval not less than 7 days before the work starts.

- 1) **Mixing Equipment:** The mixing machine shall be a continuous flow mixing unit, capable of delivering accurate predetermined proportions of aggregate, mineral fillers, water and asphalt emulsion to a revolving multi blade mixer tank, and of discharging the thoroughly mixed product on a continuous basis. The machine shall be capable of mixing materials in preset proportions regardless of the speed of the machine engine, and without changing machine settings. The spreader box shall be furnished with a full width burlap drag.

The aggregate shall be pre-wetted immediately prior to mixing with the emulsion. The mixing unit shall be capable of thoroughly blending all ingredients together without violent action. The mixing machine shall be equipped with suitable means of accurately metering each individual material being fed into the mixer, so the machine can be accurately calibrated and that the quantities of material used during any one period can be accurately totaled.

The mixing machine shall be equipped with a water pressure system, and fog type spray bar adequate for completely fogging the pavement surface with up to 0.55 gallons per square yard, immediately ahead of the spreading equipment.

- 2) **Spreading Equipment:** The spreader box shall be equipped to prevent loss of mixture from all sides and shall have a flexible rear strike-off screed. It shall be capable of producing a uniform surface over its full width. The ability to regulate the width of placement of new material is a desirable feature. It shall have suitable means for side tracking to compensate for deviations in pavement geometry. Drags shall be kept in a completely flexible condition at all times. The box shall be kept clean, and build-up of asphalt and aggregate shall not be permitted.
- 3) **Cleaning Equipment:** Power brooms, power blowers, air compressors, water flushing equipment and hand brooms shall be suitable for cleaning the base pavement surface and cracks therein.

Application: The slurry mixture shall be of the desired consistency as it leaves the mixer, and no additional elements shall be added in the spreader box. A sufficient amount of slurry shall be carried in all parts of the spreader box at all times so that complete coverage is obtained over the application area.

Work hours shall be established at the pre-construction meeting. Each day's application of slurry surfacing shall end with sufficient time to allow for complete curing by the end of the established work hours.

No lumping, balling or unmixed aggregates shall be allowed in the mixer or spreader box. If the coarse aggregate settles to the bottom of the mix, the affected slurry will be removed from the pavement and the problem corrected. No breaking of the emulsion will be allowed in the spreader box. No longitudinal streaks will be allowed in the finished pavement. Any area of longitudinal streaking will be replaced or repaired.

Operators and equipment shall be capable of producing straight lines along curbs and shoulders. No runoff into these areas will be permitted. Overlap onto gutter pans shall not exceed two (2) inches. The Contractor shall remove excessive overlap or runoff. Lines at intersections will be kept straight to provide a neat looking appearance.

- 1) Joints: Longitudinal joints shall be overlapped no more than 6 inches over previously placed slurry. Building paper shall be used at transverse joints to minimize or eliminate overlap and bumps. No excessive build-up or unsightly appearance shall be permitted on longitudinal or transverse joints. Drags are required and shall be burlap type. Drags must be kept relatively clean and free of excessive build-up. Drags shall be replaced daily or more often at the discretion of the Engineer.
- 2) Hand Work: Approved squeegees shall be used to spread slurry in areas not accessible to the slurry mixer. Squeegee areas shall be hand finished with a burlap drag prior to breaking of the emulsion. Care shall be taken to leave a pleasing appearance similar to that of the machine spreader surface.
- 3) Curing: The slurry seal mixture shall be cured and the roadway opened to traffic within 3 hours of placement. Each day's application of slurry surfacing shall end with sufficient time to allow for complete curing by the end of normal work hours as set at the pre-construction meeting.

Method of Measurement and Payment: Slurry Seal shall be measured and paid for by the square yard sealed and accepted by the City. Payment shall be full compensation for the Slurry Seal work completed in accordance with the above specifications.

ASPHALT REJUVENATING AGENT:

This work consists of preparing and treating an existing surface with asphalt material, and blotter material if required per CDOT Section 407 and Section 702 Standards and Specifications.

Weather Limitations: Prime coat and tack coat shall not be applied under the following conditions:

1. When the surface is wet.
2. When weather conditions would prevent the proper construction of the prime or tack coat

Equipment: The Contractor shall provide equipment for heating and uniformly applying asphalt material and blotter material.

The distributor and equipment shall be capable of uniformly distributing asphalt material at even temperature and uniform pressure on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard. The allowable variation from any specified rate shall not exceed plus or minus 0.02 gallon per square yard. Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

The distributor for rejuvenating agent shall also be equipped with the following:

1. Heating facilities with controls to reach a temperature of 130 °F.
2. Circulating system to maintain proper mixture of the rejuvenating agents.

Preparation of Surface: Preparation of the surface to be treated shall include all work necessary to provide a smooth, dry, uniform surface. The work shall include patching, brooming, shaping to required grade and section, compaction and removal of unstable corrugated areas

The edges of existing pavements that are to be adjacent to new pavement shall be cleaned to permit the adhesion of asphalt materials.

Application of Asphalt Material: Asphalt material shall be applied by a pressure distributor in a uniform and continuous spread. When traffic is maintained, not more than ½ of the width of the section shall be treated in one application, or sufficient width shall be left to adequately handle traffic. Care shall be taken so the application of asphalt material at the junctions of spreads is not in excess of the specified quantity. Excess material shall be removed or distributed as directed. Skipped areas or deficiencies shall be corrected. Asphalt material shall not be placed on any surface where traffic will travel on the freshly applied material.

The rate of application, temperatures, and areas to be treated shall be approved before application of the coating.

Application of Blotter Material: If, after the application of the prime coat or rejuvenating agent the asphalt material fails to penetrate and the roadway must be used by traffic, blotter material shall be spread in the quantity required to absorb excess asphalt material.

Method of Measurement and Payment: Asphalt Rejuvenator shall be measured and paid for by the square yard sealed and accepted by the City. Payment shall be full compensation for the Asphalt Rejuvenator work completed in accordance with the above specifications.

CHIP SEAL:

Equipment: All equipment shall conform to the requirements of Items 25 of the Metropolitan Government Pavement Engineers Council (MGPEC) Specifications, unless specified otherwise in these Special Conditions. All equipment, tools, and machines used in the performance of this work shall be maintained in proper working order at all times.

Sweepers: A minimum of two vacuum designed sweepers having only negative air pressure at the road surface capable of removing excess aggregate and debris material shall be used on this Project. The body hoppers of the vacuum sweepers shall be a minimum capacity of ten cubic yards, and the negative air pressure at the intake shall be rated at forty-six inches (46") of negative water pressure. Sweepers shall meet applicable U.S. Environmental Protection Agency Standards. No mechanical pick-up brooms will be allowed on this project.

Bituminous Distributor: The distributor(s) shall be self-powered and capable of distributing a uniform application rate of emulsion varying from 0.05-1.00 gallons per square yard over a variable width of up to 15 feet. The distributor(s) shall be computer controlled or calibrated to conform to the manufacturer's procedure prior to application of the emulsion. Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump, and full circulation bars adjustable laterally and vertically.

Aggregate Spreader: The chip seal aggregate shall be placed by a self-propelled aggregate spreader supported by at least four wheels equipped with pneumatic tires on two axles. Prior to the start of work, the aggregate spreader shall be calibrated to achieve the specified cover coat aggregate application rate. The

aggregate spreader shall be capable of providing a uniform layer of aggregate at the specified application rate per square yard over a variable width up to 15 feet in a single pass. The aggregate spreader shall be equipped with computerized application controls so that the required amount of cover coat aggregate is deposited uniformly over the full width of the CRS-2P emulsion.

Rollers: A minimum of two self-propelled pneumatic tired rollers shall be used to seat the chip seal application. The rubber tired rollers shall weigh at least 10 tons each. Tire pressure shall be as specified by the manufacturer and shall not vary more than +/- 5.0 psi.

Application of Bituminous Materials: The CRS-2P emulsion shall be applied by means of a self-powered pressure distributor capable of providing a uniform and continuous application at the specified rate and on variable widths of up to 15 feet in a single pass. Where multiple passes are required to complete the full width, the four inches (4") adjacent to the second pass may be left with 50% coverage, provided the next pass of the distributor completes the full application rate as specified. The emulsion shall be applied at a minimum temperature of 160° F.

The distributor shall be moving forward at the proper application speed at the time the spray bar is opened. If streaking of the emulsion occurs, the distributor operation shall cease immediately until the cause is determined and corrected. Streaking of the emulsion, skipped areas, and other deficiencies shall be corrected immediately by the Contractor at no cost to the City before the operation may continue. At no time shall the emulsion be allowed to break, set, chill, harden, or otherwise impair aggregate retention before the aggregate has been properly applied and rolled.

Application of Cover Coat Aggregate (Chip Seal): The cover coat aggregate shall be applied by the aggregate spreader at the specified rate and gradation immediately following application of the CRS-2P emulsion. The width of the aggregate spreader shall be equal to width of the emulsion spread, except where additional passes of the aggregate spreader are required. Areas which are deficient in cover coat aggregate shall be covered immediately with additional material.

Rolling: Initial rolling shall begin immediately following the cover coat aggregate application. Two self-propelled pneumatic tired rollers shall work in tandem until a minimum of three complete passes are obtained. At no time shall the rollers travel more than ten miles per hour.

Sweeping and Fog Seal: Within 24 hours of the Chip Seal application, the surface shall be swept clean and all loose chip removed from the roadway, sidewalks, gutters, medians, landscaping, and all adjacent areas without removing any embedded material in the newly chip sealed surface. Immediately following the sweeping, a fog seal emulsion of one part CRS-2P to one part potable water shall be applied to the swept surface at the rate of 0.10 to 0.12 gallons per square yard. The fog seal application MUST be allowed to set before opening any one lane or section to traffic. Failure to comply with this requirement may result in a stop work order and further price reductions for each incident of violation in accordance with the Price Reduction Schedule in SC-B-6. Work will not continue on other portions of the roadway until sweeping and fog seal application has been completed to the satisfaction of the City. The Contractor shall conduct additional sweeping if so directed at no additional cost to the City.

Method of Measurement and Payment: Chip Seal shall be measured and paid for by the square yard sealed and accepted by the City. Payment shall be full compensation for the Chip Seal work completed in accordance with the above specifications.

HOT CHIP SEAL:

Mixing Plant for Hot Cover Coat shall be capable of producing a uniform material, have adequate capacity, and be maintained in good mechanical condition. Dust, smoke, or other contaminants shall be controlled at the plant site to meet all air quality requirements in the "Colorado Air Quality Control Act," Title 25, Article 7, CRS and regulations promulgated thereunder.

Hauling Equipment for Hot Cover Coat shall have clean beds thinly coated with a minimum amount of paraffin oil, lime solution, or other approved release agent. Petroleum distillates such as kerosene or fuel oil will not be permitted. Each truck shall have a cover of canvas or other suitable material to protect the mixture from the weather and excessive temperature loss or cooled layers of mix in the truck.

Self-propelled pavers shall be provided for full lane width paving, and shall be equipped with a screed assembly, heated if necessary, capable of spreading and finishing the bituminous plant mix material in full lane widths applicable to the typical section and thickness shown in the Contract.

The paver shall have an automatic distribution system that will place and spread the mixture uniformly in front of the screed.

The paver shall be capable of operating at forward speeds consistent with uniform and continuous paving of the mixture. Stop and go operations of the paver shall be avoided. The screed or strike-off assembly shall produce the specified finished surface without tearing, shoving, or gouging the mixture. Self-propelled pavers shall be equipped with automatic screed controls with sensors capable of sensing grade from an outside reference line and maintaining the screed at the specified longitudinal grade and transverse slope. The sensor shall be constructed to operate from either or both sides of the paver.

The controls shall be capable of maintaining the screed at the specified transverse slope within plus or minus 0.1 percent. Automatic mode should be used where possible. If the automatic controls fail or malfunction the equipment may be operated manually for the remainder of the normal working day, provided specified results are obtained.

Steel wheel rollers shall be used to seat the hot cover coat material.

Application:

Chip seal application, to include sweeping and fog seal, shall be in accordance with section 12 of the City Engineering Code, and Item 25 of the Metropolitan Government Pavement Engineers Council (MGPEC) Specifications.

Hot cover coat shall be applied within 5 days of the chip seal application. The material shall have a minimum temperature of 275 degrees F at placement and be applied in a 1/2" thick layer. A minimum of two steel wheel rollers making two or more passes shall follow immediately to seat and cool the material. The Contractor shall be responsible for cleaning all utility covers following application of hot cover coat.

Method of Measurement and Payment: Hot Chip Seal shall be measured and paid for by the square yard sealed and accepted by the City. Payment shall be full compensation for the Hot Chip Seal work completed in accordance with the above specifications.

CRACK SEAL

Crack Sealing Requirements

This specification covers the work associated with the cleaning and sealing of all roadway cracks in excess of 1/8 in width, as determined by the Project Manager. Crack Sealer is used for working cracks, cracks that have more than 1/4" seasonal movement. Both hot and cold materials are currently available for crack sealing; however, this specification is meant to only apply to hot applied materials.

Materials: The material used to seal the cracks shall meet or exceed requirements of ASTM d-66900, TYPE II, Joint Sealants, Hot Poured, for concrete and Asphalt Pavements. Any materials that ravel or can be pulled out by hand after placement shall not be used. The crack sealer shall be made and placed in such a manner to not damage the hot plants bituminous surface course overlay.

Execution: Prior to placement of the joint filler, all cracks in the roadway section 1/8/-inch or larger **across shall be cleaned out using compressed air.** The velocity created by the nozzle shall be sufficient to loosen and remove all foreign materials from the crack being cleaned.

Care shall be taken to avoid accident or injury caused by this cleaning operation

After the crack has been cleaned and dried the joint filler shall be applied per the manufacturer's recommendations. The joint filler shall be brought flush with the surface of the existing roadway. Cracks shall be sealed to minimum depth equal to 2 X crack width or the full thickness of the pavement. After filling, the Contractor shall sweep/clean all sidewalks and driveways adjacent to the roadway.

The finished level of crack seal or crack filler shall be flush to 1/8" above the asphalt surface. Excess material shall be removed by the Contractor at the Contractor's expense.

The Contractor shall provide adequate signing on the streets while working in the streets to protect the public. All signing, flagging and traffic control devices shall conform to the Manual on Uniform Traffic Control Devices. The Contractor shall include any and all signing, flagging and all other traffic control devices in the bid for this item.



Mastic and Crack filling Requirements

This specification covers the work associated with the cleaning and filling of all roadway cracks in excess of ½-inch in width, as determined by the Project Manager. Crack Filler should be used for nonworking cracks. Non-working cracks are cracks that have annual movement less than ½". Non-working crack types may include wide transverse cracks. If a crack exhibits edge deterioration it should be filled not sealed.

Materials

The material used to fill the cracks shall be capable of meeting the following requirements:

Physical Properties	Test Method	Specification
Wear Resistant Coarse Aggregate		
Resistance to abrasion and impact (grading C)	ASTMC131	20% degradation max
Mastic Binder		
Penetration @ 77° F (25°C), 150g, 5 sec	ASTMD5329	100 dmm max
Penetration @ 122° F (50°C) 150g, 5 sec	ASTMD5329	150 dmm max
Flow @ 140° F, 75° angle, 5 hours	ASTMD5329	3 mm max
Softening point (R&B)	ASTMD36	190°F (88°C) min
Flexibility @32°F, .25" mandrel 90° bend 10 sec	ASTM D3111 Mod	Bend without cracking
Finished Mastic Product		
Low Temperature Flexibility	ASTM D3111 Modified	Pass @32°F
Water absorption after 24 hours @122°F	ASTM D517 Section 9.2 modified	1% max absorption

Any materials that ravel or can be pulled put by hand after placement shall not be used. The crack filler shall be made and placed in such a manner to not damage the hot plant bituminous surface course overlay.

Execution

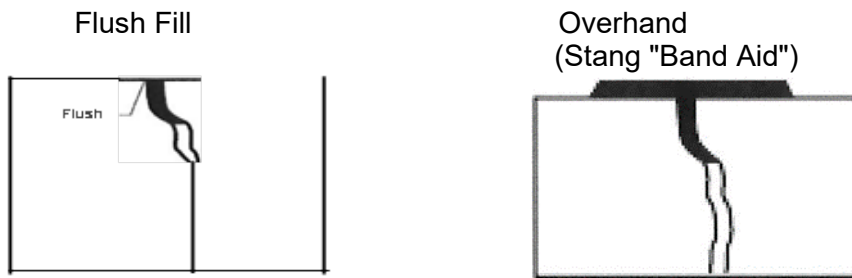
Prior to placement of the joint filler, all cracks in the roadway section ½ inch or larger across shall be cleaned out using compressed air. The velocity created by the nozzle shall be sufficient to loosen and remove foreign materials from the crack being cleaned.

Care shall be taken to avoid accident or injury caused by this cleaning operation.

After the crack has been cleaned and dried, the joint filler shall be applied per the manufacturer's recommendations. The joint filler shall be brought flush with the surface of the existing roadway. Cracks shall be sealed to a minimum depth equal to 2 x crack width or the full thickness of pavement. After filling, the Contractor shall sweep/clean all sidewalks and driveways adjacent to the roadway.

The finished level of crack seal or crack filler shall be flush to 1/8" above the asphalt surface. Excess material shall be removed by the Contractor at the Contractors expense.

The Contractor shall provide adequate signing on the streets while working in the streets to protect the public. All signing, flagging, and traffic control devices shall conform to the Manual on Uniform Traffic Control Devices. The Contractor shall include any and all signing, flagging and all other traffic control devices in his bid form for this item



Equipment

Equipment shall be specified by the sealant manufacturer. All equipment shall be kept in good working order, free of leaks and properly muffled. All taxes, licenses, and fees shall be paid and proper licenses and permits shall be posted as required by law.

An oil jacketed type melting quint equipped with both agitation and recirculation systems shall be used to heat the sealant. Direct Fire Melters will not be allowed. The unit shall be equipped with separate thermometers for both the oil bath and the crack sealing material.

Materials shall be heated according to the manufacturer's specifications. Fresh material shall not be added to material that was overheated in an attempt to make it acceptable. Material that has been overheated shall be discarded.

CONSTRUCTION REQUIREMENTS

Quality Control Requirement Checklist

1. Climatic Conditions
 - a. Surface temperature is at least 45° F and rising or per manufacturer's recommendations.
 - b. No moisture, fog or dew is present
 - c. Early morning operations should be performed in direct sunlight.
2. Material Preparation
 - a. Proper safety garments are worn (hard hat, reflective vest, long-sleeved shirt, pants, steel toed boots, safety goggles, and hearing protection).
 - b. Heating oil in the melter jacket is not fuming and the level is adequate.
 - c. Temperature gauge on the melter has been calibrated:
 - d. Measure sealant temperature with a thermometer
 - e. Ensure that the reading on the thermometer is the same as the reading on the melter temperature gauge.
 - f. Sealant is never to be reheated above the manufacture 's recommended pouring temperature.
 - g. Material safety data sheet (MSDS) is available on-site.
3. Cleaning of Cracks
 - a. Proper safety garments are worn (hard hat, reflective vest, long-sleeved shirt, pants, steel toed boots, safety goggles, and hearing protection).
 - b. A power sweeper or vacuum cleaner is being used to remove dirt and debris from the pavement surface.
 - c. Compressor for high-pressure air provides at least 100 psi
 - d. Oil and moisture filters on compressor work properly
 - e. Temperature of the hot-air lance is below 930° F and the tip is 2 to 4 inches from the crack
 - f. The cleanliness of the crack is being checked every 30 minutes
 - g. The crack is dry
 - h. No deicing chemical residue is present
4. Sealant Application
 - a. Hot-poured sealant is poured at the manufacturer's recommended temperature
 - b. The material is applied to the inside of the cracks
 - c. Insure that sealant is placed up to the asphalt surface
 - d. There is sufficient sealant to allow for overhand (if applicable)
 - e. There are no bubbles due to moisture present
5. Overhanding of Sealant (if applicable)
 - a. Overhand is not more than 3 inches wide
 - b. Overhand is not more than 1/8 inch above the pavement surface
 - c. Overhand is formed during, or immediately after, sealant application
 - d. Excess sealant is removed before hardening
6. Sealant Protection
 - a. Traffic is rerouted until sealant is set
 - b. A liquid based material may be used to prevent tracking of hot crack seal material.

Measurements

Crack sealant shall be measured and paid but the ton complete in place and accepted. The contractor shall measure and the inspector will verify the following:

1. Before work starts each day
 - a. The amount of material in the melter
 - b. Number and weight of container of material on site
 - c. All containers are clearly marked with manufacturer's information
2. At the end of work each day
 - a. Amount of material in melter
 - b. Number of containers of material not used

The Contractor shall certify that the material in the melter is per the specifications and has not been overheated. Measurement will not begin before the inspector arrives. Inspector shall give adequate notice if material is to be delivered during the work day and have the opportunity to verify quantity. Counting on delivering boxes or lids shall not be an acceptable method of verifying quantity of material.

4" HMA PATCHING and EXTRA DEPTH PATCHING

The Project Inspector will mark areas to be patched and the work done in accordance with these Special Conditions, or as directed otherwise by the Project Manager.

The contractor shall remove the failed pavement, base course, and subgrade soil to the depth required by the type of street. The patching and normal excavation depth and patching material thicknesses shall be as specified:

<u>Type of Street</u>	<u>Asphalt Depth (after milling)</u>
Residential (Local)	4-inches (5-inches, 30-feet from intersections or cross-pans)
Collector	5-inches
Arterial	7-inches

Areas requiring patching will be marked by the City at a minimum width of five (5) feet horizontally and shall be sawcut to a minimum six (6) inch depth, or $\frac{3}{4}$ of the pavement thickness up to a maximum depth of nine (9") inches if the pavement thickness is greater than six (6") inches following milling of the top two (2") inches of existing pavement. The method of cutting the pavement shall be sawcut or a method otherwise approved by the City and shall result in a neat, straight line and vertical face on the existing pavement without deformation of the surface at the cut. Use of a wheel roller shall not be considered an acceptable cutting method. The subgrade shall be compacted by a roller, where feasible, prior to placing patching asphalt.

Vertical faces of the cut shall be adequately coated with CSS-1h tack material prior to patching. Asphalt lifts shall not exceed three (3) inches in depth. HMA patching shall be placed by use of a spreader box where dimensions allow for its use and shall otherwise be placed to avoid segregation of the aggregate in the asphalt patching mix. Patches that are so placed and exhibit excessive segregation in accordance with Standard Specification 11.11 - Segregation and as determined by the Project Inspector or Project Manager shall be marked for immediate removal and replacement.

4" HMA Patching shall be either HMA (Grading S)(75)(PG64-22) and/or HMA(Grading SG)(75)(PG64-22). The use of either or both asphalt mixes shall be as directed by the Project Manager and based on the existing subgrade conditions. No extra payment shall be made for using one or both asphalt mixes, but shall be included in the unit cost of 4" HMA Patching.

4" HMA PATCHING: shall be measured and paid for by the square yard and shall include asphalt sawcutting, removal and disposal of asphalt mat, subgrade removal and disposal, compaction, proof roll where necessary, tack coat, patching with HMA (Grading S)(75)(PG64-22) and/or HMA (Grading SG)(75)(PG64-22), and all labor, equipment, materials, and incidentals necessary to complete the work. Asphalt cement shall not be paid for separately but shall be included in the work.

Where patching greater than four inches (4") in depth is required, the additional depth patching shall be measured and paid for by the square yard – inch under EXTRA DEPTH PATCHING and shall include asphalt sawcutting, removal and disposal of asphalt mat, subgrade removal and disposal, compaction, proof roll where necessary, tack coat, patching with HMA (Grading S)(75)(PG64-22) or (Grading SG)(75)(PG64-22), and all labor, equipment, materials, and incidentals necessary to complete the work. Asphalt cement shall not be paid for separately but shall be included in the work.

SC-B-11 WATER VALVE BOXES, SURVEY RANGE BOXES, AND MANHOLES: Water valve boxes, survey range boxes, manholes, and other appurtenances within the project limits shall be protected and kept clean during the street surface seal operation. They shall be covered in a suitable manner prior to the surface seal application and the covering removed immediately upon completion of the operation. Grade adjustments of such structures, if necessary, will be accomplished by City of Arvada, Streets Division personnel, Utilities Division personnel, or by the applicable Public Utility Companies. The Contractor shall give the

Project Inspector at least two working days' notice prior to beginning the chip seal operation to allow scheduling of structure adjustments where necessary by City personnel or Public Utilities Companies.

It will be the sole responsibility of the Contractor to repair valve boxes, survey range boxes, manholes, and other appurtenances damaged by the Contractor. Asphalt repairs shall include at a minimum saw cutting +/-4'X4'X6", excavation and removal, subgrade compaction, HMA patching to final grade, prior to chip seal application.

SC-B-12 INLET PROTECTION: This work shall consist of installation and maintenance of storm drain inlet protection at all inlets located within the work limits of each street location and at all locations affected by the milling, patching, surface replacement and overlay operations throughout the duration of the project. For Type R Inlets, the inlet protection device shall consist of a 4" to 6" diameter aggregate filled, woven geotextile fabric or "rock sock", supported by concrete block, and shall be installed prior to any construction activity where debris may enter storm drain inlets. The aggregate for this device shall consist of gravel or crushed stone meeting the requirements of CDOT Table 703-7, Class C. A pre-manufactured device may be used as an alternative, subject to the approval of the City. Grated type inlets shall be completely covered during each phase of milling, patching and overlay operations. All inlet protection devices shall be functional and maintained throughout the course of the project and removed following completion of each operation.

Storm drain inlet protection shall be capable of remaining in place during a storm event. Type R Inlet devices shall have an approximate weight of 7 to 10 pounds per lineal foot of device. The device shall be capable of conforming to the shape of the curb. The ends of the device shall extend a minimum of one foot past each end of the inlet.

Measurement and Payment for "Inlet Protection" shall be paid as a percentage of the lump sum bid item for the contract amount earned. Payment for "Inlet Protection" shall include all labor, materials, equipment and incidentals required for each phase of the work. No additional compensation will be made for replacement of damaged devices or reuse of devices during each operation.

SC-B-13 PORTABLE VARIABLE MESSAGE SIGN: The Contractor shall furnish, operate, and maintain a minimum of one Portable Variable Message Sign at each end of the work location when specified by the Project Manager. Each sign shall be placed at least seven (7) days prior to the start of construction activity and maintained in satisfactory operating condition throughout the duration of milling, patching, and overlay operations at each location.

Each sign shall be fully self-contained on a portable trailer capable of being licensed for normal highway travel and shall include leveling and stabilization jacks. The sign panel shall display a minimum of three eight-character lines of text. The text of the messages shall not scroll or travel horizontally or vertically across the face of the sign. The sign panel shall be a dot-matrix type with either fluorescent yellow flip-disks legend or LED legend on a flat black background. Each sign shall have its own separate power source with an independent battery back-up source to provide continuous operation upon failure of the primary power source.

The mounting of the sign on the trailer shall be such that the bottom of the sign panel is a minimum of five feet above the roadway, visible from one-half mile under both day and night conditions, and legible from a minimum of 650 feet.

"Portable Variable Message Signs" will be measured by each unit for each day actually used throughout the project. Payment for each unit shall include delivery to each location, maintenance, operation, storage, repairs, relocation to other sites, and all labor, equipment, materials, and incidentals. Additional payment will not be made for units used at one location and then relocated to another work location once the work is completed at the previous location.

Payment for "Temporary Raised Pavement Markers" shall be paid as a percentage of the lump sum bid item for the contract amount earned and shall constitute full compensation for furnishing retro-reflective raised markers and adhesive, placement and removal, traffic control, and all materials, labor, equipment, and incidentals necessary to complete the work.

SC-B-14 REMOVAL OF PAVEMENT MARKING: Removal of pavement marking shall be done in accordance with Section 202.05 of the 2017 Colorado Department of Transportation Standard Specifications for Road and Bridge Construction.

Measurement and Payment:

"Removal of Pavement Marking" shall be paid for as lineal foot and shall be full compensation for removing and disposing of pavement marking and protection of existing pavement and adjoining properties during removal operations.

SC-B-15 RAISED PAVEMENT MARKERS (TEMPORARY): Temporary raised pavement markers (TRPMs) approved by the City shall be placed by the Contractor on all center lines, turn pockets, bike lanes, skip lines and edge lines, prior to the chip seal application on all roadways in the Street Schedule. The TRPMs shall be retro reflective and shall meet the requirements of the current Manual of Uniform Traffic Control Devices (MUTCD), and Section 627 of the 2017 CDOT Standard Specifications, and supplement thereto. The location and placement of temporary raised pavement markers shall be coordinated through the City's Traffic section. The temporary markers shall be removed by the Contractor at the time permanent pavement markings are applied.

SC-B-16 PERMANENT PAVEMENT MARKING: This work consists of re-stripping and pavement where placement is required as determined by the City Of Arvada Traffic Division. The material used for this project shall be in conformance with CDOT Section 627 or per the manufacturer's specifications if not covered by CDOT Specifications.

Pavement Markings shall be applied in accordance with Subsection 627.03 - 627.11 of the CDOT Specifications. Payment for Permanent Pavement Marking shall be paid in accordance with the unit pricing specified and shall constitute compensation for furnishing, placement, traffic control, and all labor equipment and incidentals necessary to complete the work.

SC-B-17 MATERIALS TESTING & QUALITY CONTROL: The City will provide materials testing services throughout the duration of this contract. The Contractor is encouraged to take independent or additional tests at his discretion, but such tests shall be performed at no additional cost to the City. The Contractor will cooperate with the City to ensure that adequate material samples are made available to the Project Tester and that such materials are accessible at all times.

The Contractor's attention is directed to Section 131 of the City Engineering Code and the appropriate subsections thereof regarding production tolerances, inspection, materials testing, and frequency of testing. Specifications contained in these Sections and subsections of the Standard Specifications will be strictly adhered to.

When the City determines that the material furnished, work performed, or the finished product is not in conformity with these contract documents and has resulted in inferior or unsatisfactory product, the finished product or materials shall be removed and replaced or otherwise corrected by, and at the expense of the Contractor, unless the Project Engineer or Manager determines that the work can be accepted at a reduced price. Payment reduction, where allowed, shall be accomplished by adjusting pay quantities by applying contract unit prices to the reduced quantities.

OBLIGATIONS TO PUBLIC

SC-C-1 DRIVEWAY ACCESS: Contractor shall coordinate the work and minimize inconveniences to citizens and affected property owners. Residents shall be notified by the contractor 24 hours prior to the time that access must be denied to their driveway or when the driveway will be blocked for any period of time. Residents shall be provided access to their driveways between 5:00 pm and 7:30 am, and at all times on weekends or holidays or when work is not occurring.

SC-C-2 NOTIFICATION OF ADJACENT PROPERTY OWNERS AND MANAGERS: The contractor shall notify property managers, owners, tenants, or responsible parties that work or dwell in buildings adjacent to the construction site, in writing, not less than seven days prior to construction of the impending construction activity.

The contractor shall prepare a written notification describing the method, location and likely duration of construction. It shall also include both a phone number where a representative of the contractor can be reached during normal business hours and the name and telephone number of the City's project manager and municipal inspector. The written notice shall be approved by the project manager prior to distribution. Distribution shall be coordinated with the City's municipal inspector.

Contractor shall also provide written notification to residents 24 hours prior to the start of construction on each street and also notify residents once individual sewer service laterals are reinstated. The contractor shall also notify residents as necessary should the construction schedule change due to unforeseen circumstances.

PAYMENT: Prorated payment of the contract amount bid for citizen notification will be made monthly. The percentage paid shall be equal to the percentage of total contract dollar amount completed that month. In no case will payment be more than 100% of the amount bid for Citizen Notification.

STORMWATER MANAGEMENT

SC-D-1 EROSION CONTROL This work shall consist of all materials, installation, maintenance, and removal of erosion control measures using Best Management Practices (BMPs) located within the erosion control limits of each street reconstruction and parking lot location listed on the Street Schedule and Summary of Approximate Quantities throughout the duration of the contract. The Contractor shall comply with all provisions of the City of Arvada Site Development Permit for this project, which will be considered as a part of the contract documents.

BEST MANAGEMENT PRACTICES (BMPs) FOR STORMWATER MANAGEMENT:

This section provides a set of criteria and technical guidance for erosion and sediment control and material management at concrete replacement and asphalt projects. Erosion control measures limit erosion of soil from disturbed areas including stockpiled material at the construction site. Sediment control measures prevent the transport of sediment off-site to downstream properties and stormwater conveyances. Materials management is the practice of containing and controlling all materials used in order to eliminate potential pollutants from leaving the site. Due to the fast paced nature of concrete and asphalt projects, the site's erosion and sediment controls and material management BMPs must be inspected and maintained daily.

Site Development Permit (SDP):

In accordance with the City of Arvada's permit criteria, concrete and asphalt operations including the installation and repair of all concrete and asphalt public right of ways must acquire a City Site Development Permit and implement and maintain erosion control, sediment entrapment and material management BMPs.

Initial documentation required:

1. Completed SDP application
2. Application fee (waived for City funded projects)
3. Escrow/LOC (waived for City funded projects)
4. Site map
5. Potential pollutant list
6. BMP specification details

SDP - Required Documentation:

A site map including construction boundaries, all locations of BMPs, stockpiles, staging areas, portable restrooms, concrete containment/washout area, construction material storage and waste material storage must be provided to the City's Stormwater Division prior to beginning work. This site map must be updated daily to reflect the site's condition.

Potential pollutants must be listed and BMPs prescribed for each individual pollutant. If on-site fueling or maintenance will be conducted, a spill plan must be provided to the Stormwater Division prior to beginning work and a copy must be retained by fueling/maintenance personnel during operations.

A copy of these requirements including BMP specifications and applicable details indicated in this Section and drawings contained within the City Standard Specifications must remain on site and referred to by any personnel installing, maintaining, repairing, repositioning or inspecting BMPs.

A daily log of BMP inspections, installation, repair and maintenance must be kept on site. This log must contain the date, name, location of BMP, and nature of work. It must also include that the site map was revised.

SDP - Enforcement Policy:

If it is determined by the City inspector that control measures are not inspected, installed and maintained daily, payment to the contractor may be withheld. If control measures are not installed or maintained for a period of three consecutive days, a separate company will be contracted to do the work, whereas costs incurred will be 100% reimbursed to the City with an inclusion of an additional 50% for administrative fees.

Site Development Permit BMP Requirements for Concrete and Asphalt Operations:

- a. All paved surfaces, gutters and sidewalks affected by work must be cleaned at the end of each day.
- b. All inlets within and downstream of the work areas shall be protected.
- c. Curb check dams will be installed at all locations downstream of work areas where stormwater flows may potentially come in contact with dirt and exit the work area.
- d. An area must be designated for construction material waste. All waste materials must be placed into waste containers and covered immediately.
- e. Portable Toilets must be provided on site and an area designated for their placement.
- f. A portable concrete washout basin (where applicable) must be provided on site.
- g. Staging areas must be designated and employ appropriate BMPs.
- h. Stockpiles must, at all times, have perimeter control measures installed at the downstream side and all material dragged from a stockpile during operations must be swept back into the pile at the end of each day.
- i. If replacing a storm sewer inlet, pipes within the inlet must be temporarily plugged during the inlet construction.
- j. All erosion and sediment control measures shall be maintained and repaired by the Contractor during construction as needed to assure continued performance of their intended function. All erosion and sediment control measures must be inspected, maintained, and replaced daily if necessary.
- k. After all work has been completed, including asphalt and re-vegetation, cleanup and remove all temporary construction erosion and sediment control measures.
- l. During the construction, the Contractor shall be responsible for preventing and controlling on-site erosion, and keeping the property sufficiently watered to minimize wind-blown dust/sediment. The Contractor shall also be responsible for installing and maintaining all erosion control facilities show herein.

BEST MANAGEMENT PRACTICES (BMPs)

BMP/Control Measure - Stockpiles

BMP/Control Measure Application - Straw Wattle or Rock Bag used for stockpile containment. If stockpiles are located within 100 feet of a waterway, including conveyances to them, additional sediment controls must be provided which could include silt fencing. A weighted down wattle or rock bag must be installed on the downstream side of all stockpiles.

BMP/Control Measure Installation - Install in an arced position on the downhill side of stockpiles. Place two feet from the toe of the stockpile to allow for ponding. Instruct persons accessing the stockpiles with equipment to work around the control measure or temporarily relocate it. Damaged control measures must be replaced immediately.

BMP/Control Measure Maintenance - Sediment entrapment control measures (wattles or rock bags) must be cleaned and repositioned daily. Broken or crushed control measures must be replaced immediately. Any materials spilled from the control measure when damage occurs must be removed from the site and disposed of.

BMP Detail - SW-10.

BMP/Control Measure – Perimeter Sediment Control

BMP/Control Measure Application – Sediment Control Logs are used as a sediment barrier to intercept sheet flow runoff from disturbed areas.

BMP/Control Measure Installation – Install around the entire perimeter of the disturbed area.

BMP/Control Measure Maintenance - Remove accumulated sediment before the depth is one-half the height of the sediment log and repair damage to the sediment log by replacing the damaged section.

BMP Detail – SW-11

BMP Control Measure - Inlet Protection

BMP/Control Measure Application - An approved design for protecting inlets must be installed at all storm sewer inlets directly downstream of and within the work area.

BMP/Control Measure Installation - Install around the entire inlet or from curb to curb.

BMP/Control Measure Maintenance - Inlet protection must be repositioned or replaced at the end of every day. Sediment and debris accumulated at inlet protection must be removed and disposed of daily.

BMP/Control Measure Detail - SW-9, Colorado Department of Transportation M Standard M-208-1 Storm Drain Inlet Protection (Type II) Option A and B or “Dandy Bag,” or approved equal. In circumstances where vehicles will be traveling close to or on gutter pans, CDOT type inlet protection or “Dandy Bags” shall be used. No extra payment will be made for the use of CDOT type or Dandy Bag Inlet protection but shall be included in the lump sum cost of Erosion Control.

BMP/Control Measure - Inlet Pipe Protection

BMP/Control Measure Application - An approved design for protecting pipes during storm sewer inlet re- construction must be installed within the inlet at all pipe connections.

BMP/Control Measure Installation - Install at piping within inlet.

BMP/Control Measure Maintenance - Inlet protection must be repositioned or replaced at the end of every day. Sediment and debris accumulated at inlet protection must be removed and disposed of daily. After inlet construction is completed all dirt, materials and pipe protection must be removed and disposed of and an approved inlet protection installed.

BMP Detail - SW-9.

BMP/Control Measure - Check Dams (Curb/Rock Sock)

BMP/Control Measure Application – Rock bag gutter check dams used for sediment entrapment downstream of work area.

BMP/Control Measure Installation - Rock bags must be installed within gutters, contacting the curb and set at a 45-degree angle.

BMP/Control Measure Maintenance - Rock bags must be repositioned or replaced if broken daily. Accumulated sediment must be removed and disposed of daily.

BMP Detail - SW-2.

BMP/Control Measure - Street Sweeping (Non-Structural BMP)

BMP/Control Measure Application - Street sweeping either by machine or manually for the removal of excess materials on the roadway, sidewalks or gutters.

BMP/Control Measure Maintenance - Street sweeping must be conducted at the end of each day. This includes the removal of materials in the gutters or accumulated at sediment entrapment control measures.

BMP Detail - No detail.

BMP/Control Measure - Stabilized Staging Areas

BMP/Control Measure Application - Areas designated for equipment and material storage.

BMP/Control Measure Installation - Staging areas whether on private or public areas must remain organized and clean. The staging area may be used for equipment and construction material storage, sanitary waste receptacles and other waste receptacles. All fluids or hazardous materials stored at the staging area must be stored inside or covered on pallets.

BMP/Control Measure Maintenance - Organize and clean the staging area daily. Do not allow dumpsters to become over full or store waste piles on site. All waste piles must be contained.

BMP Detail - SW-7.

BMP/Control Measure – Vehicle Tracking Control

BMP/Control Measure Application - Vehicle tracking control provides stabilized construction site access to remove sediment (mud or dirt) from vehicles and reducing tracking onto the paved surface.

BMP/Control Measure Installation – Install at construction site access.

BMP/Control Measure Maintenance - Replace aggregate used for a stabilized entrance/exit as needed. If the area becomes clogged and ponds water, remove and dispose of excess sediment or replace material with a fresh layer of aggregate as necessary. Ensure rock and debris from the vehicle tracking area do not enter the public right-of-way. Remove sediment that is tracked onto the public right of way daily or more frequently as needed.

BMP Detail - SW-5.

BMP/Control Measure - Waste Management

BMP/Control Measure Application - All waste generated on site must be contained. At no time will construction debris or waste generated at the site be allowed to be stored on site, uncontained.

BMP/Control Measure Installation - Dumpsters and trash bins must be provided on site and placed in a designated area.

BMP/Control Measure Maintenance - Receptacles must be emptied frequently. Liquids may not be placed within the receptacles if there is a possibility they could leak.

BMP Detail - No detail.

BMP/Control Measure - Materials Management

BMP/Control Measure Application - Construction materials including stockpiles and equipment must be stored in a designated area.

BMP/Control Measure Installation - Perimeter control measures must be installed at all stockpiles, at pipe storage areas, and where equipment is stored on impervious surfaces that may contribute grease, oil or dirt to the site.

BMP/Control Measure Maintenance - Materials must be kept organized and neatly stored. Perimeter control measures must be repositioned or replaced if damaged, daily.

BMP Detail - No detail.

BMP/Control Measure - Fueling/Maintenance Operations

BMP/Control Measure Application - If equipment undergoes fueling, maintenance or repair on site, control measures must be used to include use of a double-wall tank.

BMP/Control Measure Installation - A drip pan or container will be used during on site fueling, maintenance or repair operations. Absorbents must be available should a spill occur.

BMP/Control Measure Maintenance - Spills must be cleaned up immediately. Fluids leaking from any vehicle or equipment must be cleaned immediately and that vehicle or piece of equipment repaired or removed from the site.

BMP Detail - No detail.

BMP/Control Measure - Sanitary Waste Management (Portable Toilets)

BMP/Control Measure Application - Portable sanitary waste receptacles required on site for use by all personnel.

BMP/Control Measure Installation - Portable receptacles must be secured in place and not positioned on an impervious surface. Receptacles must be located at least 3' from all impervious areas, flow lines, ditches, creeks or storm sewer inlets. Attachment to fencing or a roll-off/dumpster to preventing tipping may be allowed if no other alternatives are available.

BMP/Control Measure Maintenance - Receptacles must be checked daily and routinely maintained. In the event materials are spilled from a receptacle, immediate clean-up is required. If a contracted company must respond for the clean-up and the response time is unknown, absorbents must be applied to the spill by the onsite contractor immediately.

BMP Detail – No detail.

Measurement and Payment for Erosion Control shall be paid on a monthly basis as a percentage of the lump sum bid item for the contract amount earned. Payment for Erosion Control shall include all labor, materials, equipment and incidentals required for each phase of the work. No additional compensation will be made for the Erosion Control Supervisor (ECS), installation, maintenance or removal of bmp/control measure devices, additional devices required by the City's Stormwater Management Division, or reuse of bmp/control measure devices during construction operations included in this contract, or sufficiently controlling mud and dust to reduce or eliminate complaints to the City of Arvada from affected property owners and citizens.

BID BOND

We, the undersigned _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto the City of Arvada, Colorado, in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

THE CONDITION of this obligation is such that whereas the Principal has submitted to the City of Arvada, Colorado the accompanying Bid Proposal, and hereby made a part hereof to enter into a Contract Agreement for the construction of City of Arvada Project No. 24- ST-02.

WHEREAS, the City, as a condition for receiving said Bid Proposal, requires the Principal to deposit with the City a Bid Proposal Guaranty, equivalent to not less than 5 Percent of the amount of said Bid Proposal.

NOW THEREFORE,

- (A) If said Bid Proposal shall be rejected; or in the alternate,
- (B) If said Bid Proposal shall be accepted and the Principal shall execute and deliver a Contract Agreement (properly completed in accordance with said Bid Proposal) and shall furnish a Performance and Payment Bond upon the forms prescribed by the City for the faithful performance of said Contract; and for the payment of all persons performing labor or furnishing materials in connection therewith; and shall in all other respects perform the agreement created by the acceptance of said Bid Proposal;

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the City may accept such Bid and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, this ___ day of _____, 2023, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL

Name: _____

Address: _____

By: _____

Title: _____

SURETY

_____.

_____.

By: _____

Title: _____

Attorney-in-Fact:

(SEAL)

NOTE: Surety Companies executing bonds must be authorized to transact business in the State of Colorado and be acceptable to the City.

BID PROPOSAL

TO: City of Arvada, Colorado (hereinafter called "CITY").

FROM: _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as (a corporation), (a partnership), (an individual).

The Bidder, in compliance with your Advertisement for Bids, hereby proposes to perform all Work in strict accordance with the Contract Documents, for the construction of City of Arvada Project No. 24-ST-02 entitled **2024 Hot Chip, Slurry, Cape and Crack Seal Surface Treatment Program** within the time set forth therein, and at the prices stated on the included Bid Schedule as totaled herein.

By submission of this Bid Proposal, each Bidder certifies, and in the case of a joint venture each party thereto certifies as to his/her own organization, that this Bid Proposal has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid Proposal with any other Bidder or with any competitor.

Bidder acknowledges receipt of **Addendum Nos.** Initials: _____

Bidder states that their:

Major Material Suppliers are:

.
. .
. .

Material They Will Supply

Major Subcontractors are:

.
. .
. .

Work They Will Perform

CONTRACT TIME AND LIQUIDATED DAMAGES: All work shall be completed, including clean-up, within **270** working days after the date to be specified in the Notice to Proceed. A Notice to Proceed is anticipated to be issued on or about March 1, 2024. The bidder shall agree to pay the owner the sum of \$3,300 for each calendar day that the work exceeds the allotted contract time. Contract time may be adjusted by Change Order.

Total from included Bid Schedule:

TOTAL BID \$ _____

SUBMITTED BY:

Company Name: _____

Contact Names: _____

Address: _____

Phone: (_____) _____ Email(s): _____

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the Contractor;
- He/she has read all Terms and Conditions and technical specifications made available in conjunction with this solicitation and fully accept and acknowledge this bid is consistent with the specifications and terms and conditions.
- The bid 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

PAYMENT TERMS: The City standard is net thirty (30) days but every effort is made to meet net fifteen (15) days after the approved partial payment date when the contractor is satisfactorily performing the contract. The final 5% of total payment will be paid once the contract is completed satisfactorily, advertisement for final settlement is complete, and the project is accepted by the City. Payment is the date of the check mailing or date of the credit card transaction.

BID SCHEDULE



City of Arvada CSB 23-PW-095 (Project No. 24-ST-02)

Hot Chip, Slurry, Cape and Crack Seal Surface 2024 Treatment Program

Contractor: _____ Date _____

Address, City, Zip: _____

Telephone: _____ Bid Prepared by: _____

ITEM	BASE BID DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENSION
Roadway Items					
1	Slurry Seal Type II	187,205	SY		\$0.00
2	Cape Seal	72,343	SY		\$0.00
3	Crack Seal	150,000	LBS		\$0.00
4	Wide Crack Seal (Mastic)	10,000	LBS		\$0.00
5	4" HMA Asphalt Patching	5,000	SY		\$0.00
6	Rejuvenating Agent	22,000	SY		\$0.00
Pavement Markings					
7	Removal of Pavement Marking	11,000	LF		\$0.00
8	Temporary Raised Pavement Markers	1	LS		\$0.00
9	Epoxy Pavement Marking	60	GAL		\$0.00
10	Epoxy Pavement Marking Mobilization	1	EA		\$0.00
11	Inlayed Thermoplastic (Crosswalk, Stop Bar)	3,356	SF		\$0.00
12	Inlayed Thermoplastic (Shark Teeth)	3	EA		\$0.00
13	Inlayed Thermoplastic (Turn Arrow)	8	EA		\$0.00
14	Inlayed Thermoplastic (Straight Arrow)	23	EA		\$0.00
15	Inlayed Thermoplastic (Sharrow)	18	EA		\$0.00
16	Inlayed Preformed Thermoplastic (Bike Symbol without Bike Lane Arrow)	2	EA		\$0.00
17	Inlayed Preformed Thermoplastic (Bike Symbol with Straight Bike Lane Arrow)	32	EA		\$0.00
Traffic Control					
18	Portable Variable Message Sign	1	DAY		\$0.00
19	Arrow Board	40	DAY		\$0.00
20	Traffic Control Management	60	DAY		\$0.00
21	Flagging	960	HR		\$0.00
22	Uniformed Traffic Control	300	HR		\$0.00
23	Uniformed Traffic Control Vehicle	300	HR		\$0.00
Lump Sum Items					
24	Traffic Control Devices	1	LS		\$0.00
25	Stormwater Management/Erosion Control	1	LS		\$0.00
26	Citizen Notification	1	LS		\$0.00
27	Mobilization	1	LS		\$0.00
28	Minor Contract Revisions	1	LS		\$0.00
BASE BID				TOTAL	\$0.00
ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENSION
ALTERNATE					
29	Hot Chip Seal	25,000	SY		\$0.00
30	Edge Milling	30,000	LF		\$0.00
31	Chip Seal Type II (1/4")	50,000	SY		\$0.00
32	Chip Seal Type III (3/8")	20,000	SY		\$0.00
33	Microsurfacing	25,000	SY		\$0.00
ALTERNATE				TOTAL	\$0.00
BASE BID + ALTERNATE				TOTAL	\$0.00

* City of Arvada Measurement and Basis of Payment number and/Project Special Provisions and/or modified detail
Payment will be based upon actual quantities performed

REQUIRED CONTRACTOR SUBMITTAL FORM

SUBMITTAL CHECKLIST:

Bid Proposals shall be submitted in the order listed below with each section clearly identified. **Missing information or required documents may result in submission being deemed non-responsive.**

- ☐ Submit completed City Submittal Forms including this sheet, Bid Bond, Bid Proposal, Bid Schedule, Performance Measures Form, and any other attachments requested.
- ☐ Submit implementation timeline and warranties, if applicable.
- ☐ Attach Contractor's Licensing, if applicable.
- ☐ Insurance – Checking this box accepts that the insurance requirements listed by the City are acceptable.
- ☐ Please initial to acknowledge Addenda, if any, have been considered in your proposal: #1_____ #2_____ #3_____

REFERENCES:

- ☐ Check here if Contractor'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: _____

.

VENDOR NAME: _____

SOLICITATION #: 23-PW-095

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 the City will monitor and report on the Vendor's 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 be evaluated by the City per these defined metrics 2 months prior to contract renewal. The department will review with the vendor any measures needing improvement.

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 be considered when renewing or awarding a contract with a vendor.

PERFORMANCE AND PAYMENT BOND

Bond No. _____

(Firm) _____

(Address) _____

(an Individual), (a Partnership), (a Corporation), hereinafter called Principal; and

(Firm) _____

(Address) _____

hereinafter called Surety, are held and firmly bound unto the City of Arvada, a Colorado municipal corporation, 8101 Ralston Road, Arvada, Colorado 80002, hereinafter called the City, in the penal sum of _____, Dollars, _____, in lawful money of the United States, for the payment of such sum will and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION are such that the Principal entered into a certain Contract with the City, dated the _____ day of _____, 2023, a copy of which is hereto attached and made a part hereof, for the performance of City of Arvada Project No. **24-ST-02, CSB#23-PW-095**.

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the City, with or without Notice to the surety and during the life of the guaranty period, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the City from all cost and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the City all outlay and expense which the City may incur in making good any default, and if he shall promptly make payment to all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, repairs on machinery, equipment and tools, consumed, rented or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between City and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three counterparts, each one of which shall be deemed an original, this the ____ day of _____, 2023.

IN PRESENCE OF:

PRINCIPAL _____

By _____

Address _____

(Corporate Seal)

OTHER PARTNERS

(Surety Seal)

SURETY _____

Attorney _____ in _____ Fact _____

Address _____

Note: If Contractor is Partnership, all partners should execute Bond.

Important: Surety Company must be authorized to transact business in the State of Colorado and be acceptable to the City.

NOTICE OF AWARD

Date

Company

Address

City, State Zip

RE: Project No. _____, _____

Dear Representative of _____:

The City of Arvada, Colorado (hereinafter called "City") has considered the Bid Proposals submitted for referenced work in response to its Advertisement for Bids dated _____ and Information for Bidders.

You are hereby notified that your Bid Proposal has been accepted, for items and prices stated in the Bid Schedule, in the amount of \$ _____.

You are required to execute the Contract, the Insurance Certificates and a Performance and Payment Bond within seven (7) days from the date of this Notice to you.

The Performance and Payment Bond needs to be filled out, returned (one original must be returned to the City), and accompanied by the Power of Attorney from your surety company. Also, please make sure that the insurance certificate is in the minimum amounts set forth in the Contract Documents and the City of Arvada is named as an additional insured for the specific Project Number and Title. An Additional Insured endorsement certificate should also be attached.

If you fail to execute said Contract and furnish the necessary Insurance Certificates and Bond within the time allotted from this date, the City will be entitled to consider all your rights arising out of the City's acceptance of your Bid Proposal as abandoned and as a forfeiture of your Bid Bond. The City will be entitled to such other rights as may be granted bylaw.

You are required to return an acknowledged copy of this Notice of Award and enclosures to the Project

Engineer. CITY OF ARVADA, COLORADO

City Engineer

BIDDER

Company

Receipt of above Notice of Award accompanied with a Performance and Payment Bond form and a copy of the Contract is hereby acknowledged.

This _____ day of _____, 20____.

By: _____

Name: _____

Title: _____

NOTICE TO PROCEED

Date

Company
Address
City, State Zip

RE: Project No. _____, _____

Dear Representative of _____:

You are hereby notified to commence work on referenced Project, in accordance with the Contract dated _____
on or before _____, and you are to complete the Work, including cleanup within _____ calendar days thereafter.

The date of completion of all Work is therefore _____.

CITY OF ARVADA, COLORADO

City Engineer

BIDDER

Receipt of this Notice to Proceed is hereby acknowledged this _____ day of ____, 20 ____.

Company

By: _____

Title: _____

**AN AGREEMENT BY AND BETWEEN THE CITY
OF ARVADA AND

FOR _____
IN AN AMOUNT NOT TO EXCEED \$_____.00**

This Agreement made this _____ day of _____, 20____ by and between the City of Arvada, a home rule municipal corporation (“Arvada” and/or “City”) and _____, a _____ (“Contractor”).

WITNESSETH: That for and in consideration of the covenants, promises, and payments hereinafter mentioned:

1. Contractor will commence and complete the _____ described in the Contract Documents relating to CSB-_____, issued _____, 20 , (“the Work”).
2. Contractor will furnish all material, supplies, tools, equipment, labor, and other services necessary for the completion of the Work.
3. Contractor will commence the work required by the Contract Documents within ten (10) calendar days after the date of Notice to Proceed.
4. Contractor will complete the work required by the Contract Documents by _____ after the date of the Notice to Proceed unless the period for completion is extended otherwise by the Contract Documents.
5. Contractor agrees to perform all of the work described in the Contract Documents for an amount not to exceed \$_____.00 for the Work.
6. The term “Contract Documents” means and includes the following:
 - A. Arvada’s Request for [Project Title], CSB-_____ (“CSB”);
 - B. CSB Exhibits (if any);
 - C. CSB Addenda (if any);
 - D. Contractor’s Response to CSB-_____, Advertisement for Bid, Bid Proposal, Bid Schedule, Bid Bond, Certificate of Insurance;
 - E. Notice of Award;
 - F. Performance and Payment Bond;
 - G. Notice to Proceed;
 - H. Change Orders (if any);
 - I. City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements;
 - J. Project special provisions prepared or issued by City of Arvada (or its Consultant if applicable);
 - K. Detail drawings and Bid Documents prepared or issued by City of Arvada (or its Consultant if applicable);
 - L. Specification Illustrations and attachments; and
 - M. All supplementary requirements regarding wage rates, E.E.O., affirmative action and all other Federal-State requirements as outlined in the specifications.
7. INVOICES AND COMPENSATION. Contractor will follow Bid schedule and partial payments will

be made accordingly NET 15 but no later than NET 30.

8. GENERAL TERMS AND CONDITIONS, SPECIAL TERMS AND CONDITIONS, INSURANCE REQUIREMENTS, PROJECT SPECIAL PROVISIONS, AND OTHER CSB REQUIREMENTS. Contractor affirms that it has read and is familiar with the Contract Documents, including but not limited to the General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, and other CSB requirements, and agrees to be bound by those terms and conditions.

9. CHANGE ORDERS. Contractor shall perform the Work as described in the Contract Documents or as amended by the mutual consent of the parties in writing. Should the parties agree in writing to a change in the scope of services, then the parties will timely execute any applicable Change Order, which will address changes in scope of services, completion date, contract amount, any applicable material modifications, and any other matters that the parties deem necessary.

10. PREFERENCES IN EMPLOYMENT OF COLORADO LABOR. To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:

- a. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- b. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.

11. PERFORMANCE MEASURES. The Performance Measures for this Agreement shall be those outlined by Arvada in Section 22 of Special Terms and Conditions for Bidders in the CSB, which are included in the Contract Documents that are exhibits to this agreement.

12. 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.

13. BINDING EFFECT. This Agreement shall inure to the benefit of, and be binding upon, the parties, their respective legal representatives, successors, heirs, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise expressly authorized herein.

14. PARAGRAPH CAPTIONS. The paragraph captions in this Agreement are set forth only for the convenience and reference of the parties and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.

15. INTEGRATION, AMENDMENT, AND SEVERABILITY. This Agreement represents the entire agreement between the parties, and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties. If any other provision of this Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Agreement shall continue in full force and effect if the essential terms and conditions of this Agreement for both parties remain valid, legal, and enforceable.

16. NOTICES. Any notice or notification required or permitted by the Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent by certified mail or registered mail, postage and fees prepaid, addressed to the party to whom such notice is to be given at the address set forth on the signature page below, or at such other address as has been previously

furnished in writing, to the other party or parties. Such notice or notification shall be deemed to have been given when deposited in the United States mail.

17. **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, has been properly acknowledged by attestation, notary acknowledgment, or both, 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.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement which shall be deemed an original on the date first above written.

CITY OF ARVADA, COLORADO

8101 Ralston Road
Arvada, CO 80002

ATTEST/WITNESS:

City Clerk

APPROVED AS TO FORM:

For Rachael Morris, City Attorney

By: _____

CONTRACTOR

Name:

Title:

CHANGE ORDER

No.

TO:

Upon Contractor acceptance and City approval, the work and Contract Documents for City of Arvada, Project No. _____, entitled _____ will be adjusted to include the following:

<u>Item</u>	<u>Description</u>	<u>Qty.</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Add/Delete</u>
1.	<u>ADD</u>				
2.					
3.					
4.					

TOTAL ADD	\$ _____
------------------	----------

<u>Adjustments to Contract Price & Time</u>	<u>Contract Dollars</u>	<u>Calendar Days</u>
Contract Totals through and including Previous Change Orders	\$ _____	
Adjustments this Change Order (Increase)	\$ _____	
Contract Totals to Date – Including Change Order No. _	\$ _____	
Contract Time Expires on:		

APPROVED FOR CITY

ATTEST:

8101 Ralston Road
Arvada, CO 80002

City Clerk

ACCEPTED FOR CONTRACTOR

By: _____ Title: _____

Date: _____

APPROVED AS TO FORM:

For Rachael Morris, City Attorney

By: _____



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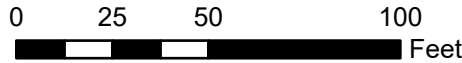
SHEET - 1



LEGEND



1:600



DATE: 10/12/2023

AERIAL: 2023

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0 25 50 100 Feet

DATE: 10/12/2023

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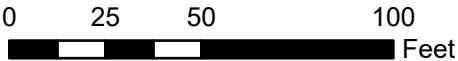
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DATE: 10/12/2023

AERIAL: 2023

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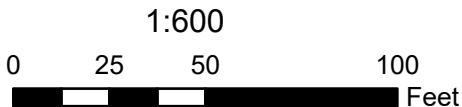
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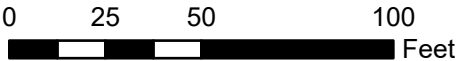
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DATE: 10/12/2023

AERIAL: 2023

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0 25 50 100 Feet

DATE: 10/12/2023

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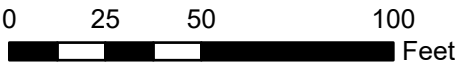
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DATE: 10/12/2023

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0 25 50 100 Feet

DATE: 10/12/2023

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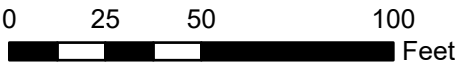
SHEET - 11



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DATE: 10/12/2023

AERIAL: 2023

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SHEET - 12



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DATE: 10/12/2023

AERIAL: 2023

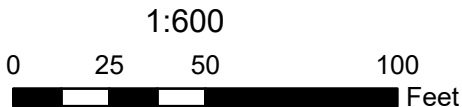
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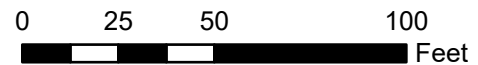
SHEET - 14



LEGEND



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DATE: 10/12/2023

AERIAL: 2023

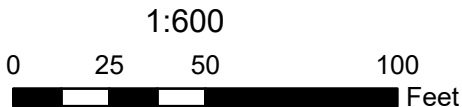
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0 25 50 100 Feet

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DRAFT

Legend:

- Cape Seal
- Crack Seal
- Rejuvenator
- Slurry Seal
- Crack Seal and Patching

Map Labels:

W. 80TH AVE, W. 78TH AVE, W. 76TH AVE, W. 74TH AVE, W. 72ND AVE, W. 70TH AVE, W. 68TH AVE, W. 66TH AVE, W. 64TH AVE, W. 62ND AVE, W. 60TH AVE, W. 58TH AVE, W. 56TH AVE, W. 54TH AVE, W. 52ND AVE, W. 50TH AVE, W. 48TH AVE, W. 46TH AVE, W. 44TH AVE, W. 42ND AVE, W. 40TH AVE, W. 38TH AVE, W. 36TH AVE, W. 34TH AVE, W. 32ND AVE, W. 30TH AVE, W. 28TH AVE, W. 26TH AVE, W. 24TH AVE, W. 22ND AVE, W. 20TH AVE, W. 18TH AVE, W. 16TH AVE, W. 14TH AVE, W. 12TH AVE, W. 10TH AVE, W. 8TH AVE, W. 6TH AVE, W. 4TH AVE, W. 2ND AVE, W. 1ST AVE, W. 0TH AVE, W. -2ND AVE, W. -4TH AVE, W. -6TH AVE, W. -8TH AVE, W. -10TH AVE, W. -12TH AVE, W. -14TH AVE, W. -16TH AVE, W. -18TH AVE, W. -20TH AVE, W. -22ND AVE, W. -24TH AVE, W. -26TH AVE, W. -28TH AVE, W. -30TH AVE, W. -32ND AVE, W. -34TH AVE, W. -36TH AVE, W. -38TH AVE, W. -40TH AVE, W. -42ND AVE, W. -44TH AVE, W. -46TH AVE, W. -48TH AVE, W. -50TH AVE, W. -52ND AVE, W. -54TH AVE, W. -56TH AVE, W. -58TH AVE, W. -60TH AVE, W. -62ND AVE, W. -64TH AVE, W. -66TH AVE, W. -68TH AVE, W. -70TH AVE, W. -72ND AVE, W. -74TH AVE, W. -76TH AVE, W. -78TH AVE, W. -80TH AVE.

RD ROAD (CSH 72), WARD ROAD (CSH 72), RALSTON ROAD (CSH 72), WADSWORTH BLVD. (CSH 121), SHERIDAN BLVD. (CSH 95), I-70, I-25, I-76.

SHEET OF 1	PROJECT MANAGER C. BIDDLE DRAWN BY C. KELLEY DATE 10/16/2023	24-ST-02 - 2024 Crack, Cape, Hot Chip, Slurry Seal Surface Treatments	 CITY OF ARVADA	Public Works Department Engineering Division 8101 Ralston Rd. Arvada, Colorado 80002 Phone 720-898-7640	NO.	REVISION	DATE	BY
					1			
					2			
					3			
					4			

CRACK SEAL

Street Name	From	To	Function Class - Collector and SY	Function Class - 2 Lane Arterial and SY	Function Class - 4 Lane Arterial and SY	Function Class - Local and SY
W 82nd Ave	W 82nd Place	Indiana Street		4,082.36		
W 80th Ave	Indiana Street	round a bout (not included)		19,838.62		
W 80th Ave	round a bout (not included)	12975 W 80th (end of jurisdiction)		15,623.22		
Westwoods Mesa						
W 70th Avenue	Kendrick Street	Indiana Court				5,800.00
W 69th Place	Kilmer Street	Indiana				6,231.90
Juniper Court	W 69th Pl	W 68th Place				1,299.00
W 68th Place	Juniper Court	Joyce Street				1,167.00
Juniper Court	W 69th Pl	W 70th Ave				930.00
Isabell Ct	W 69th Pl	W 70th Ave				1,200.00
Isabell St	W 69th Pl	W 70th Ave				1,311.00
Ralston Ridge - South of Farm						-
W 69th Lane/Holman St	Indiana	End of Holman Street				1,638.89
Howell Street	W 69th Lane	End of Howell Street				580.56
Ralston Ridge - North of Farm						-
Holman Street	W 72nd Ave	End of Holman Street				1,486.11
W 71st Drive/Howell Court	Holman Street	End of Howell Court				1,388.89
W 82nd Ave	Ward Lane/End of Jurisdiction	Simms Street	9,170.00			
W 72nd Avenue	End of Jurisdiction	Indiana Street		585.00		
W 72nd Avenue	Indiana Street	Simms (May be less due to construction)		10,164.00		
Oak Street						
Oak Street	W 80th Ave	End	2,896.00			
Macarthur Park						
W 82nd Lane	Kipling Street	Kline Street				375.00
Kline Street	End	West 82nd Ave				745.00
W 82nd Ave/Kline Street	Kipling Street	W 81st Avenue				838.00
W 82nd Drive	Kline Street	End				140.00
W 82nd Place	Kline Street	End				209.00
Woodrun and Pomona Lakes						
Hoyt Way	W 80th Avenue	Garrison Street	3,510.00			
Garrison Street	W 84th Avenue	W 86th Place	976.00			
W 84th Avenue	Garrison Street	Pomona Drive	2,530.00			
Everett Way	Garrison Street	W 84th Avenue				2,047.00
Club Crest Drive	W 80th Avenue	W 84th Avenue	3,278.00			
West 81st Place	Club Crest Drive	Pomona Drive				2,843.00
W 81st Lane	Club Crest Drive	W 81st Place				1,335.00
W 81st Drive	W 81st Lane	Pomona Drive				3,183.00
W 80th Avenue	Kipling Street	Sheridan			15,774.00	
Arbor Estates						
Fenton Ct	W 80th Pl	End				1,073.33
W 80th Circle	Gray Ct	Pomona Dr				3,173.33
Gray Circle	W 80th Circle	End				573.33
Pomona Dr	Gray Ct	End				1,463.33
W 81st Circle	Gray Ct	End				733.33
W 81st PL	Gray Ct	End				683.33

Gray Ct	W 81st Pl	End				2,870.00
W 81st Pl	Gray Ct	End				650.00
W 82nd Dr.	Gray Ct	End				426.67
W 80th Avenue	Kipling Street	Sheridan			140,213.33	
Chase Drive	W 80th Avenue	Lamar Drive	13,916.44			
Pierce Street	W 72nd Avenue	W 80th Avenue	24,448.89			
W 76th Avenue	Wadsworth Blvd	Westminster Boarder/6096 W 75th Pl				
Ingalls Street	W 76th Ave	Property Line	28,244.44			
		W 78th Place				3,850.00
South of 72nd Avenue Map Locations						
Rensselaer Drive	Independence	Ralston Road	7,346.67			
W 64th Avenue	Independence	Oberon Road				
Holland Street	W 64th Avenue	End				2,126.67
W 63rd Avenue	Estes Street	End				580.00
W 63rd Place	Estes Street	Carr Street				2,230.00
Carr Street	72nd	Ralston Road				4,283.33
W 64th Avenue	Carr Street	Wadsworth Blvd	40,417.78			
W 64th Avenue	Wadsworth Blvd	Lamar Street	12,555.56			
Pierce Street	W 64th Avenue	Ralston Road		15,960.00		
Lamar Street	W 64th Avenue	Ralston Road	17,075.56			
W 57th Avenue	Independence	Olde Wadsworth Blvd	14,598.89			
Balsam Street	Ralston Road	Grandview	25,573.33			
Carr Street	W 57th Avenue	W 52nd Avenue				2,840.00
			10,576.67			
		QUANTITY TOTALS	217,114.22	66,253.20	155,987.33	62,305.01

SLURRY SEAL

Roadways with Pavement Markings and Striping

Street Name	From	To	Function Class - Collector and SY	Function Class - 2 Lane Arterial and SY	Function Class - Local and SY
Alta Vista					
Independence	Books Drive	W 66th Avenue	13,640.00		
W 59th Place	Ralston Road	Brooks Drive	703.33		
Brooks Drive	W 59th Place	Carr Street	22,120.00		
Garrison Street	Oberon Road	Ralston Road		14,832.89	
W 62nd Avenue	Independence Street	Garrison			4,310.00
Cole Drive	Garrison Street	Estes Street			4,270.00
Alta Vista Drive	Estes Street	Carr Street			4,460.00
Flower Street	Cole Drive	Brooks Drive			7,303.33
Field Street	Cole Drive	Brooks Drive			7,843.33
Everett Street	Cole Drive	Brooks Drive			7,623.33
W 61st Avenue	Garrison Street	Everett Street			2,600.00
Estes Court	Cole Drive	Brooks Drive			7,273.33
Estes Street	Oberon Road	Brooks Drive			8,013.33
W 60th Avenue	Everett Street	Dover Street			4,260.00
Dudley Court	Alta Visa	Brooks Drive			6,780.00
Dudley Street	Alta Visa	Brooks Drive			6,336.67
Dover Street	Alta Visa	Brooks Drive			5,923.33
Cody Street	Alta Visa	Brooks Drive			5,243.33
W 61st Avenue	Dover Street	Carr Street			1,616.67
W 73rd Place	Kipling Street	West to End			11,001.67
W 78th Avenue	Kipling Street	Nelson Street			-
W 79th Place/Nelson Street	Newman Street	W 77th Place			5,402.78
W 84th Avenue/Newcombe Street	Simms Street	W 86th Parkway			-
Candelight					13,167.78
W 59th Place	W 59th Drive	W 69th Drive			3,925.33
W 59th Drive	Eldridge	Braun Way			3,872.00
Braun Way	North and South End	End of Culdesacs			1,586.67
Cole Way	W 59th Drive	W 58th Drive			2,912.00
W 58th Place	W 59th Drive	W 59th Avenue			3,210.67
W 59th Avenue	W 59th Drive	Cole Way			2,306.67
W 58th Drive	Cole Way	End of Culdesacs			936
		QUANTITY TOTALS	36,463.33	14,832.89	135,908.78

Cape Seal

Street Name	From	To	Function Class - Local and SY
W 71st Avenue	Hackberry Hill Road	Saulsbury Street	2,460.00
Saulsbury Circle	W 71st Pl	End of Culdesac	830.00
Reed Court	W 72nd Avenue	W71st Place	700.00
Quay St/W 71st Pl/Saulsbury St	W 70th Avenue	W 70th Avenue	5,510.00
Reed Circle	W 71st Avenue	End of Culdesac	566.67
Quay Circle	W 71st Avenue	End of Culdesac	700.00
W 71st Avenue	Saulsbury Street	Pierce Street	3,870.00
Reed Court	W 71st Avenue	W 70th Avenue	1,920.00
Reed Street	W 71st Avenue	W 70th Avenue	1,933.33
Quay Street	W 71st Avenue	W 70th Avenue	1,950.00
W 70th Avenue	Saulsbury Street	Pierce Street	3,896.67
Saulsbury Street/W 68th Place	W 70th Avenue	Quay Ct	5,003.33
Quay Court	W 70th Avenue	W 68th Avenue	5,193.33
W 69th Place	Quay Ct	Pierce Street	2,523.33
Quay Street/W 68th Place	W 69th Place	Pierce Street	3,976.67
W 69th Avenue	Quay Ct	Pierce Street	2,233.33
W 69th Avenue	Teller Ct	Saulsbury Street	856.67
Teller Court/W 68th Place	W 71st Avenue	Upham Street	6,736.67
Upham Street	W 71st Avenue	W 68th Avenue	6,683.33
W 70th Avenue	Saulsbury	End of Culdesac	4,086.67
Vance Street	W 70th Avenue	End of Culdesac	493.33
W 69th Avenue	Wadsworth Blvd	Upham Street	2,480.00
Webster Street	W 69th Place	W 69th Avenue	1,953.33
Vance Street/W 69th Place	Wadsworth Blvd	W 68th Avenue	5,786.67
		QUANTITY TOTALS	72,343.33

CRACK.MASTIC.PATCHING

Street Name	From	To	Function Class - Local and SY
SKYLINE ESTATES			
W 55th Lane	Parfet St	West to end	4,347.00
Quail Court	W 55th Lane	W 54th Lane	1,272.00
Quail Street	W 55th Lane	W 54th Lane	1,554.00
W 55th Place	Quail Street	End	915.00
W 54th Lane	Parfet St	West to end	3,684.00
W 54th Avenue (two sides seperated by Median)	Parfet St	End of W 54th Avenue (turns into W 54th Dr.	5,580.00
Parfet Street	West 58th Place	South to End	8,811.00
W 56th Place	Parfet St	Miller Street	1,092.00
W 56th Place/Miller Street (confirm boundary w/WR)	Kipling Parkway	Ridge Road	12,600.00
W 55th Drive	Lewis Street	End	2,922.00
W 55th Drive (partially concrete)	W 55th Drive	W 56th Place	63.00
Lewis Street (partially concrete)	W 56th Place	W 55th Lane	1,800.00
W 55th Place	Miller Street	Lewis Street	1,182.00
W 55th Lane	W 55th Place	End	2,400.00
Lewis Court	Lewis Street	W 55th Lane	990.00
W 54th Lane/Oak Court	Parfet St	Parfet St	5,331.00
Oak Court - cul de sac	Oak Ct	End	480.00
W 54th Place	East and West Bound	End to End	5,301.00
Oak Street	W 54th Avenue	W 54th Place	576.00
Nelson Street	W 54th Avenue	W 54th Place	663.00
W 54th Ave - culdesac	W 54th Avenue	End	315.00
W 54th Avenue	Parfet St	Miller Street	5,850.00
Owens Street	W 54th Avenue	W 53rd Avenue	2,940.00
Oak Court	W 54th Avenue	W 53rd Avenue	2,718.00
W 53rd Avenue	Parfet Street	Oak Street	1,788.00
Oak Street	Ridge Road	W 53rd Avenue	945.00
		QUANTITY TOTALS	76,119.00



24ST02- AERIALS

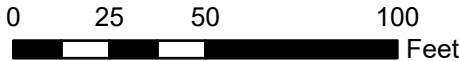
SHEET - 1



LEGEND



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DATE: 10/12/2023

AERIAL: 2023

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SHEET - 2



LEGEND



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0 25 50 100 Feet

DATE: 10/12/2023

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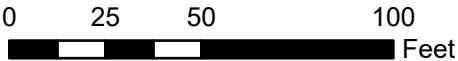
24ST02- AERIALS
SHEET - 3



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DATE: 10/12/2023

AERIAL: 2023

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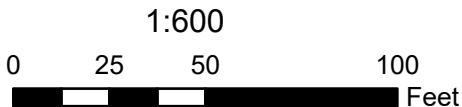
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SHEET - 4



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DATE: 10/12/2023

AERIAL: 2023

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DATE: 10/12/2023

AERIAL: 2023

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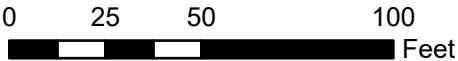
SHEET - 6



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DATE: 10/12/2023

AERIAL: 2023

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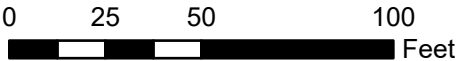
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SHEET - 7



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DATE: 10/12/2023

AERIAL: 2023

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SHEET - 8



LEGEND



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0 25 50 100 Feet

DATE: 10/12/2023

AERIAL: 2023

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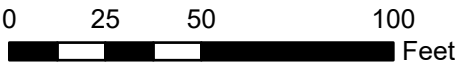
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SHEET - 9



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DATE: 10/12/2023

AERIAL: 2023

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24ST02- AERIALS

SHEET - 10



LEGEND



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DATE: 10/12/2023

AERIAL: 2023

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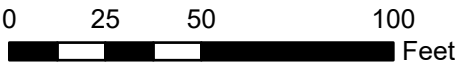
SHEET - 11



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DATE: 10/12/2023

AERIAL: 2023

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SHEET - 12



LEGEND



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0 25 50 100 Feet

DATE: 10/12/2023

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SHEET - 13



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SHEET - 14



LEGEND



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DATE: 10/12/2023

AERIAL: 2023

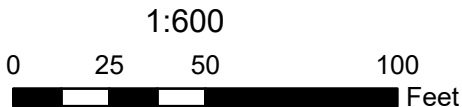
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SHEET - 15



LEGEND



DATE: 10/12/2023

AERIAL: 2023

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SHEET - 16



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1:600

0 25 50 100 Feet

DATE: 10/12/2023

AERIAL: 2023

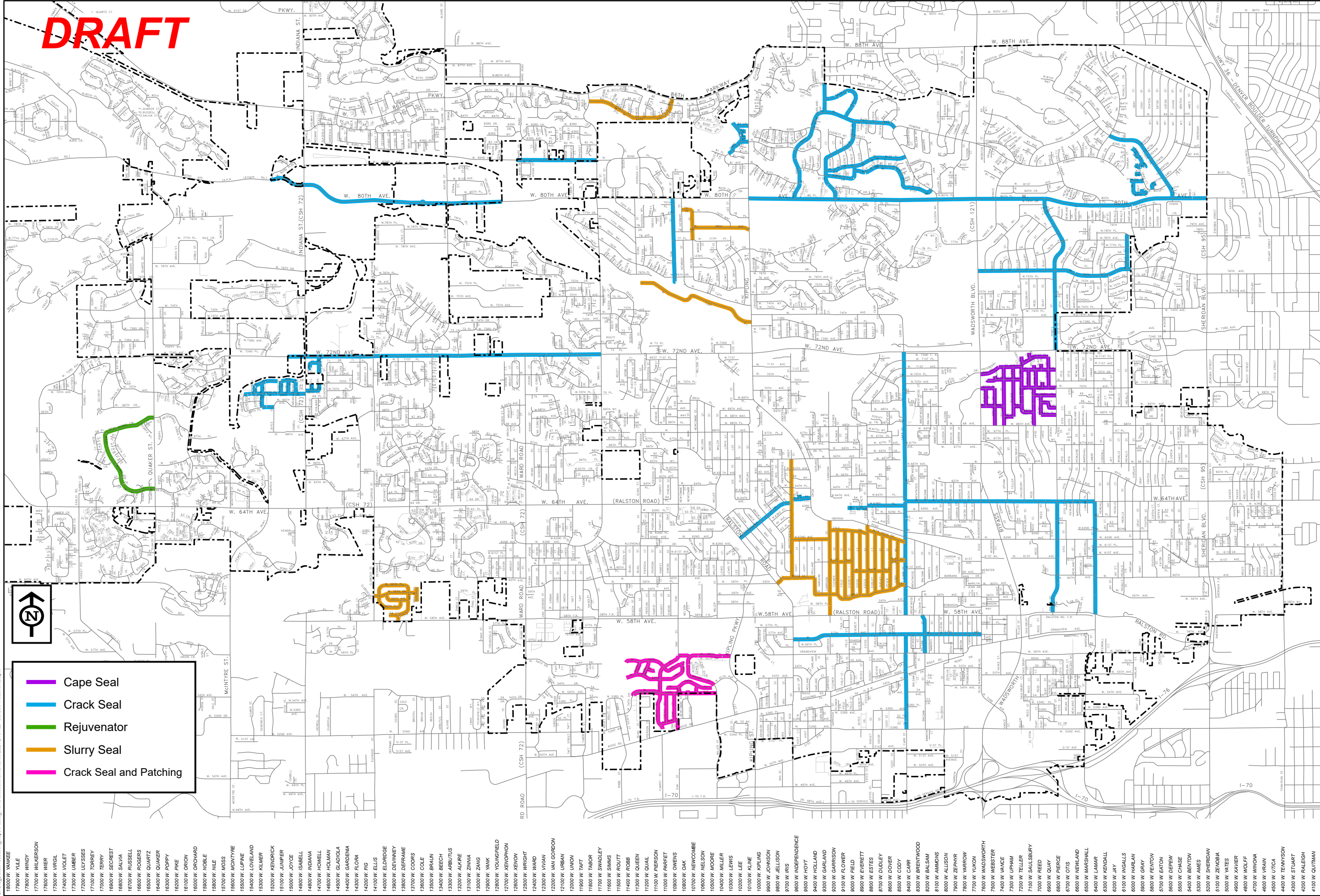
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CRACK SEAL

Street Name	From	To	Function Class - Collector and SY	Function Class - 2 Lane Arterial and SY	Function Class - 4 Lane Arterial and SY	Function Class - Local and SY
W 82nd Ave	W 82nd Place	Indiana Street		4,082.36		
W 80th Ave	Indiana Street	round a bout (not included)		19,838.62		
W 80th Ave	round a bout (not included)	12975 W 80th (end of jurisdiction)		15,623.22		
Westwoods Mesa						
W 70th Avenue	Kendrick Street	Indiana Court				5,800.00
W 69th Place	Kilmer Street	Indiana				6,231.90
Juniper Court	W 69th Pl	W 68th Place				1,299.00
W 68th Place	Juniper Court	Joyce Street				1,167.00
Juniper Court	W 69th Pl	W 70th Ave				930.00
Isabell Ct	W 69th Pl	W 70th Ave				1,200.00
Isabell St	W 69th Pl	W 70th Ave				1,311.00
Ralston Ridge - South of Farm						-
W 69th Lane/Holman St	Indiana	End of Holman Street				1,638.89
Howell Street	W 69th Lane	End of Howell Street				580.56
Ralston Ridge - North of Farm						-
Holman Street	W 72nd Ave	End of Holman Street				1,486.11
W 71st Drive/Howell Court	Holman Street	End of Howell Court				1,388.89
W 82nd Ave	Ward Lane/End of Jurisdiction	Simms Street	9,170.00			
W 72nd Avenue	End of Jurisdiction	Indiana Street		585.00		
W 72nd Avenue	Indiana Street	Simms (May be less due to construction)		10,164.00		
Oak Street						
Oak Street	W 80th Ave	End	2,896.00			
Macarthur Park						
W 82nd Lane	Kipling Street	Kline Street				375.00
Kline Street	End	West 82nd Ave				745.00
W 82nd Ave/Kline Street	Kipling Street	W 81st Avenue				838.00
W 82nd Drive	Kline Street	End				140.00
W 82nd Place	Kline Street	End				209.00
Woodrun and Pomona Lakes						
Hoyt Way	W 80th Avenue	Garrison Street	3,510.00			
Garrison Street	W 84th Avenue	W 86th Place	976.00			
W 84th Avenue	Garrison Street	Pomona Drive	2,530.00			
Everett Way	Garrison Street	W 84th Avenue				2,047.00
Club Crest Drive	W 80th Avenue	W 84th Avenue	3,278.00			
West 81st Place	Club Crest Drive	Pomona Drive				2,843.00
W 81st Lane	Club Crest Drive	W 81st Place				1,335.00
W 81st Drive	W 81st Lane	Pomona Drive				3,183.00
W 80th Avenue	Kipling Street	Sheridan			15,774.00	
Arbor Estates						
Fenton Ct	W 80th Pl	End				1,073.33
W 80th Circle	Gray Ct	Pomona Dr				3,173.33
Gray Circle	W 80th Circle	End				573.33
Pomona Dr	Gray Ct	End				1,463.33
W 81st Circle	Gray Ct	End				733.33
W 81st PL	Gray Ct	End				683.33

Gray Ct	W 81st Pl	End				2,870.00
W 81st Pl	Gray Ct	End				650.00
W 82nd Dr.	Gray Ct	End				426.67
W 80th Avenue	Kipling Street	Sheridan			140,213.33	
Chase Drive	W 80th Avenue	Lamar Drive	13,916.44			
Pierce Street	W 72nd Avenue	W 80th Avenue	24,448.89			
W 76th Avenue	Wadsworth Blvd	Westminster Boarder/6096 W 75th Pl				
Ingalls Street	W 76th Ave	Property Line	28,244.44			
		W 78th Place				3,850.00
South of 72nd Avenue Map Locations						
Rensselaer Drive	Independence	Ralston Road	7,346.67			
W 64th Avenue	Independence	Oberon Road				
Holland Street	W 64th Avenue	End				2,126.67
W 63rd Avenue	Estes Street	End				580.00
W 63rd Place	Estes Street	Carr Street				2,230.00
Carr Street	72nd	Ralston Road				4,283.33
W 64th Avenue	Carr Street	Ralston Road	40,417.78			
W 64th Avenue	Wadsworth Blvd	Wadsworth Blvd	12,555.56			
Pierce Street	Wadsworth Blvd	Lamar Street		15,960.00		
Lamar Street	W 64th Avenue	Ralston Road	17,075.56			
W 57th Avenue	W 64th Avenue	Ralston Road	14,598.89			
Balsam Street	Independence	Olde Wadsworth Blvd	25,573.33			
Carr Street	Ralston Road	Grandview				2,840.00
	W 57th Avenue	W 52nd Avenue	10,576.67			
		QUANTITY TOTALS	217,114.22	66,253.20	155,987.33	62,305.01

G:\GIS_Data\Production_Maps\Public_Works\Streets\Maintenance\2024\24ST02_Surface Treatments.aprx



SHEET OF	24-ST-02 - 2024 Crack, Cape, Hot Chip, Slurry Seal Surface Treatments				PROJECT MANAGER C. BIDDLE DRAWN BY C. KELLEY DATE 10/16/2023				CITY OF ARVADA				Public Works Department Engineering Division 8101 Ralston Rd. Arvada, Colorado 80002 Phone 720-898-7640				NO. REVISION				DATE				BY			
	1												1															
	2												2															
	3												3															
	4												4															

SLURRY SEAL

Roadways with Pavement Markings and Striping

Street Name	From	To	Function Class - Collector and SY	Function Class - 2 Lane Arterial and SY	Function Class - Local and SY
Alta Vista					
Independence	Books Drive	W 66th Avenue	13,640.00		
W 59th Place	Ralston Road	Brooks Drive	703.33		
Brooks Drive	W 59th Place	Carr Street	22,120.00		
Garrison Street	Oberon Road	Ralston Road		14,832.89	
W 62nd Avenue	Independence Street	Garrison			4,310.00
Cole Drive	Garrison Street	Estes Street			4,270.00
Alta Vista Drive	Estes Street	Carr Street			4,460.00
Flower Street	Cole Drive	Brooks Drive			7,303.33
Field Street	Cole Drive	Brooks Drive			7,843.33
Everett Street	Cole Drive	Brooks Drive			7,623.33
W 61st Avenue	Garrison Street	Everett Street			2,600.00
Estes Court	Cole Drive	Brooks Drive			7,273.33
Estes Street	Oberon Road	Brooks Drive			8,013.33
W 60th Avenue	Everett Street	Dover Street			4,260.00
Dudley Court	Alta Visa	Brooks Drive			6,780.00
Dudley Street	Alta Visa	Brooks Drive			6,336.67
Dover Street	Alta Visa	Brooks Drive			5,923.33
Cody Street	Alta Visa	Brooks Drive			5,243.33
W 61st Avenue	Dover Street	Carr Street			1,616.67
W 73rd Place	Kipling Street	West to End			11,001.67
W 78th Avenue	Kipling Street	Nelson Street			-
W 79th Place/Nelson Street	Newman Street	W 77th Place			5,402.78
W 84th Avenue/Newcombe Street	Simms Street	W 86th Parkway			-
Candelight					13,167.78
W 59th Place	W 59th Drive	W 69th Drive			3,925.33
W 59th Drive	Eldridge	Braun Way			3,872.00
Braun Way	North and South End	End of Culdesacs			1,586.67
Cole Way	W 59th Drive	W 58th Drive			2,912.00
W 58th Place	W 59th Drive	W 59th Avenue			3,210.67
W 59th Avenue	W 59th Drive	Cole Way			2,306.67
W 58th Drive	Cole Way	End of Culdesacs			936
		QUANTITY TOTALS	36,463.33	14,832.89	135,908.78

Cape Seal

Street Name	From	To	Function Class - Local and SY
W 71st Avenue	Hackberry Hill Road	Saulsbury Street	2,460.00
Saulsbury Circle	W 71st Pl	End of Culdesac	830.00
Reed Court	W 72nd Avenue	W71st Place	700.00
Quay St/W 71st Pl/Saulsbury St	W 70th Avenue	W 70th Avenue	5,510.00
Reed Circle	W 71st Avenue	End of Culdesac	566.67
Quay Circle	W 71st Avenue	End of Culdesac	700.00
W 71st Avenue	Saulsbury Street	Pierce Street	3,870.00
Reed Court	W 71st Avenue	W 70th Avenue	1,920.00
Reed Street	W 71st Avenue	W 70th Avenue	1,933.33
Quay Street	W 71st Avenue	W 70th Avenue	1,950.00
W 70th Avenue	Saulsbury Street	Pierce Street	3,896.67
Saulsbury Street/W 68th Place	W 70th Avenue	Quay Ct	5,003.33
Quay Court	W 70th Avenue	W 68th Avenue	5,193.33
W 69th Place	Quay Ct	Pierce Street	2,523.33
Quay Street/W 68th Place	W 69th Place	Pierce Street	3,976.67
W 69th Avenue	Quay Ct	Pierce Street	2,233.33
W 69th Avenue	Teller Ct	Saulsbury Street	856.67
Teller Court/W 68th Place	W 71st Avenue	Upham Street	6,736.67
Upham Street	W 71st Avenue	W 68th Avenue	6,683.33
W 70th Avenue	Saulsbury	End of Culdesac	4,086.67
Vance Street	W 70th Avenue	End of Culdesac	493.33
W 69th Avenue	Wadsworth Blvd	Upham Street	2,480.00
Webster Street	W 69th Place	W 69th Avenue	1,953.33
Vance Street/W 69th Place	Wadsworth Blvd	W 68th Avenue	5,786.67
		QUANTITY TOTALS	72,343.33

CRACK.MASTIC.PATCHING

Street Name	From	To	Function Class - Local and SY
SKYLINE ESTATES			
W 55th Lane	Parfet St	West to end	4,347.00
Quail Court	W 55th Lane	W 54th Lane	1,272.00
Quail Street	W 55th Lane	W 54th Lane	1,554.00
W 55th Place	Quail Street	End	915.00
W 54th Lane	Parfet St	West to end	3,684.00
W 54th Avenue (two sides seperated by Median)	Parfet St	End of W 54th Avenue (turns into W 54th Dr.	5,580.00
Parfet Street	West 58th Place	South to End	8,811.00
W 56th Place	Parfet St	Miller Street	1,092.00
W 56th Place/Miller Street (confirm boundary w/WR)	Kipling Parkway	Ridge Road	12,600.00
W 55th Drive	Lewis Street	End	2,922.00
W 55th Drive (partially concrete)	W 55th Drive	W 56th Place	63.00
Lewis Street (partially concrete)	W 56th Place	W 55th Lane	1,800.00
W 55th Place	Miller Street	Lewis Street	1,182.00
W 55th Lane	W 55th Place	End	2,400.00
Lewis Court	Lewis Street	W 55th Lane	990.00
W 54th Lane/Oak Court	Parfet St	Parfet St	5,331.00
Oak Court - cul de sac	Oak Ct	End	480.00
W 54th Place	East and West Bound	End to End	5,301.00
Oak Street	W 54th Avenue	W 54th Place	576.00
Nelson Street	W 54th Avenue	W 54th Place	663.00
W 54th Ave - culdesac	W 54th Avenue	End	315.00
W 54th Avenue	Parfet St	Miller Street	5,850.00
Owens Street	W 54th Avenue	W 53rd Avenue	2,940.00
Oak Court	W 54th Avenue	W 53rd Avenue	2,718.00
W 53rd Avenue	Parfet Street	Oak Street	1,788.00
Oak Street	Ridge Road	W 53rd Avenue	945.00
		QUANTITY TOTALS	76,119.00



CITY OF ARVADA

PURCHASING DIVISION
FACSIMILE: 720-898-7098 ▲ TDD: 720-898-7869
PHONE: 720-898-7099

REQUEST FOR PROPOSALS- ADDENDUM No. 1

Proposal #: 23-PW-095

Title: Surface Treatments - Street Crack, Chip & Slurry Seal (24-ST-02)

Addendum #: 1

Today's Date: 11/14/2023

Proposals Due By: 11/16/2023 - **2:00 PM** MDT (NO CHANGE)

Questions Deadline: 11/09/2023 - **2:00 PM** MDT (NO CHANGE)

Solicitation and all related addenda and communications are available at WWW.BIDNETDIRECT.COM.

The following clarifications are provided to be incorporated into the Request for Proposals.
All other information shall remain unchanged.

Questions/Answers:

Q1 - In the Prebid meeting it was stated that alternate bid items may be used at some point during the multi-year contract. Will bids that do not include pricing for all the alternate bid items be considered non-responsive?

A1 - Bids that do not include pricing for alternate bid items will be considered non-responsive. The award will be based on the Total of the base bid and alternate.

Q2 - Will the project be awarded on the base bid alone or on a combination of the base bid and the alternate bid combined?

A2 - The project will be awarded based upon the **TOTAL AMOUNT** which is the sum of the Base Bid Total and Alternate

Q3 - Bid Item 7 Removal of Pavement Markings has a quantity of 11,000 linear feet. Since this item includes nonlinear removals, such as stop bars, crosswalks and arrows can the City change LF to SF for removal of pavement markings? If not, what width should contractors base the 11,000 lineal feet of removals on?

A3 - Bid Item 7 - Removal of Pavement Markings. This line item is as it relates to Pavement Lane Markings (Striping). It does not include nonlinear removals, such as stop bars, crosswalks and arrow. The Unit will remain as LF.

Q4 - Bid items 11 through 17 calls for Thermoplastics to be inlaid. Inlaying thermoplastics is not an industry standard for Slurry Seal, Chip Seals and Cape Seals. Grinding of freshly placed emulsions will produce an adhesion failure and compromise the seal's ability to protect the asphalt. In general, we have not seen the necessity to inlay thermoplastics on surface treatments. Please advise on how this item should be bid.

A4 - Bid Items 11 through 17 calling for Thermoplastics to be inlaid. This bid item's intent of Bid Items 11 through 17 is, if the City's Traffic Department directs the current pavement markings to be replaced or additional pavement markings are directed to be installed **BEFORE** the Slurry Seal, Chip Seal and Cape Seal Treatment. Any existing thermoplastic Pavement Markings will be protected by covering during the treatment process. Protective covering will be removed thereafter. The cost to protect the pavement markings during construction is to be included in the pay item for the specified treatment.



CITY OF ARVADA

PURCHASING DIVISION

FACSIMILE: 720-898-7098 ▲ TDD: 720-898-7869

PHONE: 720-898-7099

Q&A CONTINUED –

Q5 - Is Reclamite an approved rejuvenating agent for Line Item 6 Rejuvenating Agent?

A5 - The Rejuvenating Agent must meet the CDOT Standards and Specifications for Rejuvenating Agents - Reference CDOT Standards and Specifications Section 407 and Section 702 as specified in the bid documents under Asphalt Rejuvenating Agent

Q6 - Bid schedule items 11-17, can we use Preformed Thermoplastic materials to install markings.

A6 - Reference the City of Arvada Engineering Code of Standards and Specifications 2023 to present - specifically Section 732.00 Pavement Markings. The link to the Engineering Code of Standards and Specifications is: <https://library.municode.com/co/arvada/munidocs/munidocs?nodeId=633ed8dc0663b>

Q7 - If yes, to Question 6 - does City of Arvada require 90 mil or 125 mil materials

A7 - Reference the City of Arvada Engineering Code of Standards and Specifications 2023 to present - specifically Section 732.00 Pavement Markings. The link to the Engineering Code of Standards and Specifications is: <https://library.municode.com/co/arvada/munidocs/munidocs?nodeId=633ed8dc0663b>

Q8 - Bid Schedule items 11-17 reference "Inlayed" markings. Groove inlay on chip seal would damage surface to the extent of removing the new chip surface. Can the preformed thermoplastic markings be surface applied?

A8 - Bid Items 11 through 17 calling for Thermoplastics to be inlayed. This bid item's intent of Bid Items 11 through 17 is, if the City's Traffic Department directs the current pavement markings to be replaced or additional pavement markings are directed to be installed BEFORE the Slurry Seal, Chip Seal and Cape Seal Treatment. Any existing thermoplastic Pavement Markings will be protected by covering during the treatment process. Protective covering will be removed thereafter. The cost to protect the pavement markings during construction is to be included in the pay item for the specified treatment.

End of Q&A - Addendum #1

Exhibit B

An Agreement By And Between The City Of Arvada And
A-1 Chipseal Co. For 2024 Surface Treatment Program,
Project No. 24-ST-02, In An Amount Not To Exceed
\$3,147,254.08

BID BOND

We, the undersigned A-1 Chipseal Company as Principal, and Western Surety Company as Surety, are hereby held and firmly bound unto the City of Arvada, Colorado, in the penal sum of Five Percent of Amount Bid---(5%--) for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

THE CONDITION of this obligation is such that whereas the Principal has submitted to the City of Arvada, Colorado the accompanying Bid Proposal, and hereby made a part hereof to enter into a Contract Agreement for the construction of City of Arvada Project No. 24- ST-02. Hot Chip, Slurry, Cape and Crack Seal - 2024 Surface Treatment Program

WHEREAS, the City, as a condition for receiving said Bid Proposal, requires the Principal to deposit with the City a Bid Proposal Guaranty, equivalent to not less than 5 Percent of the amount of said Bid Proposal.

NOW THEREFORE,

- (A) If said Bid Proposal shall be rejected; or in the alternate,
- (B) If said Bid Proposal shall be accepted and the Principal shall execute and deliver a Contract Agreement (properly completed in accordance with said Bid Proposal) and shall furnish a Performance and Payment Bond upon the forms prescribed by the City for the faithful performance of said Contract; and for the payment of all persons performing labor or furnishing materials in connection therewith; and shall in all other respects perform the agreement created by the acceptance of said Bid Proposal;

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

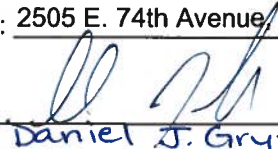
The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the City may accept such Bid and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, this 16th day of November, 2023, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL

Name: A-1 Chipseal Company

Address: 2505 E. 74th Avenue, Denver, CO 80229

By: 

Title: President

SURETY

Western Surety Company

151 N. Franklin Street, Chicago, IL 60606

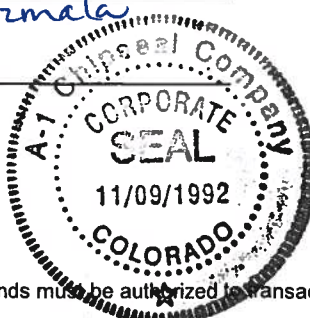
By: 

Jody L. Anderson

Title: Attorney-In-Fact

Attorney-in-Fact:

(SEAL)



NOTE: Surety Companies executing bonds must be authorized to transact business in the State of Colorado and be acceptable to the City.

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

Evan E Moody, Karen A Feggestad, Bradley J Moody, Tina Marie Post, Jody L Anderson, Elizabeth Ostblom, Andrew J Waterbury, Individually

of Denver, CO, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law and Resolutions printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 26th day of June, 2023.



WESTERN SURETY COMPANY

Larry Kasten, Vice President

State of South Dakota }
County of Minnehaha } ss

On this 26th day of June, 2023, before me personally came Larry Kasten, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is a Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires

March 2, 2026



M. Bent, Notary Public

CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law and Resolutions of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 16th day of November, 2023



WESTERN SURETY COMPANY

L. Nelson, Assistant Secretary

Authorizing By-Laws and Resolutions

ADOPTED BY THE SHAREHOLDERS OF WESTERN SURETY COMPANY

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the shareholders of the Company.

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, and Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

This Power of Attorney is signed by Larry Kasten, Vice President, who has been authorized pursuant to the above Bylaw to execute power of attorneys on behalf of Western Surety Company.

This Power of Attorney may be signed by digital signature and sealed by a digital or otherwise electronic-formatted corporate seal under and by the authority of the following Resolution adopted by the Board of Directors of the Company by unanimous written consent dated the 27th day of April, 2022:

“RESOLVED: That it is in the best interest of the Company to periodically ratify and confirm any corporate documents signed by digital signatures and to ratify and confirm the use of a digital or otherwise electronic-formatted corporate seal, each to be considered the act and deed of the Company.”

BID PROPOSAL

TO: City of Arvada, Colorado (hereinafter called "CITY").

FROM: A-1 Chipseal Co. (hereinafter called "BIDDER"), organized and existing under the laws of the State of Colorado doing business as (a corporation), (a partnership), (an individual).

The Bidder, in compliance with your Advertisement for Bids, hereby proposes to perform all Work in strict accordance with the Contract Documents, for the construction of City of Arvada Project No. 24-ST-02 entitled **2024 Hot Chip, Slurry, Cape and Crack Seal Surface Treatment Program** within the time set forth therein, and at the prices stated on the included Bid Schedule as totaled herein.

By submission of this Bid Proposal, each Bidder certifies, and in the case of a joint venture each party thereto certifies as to his/her own organization, that this Bid Proposal has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid Proposal with any other Bidder or with any competitor.

Bidder acknowledges receipt of **Addendum Nos. 1** Initials: 07

Bidder states that their:

Major Material Suppliers are:

Black Rock Material & Supply

Material They Will Supply

Aggregate, Crack Seal, Emulsion

Major Subcontractors are:

Vance Brothers

Road Safe

Trinity Traffic

Alpha Milling

Work They Will Perform

Rejuvenating Agent

Striping

Traffic Control

Milling

CONTRACT TIME AND LIQUIDATED DAMAGES: All work shall be completed, including clean-up, within **270** working days after the date to be specified in the Notice to Proceed. A Notice to Proceed is anticipated to be issued on or about March 1, 2024. The bidder shall agree to pay the owner the sum of \$3,300 for each calendar day that the work exceeds the allotted contract time. Contract time may be adjusted by Change Order.

Total from included Bid Schedule:

TOTAL BID \$ 3,147,254.08

SUBMITTED BY:

Company Name: A-1 Chipseal Co.

Contact Names: Dennis Martinez

Address: 2505 E. 74th Ave., Denver, CO 80229

Phone: (303) 464-9267 Email(s): dennism@asphaltrepair.com

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the Contractor;
- He/she has read all Terms and Conditions and technical specifications made available in conjunction with this solicitation and fully accept and acknowledge this bid is consistent with the specifications and terms and conditions.
- The bid is in all respects fair, without outside collusion or otherwise illegal action.

By: [Signature]
Signature of Authorized Agent

Daniel J. Gryzmala

Typed/Printed Name of Agent

11/16/2023

Date

President

Title of Agent

84-1216817

FEIN

dgryzmala@a-1chipseal.com

Agent email



PAYMENT TERMS: The City standard is net thirty (30) days but every effort is made to meet net fifteen (15) days after the approved partial payment date when the contractor is satisfactorily performing the contract. The final 5% of total payment will be paid once the contract is completed satisfactorily, advertisement for final settlement is complete, and the project is accepted by the City. Payment is the date of the check mailing or date of the credit card transaction.

BID SCHEDULE

City of Arvada CSB 23-PW-095 (Project No. 24-ST-02)

Hot Chip, Slurry, Cape and Crack Seal Surface 2024 Treatment Program



A-1 Chipseal Co.
Contractor

11/16/2023
Date

Daniel J. Gryzmala
Prepared By

ITEM	BASE BID DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENSION
Roadway Items					
1	Slurry Seal Type II	187,205	SY	\$3.17	\$593,439.85
2	Cape Seal	72,343	SY	\$7.61	\$550,530.23
3	Crack Seal	150,000	LBS	\$2.53	\$379,500.00
4	Wide Crack Seal (Mastic)	10,000	LBS	\$2.95	\$29,500.00
5	4" HMA Asphalt Patching	5,000	SY	\$80.56	\$402,800.00
6	Rejuvenating Agent	22,000	SY	\$3.60	\$79,200.00
Pavement Markings					
7	Removal of Pavement Marking	11,000	LF	\$3.35	\$36,850.00
8	Temporary Raised Pavement Markers	1	LS	\$500.00	\$500.00
9	Epoxy Pavement Marking	60	GAL	\$325.00	\$19,500.00
10	Epoxy Pavement Marking Mobilization	1	EA	\$10,000.00	\$10,000.00
11	Inlayed Thermoplastic (Crosswalk, Stop Bar)	3,356	SF	\$17.00	\$57,052.00
12	Inlayed Thermoplastic (Shark Teeth)	3	EA	\$355.00	\$1,065.00
13	Inlayed Thermoplastic (Turn Arrow)	8	EA	\$500.00	\$4,000.00
14	Inlayed Thermoplastic (Straight Arrow)	23	EA	\$475.00	\$10,925.00
15	Inlayed Thermoplastic (Sharrow)	18	EA	\$550.00	\$9,900.00
16	Inlayed Preformed Thermoplastic (Bike Symbol without Bike Lane Arrow)	2	EA	\$385.00	\$770.00
17	Inlayed Preformed Thermoplastic (Bike Symbol with Straight Bike Lane Arrow)	32	EA	\$560.00	\$17,920.00
Traffic Control					
18	Portable Variable Message Sign	1	DAY	\$75.00	\$75.00
19	Arrow Board	40	DAY	\$50.00	\$2,000.00
20	Traffic Control Management	60	DAY	\$1,420.00	\$85,200.00
21	Flagging	960	HR	\$38.00	\$36,480.00
22	Uniformed Traffic Control	300	HR	\$79.50	\$23,850.00
23	Uniformed Traffic Control Vehicle	300	HR	\$23.32	\$6,996.00
Lump Sum Items					
24	Traffic Control Devices	1	LS	\$6,500.00	\$6,500.00
25	Stormwater Management/Erosion Control	1	LS	\$6,500.00	\$6,500.00
26	Citizen Notification	1	LS	\$1,000.00	\$1,000.00
27	Mobilization	1	LS	\$52,500.00	\$52,500.00
28	Minor Contract Revisions	1	LS	\$1.00	\$1.00
BASE BID				TOTAL	\$2,424,554.08
ALTERNATE					
29	Hot Chip Seal	25,000	SY	\$11.00	\$275,000.00
30	Edge Milling	30,000	LF	\$1.60	\$48,000.00
31	Chip Seal Type II (1/4")	50,000	SY	\$4.36	\$218,000.00
32	Chip Seal Type III (3/8")	20,000	SY	\$4.46	\$89,200.00
33	Microsurfacing	25,000	SY	\$3.70	\$92,500.00
ALTERNATE				TOTAL	\$722,700.00
BASE BID + ALTERNATE				TOTAL	\$3,147,254.08

* City of Arvada Measurement and Basis of Payment number and/Project Special Provisions and/or modified detail
Payment will be based upon actual quantities performed

* Minor Contract revisions entered as \$1.00 to confirm responsiveness. City directs Minor Contract Revision based on budget pricing.



REQUIRED CONTRACTOR SUBMITTAL FORM

SUBMITTAL CHECKLIST:

Bid Proposals shall be submitted in the order listed below with each section clearly identified. **Missing information or required documents may result in submission being deemed non-responsive.**

- ☒ Submit completed City Submittal Forms including this sheet, Bid Bond, Bid Proposal, Bid Schedule, Performance Measures Form, and any other attachments requested.
- ☒ Submit implementation timeline and warranties, if applicable.
- ☒ Attach Contractor's Licensing, if applicable.
- ☒ Insurance – Checking this box accepts that the insurance requirements listed by the City are acceptable.
- ☒ Please initial to acknowledge Addenda, if any, have been considered in your proposal: #1 ✓ #2 _____ #3 _____

REFERENCES:

- ☒ Check here if Contractor'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: _____

VENDOR NAME: A-1 Chipseal Co.

SOLICITATION #: 23-PW-095

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 the City will monitor and report on the Vendor's 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 be evaluated by the City per these defined metrics 2 months prior to contract renewal.
- The department will review with the vendor any measures needing improvement.

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. A-1 Chipseal Co. will submit monthly pay applications by the 5th day following month end.
2.

(b) Punctuality/Responsiveness

Example Measure: Reporting of project status will occur monthly with the City and consultant's Project Manager.

1. A-1 Chipseal Co. will submit completed quantities the next business day.
2. Schedule will be provided at pre-construction meeting and updated weekly as necessary.

(c) Quality/Reliability

Example Measure: Revisions are drafted within two weeks, and no more than 3 revisions prior to final draft.

1. A-1 Chipseal Co. will address any issues within 7 business days.
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. A-1 Chipseal Co. sends communications 100% via email to reduce paper.
2. A-1 Chipseal Co. recycles paper in our offices.
A-1 Chipseal Company utilizes digital job files to reduce paper consumption.

Performance measures will be queried for every year of the contract. Performance measures reporting will be considered when renewing or awarding a contract with a vendor.

A-1 Chipseal Co.

50 Largest Jobs

2018 - 2022

Initial Contract \$ Amount	Final Contract \$ Amount	Self-Performed \$ Value	Project Name	Owner's Name, Address, Contact Name & Phone No.	Project Description	Completion Date	Liquidated Damages
\$ 1,277,477.27	\$ 1,218,325.95	\$ 1,209,683.95	Adams County Gravel Chip	Adams County 4430 S. Adams County Parkway Brighton, CO 806018212 Liz Estrada (720) 523-6052	Chip Seal	10/31/22	No
\$ 987,736.51	\$ 775,488.92	\$ 715,155.93	Adams County Slurry Seal	Adams County 4430 S. Adams County Parkway Brighton, CO 806018212 Liz Estrada (720) 523-6052	Slurry Seal	11/30/22	No
\$ 887,461.40	\$ 740,602.30	\$ 709,181.30	Adams County	Adams County 4430 S. Adams County Parkway Brighton, CO 806018212 Liz Estrada (720) 523-6052	Asphalt, Slurry, Crack Seal	09/30/21	No
\$ 794,394.00	\$ 782,239.57	\$ 747,503.19	Adams County 2019 Seal Program	Adams County 4430 S. Adams County Parkway Brighton, CO 806018212 Liz Estrada (720) 523-6052	Asphalt, Chip Seal, Crack Seal, Slurry Seal	03/27/20	No
\$ 3,986,575.80	\$ 4,982,533.35	\$ 4,309,982.80	Denver 2020 Chipseal Program	City & County of Denver 201 W. Colfax Ave. Dept 908 Denver, CO 80202 Accounts Payable (303) 446-3466	Chip Seal, Crack Seal	12/31/20	No
\$ 1,150,902.18	\$ 1,019,018.97	\$ 680,568.52	City of Arvada	City of Arvada P.O. Box 8101 Arvada, CO 800018101 Christopher Yaney (720) 898-7730	Chip Seal, Crack Seal, Slurry Seal	12/31/22	No
\$ 2,752,957.27	\$ 2,752,356.67	\$ 2,584,776.58	Aurora 2020 Surface Treatment	City of Aurora 15740 E 32nd Ave Aurora, CO 80011 Raul Griego (303) 326-8208	Asphalt, Chip Seal, Slurry Seal, Crack Seal	12/18/20	No
\$ 2,436,601.38	\$ 2,548,099.72	\$ 2,495,402.71	City of Aurora	City of Aurora 15740 E 32nd Ave Aurora, CO 80011 Raul Griego (303) 326-8208	Asphalt, Chip Seal, Slurry Seal, Crack Seal	12/28/18	No
\$ 2,263,994.02	\$ 2,267,866.27	\$ 2,200,415.72	Aurora 2019 Surface Trmt Proj	City of Aurora 15740 E 32nd Ave Aurora, CO 80011 Raul Griego (303) 326-8208	Asphalt, Chip Seal, Slurry Seal, Crack Seal	12/13/19	No
\$ 1,950,995.29	\$ 1,960,414.46	\$ 1,821,644.68	City of Aurora	City of Aurora 15740 E 32nd Ave Aurora, CO 80011 Raul Griego (303) 326-8208	Asphalt, Chip Seal, Slurry Seal, Crack Seal	11/30/21	No

A-1 Chipseal Co.

50 Largest Jobs

2018 - 2022

Initial Contract \$ Amount	Final Contract \$ Amount	Self-Performed \$ Value	Project Name	Owner's Name, Address, Contact Name & Phone No.	Project Description	Completion Date	Liquidated Damages
\$ 3,321,849.51	\$ 2,900,967.07	\$ 1,644,216.26	City of Brighton	City of Brighton 22 South 4th Ave Brighton, CO 80601 Bill Allen (303) 655-2036	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	08/31/22	No
\$ 3,202,015.00	\$ 3,195,946.19	\$ 2,031,599.84	Brighton 2020 Street Project	City of Brighton 22 South 4th Ave Brighton, CO 80601 Bill Allen (303) 655-2036	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	09/24/21	No
\$ 1,928,396.51	\$ 2,387,706.16	\$ 1,531,078.39	Brighton 2019 Street Project	City of Brighton 22 South 4th Ave Brighton, CO 80601 Bill Allen (303) 655-2036	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	09/30/20	No
\$ 1,577,971.21	\$ 1,566,377.97	\$ 1,171,593.25	Brighton 2018 St Pres. Proj	City of Brighton 22 South 4th Ave Brighton, CO 80601 Bill Allen (303) 655-2036	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	11/30/18	No
\$ 3,544,870.05	\$ 3,764,955.26	\$ 2,615,001.33	City of Broomfield	City of Broomfield One DesCombes Drive Broomfield, CO 80020 Justin Mundt (303) 464-5675	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	12/18/21	No
\$ 3,102,258.81	\$ 3,118,662.39	\$ 1,888,354.48	City of Broomfield	City of Broomfield One DesCombes Drive Broomfield, CO 80020 Justin Mundt (303) 464-5675	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	12/31/22	No
\$ 2,972,122.78	\$ 2,900,967.04	\$ 1,644,216.23	Broomfield 2019 Street Project	City of Broomfield One DesCombes Drive Broomfield, CO 80020 Justin Mundt (303) 464-5675	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	12/13/19	No
\$ 2,891,822.38	\$ 2,943,354.06	\$ 1,653,424.70	Broomfield 2018 Street Project	City of Broomfield One DesCombes Drive Broomfield, CO 80020 Justin Mundt (303) 464-5675	Asphalt, Chipseal, Crack Seal, Slurry Seal, Concrete, Hot Chip Seal	11/14/18	No
\$ 2,848,940.52	\$ 2,427,400.02	\$ 2,369,626.55	City of Colorado Springs	City of Colorado Springs PO Box 1575 - MC 240 Colorado Springs, CO 80915 Kathryn Livingston (719) 385-6813	Chip Seal	11/30/20	No
\$ 2,015,159.19	\$ 2,116,316.73	\$ 2,109,093.47	Colorado Springs Chipseal	City of Colorado Springs PO Box 1575 - MC 240 Colorado Springs, CO 80915 Kathryn Livingston (719) 385-6813	Chip Seal	11/30/18	No

A-1 Chipseal Co.
50 Largest Jobs
2018 - 2022

Initial Contract \$ Amount	Final Contract \$ Amount	Self-Performed \$ Value	Project Name	Owner's Name, Address, Contact Name & Phone No.	Project Description	Completion Date	Liquidated Damages
\$ 1,676,136.73	\$ 1,655,735.90	\$ 1,640,237.90	Colorado Springs	City of Colorado Springs PO Box 1575 - MC 240 Colorado Springs, CO 80915 Kathryn Livingston (719) 385-6813	Chip Seal	11/30/22	No
\$ 1,568,164.61	\$ 1,536,037.21	\$ 1,511,192.38	City of Colorado Springs	City of Colorado Springs PO Box 1575 - MC 240 Colorado Springs, CO 80915 Kathryn Livingston (719) 385-6813	Chip Seal	10/15/21	No
\$ 1,395,258.56	\$ 1,363,218.50	\$ 1,347,671.10	Colorado Springs 2020 Crackseal	City of Colorado Springs PO Box 1575 - MC 240 Colorado Springs, CO 80915 Kathryn Livingston (719) 385-6813	Crack Seal	01/11/21	No
\$ 798,911.10	\$ 1,601,078.40	\$ 1,581,682.73	Colorado Springs Crackseal	City of Colorado Springs PO Box 1575 - MC 240 Colorado Springs, CO 80915 Kathryn Livingston (719) 385-6813	Crack Seal	12/28/18	No
\$ 2,213,463.61	\$ 2,005,647.53	\$ 2,001,597.49	Ft Collins 2018 Surface Prog	City of Fort Collins 281 N. College Ave. Fort Collins, CO 80522 Stan Welsch - Finance Debbie D (970) 416-2091	Chip Seal, Slurry Seal	10/26/18	No
\$ 2,016,965.01	\$ 1,946,568.40	\$ 1,926,478.94	City of Fort Collins	City of Fort Collins 281 N. College Ave. Fort Collins, CO 80522 Stan Welsch - Finance Debbie D (970) 416-2091	Chip Seal, Slurry Seal	10/31/22	No
\$ 1,798,562.21	\$ 1,670,322.71	\$ 1,644,814.21	City of Fort Collins	City of Fort Collins 281 N. College Ave. Fort Collins, CO 80522 Stan Welsch - Finance Debbie D (970) 416-2091	Chip Seal, Slurry Seal	07/31/21	No
\$ 1,759,196.39	\$ 1,639,711.84	\$ 1,635,302.06	Ft Collins 2019 Asphalt Progra	City of Fort Collins 281 N. College Ave. Fort Collins, CO 80522 Stan Welsch - Finance Debbie D (970) 416-2091	Chipseal, Slurry Seal, Patching	09/27/19	No
\$ 803,677.55	\$ 775,480.68	\$ 755,501.78	Ft Collins - 2020 Capaseal	City of Fort Collins 281 N. College Ave. Fort Collins, CO 80522 Stan Welsch - Finance Debbie D (970) 416-2091	Chip Seal, Slurry Seal	11/30/20	No
\$ 1,036,792.56	\$ 1,061,598.74	\$ 1,054,662.42	Greeley 2019 Chip/Slurry Prog	City of Greeley 1000 10th Street Greeley, CO 80631 Pat Hill (970) 350-9450	Chip Seal, Slurry Seal	12/13/19	No

A-1 Chipseal Co.
50 Largest Jobs
2018 - 2022

Initial Contract \$ Amount	Final Contract \$ Amount	Self-Performed \$ Value	Project Name	Owner's Name, Address, Contact Name & Phone No.	Project Description	Completion Date	Liquidated Damages
\$ 1,032,544.30	\$ 915,197.37	\$ 914,411.97	Loveland Chipseal Project	City of Loveland 500 East Third Loveland, CO 80537 Heather Ramseyer - AP (970) 962-2310	Chip Seal	09/11/16	No
\$ 840,002.02	\$ 795,175.22	\$ 787,015.44	Loveland 2020 Chipseal Project	City of Loveland 500 East Third Loveland, CO 80537 Heather Ramseyer - AP (970) 962-2310	Chip Seal	07/31/20	No
\$ 1,428,079.40	\$ 1,383,193.26	\$ 1,139,622.75	City of Montrose	City of Montrose 433 S First Street Montrose, CO 81402 Ryan Cushman (970) 240-1485	Chip Seal, Slurry Seal	09/30/22	No
\$ 1,644,815.75	\$ 1,604,516.82	\$ 523,793.74	City of Westminster	City of Westminster 6575 West 88th Ave. Westminster, CO 80030 Barb - Finance A/P NET 30 days (303) 658-2522	Hot Chip Seal	07/31/22	No
\$ 839,138.86	\$ 967,741.18	\$ 293,622.05	Westminster 2019 Chipseal	City of Westminster 6575 West 88th Ave. Westminster, CO 80030 Barb - Finance A/P NET 30 days (303) 658-2522	Hot Chip Seal	10/21/19	No
\$ 1,726,505.86	\$ 1,693,239.59	\$ 957,934.56	CDOT Region 4 Overlay Project	Colorado Dept. of Transport. 4201 E. Arkansas Room 158 Denver, CO 80222 Rick (720) 299-5552	Chip Seal	08/31/21	No
\$ 1,259,554.50	\$ 1,092,812.46	\$ 991,269.78	CDOT Proj #MTCA R100	Colorado Dept. of Transport. 4201 E. Arkansas Room 158 Denver, CO 80222 Rick (720) 299-5552	Chip Seal	11/30/18	No
\$ 1,096,643.82	\$ 1,058,920.07	\$ 896,287.10	CDOT State Highway 72B	Colorado Dept. of Transport. 4201 E. Arkansas Room 158 Denver, CO 80222 Rick (720) 299-5552	Chip Seal	09/30/22	No
\$ 976,099.32	\$ 900,377.60	\$ 773,330.94	CDOT - Chipseal	Colorado Dept. of Transport. 4201 E. Arkansas Room 158 Denver, CO 80222 Rick (720) 299-5552	Chip Seal	07/13/18	No
\$ 936,398.01	\$ 838,425.70	\$ 606,981.53	CDOT US 24 Alamosa	Colorado Dept. of Transport 3803 N Main Ave Suite 100 Durango, CO 81301 Darrell Wells (970) 398-3626	Chip Seal	06/29/20	No

A-1 Chipseal Co.

50 Largest Jobs

2018 - 2022

Initial Contract \$ Amount	Final Contract \$ Amount	Self-Performed \$ Value	Project Name	Owner's Name, Address, Contact Name & Phone No.	Project Description	Completion Date	Liquidated Damages
\$ 978,670.62	\$ 995,206.92	\$ 992,557.74	Pueblo County	Pueblo County 33601 United Ave Pueblo, CO 81001 Larim Ayoub (719) 569-1633	Chip Seal, Slurry Seal	07/31/22	No
\$ 1,215,621.87	\$ 1,244,884.99	\$ 1,084,400.20	Erie 2018 Street Maint Project	Town of Erie P.O. Box 750 Erie, CO 80516 Frank McIlwain (303) 926-2883	Asphalt, Chip Seal, Crack Seal,	12/10/18	No
\$ 949,999.99	\$ 949,984.50	\$ 946,553.88	Town of Milliken	Town of Milliken 2951 Ash Street Milliken, CO 80543 Courtney Diller - Finance (970) 660-5048	Asphalt, Crack Seal, Slurry Seal	11/14/18	No
\$ 1,780,327.91	\$ 1,659,657.38	\$ 1,501,280.45	Town of Parker	Town of Parker 20120 E Mainstreet Parker, CO 80138 Ron Martinez (303) 805-3163	Asphalt, Chip Seal, Slurry Seal, Crack Seal	11/29/18	No
\$ 967,655.01	\$ 902,800.37	\$ 845,621.42	Weld County	Weld County 1150 O Street Greeley, CO 80631 Josh Holbrook (970) 304-6496	Slurry Seal/Sand Seal	10/15/21	No
\$ 967,146.20	\$ 912,630.03	\$ 864,891.66	Weld County	Weld County 1150 O Street Greeley, CO 80631 Josh Holbrook (970) 304-6496	Slurry Seal/Sand Seal	08/28/20	No
\$ 957,716.16	\$ 923,669.43	\$ 893,286.47	Weld County 2019 Slurry Seal	Weld County 1150 O Street Greeley, CO 80631 Josh Holbrook (970) 304-6496	Slurry Seal/Sand Seal	09/23/19	No
\$ 944,065.51	\$ 909,048.26	\$ 883,487.26	Weld County 2018 Program	Weld County 1150 O Street Greeley, CO 80631 Josh Holbrook (970) 304-6496	Slurry Seal/Sand Seal	10/26/18	No
\$ 820,881.34	\$ 741,979.60	\$ 718,959.80	Weld County	Weld County 1150 O Street Greeley, CO 80631 Josh Holbrook (970) 304-6496	Slurry Seal/Sand Seal	10/31/16	No



Timeline

A-1 Chipseal confirms work will be completed within the time allotted in the contract.

Task	Anticipated Days to Complete
Striping Removals	3
Chip Seal	2
Sweeping	2
Slurry Seal	10-12
Cape Seal	5-7
Crack Seal	55-60
Mastic	4-6
Patching	18-20
Striping	20
Milling	3
Fog Seal	1
Hot Chip Seal	3

Warranty

The warranty period for this project shall be two years in accordance with section SC-A-14 of the project specifications.



Public Works Department - Engineering Division
8101 Ralston Rd. Arvada, CO 80001

720-898-7640(Phone)

engineeringpermits@arvada.org
(email)
www.arvada.org

MUNICIPAL CONTRACTOR'S LICENSE CONTRACTOR RIGHT OF WAY AEC302

CONTRACTOR INFORMATION

A-1 CHIPSEAL CO
2505 E 74TH AVE
DENVER CO 80229

LICENSE INFORMATION

Expiration: 6/9/2024		
License Grades: MUNICIPAL GENERAL CONTRACTOR,		
Authorized Signers: TERRY HORTON RICK WHITFIELD DANIEL GRYZMALA JOSH KRUEGER SCOTT VOGL RUBEN MEDINA ROGELIO CONTRERAS		
Fee	Paid Amount	Paid Date
\$210.00	\$210.00	4/12/2023

Jenny Wolfschlag P.E.

Jenny Wolfschlag, P.E.
City Engineering

Contractor's Responsibilities:

***Notes Regarding Permits:

License and Permit: Municipal General Contractor License holder is the sole responsible party accountable for the work performed by subcontractors and is responsible for compliance with all city codes, specifications, and approved construction drawings.

Permittee: The municipal General Contractor is responsible for applying for and managing the permit. Subcontractors will perform their portion of the larger project under the supervision of the Municipal General Contractor and will no longer be required to obtain a separate city license or permit.

Work without a permit: Anyone working within City of Arvada R.O.W. without a valid permit shall be assessed a surcharge equal to twice the value of the required permit or \$250.00, whichever is larger.

Inspections: Inspections must be scheduled through arvadapermits.org by 7am on the day of inspection.

Trench Backfill: Trenches less than 50 feet in length shall be backfilled with a flowable fill material. Trenches longer than 50 feet shall be backfilled with a select material approved by the City prior to placement of backfill.

Traffic Control: A copy of the permit and the approved traffic control plan shall be on the project site at all times that work is being performed.

New Streets: If the street, or last maintenance of the street, is less than 3 years old, the contractor must have approval through the Public Works Director to cut the street in accordance with Arvada Code 78-308. If the street, or last maintenance of the street is between 4 and 5 years old, the required restoration work must be completed within 7 days in accordance with Arvada Code 78-307.

Failure to Comply: Failure to comply may result in a Stop Work Order, suspension/revocation of permit, or of license.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

01/24/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Moody Insurance Agency, Inc. 8055 East Tufts Avenue Suite 1000 Denver CO 80237	CONTACT NAME: Moody Insurance PHONE (A/C, No, Ext): (303) 824-6600 FAX (A/C, No): (303) 370-0118 E-MAIL ADDRESS: certrequest@moodyins.com														
INSURED A-1 Chipseal Company, DBA: Rocky Mountain Pavement, LLC 2505 E. 74th Ave Denver CO 80229-6621	<table><tr><th>INSURER(S) AFFORDING COVERAGE</th><th>NAIC #</th></tr><tr><td>INSURER A: Selective Insurance Co of America</td><td>12572</td></tr><tr><td>INSURER B: Pinnacol Assurance</td><td>41190</td></tr><tr><td>INSURER C: Evanston Insurance Company</td><td>35378</td></tr><tr><td>INSURER D:</td><td></td></tr><tr><td>INSURER E:</td><td></td></tr><tr><td>INSURER F:</td><td></td></tr></table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A: Selective Insurance Co of America	12572	INSURER B: Pinnacol Assurance	41190	INSURER C: Evanston Insurance Company	35378	INSURER D:		INSURER E:		INSURER F:	
INSURER(S) AFFORDING COVERAGE	NAIC #														
INSURER A: Selective Insurance Co of America	12572														
INSURER B: Pinnacol Assurance	41190														
INSURER C: Evanston Insurance Company	35378														
INSURER D:															
INSURER E:															
INSURER F:															

COVERAGES**CERTIFICATE NUMBER:** 23-24 Master**REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS														
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☒ PRO-JECT ☐ LOC OTHER:			S2501487	02/01/2023	02/01/2024	<table><tr><td>EACH OCCURRENCE</td><td>\$ 1,000,000</td></tr><tr><td>DAMAGE TO RENTED PREMISES (Ea occurrence)</td><td>\$ 500,000</td></tr><tr><td>MED EXP (Any one person)</td><td>\$ 15,000</td></tr><tr><td>PERSONAL & ADV INJURY</td><td>\$ 1,000,000</td></tr><tr><td>GENERAL AGGREGATE</td><td>\$ 2,000,000</td></tr><tr><td>PRODUCTS - COMP/OP AGG</td><td>\$ 2,000,000</td></tr><tr><td></td><td>\$</td></tr></table>	EACH OCCURRENCE	\$ 1,000,000	DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 500,000	MED EXP (Any one person)	\$ 15,000	PERSONAL & ADV INJURY	\$ 1,000,000	GENERAL AGGREGATE	\$ 2,000,000	PRODUCTS - COMP/OP AGG	\$ 2,000,000		\$
EACH OCCURRENCE	\$ 1,000,000																				
DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 500,000																				
MED EXP (Any one person)	\$ 15,000																				
PERSONAL & ADV INJURY	\$ 1,000,000																				
GENERAL AGGREGATE	\$ 2,000,000																				
PRODUCTS - COMP/OP AGG	\$ 2,000,000																				
	\$																				
A	☒ AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ OWNED AUTOS ONLY ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ONLY ☐ NON-OWNED AUTOS ONLY			S2501487	02/01/2023	02/01/2024	<table><tr><td>COMBINED SINGLE LIMIT (Ea accident)</td><td>\$ 1,000,000</td></tr><tr><td>BODILY INJURY (Per person)</td><td>\$</td></tr><tr><td>BODILY INJURY (Per accident)</td><td>\$</td></tr><tr><td>PROPERTY DAMAGE (Per accident)</td><td>\$</td></tr><tr><td>Uninsured motorist</td><td>\$ 1,000,000</td></tr></table>	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000	BODILY INJURY (Per person)	\$	BODILY INJURY (Per accident)	\$	PROPERTY DAMAGE (Per accident)	\$	Uninsured motorist	\$ 1,000,000				
COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000																				
BODILY INJURY (Per person)	\$																				
BODILY INJURY (Per accident)	\$																				
PROPERTY DAMAGE (Per accident)	\$																				
Uninsured motorist	\$ 1,000,000																				
A	☒ UMBRELLA LIAB ☒ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE DED ☒ RETENTION \$ \$0			S2501487	02/01/2023	02/01/2023	<table><tr><td>EACH OCCURRENCE</td><td>\$ 10,000,000</td></tr><tr><td>AGGREGATE</td><td>\$ 10,000,000</td></tr><tr><td></td><td>\$</td></tr></table>	EACH OCCURRENCE	\$ 10,000,000	AGGREGATE	\$ 10,000,000		\$								
EACH OCCURRENCE	\$ 10,000,000																				
AGGREGATE	\$ 10,000,000																				
	\$																				
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below Y/N ☒ N	N/A		4055760	02/01/2023	02/01/2024	<table><tr><td>PER STATUTE</td><td>OTH-ER</td></tr><tr><td>E.I. EACH ACCIDENT</td><td>\$ 500,000</td></tr><tr><td>E.I. DISEASE - EA EMPLOYEE</td><td>\$ 500,000</td></tr><tr><td>E.I. DISEASE - POLICY LIMIT</td><td>\$ 500,000</td></tr></table>	PER STATUTE	OTH-ER	E.I. EACH ACCIDENT	\$ 500,000	E.I. DISEASE - EA EMPLOYEE	\$ 500,000	E.I. DISEASE - POLICY LIMIT	\$ 500,000						
PER STATUTE	OTH-ER																				
E.I. EACH ACCIDENT	\$ 500,000																				
E.I. DISEASE - EA EMPLOYEE	\$ 500,000																				
E.I. DISEASE - POLICY LIMIT	\$ 500,000																				
C	Pollution Liability			CPLMOL114903	02/01/2023	02/01/2025	<table><tr><td>Each Occurrence Limit</td><td>\$5,000,000</td></tr><tr><td>Aggregate Limit</td><td>\$5,000,000</td></tr><tr><td>Deductible</td><td>\$10,000</td></tr></table>	Each Occurrence Limit	\$5,000,000	Aggregate Limit	\$5,000,000	Deductible	\$10,000								
Each Occurrence Limit	\$5,000,000																				
Aggregate Limit	\$5,000,000																				
Deductible	\$10,000																				

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

SAMPLE COI

CERTIFICATE HOLDER**CANCELLATION**

A-1 Chipseal Co. 2505 E. 74th Ave. Denver CO 80229	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE Moody Insurance Agency
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AGENCY CUSTOMER ID: 00015073

LOC #: _____



ADDITIONAL REMARKS SCHEDULE

Page _____ of _____

AGENCY Moody Insurance Agency, Inc.		NAMED INSURED A-1 Chipseal Company, DBA: Rocky Mountain Pavement, LLC	
POLICY NUMBER		EFFECTIVE DATE:	
CARRIER	NAIC CODE		

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: 25 **FORM TITLE:** Certificate of Liability Insurance: Notes

CONTRACTUAL LIABILITY APPLIES PER POLICY TERMS AND CONDITIONS

Additional Named Insureds:

A-1 Chipseal Company
 DBA Rocky Mountain Pavement, LLC
 Black Rock Material & Supply, LLC
 DBA Rocky Mountain Parking Lot Services

Location Schedule:

2505 E. 74th Avenue, Denver, CO 80229
 7231-35 Cole View, Colorado Springs, CO 80915
 20 Monarch Lane, Pueblo, CO 81004
 4690 Joliet Street, Denver, CO 80229
 10800 Highway 90, Arvada CO 80403

Inland Marine Policy:

Policy Number: S2501487
 Policy Effective Dates: 2-1-2023 to 2-1-2024
 Insurer: Selective Insurance Company of America

Total Combined Scheduled Contractor's Equipment Value: \$8,139,068

Scheduled Contractor's Equipment Deductible: \$10,000
 Leased & Rented Equipment From Others Limit: \$1,000,000

General Liability Policy:

General Liability Deductible: \$2,000
 CG 73 00 01/19 From Attached Includes:
 Blanket Additional Insured status applies only to the extent provided in form CG 79 88 01/19.

Blanket Waiver of Subrogation applies only to the extent provided in form CG 73 00 01/19.
 General Liability Policy is Primary and Non-Contributory only to the extent provided in form CG 79 88 01/19.

Auto Liability Policy:

Physical Damage Deductibles: Comprehensive: \$2,000, Collision: \$2,000
 CA 78 09 / From Attached Includes:
 Blanket Additional Insured status applies only to the extent provided in form CA 78 09 11/17.
 Blanket Waiver of Subrogation applies only to the extent provided in form CA 78 09 11/17.

Umbrella Policy:

Umbrella Policy is on a follow(1) form basis for underlying insurance coverages: General Liability, Automobile Liability, and Employers Liability.
 Additional insured status will follow when required by written contract, including Primary and Non-Contributory Status.

Worker's Compensation Policy:

359-B Form Attached Includes:
 Blanket Waiver of Subrogation status applies when required by written contract.

****Please Note Hard Copies of Endorsement will not be sent out via mail. All Endorsements will only be sent electronically via email. Please send your email address to certrequest@moodyins.com for forms and future mailings****

Elite PacSM
Commercial Automobile Extension

COMMERCIAL AUTO
CA 78 16 11 17

SCHEDULE OF COVERAGE EXTENSIONS AND LIMITS OF INSURANCE

This ElitePac Schedule is a summary of additional coverages, coverage modifications and corresponding Limits of Insurance that supplements the Business Auto Coverage Form. No coverage is provided by this summary. Refer to the actual endorsement for changes affecting your insurance protection.

DESCRIPTION	
AMENDMENTS TO SECTION II - LIABILITY COVERAGE	
Newly Acquired Or Formed Organizations	Coverage Extension
Limited Liability Companies	Coverage Extension
Employees As Insureds	Coverage Extension
Blanket Additional Insureds	Coverage Extension
Expenses For Bail Bonds And Loss Of Earnings	
Bail Bonds	\$3,000 Per "Accident"
Loss Of Earnings	\$1,000 Per Day
Employee Indemnification and Employer's Liability Amendment	Coverage Extension
Fellow Employee Coverage	Coverage Extension
Care, Custody Or Control Amendment	\$1,000 per "Accident"; \$500 Deductible Per "Accident"
AMENDMENTS TO SECTION III - PHYSICAL DAMAGE COVERAGE	
Towing And Labor	Coverage Extension
Private Passenger Auto, Social Service Van or Bus, Light Truck Medium, Heavy and Extra Heavy Trucks	\$75 Per Tow \$150 Per Tow
Glass Breakage Deductible	Coverage Extension
Additional Transportation Expenses	\$60 per day up to a maximum of \$1,800
Hired Auto Physical Damage Coverage	\$75,000 per "loss"
Hired Auto Loss of Use Coverage	\$750 Per "Accident"
Auto Loan/Lease Gap Coverage (Not Available in New York)	Coverage Extension
Personal Effects	\$500 Per "Accident"
Airbag Coverage	Coverage Extension
Expanded Audio, Visual, And Data Electronic Equipment Coverage	Coverage Extension
Comprehensive Deductible - Location Tracking Device	Coverage Extension
Physical Damage Limit Of Insurance	Coverage Extension

DESCRIPTION	
AMENDMENTS TO SECTION IV - BUSINESS AUTO CONDITIONS	
Duties In The Event Of Accident, Claim, Suit Or Loss	Coverage Extension
Waiver of Subrogation	Coverage Extension
Multiple Deductibles	Coverage Extension
Concealment, Misrepresentation Or Fraud	Coverage Extension
Policy Period, Coverage Territory	Coverage Extension
Two Or More Coverage Forms Or Policies Issued By Us - Deductibles	Coverage Extension
AMENDMENTS TO SECTION V - DEFINITIONS	
Bodily Injury Including Mental Anguish (Not Applicable in New York)	Broadened Definition
Coverage Territory	Broadened Definition

General Liability Extension Endorsement

COMMERCIAL GENERAL LIABILITY
CG 73 00 01 19

SUMMARY OF COVERAGES (Including Index)

This is a summary of the various additional coverages and coverage modifications provided by this endorsement. No coverage is provided by this summary. Refer to the actual endorsement (Pages 3-through-9) for changes affecting your insurance protection.

DESCRIPTION	PAGE FOUND
Additional Insureds - Primary and Non-Contributory Provision	Page 8
Blanket Additional Insureds - As Required By Contract	Page 5
• Owners, Lessees or Contractors (includes Architects, Engineers or Surveyors) • Lessors of Leased Equipment • Managers or Lessors of Premises • Mortgagees, Assignees and Receivers • Any Other person or organization other than a joint venture • Grantors of Permits	
Broad Form Vendors Coverage	Page 7
Damage To Premises Rented To You (Including Fire, Lightning or Explosion)	Page 3
Electronic Data Liability (\$100,000)	Page 4
Employee Definition Amended	Page 9
Employees As Insureds Modified	Page 5
Employer's Liability Exclusion Amended (Not applicable in New York)	Page 3
Incidental Malpractice Exclusion modified	Page 7
Knowledge of Occurrence, Claim, Suit or Loss	Page 7
Liberalization Clause	Page 8
Mental Anguish Amendment (Not applicable to New York)	Page 9
Newly Formed or Acquired Organizations	Page 5
Non-Owned Aircraft	Page 3
Non-Owned Watercraft (under 60 feet)	Page 3
Not-for-profit Members - as additional insureds	Page 5
Personal And Advertising Injury - Discrimination Amendment (Not applicable in New York)	Page 8
Products Amendment (Medical Payments)	Page 4
Supplementary Payments Amended - Bail Bonds (\$5,000) and Loss of Earnings (\$1,000)	Page 4
Two or More Coverage Parts or Policies Issued By Us	Page 8
Unintentional Failure to Disclose Hazards	Page 8
Waiver of Transfer of Rights of Recovery (subrogation)	Page 8
When Two or More Coverage Parts of this Policy Apply to a Loss	Page 3

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General Liability Extension Endorsement

COMMERCIAL GENERAL LIABILITY
CG 73 00 01 19

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies the insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

The **SECTIONS** of the Commercial General Liability Coverage Form identified in this endorsement will be amended as shown below. However, if (a) two or more Coverage Parts of this policy, or (b) two or more forms or endorsements within the same Coverage Part apply to a loss, coverage provision(s) with the broadest language will apply, unless specifically stated otherwise within the particular amendment covering that loss.

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

COVERAGES - Amendments

SECTION I - COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY

EXCLUSIONS

Employer's Liability Amendment

(This provision is not applicable in the State of New York).

The following is added to Exclusion **e. Employer's Liability** under **COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY, 2. Exclusions**:

This exclusion also does not apply to any "temporary worker".

Non-Owned Aircraft, Auto or Watercraft

A. Paragraph (2) of Exclusion **g. Aircraft, Auto Or Watercraft** under **COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY, 2. Exclusions** is deleted in its entirety and replaced with the following:

(2) A watercraft you do not own that is:

- (a) Less than 26 feet long and not being used to carry persons or property for a charge; or
- (b) At least 26 feet, but less than 60 feet long, and not being used to carry persons or property for a charge. Any person is an insured who uses or is responsible for the use of such watercraft with your expressed or implied consent. However, if the insured has any other valid and collectible insurance for "bodily injury" or "property damage" that would be covered under this provision, or on any other basis, this coverage is then excess, and subject to Condition 4. **Other Insurance, b. Excess Insurance** under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS**.

B. The following is added to Exclusion **g. Aircraft, Auto Or Watercraft** under **COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY, 2. Exclusions**:

This exclusion does not apply to:

- (6) Any aircraft, not owned or operated by any insured, which is hired, chartered or loaned with a paid crew. However, if the insured has any other valid and collectible insurance for "bodily injury" or "property damage" that would be covered under this provision, or on any other basis, this coverage is then excess, and subject to Condition 4. **Other Insurance, b. Excess Insurance** under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS**.

Damage To Premises Rented to You

A. The last paragraph of Paragraph 2. **Exclusions** under **COVERAGE A BODILY INJURY AND PROPERTY DAMAGE** is deleted in its entirety and replaced with the following:

Exclusions **c. through n.** do not apply to damage by fire, lightning or explosion to premises rented to you or temporarily occupied by you with the permission of the owner. A separate limit of insurance applies to this coverage as described in **SECTION III - LIMITS OF INSURANCE**.

B. Paragraph 6. under **SECTION III - LIMITS OF INSURANCE** is deleted in its entirety and replaced with the following:

6. Subject to Paragraph 5. above, the most we will pay under **COVERAGE A** for damages because of "property damage" to any one premises, while rented to you, or in the case of damage caused by fire, lightning or explosion, while rented to you or temporarily occupied by you with permission of the owner, for all such damage caused by fire, lightning or explosion proximately caused by the same event, whether such damage results from fire, lightning or explosion or any combination of the three, is the amount shown in the Declarations for the Damage To Premises Rented To You Limit.

C. Paragraph a. of Definition 9. "Insured contract" under **SECTION V - DEFINITIONS** is deleted in its entirety and replaced with the following:

a. A contract for a lease of premises. However, that portion of the contract for a lease of premises that indemnifies any person or organization for damage by fire, lightning or explosion to premises while rented to you or temporarily occupied by you with the permission of the owner is not an "insured contract";

Electronic Data Liability

A. Exclusion p. **Access or Disclosure Of Confidential Or Personal Information And Data-related Liability** under **COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY, 2. Exclusions** is deleted in its entirety and replaced by the following:

p. **Access or Disclosure Of Confidential Or Personal Information And Data-related Liability**

Damages arising out of:

- (1) Any access to or disclosure of any person's or organization's confidential or personal information, including patents, trade secrets, processing methods, customer lists, financial information, credit card information or any other type of nonpublic information; or
- (2) The loss of, loss of use of, damage to, corruption of, inability to access, or inability to manipulate "electronic data" that does not result from physical injury to tangible property.

This exclusion applies even if damages are claimed for notification costs, credit monitoring expenses, forensic expenses, public relations expenses or any other loss, cost or expense incurred by you or others arising out of that which is described in Paragraph (1) or (2) above.

B. The following paragraph is added to **SECTION III - LIMITS OF INSURANCE**:

Subject to 5. above, the most we will pay under **COVERAGE A** for "property damage" because of all loss of "electronic data" arising out of any one "occurrence" is a sub-limit of \$100,000.

SECTION I - COVERAGE C MEDICAL PAYMENTS EXCLUSIONS

Any Insured Amendment

Exclusion a. **Any Insured** under **COVERAGE C MEDICAL PAYMENTS, 2. Exclusions** is deleted in its entirety and replaced with the following:

a. **Any Insured**

To any insured.

This exclusion does not apply to:

- (1) "Not-for-profit members";
- (2) "Golfing facility" members who are not paid a fee, salary, or other compensation; or
- (3) "Volunteer workers".

This exclusion exception does not apply if **COVERAGE C MEDICAL PAYMENTS** is excluded by another endorsement to this Coverage Part.

Product Amendment

Exclusion f. **Products-Completed Operations Hazard** under **COVERAGE C MEDICAL PAYMENTS, 2. Exclusions** is deleted in its entirety and replaced with the following:

f. **Products-Completed Operations Hazard**

Included within the "products-completed operations hazard".

This exclusion does not apply to "your products" sold for use or consumption on your premises, while such products are still on your premises.

This exclusion exception, does not apply if **COVERAGE C MEDICAL PAYMENTS** is excluded by another endorsement to this Coverage Part.

SECTION I - SUPPLEMENTARY PAYMENTS - COVERAGES A AND B

Expenses For Bail Bonds And Loss Of Earnings

A. Subparagraph 1.b. under **SUPPLEMENTARY PAYMENTS - COVERAGES A AND B** is deleted in its entirety and replaced with the following:

b. Up to \$5,000 for cost of bail bonds required because of accidents or traffic law violations arising out of the use of any vehicle to which Bodily Injury Liability Coverage applies. We do not have to furnish these bonds.

B. Subparagraph 1.d. under **SUPPLEMENTARY PAYMENTS - COVERAGES A AND B** is deleted in its entirety and replaced with the following:

- d. All reasonable expenses incurred by the insured at our request to assist us in the investigation or defense of the claim or "suit", including actual loss of earnings up to \$1,000 a day because of time off from work.

SECTION II - WHO IS AN INSURED - Amendments

Not-for-Profit Organization Members

The following paragraph is added to **SECTION II - WHO IS AN INSURED**:

If you are an organization other than a partnership, joint venture, or a limited liability company, and you are a not-for-profit organization, the following are included as additional insureds:

1. Your officials;
2. Your trustees;
3. Your members;
4. Your board members;
5. Your commission members;
6. Your agency members;
7. Your insurance managers;
8. Your elective or appointed officers; and
9. Your "not-for-profit members".

However only with respect to their liability for your activities or activities they perform on your behalf.

Employees As Insureds Modified

- A. Subparagraph 2.a.(1)(a) under **SECTION II - WHO IS AN INSURED** does not apply to "bodily injury" to a "temporary worker" caused by a co-"employee" who is not a "temporary worker".
- B. Subparagraph 2.a.(2) under **SECTION II - WHO IS AN INSURED** does not apply to "property damage" to the property of a "temporary worker" or "volunteer worker" caused by a co-"employee" who is not a "temporary worker" or "volunteer worker".
- C. Subparagraph 2.a.(1)(d) under **SECTION II - WHO IS AN INSURED** does not apply to "bodily injury" caused by cardio-pulmonary resuscitation or first aid services administered by a co-"employee".

With respect to this provision only, Subparagraph (1) of Exclusion 2. e. **Employer's Liability** under **SECTION I - COVERAGES, COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY** does not apply.

Newly Formed Or Acquired Organizations

- A. Subparagraph 3.a. under **SECTION II - WHO IS AN INSURED** is deleted in its entirety and replaced with the following:

- a. Coverage under this provision is afforded only until the 180th day after you acquire or form the organization or the end of the policy period, whichever is earlier. However, **COVERAGE A** does not apply to "bodily injury" or "property damage" that occurred before you acquired or formed the organization.

- B. The following paragraph is added to **SECTION II - WHO IS AN INSURED**, Paragraph 3:

If you are engaged in the business of construction of dwellings three stories or less in height, or other buildings three stories or less in height and less than 25,000 square feet in area, you will also be an insured with respect to "your work" only, for the period of time described above, for your liability arising out of the conduct of any partnership or joint venture of which you are or were a member, even if that partnership or joint venture is not shown as a Named Insured. However, this provision only applies if you maintain or maintained an interest of at least fifty percent in that partnership or joint venture for the period of that partnership or joint venture.

This provision does not apply to any partnership or joint venture that has been dissolved or otherwise ceased to function for more than thirty-six months.

With respect to the insurance provided by this provision, **Newly Formed or Acquired Organizations**, the following is added to **SECTION IV - COMMERCIAL GENERAL LIABILITY**, Paragraph 4. **Other Insurance**, Subparagraph b. **Excess Insurance**:

The insurance provided by this provision, **Newly Formed or Acquired Organizations**, is excess over any other insurance available to the insured, whether primary, excess, contingent or on any other basis.

(All other provisions of this section remain unchanged)

Blanket Additional Insureds - As Required By Contract

Subject to the **Primary and Non-Contributory** provision set forth in this endorsement, **SECTION II - WHO IS AN INSURED** is amended to include as an additional insured:

A. Owners, Lessees or Contractors/Architects, Engineers and Surveyors

1. Any person or organization for whom you are performing operations when you and such person or organization have agreed in a written contract, written agreement or written permit that such person or organization be added as an additional insured on your commercial general liability policy; and

2. Any other person or organization, including any architects, engineers or surveyors not engaged by you, whom you are required to add as an additional insured under your policy in the contract or agreement in Paragraph 1. above:

Such person or organization is an additional insured only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

- a. Your acts or omissions; or
- b. The acts of omissions of those acting on your behalf;

in the performance of your ongoing operations performed for the additional insured in Paragraph 1., above.

However, this insurance does not apply to:

"Bodily injury", "property damage" or "personal and advertising injury" arising out of the rendering of, or the failure to render, any professional architectural, engineering or surveying services by or for you, including:

- a. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; and
- b. Supervisory, inspection, architectural or engineering activities.

Professional services do not include services within construction means, methods, techniques, sequences and procedures employed by you in connection with your operations in your capacity as a construction contractor.

A person or organization's status as an additional insured under this endorsement ends when your operations for the person or organization described in Paragraph 1. above are completed.

B. Other Additional Insureds

Any of the following persons or organizations with whom you have agreed in a written contract, written agreement or written permit that such persons or organizations be added as an additional insured on your commercial general liability policy:

1. Lessors of Leased Equipment

Any person or organization from whom you lease equipment, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your maintenance, operation or use of equipment leased to you by such person or organization.

With respect to the insurance afforded to these additional insureds, this insurance does not apply to any "occurrence" which takes place after the equipment lease expires.

2. Managers or Lessors of Premises

Any person or organization from whom you lease premises, but only with respect to liability arising out of the ownership, maintenance or use of that part of the premises leased to you.

This insurance does not apply to any "occurrence" which takes place after you cease to be a tenant of that premises.

3. Mortgagees, Assignees or Receivers

Any person or organization with respect to their liability as mortgagee, assignee or receiver and arising out of the ownership, maintenance or use of your premises.

This insurance does not apply to any "occurrence" which takes place after the mortgage is satisfied, or the assignment or receivership ends.

4. Any Person or Organization Other Than A Joint Venture

Any person or organization (other than a joint venture of which you are a member), but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your acts or omissions or the acts of omissions of those acting on your behalf in the performance of your ongoing operations or in connection with property owned by you.

5. State or Governmental Agency or Political Subdivision - Permits or Authorizations

Any state or governmental agency or subdivision or political subdivision, but only with respect to:

- a. Operations performed by you or on your behalf for which the state or governmental agency or subdivision or political subdivision has issued a permit or authorization; or
- b. The following hazards for which the state or governmental agency or subdivision or political subdivision has issued a permit or authorization in connection with premises you own, rent or control and to which this insurance applies:

- (1) The existence, maintenance, repair, construction, erection or removal of advertising signs, awnings, canopies, cellar entrances, coal holes, driveways, manholes, marquees, hoist away openings, sidewalk vaults, street banners or decorations and similar exposures;
- (2) The construction, erection or removal of elevators; or
- (3) The ownership, maintenance or use of any elevators covered by this insurance.

This insurance does not apply to:

- (a) "Bodily injury" or "property damage" arising out of operations performed for the federal government, state or municipality; or
- (b) "Bodily injury" or "property damage" included within the "products-completed operations hazard".

With respect to Paragraphs 2. through 4., this insurance does not apply to structural alterations, new construction or demolition operations performed by or on behalf of such person or organization.

The provisions of this coverage extension do not apply unless the written contract or written agreement has been signed by the Named Insured or written permit issued prior to the "bodily injury" or "property damage" or "personal and advertising injury".

Broad Form Vendors Coverage

Subject to the **Primary and Non-Contributory** provision set forth in this endorsement, **SECTION II - WHO IS AN INSURED** is amended to include as an additional insured any person or organization (referred to below as vendor) for whom you have agreed in a written contract or written agreement to provide coverage as an additional insured under your policy. Such person or organization is an additional insured only with respect to "bodily injury" or "property damage" arising out of "your products" which are distributed or sold in the regular course of the vendor's business. However, the insurance afforded the vendor does not apply to:

- a. "Bodily injury" or "property damage" for which the vendor is obligated to pay damages by reason of the assumption of liability in a contract or agreement; however this exclusion does not apply to liability for damages that the vendor would have in the absence of the contract or agreement;
- b. Any express warranty unauthorized by you;

- c. Any physical or chemical change in the product made intentionally by the vendor;
- d. Repackaging, unless unpacked solely for the purpose of inspection, demonstration, testing, or the substitution of parts under instructions from the manufacturer, and then repackaged in the original container;
- e. Any failure to make such inspections, adjustments, tests or servicing as the vendor has agreed to make or normally undertakes to make in the usual course of business in connection with the sale of the product; or
- f. Products which, after distribution or sale by you, have been labeled or re-labeled or used as a container, part of ingredient of any other thing or substance by or for the vendor; however this insurance does not apply to any insured person or organization, from who you have acquired such products, or any ingredient, part or container, entering into, accompanying or containing such products.

The provisions of this coverage extension do not apply unless the written contract or written agreement has been signed by the Named Insured prior to the "bodily injury" or "property damage".

Incidental Malpractice

Subparagraph 2.a.(1)(d) under **SECTION II - WHO IS AN INSURED** is deleted in its entirety and replaced with the following:

- (d) Arising out of his or her providing or failing to provide professional health care services.

This does not apply to nurses, emergency medical technicians or paramedics if you are not in the business or occupation of providing any such professional services.

This also does not apply to "bodily injury" caused by cardio-pulmonary resuscitation or first aid services administered by a co-"employee".

This provision does not apply if you are a Social Service or Senior Living risk.

SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS - Amendments

Knowledge Of Occurrence, Claim, Suit Or Loss

The following is added to Paragraph 2. **Duties in the Event of Occurrence, Offense, Claim or Suit** under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS**:

The requirements under this paragraph do not apply until after the "occurrence" or offense is known to:

1. You, if you are an individual;
2. A partner, if you are a partnership;



3. An "executive officer" or insurance manager, if you are a corporation;
4. Your members, managers or insurance manager, if you are a limited liability company; or
5. Your elected or appointed officials, officers, members, trustees, board members, commission members, agency members, or your administrator or your insurance manager if you are an organization other than a partnership, joint venture, or limited liability company.

Primary and Non-Contributory Provision

The following is added to Paragraph 4. **Other Insurance, b. Excess Insurance** under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS:**

This insurance is primary to and we will not seek contribution from any other insurance available to an additional insured under this policy provided that:

- (1) The additional insured is a Named Insured under such other insurance; and
- (2) You have agreed in a written contract, written agreement or written permit that this insurance would be primary and would not seek contribution from any other insurance available to the additional insured.

Unintentional Failure To Disclose Hazards

The following is added to Paragraph 6. **Representations** under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS:**

However, if you should unintentionally fail to disclose any existing hazards in your representations to us at the inception date of the policy, or during the policy period in connection with any additional hazards, we shall not deny coverage under this Coverage Part based upon such failure to disclose hazards.

Waiver Of Transfer Of Rights Of Recovery

The following is added to Paragraph 8. **Transfer of Rights Of Recovery Against Others To Us** under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS:**

We will waive any right of recovery we may have against a person or organization because of payments we make for "bodily injury" or "property damage" arising out of your ongoing operations or "your work" done under a written contract or written agreement and included in the "products-completed operations hazard", if:

1. You have agreed to waive any right of recovery against that person or organization in a written contract or written agreement;
2. Such person or organization is an additional insured on your policy; or

3. You have assumed the liability of that person or organization in that same contract, and it is an "insured contract".

The section above only applies to that person or organization identified above, and only if the "bodily injury" or "property damage" occurs subsequent to the execution of the written contract or written agreement.

Liberalization

The following condition is added to **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS:**

If we revise this Coverage Part to provide more coverage without additional premium charge, subject to our filed company rules, your policy will automatically provide the additional coverage as of the day the revision is effective in your state.

Two or More Coverage Parts or Policies Issued By Us

(This provision is not Applicable in the state of New York or Wisconsin).

The following condition is added to **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS:**

It is our intention that the various coverage parts or policies issued to you by us, or any company affiliated with us, do not provide any duplication or overlap of coverage. We have exercised diligence to draft our coverage parts and policies to reflect this intention. However, if the facts and circumstances that will respond to any claim or "suit" give rise to actual or claimed duplication or overlap of coverage between the various coverage parts or policies issued to you by us or any company affiliated with us, the limit of insurance under all such coverage parts or policies combined shall not exceed the highest applicable limit under this coverage, or any one of the other coverage forms or policies.

This condition does not apply to any Excess or Umbrella policy issued by us specifically to apply as excess insurance over this coverage part or policy to which this coverage part is attached.

SECTION V - DEFINITIONS

Discrimination

(This provision does not apply in New York).

- A. The following is added to Definition 14. "Personal and advertising injury":

"Personal and advertising injury" also means "discrimination" that results in injury to the feelings or reputation of a natural person, however only if such "discrimination" or humiliation is:

1. Not done by or at the direction of:
 - a. The insured; or

- b. Anyone considered an insured under **SECTION II - WHO IS AN INSURED;**

- 2. Not done intentionally to cause harm to another person.
- 3. Not directly or indirectly related to the employment, prospective employment or termination of employment of any person or persons by any insured.
- 4. Not arising out of any "advertisement" by the insured.

B. The following definition is added to SECTION V - DEFINITIONS:

"Discrimination" means:

- a. Any act or conduct that would be considered discrimination under any applicable federal, state, or local statute, ordinance or law;
- b. Any act or conduct that results in disparate treatment of, or has disparate impact on, a person, because of that person's race, religion, gender, sexual orientation, age, disability or physical impairment; or
- c. Any act or conduct characterized or interpreted as discrimination by a person based on that person's race, religion, gender, sexual orientation, age, disability or physical impairment.

It does not include acts or conduct characterized or interpreted as sexual intimidation or sexual harassment, or intimidation or harassment based on a person's gender.

Electronic Data

The following definition is added to **SECTION V - DEFINITIONS:**

"Electronic data" means information, facts or programs stored as or on, created or used on, or transmitted to or from computer software, including systems and applications software, hard or floppy disks, CD-ROMS, tapes, drives, cell, data processing devices or any other media which are used with electronically controlled equipment. For the purpose of the Electronic Data Liability coverage provided by this endorsement, Definition 17, "Property damage" is deleted in its entirety and replaced by the following:

17. "Property damage" means:

- a. Physical injury to tangible property, including all resulting loss of use of that property. All such loss of use shall be deemed to occur at the time of the physical injury that caused it; or

- b. Loss of, loss of use of, damage to, corruption of, inability to access, or inability to properly manipulate "electronic data", resulting from physical injury to tangible property. All such loss of "electronic data" shall be deemed to occur at the time of the "occurrence" that caused it.

For the purpose of the Electronic Data Liability coverage provided by this endorsement, "electronic data" is not tangible property.

Employee Amendment

Definition 5, "Employee" under **SECTION V - DEFINITIONS** is deleted in its entirety and replaced by the following:

- 5. "Employee" includes a "leased worker", or a "temporary worker". If you are a School, "Employee" also includes a student teacher.

Golfing Facility

The following definition is added to **SECTION V - DEFINITIONS:**

"Golfing facility" means a golf course, golf club, driving range, or miniature golf course.

Mental Anguish Amendment

(This provision does not apply in New York).

Definition 3, "Bodily injury" under **SECTION V - DEFINITIONS** is deleted in its entirety and replaced with the following:

- 3. "Bodily injury" means bodily injury, sickness or disease sustained by a person, including death resulting from any of these at any time. This includes mental anguish resulting from any bodily injury, sickness or disease sustained by a person. (In New York, mental anguish has been determined to be "bodily injury").

Not-for-profit Member

The following definition is added to **SECTION V - DEFINITIONS:**

"Not-for-profit member" means a person who is a member of a not-for-profit organization, including clubs and churches, who receives no financial or other compensation.



Contracting, Installation, Service and Repair
General Liability Extended ElitePac® Endorsement

COMMERCIAL GENERAL LIABILITY
CG 79 88 01 19

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

1. BLANKET ADDITIONAL INSURED

a. Ongoing Operations

SECTION II — WHO IS AN INSURED is amended to include as an additional insured:

1. Any person or organization for whom you are performing operations when you and such person or organization have agreed in a written contract, written agreement or written permit that such person or organization be added as an additional insured on your commercial general liability policy; and
2. Any other person or organization, including any architects, engineers or surveyors not engaged by you, whom you are required to add as an additional insured under your policy in the contract or agreement in Paragraph 1. above;

Such person or organization is an additional insured only with respect to liability arising out of your ongoing operations performed under that contract, agreement, or permit when that contract, agreement, or permit requires the additional insured be added with respect to liability arising out of your ongoing operations.

If the written contract, written agreement, or written permit does not require that the additional insured be added with respect to liability arising out of your ongoing operations, then such person or organization is an additional insured only with respect to "bodily injury", "property damage" or "personal and advertising injury" caused in whole or in part by your ongoing operations performed under that contract, agreement, or permit.

b. Completed Operations

SECTION II — WHO IS AN INSURED is amended to include as an additional insured:

1. Any person or organization for whom you are performing or have performed operations when you and such person or organization have agreed in a written contract, written agreement or written permit that such person or organization be added as an additional insured on your commercial general liability policy; and
2. Any other person or organization, including any architects, engineers or surveyors not engaged by you, whom you are required to add as an additional insured under your policy in the contract or agreement in Paragraph 1. above;

Such person or organization is an additional insured only with respect to their liability arising out of "your work" performed under that contract, agreement, or permit and included in the "products-completed operations hazard" when that contract, agreement, or permit requires the additional insured be added with respect to liability arising out of "your work" performed under that contract, agreement, or permit and included in the "products-completed operations hazard".



If the written contract, written agreement, or written permit does not require that the additional insured be added with respect to liability arising out of "your work" performed under that contract, agreement, or permit and included in the "products-completed operations hazard", then such person or organization is an additional insured only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by "your work" performed under that contract, agreement, or permit and included in the "products-completed operations hazard".

- c. The coverages provided in Paragraphs a. and b. do not apply unless the written contract or written agreement has been signed by the Named Insured or written permit issued prior to the "bodily injury", "property damage" or "personal and advertising injury".

d. **Exclusions**

- (1) With respect to the insurance afforded to additional insureds under a. **Ongoing Operations** the following is added to 2. **Exclusions** under **SECTION I — COVERAGE A — BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

This insurance does not apply to "bodily injury", "property damage", or "personal and advertising injury" occurring after:

- (a) All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the site of the covered operations has been completed; or
- (b) That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.
- (2) With respect to the insurance afforded to these additional insureds under a. **Ongoing Operations** and b. **Completed Operations**, the following is added to 2. **Exclusions** under **SECTION I — COVERAGE A — BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

This insurance does not apply to:

"Bodily injury", "property damage", or "personal and advertising injury" arising out of the rendering of, or the failure to render, any professional architectural, engineering or surveying services, including:

- (a) The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or
- (b) Supervisory, inspection, architectural or engineering activities.

e. **Conditions**

With respect to the insurance afforded to these additional insureds under a. **Ongoing Operations** and b. **Completed Operations** the following is added to Paragraph 4. **Other Insurance**, a. **Primary Insurance** under **SECTION IV — COMMERCIAL GENERAL LIABILITY CONDITIONS**:

This insurance is primary and will not contribute with any other insurance available to an additional insured under this coverage part provided that:

- (1) The additional insured is a Named Insured under such other insurance.
- (2) You have agreed in a written contract, written agreement or written permit to include that additional insured on your General Liability policy on a primary and/or non-contributory basis.

2. **PROPERTY DAMAGE CARE, CUSTODY OR CONTROL**

The following is added to **Exclusion j.** under **SECTION I — COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

Paragraphs (4) and (5) do not apply for the limited purpose of providing the coverage and sub-limits of liability as set forth below.

We will pay those sums that the insured becomes legally obligated to pay as damages arising out of "property damage" to:

- (1) Personal property in the care, custody or control of the insured; and

- (2) That particular part of real property on which you or any contractors or subcontractors working directly or indirectly on your behalf are performing operations, if the "property damage" arises out of those operations.

The most we will pay under (1) and (2) above in any one "occurrence" or for all damages during any one policy period is a sub-limit of \$100,000.

These limits are included in and not in addition to the Limits of Insurance shown in the Declarations of the Commercial General Liability Policy.

Our right and duty to defend the insured against any "suit" for damages under (1) and (2) above ends when we have used up the applicable sub-limit of liability in the payment of judgments or settlements under it.

3. OTHER INSURANCE AMENDMENT — SUPPLEMENTAL COVERAGE FOR INSURED'S INVOLVEMENT IN A CONSOLIDATED (WRAP-UP) INSURANCE PROGRAM OR SIMILAR PROJECT

The following is added to **SECTION IV — COMMERCIAL GENERAL LIABILITY CONDITIONS**, Paragraph 4. **Other Insurance b. Excess Insurance (1)(a)**:

- (v) That is covered by a consolidated (wrap-up) or similar insurance program provided by the prime contractor/project manager or owner of the construction project in which you are involved for your ongoing operations or operations included within the "products-completed operations hazard", unless such consolidated (wrap-up) or similar program is specifically excluded from coverage on this policy.

4. FELLOW EMPLOYEE EXTENSION

Under **SECTION II — WHO IS AN INSURED** Paragraphs 2.a. and 2.a. (1) are replaced by the following:

- a. Your "volunteer workers" only while performing duties related to the conduct of your business, or your "employees", other than either your "executive officers" (if you are an organization other than a partnership, joint venture, or limited liability company) or your managers (if you are a limited liability company), but only for acts within the scope of their employment by you or while performing duties related to the conduct of your business. The Employers Liability exclusion (**SECTION I COVERAGES; COVERAGE A**, exclusion e.) does not apply to this provision. However, none of these "employees" or "volunteer workers" are insureds for:

- (1) "Bodily injury" or "personal and advertising injury":

- (a) Arising out of his or her providing or failing to provide professional health care services.

5. CONTRACTUAL LIABILITY (RAILROADS)

Definition 9. Insured Contract is amended as follows:

Paragraph c. is deleted in its entirety and replaced with the following:

Any easement or license agreement;

Paragraph f.(1) is deleted in its entirety.

6. CONTRACTUAL LIABILITY AMENDMENT — (PERSONAL AND ADVERTISING INJURY)

If it is required in a written contract, written agreement or written permit with the insured that any contractual liability exclusion for Personal Injury be removed from the policy, then Exclusion e. **Contractual Liability** under **COVERAGE B PERSONAL AND ADVERTISING INJURY, 2. Exclusions** is deleted in its entirety and replaced with the following:

e. Contractual Liability

"Personal and advertising Injury" for which the insured has assumed liability in a contract or agreement arising out of an "advertisement". This exclusion does not apply to liability for damages that the insured would have in the absence of the contract or agreement.

7. WAIVER OF GOVERNMENTAL IMMUNITY

We will waive, both in the adjustment of claims and in the defense of "suits" against the insured, any governmental immunity of the insured, unless the insured requests in writing that we not do so.

Waiver of immunity as a defense will not subject us to liability for any portion of a claim or judgment in excess of the applicable limit of insurance.

8. DAMAGE TO PREMISES RENTED TO YOU

The Limit of Insurance for Damage To Premises Rented To You is increased to \$1,000,000.

NCCI #: WC000313B
Policy #: 4055760

A-1 Chipseal Company dba Rocky Mounta
Rocky Mountain Pavement LLC
2505 E 74th Ave
Denver, CO 80229

Moody Insurance Agency Inc
8055 E. Tufts Ave
Ste 1000
Denver, CO 80237
(303) 824-6600

ENDORSEMENT: Blanket Waiver of Subrogation

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

SCHEDULE

To any person or organization when agreed to under a written contract or agreement, as defined above and with the insured, which is in effect and executed prior to any loss.

Effective Date: February 1, 2023 Expires on: February 1, 2024
Pinnacol Assurance has issued this endorsement January 23, 2023



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.2.

TO: THE HONORABLE CITY COUNCIL

DATE: January 22, 2024

SUBJECT: R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00

Report in Brief

Council action is requested on the attached resolution authorizing a construction contract with Insituform Technologies, LLC, in the amount of \$1,633,898.00. This is an annual project that involves installation of a cured in place pipe inside existing vitrified clay pipe sanitary sewer mains to extend the life of the sewer mains. The 2023 construction project involves replacement of 29,459 linear feet of 6-inch through 12-inch sanitary sewer main in various locations around the City. The attached map highlights the repair areas.

The Arvada team recommends that the City Council approve R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00.

Financial Impact

Financial Impact: \$1,633,898.00

This is a one-time request for Project Construction costs. The costs are budgeted.

Funding Source: Type: UT Wastewater Collections and Disposal Systems Enterprise Fund

Fund: Wastewater Fund Financial Account No. 42-734040-58105

CIP Project Number: 98003

Background

This is an annual project that involves installation of a cured in place pipe inside existing vitrified clay pipe sanitary sewer mains to extend the life of the sewer mains. This year's construction project involves replacement of 29,459 linear feet of 6-inch through 12-inch sanitary sewer main in various locations.

Discussion

Bids for this project were opened on December 13, 2023. Two bids were received. Insituform Technologies, LLC was the lowest bidder and has successfully completed Trenchless Sewer Main Replacements for the City of Arvada in previous years. This work is expected to take about 70 construction days to complete with a construction completion date anticipated by July 2024. The Arvada team is recommending approval.

Funding for this project is available within Wastewater Fund Financial Account No. 42-734040-58105.

Public Contact

SUBJECT: R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00

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Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

The Utilities Department has a performance measure to update and improve the City wastewater collection system. This action also aligns with the following Principle within the Infrastructure Priority Area of the City Council Strategic Plan:

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. This includes maintaining utility rates at the lowest practical levels with accurate billing that supports replacement of aging infrastructure in order to maintain robust utility systems.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00.

Suggested Motion:

I move that R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00, be (approved) (rejected).

Prepared by:
Jessica Metcalf, Civil Engineer

Reviewed by:

Approved by:

Jenny Wolfschlag, City Engineer	12/26/2023
Jacqueline Rhoades, Public Works Director	1/3/2024
Bryan Archer, Director of Finance	1/4/2024
Tammy Hedlund, Legal Specialist	1/5/2024
Jessica Morales, Assistant City Attorney	1/8/2024
Rachel Morris, City Attorney	1/10/2024
Don Wick, Deputy City Manager	1/10/2024
Lorie Gillis, City Manager	1/11/2024

Enclosure, exhibits & attachments required to support the report

SUBJECT: R24-012, A Resolution Authorizing an Agreement By and Between The City Of Arvada and Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 In An Amount Not To Exceed \$1,633,898.00

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ITEM: 8.A.2.

RESOLUTION NO. R24-012

A RESOLUTION AUTHORIZING AN AGREEMENT BY AND BETWEEN THE CITY OF ARVADA AND INSITUFORM TECHNOLOGIES, LLC FOR THE 2023 TRENCHLESS SEWER MAIN REPLACEMENT PROJECT NO. 23-SR-02 IN AN AMOUNT NOT TO EXCEED \$1,633,898.00

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 Insituform Technologies, LLC for the 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02.

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

APPROVED AND ADOPTED this 22nd day of January, 2024.

Lauren Simpson, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

**AN AGREEMENT BY AND BETWEEN THE CITY OF ARVADA AND
INSITUFORM TECHNOLOGIES, LLC FOR THE 2023 TRENCHLESS SEWER
MAIN REPLACEMENT PROJECT NO. 23-SR-02 IN AN AMOUNT NOT TO
EXCEED \$1,633,898.00**

This Agreement made this _____ day of _____, 2024, by and between the City of Arvada, a home rule municipal corporation (“Arvada” and/or “City”) and Insituform Technologies, LLC, a Delaware Limited Liability Company (“Contractor”).

WITNESSETH: That for and in consideration of the covenants, promises, and payments hereinafter mentioned:

WITNESSETH:

WHEREAS, Arvada solicited proposals from interested construction professionals for the provision of construction services related to its 2023 Trenchless Sewer Main Replacement Project No. 23-SR-02 as described in the Contract Documents (the “Project” or the “Work”); and

WHEREAS, based on Contractor’s submissions, Arvada has selected Contractor for the Project; and

WHEREAS, Arvada and Contractor desire to enter into this Agreement regarding the construction of the Project.

NOW, THEREFORE, for and in consideration of the covenants, promises, and payments hereinafter mentioned, the parties agree as follows:

ARTICLE 1. GENERAL DESCRIPTION OF SERVICES

- 1.1. **The Services.** Contractor agrees to furnish or arrange for the construction services set forth in the Contract Documents and required for the completion of the Project within the timeframe provided in the Contract Documents. Contractor represents that it is thoroughly familiar with, and understands, the requirements of the Project’s scope and is experienced in the construction of projects of the type and scope contemplated by the Contract Documents. Contractor represents to Arvada that Contractor has all necessary education, skill, knowledge, expertise and experience required for construction of the Project, and will maintain, at all times during the term of this Agreement, such personnel on its staff to provide the services contemplated hereby within the time periods required hereby. In addition, Contractor represents that it or Arvada-approved subcontractors or subconsultants performing services under this Agreement have all applicable licenses required by the State of Colorado to perform such services and all required insurance coverage as required by this Agreement and by law.

- 1.2. **Cooperation.** The Contractor shall endeavor to develop, implement and maintain, a spirit of cooperation, collegiality, and open communication with Arvada, Arvada’s Consultants, and Arvada’s residents so that the goals and objectives of each are clearly understood, potential problems are resolved promptly, and upon completion, the Project is deemed a success by all interested parties.
- 1.3. **Preparation/Sufficiency of Site.** Before commencing the Project, the Contractor shall (i) visit and thoroughly inspect the Project Site and any structure(s) or other man-made features to be modified and become familiar with local conditions under which the Project will be constructed and operated; (ii) familiarize itself with the survey, including the location of all existing buildings, utilities, conditions, streets, equipment, components and other attributes having or likely to have an impact on the Project; (iii) familiarize itself with Arvada’s engineering and design requirements, design objectives, and budget for the Project; (iv) familiarize itself with pertinent Project dates and programming needs, including the Project schedule; (v) review and analyze all Project geotechnical, environmental, and construction materials tests, investigations and recommendations, (vi) review all specifications; and (vii) gather any other information necessary for a thorough understanding of the Project. Claims by Contractor resulting from Contractor’s failure to familiarize itself with the Site or pertinent documents shall be deemed waived.
- 1.4. **Contract Documents.** The Contract Documents are incorporated herein by reference. The term “Contract Documents” means and includes the following:
- A. Arvada’s solicitation entitled Competitive Sealed Bid # 23-ENG-096, including all exhibits and/or addenda (“CSB”);
 - B. Contractor’s Response to the CSB, Advertisement for Bid, Bid Proposal, Bid Schedule, Bid Bond (“Contractor’s Response”);
 - C. Notice of Award;
 - D. Performance and Payment Bond;
 - E. Notice(s) to Proceed;
 - F. Change Orders (if any);
 - G. City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements dated October 2, 2023;
 - H. Requests for Information and Responses (if any);
 - I. All supplementary requirements regarding wage rates, E.E.O., affirmative action and all other Federal-State requirements as outlined in the specifications (if applicable).
- 1.5. **Interpretation of Contract Documents.** In the event of conflicts or discrepancies among the Contract Documents, the documents shall govern in the following order: (1) the Agreement; (2) Arvada’s CSB; (3) City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements; (4) Contractor’s Response; (5) Change Orders; (6) Requests for Information and Response.

ARTICLE 2. ARVADA'S DUTIES, OBLIGATIONS AND RESPONSIBILITIES

- 2.1. **Project Information.** Contractor acknowledges that Arvada has provided Contractor with information regarding Arvada's requirements for the Project as set forth in the Contract Documents, including Project Specifications.
- 2.2. **Arvada's Budget.** Arvada has established, and will update, an overall budget for the Project, including amounts allocated for construction, Arvada's other costs, and reasonable contingencies related to these costs as appropriate.
- 2.3. **Arvada's Representative.** Arvada will designate a representative authorized to act on Arvada's behalf with respect to the Project.
- 2.4. **Purpose of Arvada's Review.** Arvada's review, inspection, or approval of any work, Testing Documents, Applications for Payment, or other submittals shall be solely for the purpose of determining whether the same are generally consistent with Arvada's standards, policies and requirements. No review, inspection, or approval by Arvada of such work or documents shall relieve Contractor of its responsibility for the performance of its obligations under the Agreement or the accuracy, adequacy, fitness, suitability, or coordination of its construction services. Approval by any governmental or other regulatory agency or other governing body of any work, Testing Document, or the Construction Documents shall not relieve Contractor of responsibility for the performance of its obligations under this Agreement. Payment by Arvada pursuant to the Agreement shall not constitute waiver of any of Arvada's rights under the Agreement or at law, and Contractor expressly accepts the risk that defects in its performance, if any, may not be discovered until after payment, including final payment, is made by Arvada. Notwithstanding the foregoing, reasonable notice shall be given by Arvada to the Contractor if Arvada becomes aware of any fault or defect in the Project or non-conformance with the Contract Documents.

ARTICLE 3. CONSTRUCTION SERVICES REQUIREMENTS AND STANDARDS

- 3.1. **Quality of Construction Services.** Contractor shall be responsible for the quality, completeness, accuracy, and coordination of the Work. Contractor shall provide construction services that meet all industry standards, including all environmental and regulatory requirements. Arvada will provide and be responsible for all material testing and all other testing if needed.
- 3.2. **Arvada's Right to Carry Out the Work.** If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven calendar day period after written notice from Arvada to commence and continue correction of such default or neglect with diligence and promptness, Arvada may after such seven-day period, without prejudice to other remedies Arvada may have, correct such deficiencies. In such a case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for any consultant's additional services and expenses made necessary by

such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to Arvada within ten days of receipt of an invoice for such amounts from Arvada.

- 3.3. **Legal Standard.** Contractor shall furnish construction services in accordance with industry standards currently practiced by construction professionals on projects similar in size, complexity and cost to the Project.
- 3.4. **Construction Standards.** Contractor shall perform all services in accordance with requirements of governmental agencies having jurisdiction over the Project, City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements, and the requirements set forth in the Contract Documents. In addition, the Contractor's work shall comply with all applicable building codes, accessibility laws and regulations, environmental regulations, and other applicable legal requirements in effect at the time of the work. To the extent Arvada's standards exceed applicable legal requirements, such standards shall be met unless Contractor obtains a variance from Arvada in writing.
- 3.5. **Permits.** Contractor shall be responsible for obtaining all necessary permits and other governmental approvals necessary for the development of the Project and shall obtain the same at the times necessary to meet the Project schedule. Contractor's responsibility includes providing environmental services and permitting coordination as further described in the Contract Documents.
- 3.6. **Notice of Non-Compliance.** Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Arvada, and shall at once report to Arvada any errors, inconsistencies or omissions discovered as well as any foreseeable constructability issues arising from the project specifications and/or site conditions. If the Contractor performs any construction activity knowing or should have known it involves an error, inconsistent, omission or constructability issue in the Contract Documents without such notice to Arvada, the Contractor shall assume full responsibility for such performance and shall bear the full costs for correction, including reimbursement for any delay caused to the Project.

ARTICLE 4. CHANGES TO THE WORK

- 4.1. **Field Engineered Changes.** Arvada may modify the construction plans including changing the slope and alignment of flow lines and appurtenances or modifying other improvements as necessary to accommodate construction around existing utilities or other field conditions. No additional compensation shall be made for minor costs and inconveniences incurred while performing field engineering changes as directed by Arvada or its Consultant. No additional compensation shall be made for any down time encountered while Arvada determines what field engineered changes would be appropriate to accommodate construction around existing utilities or other field conditions. Reasonable time must be allowed for Arvada or its Consultant to design field engineered changes. Any additional costs for performing field engineered construction changes to

accommodate existing utilities or other field conditions and for also allowing Arvada reasonable time to design field engineered changes as necessary to complete the work shall be considered a subsidiary obligation of the contract.

- 4.2. **Pre-Construction Meetings.** Contractor agrees to assist in the preparation for and to participate in any pre-construction meetings with Arvada.
- 4.3. **Arvada Change Orders.** Arvada may, by written order signed by Arvada, at any time, and without notice to any surety, and subject to all appropriate adjustments, make changes within the general scope of this Contract in any one or more of the following: (a) changes in scope of services; (b) completion date; (c) contract amount; (d) any applicable material modifications; and, (e) any other matters that the parties deem necessary.
- 4.4. **Contractor Requested Change Orders.** The Contractor may request a Change in the Work ("Requested Change Order"), including one or more of the following: (a) changes in scope of services; (b) completion date; (c) contract amount; (d) any applicable material modifications; and, (e) any other matters that the parties deem necessary.
- 4.5. **Change Order Contents.** Any Requested Change Order shall include (a) a detailed description of the requested change to the original contract; (b) itemized documentation of any subcontractor costs; (c) the total costs associated with the proposed change; (d) the impact on the project completion date, if any, associated with the proposed change; and (e) a statement of the contractual basis for the requested change.
- 4.6. **Basis for Change Order Requests.** The following may be considered a valid basis for requesting a Change Order: (a) Contract Document error or omission; (b) Arvada induced enhancement; (c) unforeseeable constructability issue; (d) unforeseeable geotechnical issue. The following will not be considered a valid basis for requesting a Change Order absent extraordinary circumstances: (a) utility relocation; (b) utility conflicts; (c) foreseeable geotechnical issue; (d) foreseeable constructability issue; (e) defective construction.
- 4.7. **Written Authorization Required.** The Contractor shall not proceed with any change in the Work without the appropriate written authorization.

ARTICLE 5. SUPERVISION AND CONSTRUCTION PROCEDURES

- 5.1. **Supervision.** The Contractor shall supervise and direct the Work using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under this Contract, unless Contract Documents give other specific instructions concerning these matters.
- 5.2. **Acts and Omissions of Subcontractors and Agents.** The Contractor shall be responsible to Arvada for acts and omission of the Contractor's employees, Subcontractors, and their

agents and employees, and other persons performing portions of the Work under a contract with the Contractor.

- 5.3. **Inspection and Subsequent Work.** The Contractor shall be responsible for inspection or portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

ARTICLE 6. COMPENSATION.

- 6.1. **Completion of Services.** Contractor will furnish all material, supplies, tools, equipment, labor, and other services necessary for the completion of the Work within Arvada's timeframe and monetary limitations set forth below:
- 6.1.1. Contractor shall commence the Work required by the Contract Documents within seven calendar days after the date of the Notice to Proceed unless otherwise mutually agreed-upon by the Parties in writing;
 - 6.1.2. Contractor shall complete the Work required by the Contract Documents, including cleanup, within **150 consecutive calendar days** after the date to be specified in the Notice to Proceed, unless the contract time is adjusted by change order; and
 - 6.1.3. Compensation Amount. Contractor agrees to perform the Work for an amount not to exceed **\$1,633,898.00.**
- 6.2. **Term.** This contract shall commence on the date of Arvada's execution of the Agreement and shall remain in effect until such time as the commodities, equipment and/or services acquired in conjunction with this Agreement have been accepted by the City's authorized representative, unless otherwise agreed to in writing by the parties, subject to availability of funds, or Arvada's termination for convenience under the Contract Documents. Any required warranty period which exceeds this term shall remain in full force for the duration of the warranty period.
- 6.3. **Additional Services.** While Arvada has listed its major requirements for its solicitation in the Contract Documents, Arvada may, during the term of this Agreement, wish to purchase other related services identified and offered by Contractor, based upon the Bid Schedule amounts contained in Contract Documents. Arvada reserves the right to award these ancillary items to Contractor. This option, if exercised, in no way obligates Arvada to pursue additional services with Contractor.
- 6.4. **Payment for Services.** At least 20 calendar days before the date established for each monthly progress payment, the Contractor shall submit to Arvada an itemized Application for Payment for construction completed in accordance with the Bid Schedule. Such application shall be support by such data substantiating the Contractor's right to payment as Arvada may require, such as copies of invoices or requisitions from subcontractors and material suppliers and reflecting retainage. Arvada shall pay NET 30 for services performed in accordance with the Bid Schedule and with this Agreement, but in no event

shall the total Contract Amount exceed \$1,633,898.00 absent a properly executed Change Order. Measurement of the work performed and monthly payment shall be made in accordance with requirements of the Measurement and Payment Section in the Contract Documents unless otherwise specifically provided herein.

- 6.5. **Non-Conforming Materials or Construction.** Where materials installed or the finished product fails to meet minimum requirements of the Contract Documents, the basis of determining final payment to the Contractor shall be determined by the Arvada project manager.
- 6.6. **Retainage Requirements.** Contractor agrees to submit monthly invoices together with any retainage requirements as prescribed by Colorado state statutes (*see e.g., C.R.S. § 24-91-101 et seq.*). Payment from Arvada will be paid NET 30 days. Invoices will accurately reflect actual work completed by Contractor and its subconsultants or subcontractors.

ARTICLE 7. MISCELLANEOUS.

- 7.1. **Waiver.** No provision of this Agreement may be waived except by written agreement of the parties. A waiver of any provision on one occasion shall not be deemed a waiver of that provision on any subsequent occasion, unless specifically stated in writing. A waiver of any provision shall not affect or alter the remaining provisions of this Agreement.
- 7.2. **Strict Compliance.** No failure of Arvada to insist upon strict compliance by the Contractor with any provision of the Contract Documents shall operate to release, discharge, modify, change or affect any of the Contractor's obligations.
- 7.3. **Successors and Assigns.** Arvada and Contractor, respectively, bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement and to the partners, successors and assigns of such other parties with respect to all covenants of this Agreement. Contractor shall not assign (whether partially or wholly) this Agreement whether by operation of law or otherwise, without the written consent of Arvada. If Contractor makes an assignment in accordance with this provision, Contractor shall nevertheless remain legally responsible for all obligations arising under the Agreement, unless otherwise agreed in writing by Arvada.
- 7.4. **Additional Documents.** The parties agree to execute any additional documents and to take any additional action that is necessary to carry out this Agreement.
- 7.5. **Binding Effect.** This Agreement shall inure to the benefit of, and be binding upon, the parties, their respective legal representatives, successors, heirs, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise expressly authorized herein. All provisions of this Agreement which contain continuing obligations shall survive its expiration or termination.

- 7.6. **Paragraph Captions.** The paragraph captions in this Agreement are set forth only for the convenience and reference of the parties and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.
- 7.7. **Integration, Amendment, and Severability.** This Agreement represents the entire agreement between the parties, and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties. If any other provision of this Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Agreement shall continue in full force and effect if the essential terms and conditions of this Agreement for both parties remain valid, legal, and enforceable.
- 7.8. **Notices.** Any notice or notification required or permitted by the Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent electronically, or by certified mail or registered mail, postage and fees prepaid, addressed to the party to whom such notice is to be given at the address set forth on the signature page below, or at such other address as has been previously furnished in writing, to the other party or parties. Such notice or notification shall be deemed to have been given when electronically sent or when deposited in the United States mail.
- 7.9. **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.
- 7.10. **Preferences in Employment of Colorado Labor.** To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:
- 7.10.1. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- 7.10.2. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement which shall be deemed an original on the date first above written.

[signatures on next page]

DATED this _____ day of _____, 2024.

CITY OF ARVADA, a Colorado home
rule municipal corporation

Lauren Simpson
Mayor
8101 Ralston Road
Arvada, CO 80002

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris

By: _____

INSITUFORM TECHNOLOGIES, LLC, a
Delaware Limited Liability Company

Whittney Schulte
Contracting and Attesting Officer
580 Goddard Ave.
Chesterfield, MO 63005
WSchulte@Aegion.com

23-ENG-096 Trenchless Sanitary Sewer Main Replacement

An Agreement By And Between The City Of Arvada And
Insituform Technologies, LLC For The 2023 Trenchless
Sewer Main Replacement Project No. 22-SR02 In An Amount
Not To Exceed \$1,633,898.00



COMPETITIVE SEALED BID

BID #: 23-ENG-096

Title: 2023 Trenchless Sewer Main Replacement

Issue Date: 11/14/2023

Pre-bid Meeting: N/A

Questions Deadline: 11/29/2023 2:00 PM MST
Questions must be submitted through BidnetDirect.com.
Responses will be posted on Bidnet via addendum.

Bid Due Date: 12/13/2023 2:00 PM MST

Virtual Opening Information Join Zoom Meeting
<https://us06web.zoom.us/j/86083793766?pwd=tAJW2gXIB46dxryXISWGAVcmRoNmQd.1>

Meeting ID: 860 8379 3766
Passcode: 783961

Bid Delivery address: Electronic Submissions must be submitted online at BidNetDirect.com by the above date and time. Late responses will not be considered for award.

Project Delivery Date: 150 Calendar days after notice to proceed

For additional administrative information not related to the project, contact: Doreen Mazza, dmazza@arvada.org
Contact with the requesting department may result in vendor disqualification.

Documents included in this Request:

Cover Page	page 1
Advertisement for Bidders	page 2
General Terms and Conditions	page 3
Special Terms and Conditions for Bidders	page 5
Insurance Requirements	page 7
Project Special Provisions	page 9
Submittal Forms to be completed and returned	
• Bid Bond	page 19
• Bid Proposal	page 20
• Sample Bid Schedule	page 21
• Required Contractor Submittal Form	page 22
• Performance Measures Form	page 23
Preview of Documents if Awarded	page 24

ARVADA'S VISION MISSION AND VALUES

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.



ADVERTISEMENT FOR BIDS

Submit bids electronically on Bidnetdirect.com for the construction of City of Arvada, Project No. 22-SR02, Project Title: 2022 Trenchless Sewer Main Replacement

The BID DOCUMENTS, consisting of Advertisement for Bids, General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, Addendum when issued, Bid Bond, Bid Proposal, Bid Schedule, Performance and Payment Bond, Submittal Checklist and References, Sample documents, and the Project Drawings may be examined at the following location: www.bidnetdirect.com

No cost bid documents may be obtained at www.bidnetdirect.com on or after 11/14/2023.

ESTIMATED QUANTITIES OF THE MAJOR ITEMS OF WORKARE:

434 LF	6" CIPP for Sewer Main
25,065 LF	8" CIPP for Sewer Main
2,676 LF	10" CIPP for Sewer Main
1,284 LF	12" CIPP for Sewer Main
308 EA	Sewer Service Reconnections

Miscellaneous items include citizen notification, traffic control, and other appurtenances.

Bidders, subcontractors and suppliers must be familiar with the current City of Arvada Engineering Code of Standards and Specifications, dated October 2 ,2023, which will be combined with the Bid Documents to form the Contract Documents for the Project. A copy of the Standards may be obtained from the office of the City Engineer upon a non-refundable payment of \$50.00. Holders will be notified when supplemental revisions and additions are available as they are adopted. The Standards are also available at no cost on the City's web site at <https://www.arvadaco.gov/167/Engineering-Code>. Holders are responsible for keeping current their City of Arvada Engineering Code of Standards and Specifications.

Date: 11/13/23

CITY OF ARVADA



Jenny Wolfschlag
City Engineer
8101 Ralston Road
Arvada, Colorado 80002

GENERAL TERMS AND CONDITIONS

1. PAYMENTS TO CONSTITUTE CURRENT EXPENDITURES. Financial obligations of the City of Arvada, if any, after the current fiscal year are contingent on funds for that purpose being appropriated, budgeted and otherwise made available by the City Council for the City of Arvada. The City of 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 the City of Arvada within the meaning of Article X, Section 20 of the Colorado Constitution.

2. TAXES. The City of Arvada is not subject to taxation. Contractor shall not invoice Arvada for any state, federal or local taxes whatsoever. Upon written notification by the City of Arvada, Contractor shall reimburse the City of Arvada in a timely manner for any taxes erroneously paid by the City of Arvada. The Colorado Department of Revenue, Certification of Exemption for Colorado State Sales/Use Tax account number for the City of Arvada is 98-01789-0000. An exemption certificate will be provided, where applicable, upon request.

3. NO INDEMNIFICATION BY ARVADA. The City of Arvada is prohibited by Article XI, Section 1, Colorado Constitution, from indemnifying anyone. Therefore, notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, the City of Arvada does not indemnify Contractor or anyone else under this Agreement.

4. INDEMNIFICATION OF CITY.

A. Contractor: Notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, Contractor agrees to investigate, defend, indemnify and hold harmless Arvada, its elected officials, officers, employees, agents, insurers, and representatives from and against any claims, costs, losses, expenses, demands, actions, or causes of action, including reasonable attorney fees and other costs and expenses of litigation, which may be asserted against or incurred by Arvada or for which Arvada may be liable, arising from the negligence, willful misconduct, or other fault of Contractor or its employees, agents, or subcontractors in performance of the Agreement. Nothing herein is intended to constitute a covenant, promise, or agreement to indemnify and hold harmless Arvada from any liability or damages directly caused by or attributable to Arvada's own negligence. Nothing herein intended to be nor may be construed as a waiver of the immunities, protections, or limitations on damages provided to Arvada by the Colorado Governmental Immunity Act, C.R.S. §§ 24-10-101 *et seq.*, as it may from time to time be amended.

5. NO OPINION OF COUNSEL LETTERS. Pursuant to Section 8.1 of the Arvada City Charter, the City Attorney provides advice to the City Council and City Officials in matters relating to their official powers and duties and will perform such other duties as City Council may prescribe by ordinance or resolution. The City Attorney will not issue opinion of counsel letters, memoranda or statements to third parties, including, but not limited to that any contract or lease is binding on the public entity, enforceable, etc.

6. CONFIDENTIAL DOCUMENTS. Contractors 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 Contractor 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 Contractor. By its submission of the Proposal/Response, Contractor 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, Contractor 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 Contractor's objection.

7. 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 the City of Arvada or others.

8. ASSIGNMENT. Contractor shall not assign the Agreement without the prior written consent of the City of Arvada, which will not be unreasonably withheld, conditioned, or delayed. Contractor may assign the Agreement to any successor to the business of the party by merger, consolidation, or sale of assets. No assignment shall be permitted that enlarges any duty, responsibility or obligation of the City of Arvada, or that limits, curtails, or diminishes any right or privilege of the City of Arvada without the City of Arvada's express written consent.

9. NO THIRD PARTY BENEFICIARIES. It is expressly understood and agreed that enforcement of the terms and conditions of the Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to Arvada and Contractor and nothing contained in the Agreement shall give or allow any such claim or right of action to any other third party on the

Agreement. It is the express intention of Arvada and Contractor that any person other than Arvada or Contractor receiving services or benefits under the Agreement shall be deemed to be an incidental beneficiary only.

10. INDEPENDENT CONTRACTOR. Contractor and Arvada hereby represent that Contractor is an independent contractor for all purposes hereunder. As such, Contractor is not covered by any worker's compensation insurance or any other insurance maintained by Arvada except as would apply to members of the general public. Contractor shall not create any indebtedness on behalf of Arvada.

11. SUBCONTRACTING. Contractor shall not award work to subcontractor(s) in excess of fifty percent of the total contract price without Arvada's prior written approval. Contractor shall be responsible for any failure by any subcontractor or subcontractor personnel to perform in accordance with the Agreement or to comply with any duties or obligations imposed on Contractor under the Agreement to the same extent as if such failure to perform or comply was committed by Contractor or Contractor's personnel. Contractor shall be Arvada's sole point of contact regarding the services, including with respect to payment.

12. NO WAIVER OF GOVERNMENTAL IMMUNITY. Nothing contained in this or any of the exhibits attached thereto shall be construed as a waiver of any of the immunities, limitations, privileges, rights, procedures, or requirements contained in the Colorado Governmental Immunity Act, C.R.S. §§24-10-101 *et seq.*

13. RIGHT TO TERMINATE. The City of 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 thereof. In the event of termination by the City of Arvada for convenience, Contractor will be paid for requested work performed up until the time of termination by the City of Arvada, not to exceed the total amount of the contract price agreed upon by the parties.

14. COMPLIANCE WITH ALL LAWS. All of the services performed under this Agreement by Contractor shall comply with all applicable laws, rules, regulations and codes of the United States and State of Colorado, and with the charter, ordinances, rules and regulations of the City of Arvada.

15. WAIVER OF BREACH. A waiver by any party to the Agreement or the breach of any term or provision of the Agreement shall not operate or be construed as a waiver of any subsequent breach by either party.

16. GOVERNING LAW AND VENUE. Notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, the Agreement shall be governed by the laws of the State of Colorado. Venue for any action arising under the Agreement or for the enforcement of the Agreement shall be in the appropriate court for Jefferson County, Colorado.

17. FORCE MAJEURE. Any delays in or failure of performance by any party of its obligations under the Agreement shall be excused if such delays or failure are a result of acts of God, fires, floods, strikes, labor disputes, 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.

18. BINDING ARBITRATION PROHIBITED. The City of Arvada does not agree to binding arbitration by any extra-judicial body or person. Any provision to the contrary in response to the solicitation, or incorporated by reference, shall be null and void.

19. EQUAL EMPLOYMENT OPPORTUNITY. Contractor shall not refuse to hire, discharge, promote or demote, or discriminate in matters of compensation against any person otherwise qualified solely because of race, creed, sex, color, national origin or ancestry, religion, disability, age, sexual orientation, gender identity, veteran status, or any other basis prohibited by federal, state, or local law.

20. 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, has been properly acknowledged by attestation, notary acknowledgment, or both, 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.

21. PREFERENCES IN EMPLOYMENT OF COLORADO LABOR. To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:

- a. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- b. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.

22. RETAINAGE REQUIREMENTS. Contractor agrees to submit monthly invoices together with any retainage requirements as prescribed by Colorado state statutes (see *e.g.*, C.R.S. §§24-91-101 *et seq.*). Payment from Arvada will traditionally be paid NET (15) days but no later than NET thirty (30) days. Invoices will accurately reflect actual work completed by Contractor.

23. ACCESSIBILITY COMPLIANCE.

- 23.1 Arvada is obligated to comply with the Colorado Anti-Discrimination Act (C.R.S. §§24-34-300 *et seq.*)(“CADA”), which requires all digital and online platform and content providers to comply with the minimum

Accessibility Standards for Individuals with a Disability, adopted by the Colorado Office of Information Technology ("OIT") under C.R.S §24-85-103(2.5). Contractor has been advised to familiarize itself with CADA.

- 23.2 To the extent the Work or any of Contractor's services provided under the Agreement involves digital, technological components, including but not limited to software, websites, applications, digital documents (the "Material"), all Material shall comply with the OIT's currently adopted minimum *Accessibility Standards for Individuals with a Disability* at all times.
- 23.3 Contractor shall indemnify, save, 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) incurred by any of the Indemnified Parties in relationship to Contractor's failure to comply with Section (23.2) above.
- 23.4 Upon Arvada's request, Contractor shall certify to Arvada that its service(s) and digital documents are compliant with Section (23.2) above. Arvada may require Contractor's compliance to the OIT's currently adopted minimum standards of accessibility to be determined by a third party selected by Arvada to attest to Contractor's compliance.

SPECIAL TERMS AND CONDITIONS FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS. Bids submitted electronically on the BidnetDirect.com website only become available to the City of Arvada after the bid closes. Bidder shall assume full responsibility for timely upload of bid to the BidnetDirect website. The City reserves the right, where its best interest will be served, to accept or reject any conditional or qualified bid.

2. QUANTITY AND NATURE OF THE WORK. Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including Addendum. After Bids have been submitted the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

3. CONTENTS OF BID. Contractors are required to submit Bids with the following conditions:

- 1) Contractors shall make all investigations necessary to inform themselves of the sites affected and the work 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 Bids. A copy of such addenda will be publicly posted with the original CSB 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. BID SECURITY. Each Bid must be accompanied by a PHOTO of the Bid Bond, on the form attached to these contract documents, payable to the City for five (5) percent of the total amount of the Bid. As soon as the bid Prices have been compared, the City will issue intent to award on the Bidnetdirect.com web site. The vendor who is named as the intent to award Contractor must submit the physical Bid Bond within 10 days or the intent to award may be revoked. The Bid Bond of the successful Bidder will be retained until the Payment and Performance Bond has been executed and approved after which it will be returned. A certified check may be used in lieu of a Bid Bond.

5. POWER OF ATTORNEY. Attorneys-in-fact who sign Bid Bonds or Payment and Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

6. QUALIFICATION OF BIDDER. The City may make such investigation as it deems necessary to determine the ability of the Bidder to perform the work. The City reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the City that such Bidder is properly qualified to carry out the obligation of the Contract Agreement and to complete the work contemplated therein. The City reserves the right, before awarding the contract, to require a Contractor 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.

7. AWARD OF CONTRACT. Bids shall be awarded to the lowest-priced responsible and most responsive bidder whose bid meets the requirements and criteria set forth in the CSB within the limits of funds available and that best serves the City's interest. The City, within seven (7) calendar days of receipt of acceptable Contract Security and the Contract Agreement, signed by the Bidder to whom the Contract was awarded, shall sign the Contract Agreement and return to the Bidder an executed copy of the Contract Agreement. Should the City not execute the Contract Agreement within such period, the Bidder may, by written notice, withdraw their signed Contract Agreement. Such notice of withdrawal shall be effective upon receipt of the written notice by the City.

8. NOTICE OF AWARD AND FAILURE TO ENTER INTO CONTRACT. The party to whom the Contract is to be awarded will be required to execute the Contract Agreement, obtain Certificates of Insurance and a Performance and Payment Bond, as Contract security, within five (5) calendar days from the date the Notice of Award is delivered to the Bidder. The Notice of

Award shall be accompanied by the Contract Agreement and the necessary Performance and Payment Bond forms. In case of failure of the bidder to execute the Contract Agreement and provide satisfactory Insurance and Contract Security, the City may at its option, consider the Bidder in default, in which case the Bid Bond accompanying the Proposal shall become the property of the City.

9. CONTRACT DOCUMENTS. The Contract Documents consisting of the Bid Documents, which include the Advertisement for Bids, Information for Bidders, General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, Addendum, Bid Bond, Bid Proposal, Bid Schedule, Vendor Submittal Form, Construction Drawings, Supplemental Specifications and the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", dated October 2, 2023, which include the Measurement and Payment specifications, and the attached Notice of Award form, Contract Agreement form, Performance and Payment Bond form, Notice to Proceed form, and Change Order form, when combined, contain the provisions required for the construction of the Project. Information obtained from an agent or employee of the City or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the contract.

10. TERM OF CONTRACT. This contract shall commence on the date of the purchase order or contract execution and shall remain in effect until such time as the commodities, equipment and/or services acquired in conjunction with this Bid have been accepted by the City's authorized representative. Any required warranty period which exceeds this term shall remain in full force for the duration of the warranty period.

11. PRICING SHALL BE FIXED AND FIRM. The prices offered by the Contractor shall remain fixed and firm for at least 90 ninety days. No changes in the Bid shall be allowed after the date and time of the Bid deadline due to error by the Contractor.

12. CONTRACT SECURITY. A Performance and Payment Bond, on the form attached to these contract documents, in the amount of 100% of the Contract price, with a corporate surety approved by the City, will be required for the faithful performance of the Contract.

13. NOTICE TO PROCEED. The Notice to Proceed shall be issued within seven (7) calendar days of the execution of the Contract Agreement by the City. Should there be reason why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the City and the Contractor. In the event the Notice to Proceed has not been issued within the seven day period or within the period mutually agreed upon the Contractor may terminate the Contract Agreement without further liability on the part of either party.

14. MODIFICATION OR WITHDRAWAL OF BIDS BY CONTRACTOR.

Modifications to Bids- Changes to the Bid after the submission deadline shall be allowed only when the Contractor 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 Contractor's name, address, Solicitation Number and title included.

Withdrawal of Bids- If a Bid is withdrawn by Contractor after the Bid Opening, the City may, at its option, suspend the Contractor for a six (6) month period following the withdrawal. Withdrawal of the Bid after the Bid Opening will result in the Contractor forfeiting the provided Bid Bond.

15. REJECTION OF OFFERS BY CITY.

A. The City may reject a Bid, in whole or in part, for reasons including, but not be limited to:

- 1) The Contractor misstates or conceals any material fact in its Bid;
- 2) The Contractor's Bid does not strictly conform to the law or requirements of the Solicitation;
- 3) The Bid expressly requires or implies a conditional award that conflicts with the method of award stipulated in the Special Conditions;
- 4) The Bid does not include documents which are required for submission with the Bid; or
- 5) The Bid has not been executed by the Contractor through an authorized signature.

B. The City may, at its sole and absolute discretion:

- 1) Reject all or parts of Bids submitted by prospective Contractors;
- 2) Re-advertise this Solicitation;
- 3) Postpone or cancel the Solicitation;
- 4) A Bid 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 government 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.

16. 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. Contractors 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 Contractor's Bid, it shall be agreed that the Contractor's Bid fully complies with all conditions identified in this Solicitation.

17. ELIGIBILITY OF CONTRACTORS: MUST BE ENGAGED IN SUPPLYING PRODUCTS OR SERVICES RENDERED. Bids 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. Contractors 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 Contractor 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.

18. ELECTRONIC PAYMENT METHODS - CITY OF ARVADA SINGLE USE ACCOUNT.

Contractors are encouraged to consider the following method of payment.

Single Use Account: The City incorporates the use of Single User Accounts as an option to seamlessly process payment of larger dollar purchase orders and contracts to vendors/contractors/providers. A secure, one-time payment transaction account processes to pay invoices via the Contractor's merchant bank. Invoice payments have an enhanced speed-of-pay cycle that can significantly benefit cash flow.

19. CONDITIONS OF WORK AND OBLIGATION OF BIDDER. Each Bidder is responsible for independently inspecting the site and for reading and being thoroughly familiar with the Contract Documents and for providing the names of major suppliers and sub-contractors in the space provided on the Bid Proposal form. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve the Bidder from any obligation in respect to their Bid Proposal.

20. CONTRACTOR LICENSE. The Contractor to whom the contract is awarded and any subcontractors employed by the Contractor must have or acquire the appropriate Contractor's license issued by the City of Arvada Engineering Division, including submittal of license bond, necessary insurance certificate, and license fee before initiating any work. The Contractor and any subcontractors will also be required to obtain a no charge Public Improvements Permit from the City of Arvada Engineering Division prior to initiating any and all work on this project.

21. PERFORMANCE MEASUREMENTS FOR SERVICES MORE THAN \$15,000.

The City has incorporated Performance Management into its organizational culture. The City will monitor and report on the following performance measures. These measures will determine, in part, renewals and eligibility for future awards. Measures include: (a) safety as defined by observation and OSHA reportable injuries, (b) quality of contracted work, (c) work completed within required schedule, (d) administration and coordination of estimates, RFIs, ASIs, change orders, pay requests and close out documents, (e) fair and justifiable change orders, (f) responsiveness and follow through on requests.

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.

22. PREPARATION AND SUBMISSION.

Bids 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) Contractors 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) The only authorized version of this Bid is posted on WWW.BIDNETDIRECT.COM. Registration is available to receive email notification of new solicitations, addenda, and communications.

INSURANCE REQUIREMENTS

The following listed insurance requirements shall be carried by the selected Contractor 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 \$5,000,000.00, 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 \$1,000,000 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.
- 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.
- 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 Contractor fails to submit the required insurance documents within 15 calendar days after notice to submit such policies is given to the Contractor by a City representative, the Contractor 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.
- The City, through its Risk Manager, reserves the right to require additional insurance coverage and other requirements.

SPECIAL PROVISIONS

City of Arvada Project No 23-SR-02, Project Title 2023 Trenchless Sewer Main Replacement

Conditions peculiar, but essential, to the successful performance and acceptance of the work on this project are itemized below. As such, they shall take precedence over the City of Arvada Engineering Code of Standards and Specifications (latest edition).

A. GENERAL CONSIDERATIONS

- SC-A-1** **MINIMUM REQUIRED QUALIFICATIONS:** Evidence of these qualifications must be submitted.
1. Successful installation of 100,000 lineal feet or more of CIPP lining in the Front Range of Colorado in each of the last three calendar years. Front Range of Colorado is defined as Fort Collins to Pueblo.
 2. All references must be from Colorado entities. At least three references must be on projects for the proposed project manager. At least two references must be on projects for the proposed superintendent.
 3. Resumes for the proposed superintendent and project manager must be provided.
- SC-A-2** **CONTRACT TIME AND LIQUIDATED DAMAGES:** This project is to be completed, including cleanup, within 150 consecutive calendar days after the date to be specified in the Notice to Proceed, unless the contract time is adjusted by change order. The Contractor shall agree to pay to the Owner, as liquidated damages, the sum as identified in section 1121.07 Time for Completion and Liquidated Damages, for each consecutive calendar day that the work exceeds the allotted contract time.
- SC-A-3** **MEASUREMENT AND PAYMENT:** Measurement of the work performed and payment, at the unit or lump sum price quoted in the Bid Schedule, shall be made in accordance with requirements of the Measurement and Payment Section of the Contract Documents or as hereinafter stated in the Special Conditions.
- SC-A-4** **NON-CONFORMITY OF MATERIAL OR FINISHED PRODUCT:** Materials not in conformance with contract requirements or these Standards and Specifications shall be considered defective and shall be rejected in accordance with section 122.03 Removal or Unauthorized and Unacceptable Work. Rejected materials shall be removed from the work site, and Contractor shall be required to replace and/or repair materials to meet the Contract Documents.
- SC-A-5** **TAXES:** The City of Arvada is exempt from Colorado State Sales and Use Taxes on materials and equipment to be incorporated in the work. Said taxes shall not be included in the Contract Price.
- SC-A-6** **OSHA REQUIREMENTS:** Observing the rules and regulations required by the Occupational Health and Safety Administration (OSHA) is the responsibility of the Contractor on this project.
- SC-A-7** **WORKING CONDITIONS:** There shall be no construction during City observed holidays. Arvada observed holidays generally include: New Year's Day, Martin Luther King, Jr. Day, Presidents' Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Thanksgiving Day, Day After Thanksgiving, Christmas Day.
- All work to be completed on the project shall be performed during regular working hours, 7:00 a.m. until 7:00 p.m. Monday through Friday. Work hours on arterials and collector streets are from 8:30 a.m. to 3:30 p.m. There shall be no construction between 7:00 p.m. and 7:00 a.m. unless it is an emergency or is authorized by the City Manager.
- The Contractor shall submit a written request to the Project Engineer to perform overtime work outside of allowable working hours. Requests for work outside regular working hours shall be received a minimum of 10 working days prior to the proposed date of the work. The Project Engineer will complete the necessary reviews and obtain the appropriate approvals to comply with Arvada Municipal Code.
- SC-A-7** **MINOR CONTRACT REVISIONS:** Miscellaneous modifications in the work, ordered by the Project Engineer in the form of a field order, will be considered a minor contract revision. Payment for accepted work performed under this pay item "Minor Contract Revision" will be made in accordance with sections 1121.05 Changes in Contract Price and 1121.06 Changes in Contract Time of the Arvada Engineering Code of Standards and Specifications. If the contractor feels that a field order issued by the Engineer entitles the contractor to a change in the total contract price or time, or both, (i.e. the contractor feels that the field order involves costs over and above the amount available in the Minor Contract Revisions bid item) then the Contractor shall notify

the Engineer, in writing, within 15 days after receipt of the field order. The Contractor shall not execute any such field order changes ordered by the Engineer pending the receipt of a written Change Order document executed either by the City Manager or Mayor authorizing an increase in the total contract price. Any such work completed by the contractor prior to receipt of an executed Change Order will be at the contractor's risk and be subject to removal by the contractor should a Change Order not be approved and executed by the City Manager or Mayor for such work.

- SC-A-8** **FIELD ORDERS:** An authorized representative of the contractor shall acknowledge receipt of field orders by promptly signing all written field orders delivered to the job site. Verbal field orders given by the Engineer will be recorded in writing in the municipal inspector's daily report that is to be signed by the contractor's authorized representative.
- SC-A-9** **PROJECT STATUS MEETINGS:** Project status meetings will be held as necessary for scheduling, communication, and problem solving throughout the duration of the project. Contractor shall ensure that the project manager, superintendent or foreman is present and prepared to furnish the City with the schedule of work operations at each of these meetings as requested by the Engineer throughout the project.
- SC-A-10** **CHANGE OF METHOD:** Any cost due to a change in construction method will be the responsibility of the contractor.
- SC-A-11** **INSPECTION OF PIPELINE:** The contractor is responsible for being knowledgeable of the existing pipe condition prior to submitting a bid and initiating construction. The contractor may view available video of the pipe at the City's Wastewater Shops, 5555 West 56th Avenue. Call 720-898-7770 to coordinate a viewing schedule.
- SC-A-12** **CONSTRUCTION WATER:** All construction water will be provided by the City free of charge through existing City owned fire hydrants. Contractor will be required to obtain a hydrant meter from the City Utilities division which will require a \$2,000 refundable meter deposit upon return of the meter in acceptable working condition.
- SC-A-13** **STORMWATER CONSTRUCTION PERMIT:** As a subsidiary obligation of the contract, the Contractor shall obtain a Stormwater Construction Permit from the Colorado Department of Public Health and Environment, Water Quality Control Division, Permit Enforcement Section, prior to clearing, grading, or excavating a site of one (1) acre or more. A copy of the approved permit must be submitted to the City of Arvada Engineering Division prior to the start of clearing, grading or excavating of the site. A copy of the approved permit must also be available on the project site at all times during construction. Contractor shall also obtain a Colorado state Construction Dewatering Discharge Permit from the Colorado Department of Public Health and Environment for all areas where trench dewatering is required and water is discharged into a storm sewer, channel, irrigation ditch or any waters of the United States. A copy of the approved permit must be submitted to the Engineer prior to the start of any dewatering. A copy of the approved permit must also be available on the project site at all times during construction.

In addition, the Contractor shall be required to obtain a City of Arvada Site Development Permit from the Arvada Stormwater Utility Division. For permit requirements go to Arvada.org/services and click on Building/Development. Contractor shall implement best management practices that include inlet protection for all inlets affected by the work as well as stockpile protection in order to control runoff from stockpiles. Contractor shall also be required to perform daily street sweeping to limit tracking from the work site. Uncontrolled releases of dirt or silt from the project into drainage ways, which includes the gutter or stormwater inlets, constitutes a violation of Arvada Ordinance punishable by up to \$999 per day per incident. No additional payment will be made for obtaining a City of Arvada Site Development Permit and implementing best management practices required to prevent uncontrolled releases of dirt or silt from the project into drainage ways, which includes the gutter or stormwater inlets.

- SC-A-14** **APPROVED METHODS:** All bidders on this project must construct the CIPP and any maintenance hole rehabilitation and coating with a process that has been approved by the City Engineer prior to bid opening. All approved methods must meet the specifications in the City of Arvada *Engineering Code of Standards and Specifications* and these Special Conditions. Any proposed deviations from the specifications must be submitted in writing for approval at least seven (7) calendar days prior to the bid opening. Any and all departures from the specifications must be pointed out and shown on the material submitted.

The approval of other processes as equal to that specified will only be made in writing in the form of an Addendum issued by the City Engineer.

If an alternate process is approved, the contractor shall accept the responsibility for the performance of the installation and if it does not meet the intent or standard of the specified process/installer the City reserves the right to have the installation removed and reinstalled or corrected at the Contractor's expense.

Glass Reinforced Plastic (GRP) cured in place thermosetting resin pipe supplied and installed in accordance with ASTM F2019 that is cured with ultraviolet light will be considered an acceptable alternative process for the work on this project.

B. CONSTRUCTION CONSIDERATIONS

SC-B-1 **LOCATIONS AND PRIORITIES:** The City reserves the right to add, delete, or modify construction locations, priority order and portions of the work without change in the contract agreement prices, 1121.05 Changes in Contract Price of the Arvada Engineering Code of Standards and Specifications.

SC-B-2 **PRE-CONSTRUCTION AND SCHEDULING:** A pre-construction meeting will be scheduled prior to the start of work. Attendance by the contractor's project manager and/or construction superintendent will be required. A construction schedule shall be submitted by the contractor to the project engineer at least three (3) days prior to the pre-construction meeting. The schedule shall be in bar chart form and shall at a minimum indicate the start and completion dates of work at each construction location. The contractor shall also provide the City with an after-hours emergency contact phone number at the pre-construction meeting.

SC-B-3 **MINIMIZING WORK ZONE DAMAGES:** During all phases of construction including cleanup, contractor shall operate all equipment and utilize personnel so as to minimize or prevent damages to public or private property. Contractor shall limit operation of heavy equipment to safe prudent speeds and minimize operation of equipment over concrete sidewalks, curbs and gutters. Contractors shall also conduct operations to avoid dings, nicks, gouges, scrapes, etc., on streets and concrete curb, gutter and sidewalks as well as other facilities in the construction area. Should contractors' operations cause damages, contractor shall be fully responsible for repairs at no cost to the City.

All public or private property damaged during the construction process must be repaired within two weeks of street and right-of-way clean-up. Should repair items not be completed within two weeks, city may initiate and complete the repair work; deducting costs to complete the work from total contract.

SC-B-4 **LIMITATION ON CONSTRUCTION ZONE:** Unless otherwise permitted by the Engineer, installation of the CIPP shall be completed such that no more than two segments of pipe are under construction at any one time. A segment of pipe is defined as the length of pipe between two consecutive maintenance holes. Construction shall include, but not be limited to, inversion and curing of the CIPP and/or any construction that requires sanitary sewer service interruptions.

SC-B-5 **TRAFFIC CONTROL AND STREET RESTRICTIONS:** Traffic control methods shall conform to Arvada Engineering Code of Standards and Specifications and the FHA Manual for Uniform Traffic Control Devices and Colorado Supplement thereto. When working in State Highway right-of-way, traffic control methods shall meet the requirements of the Colorado Department of Transportation (CDOT). Contractor's traffic control plan is subject to CDOT approval prior to commencing work on State Highway right-of-way. No hand painted traffic control devices will be permitted. After award of the contract and prior to the start of construction, contractor shall submit two copies of the traffic control plans for approval encompassing all locations of the project. The contractor shall modify the installation to meet requirements of the City of Arvada Traffic Department, if so required.

The contractor shall notify the Arvada Traffic Division of all closures, either partial or complete, of any public street, road, highway or alley per Section 149.00 Traffic Control, Barricades and Warning Signs of Arvada's Engineering Code of Standards and Specifications. Notification shall be made a minimum of 24 hours in advance of the actual closure; except on commercial, parkway, and collector streets, where a minimum three (3) day advance notice will be required. All streets in the project will be considered for closure to thru traffic (local traffic only allowed) except for the following:

1. W 80th Avenue– Arterial
2. Wadsworth Blvd – CDOT
3. W 64th Avenue – Arterial/Collector
4. Pierce Street - Collector
5. Olde Wadsworth Blvd – Collector
6. W 62nd Avenue – Collector
7. Lamar Street – Collector
8. Ralston Rd – Arterial
9. Garrison Street – Collector

10. W 56th Avenue – Collector
11. Sheridan Blvd – CDOT
12. W 66th Ave - Collector

The above streets are classified as arterial, collector, or CDOT highway. All other streets in the project are classified as local streets. Work hours shall be as outlined below. CDOT roadway working hours must be as approved by CDOT.

MEASUREMENT: The traffic control shall be a lump sum item for all aspects of the traffic control plan. Payment for traffic control shall be full compensation for the traffic control and labor, equipment and materials required to implement the traffic control plan.

PAYMENT: Prorated payment of the contract amount bid for traffic control will be made monthly. The percentage paid shall be equal to the percentage of the total contract dollar amount completed that month. In no case shall payment be more than 100% of the amount bid for Traffic Control.

SC-B-6 STREET CLOSURE RESTRICTIONS: Lane closures in various street classifications are as follows:

ARTERIAL STREETS:	Lane closures 8:30 am – 3:30 pm only Construction activities: 8:30 am – 3:30 pm only Must maintain one lane each way at all times.
COLLECTOR STREETS:	Lane closures 8:30 am – 3:30 pm only Construction activities: 7:00 am – 7:00 pm only Must maintain one lane with adequate flagging
LOCAL STREETS:	Lane closures 7:00 am – 7:00 pm only Construction activities: 7:00 am – 7:00 pm only May be closed to thru traffic unless otherwise noted (during working hours)

If contractor violates these working time limitations without prior authorization from the Engineer, Engineer may give written notice to stop work on the project at the beginning of the next day's work and work may not resume until contractor provides written explanation for the violation and assurance to the City that there will not be a reoccurrence of the violation. If subsequent working time violations occur, Engineer will notify contractor in writing that there will be a price reduction for each incidence of unauthorized violation in accordance with this specification. Price reduction will not be imposed where changed contract conditions are encountered during the specific period or the violation in question was a result of circumstances beyond contractor or subcontractor's control. The price reduction will not constitute a penalty but will be considered a failure to perform traffic control in accordance with the contract.

An incident is any violation up to 30 minutes in duration. Each 30 minutes or increment thereof will be considered an incident. A price reduction will be assessed for each successive or cumulative 30-minute period in violation of the working time limitations, as determined by the Engineer. The price reduction for each incident will increase at a progressive rate starting with \$150 for the second incident and increasing to \$600 for the fourth and subsequent incidents in accordance with the following schedule. A 15-minute grace period will be allowed at the beginning of the second incident on the project before the price reduction is applied. The 15-minute grace period applies only to the second incident. The number of incident charges will be accumulative throughout the duration of the contract.

PRICE REDUCTION SCHEDULE

<u>INCIDENT</u>	<u>INCIDENT RATE</u>	<u>TOTAL PRICE REDUCTION</u>
1 st	Notice to Stop Work	\$0
2 nd	\$150	\$150
3 rd	\$300	\$450
4 th	\$600	\$1,050
5 th	\$600	\$1,650
6 th	\$600	\$2,250
ETC.	\$600 ETC.	\$2,850 ETC.

SC-B-7 **PROTECTION AND RESTORATION OF EXISTING LANDSCAPING:** The contractor shall protect or remove and replace, all shrubs, decorative rock, sod, underground sprinklers, signs, landscaping, fences or other private or public improvements within or adjacent to the project area. Disturbed areas shall be restored to condition equal to or better than that which existed prior to construction. All sod shall be new unless approved by the municipal inspector to re-use existing sod.

If branches of trees or shrubs will be in the path of the proposed construction, as verified by the municipal inspector prior to construction, the contractor shall prune these branches under the supervision of the City Forester.

Also, if tree or shrub roots are exposed in the construction area, the contractor shall saw cut the roots within 24 hours after the roots are exposed. The contractor shall not cut the roots with the backhoe. If the roots are improperly cut or exposed longer than 24 hours, then the tree or shrub will be considered as damaged and the contractor will be responsible for replacement at his cost.

PAYMENT: No separate payment will be made for protection and/or restoration of existing sod, decorative rock, shrubs, trees, landscaping, underground sprinklers, fences, signs and other private or public improvements in the project. This work shall be considered as subsidiary to the cost of sewer main rehabilitation (CIPP).

SC-B-8 **TRENCHLESS REHABILITATION:** Rehabilitation of the sanitary sewer mains at the locations as shown on the Project Drawings shall be completed using a City of Arvada approved CIPP process as described in the section SC-B-X of these Special Conditions. Sliplining will not be allowed. Glass Reinforced Plastic (GRP) cured in place thermosetting resin pipe supplied and installed in accordance with ASTM F2019 that is cured with ultraviolet light will be considered an acceptable alternative process for the work on this project.

Costs for this work shall include cleaning any existing root intrusion or other dirt or debris inside the pipe prior to the installation of the CIPP. All 8" felt CIPP liner shall be minimum 0.21" wall thickness or in accordance with ASTM F1216, Appendix X.1, whichever results in a greater wall thickness. The minimum Modulus of Elasticity of the felt CIPP liner per ASTM F1216 shall be 250,000 psi. CIPP shall be designed assuming no bonding to the original pipe wall. All CIPP shall be designed assuming a fully deteriorated condition of the existing pipe.

For UV cured glass reinforced plastic liner only:

All UV cured-in-place glass reinforced plastic lining products shall comply with ASTM F2019 or intent thereof as determined by the Engineer, minimum finished liner thickness 3 mm and maximum of 6 mm up to 15-inch diameter (M liner). Wall thicknesses shall be a minimum of 3 mm to a maximum of 10 mm from 18 inch to 33-inch diameter (S liner) (except for services).

The Contractor shall furnish a general purpose, polyester or vinyl ester UV Curing resin and catalyst system compatible with the Ultra Violet Light Curing process that provides cured physical strengths specified herein.

Liner material shall be manufactured with resins pre impregnated within the liner to eliminate the possibility of air bubbles and voids.

The reconstruction tube will be vacuum impregnated with UV Curing Resins in the manufacturing facility prior to installation. The Contractor shall allow the Owner to inspect the materials before installation.

The Pre-Impregnated UV Light Fiberglass Liner shall be inserted through the existing maintenance hole or other approved access by means of a pull in place process by means of a winch in which will fully extend it to the next designated maintenance hole or termination point. The Fiberglass Liner shall be inflated in place slightly with air to the manufacturer's specification for installing the UV Chain. The Ultra Violet Light Chain, with built in safety air loss shut off sensors, as provided by the ProKasro UV light chain, Shall then be installed into the liner and the gates are then to be closed. The Fiberglass liner will then be inspected with a camera mounted on the UV Chain as it is pulled to the end of the liner. After inspection and complete inflation to manufacturer's specifications, the UV light bulbs will be turned on. The curing will commence at a rate specified by the manufacturer according to the total dimensions of the size of the liner.

As the liner is curing the UV Curing System shall record all curing data in DVD format for the viewing of the City.

Initial cure shall be deemed to be complete when the UV Chain arrives at the initial entry point of insertion.

The Contractor shall apply a hydrophilic seal at the terminus of each segment. The seal shall be of a material compatible with the CIPP material.

SC-B-9 **DEWATERING AND BYPASSING SEWAGE:** The contractor shall furnish and set up all equipment, labor and materials to properly handle and divert sewage flow for the purpose of sewer main rehabilitation. The pumps and bypass lines shall be of adequate capacity and size to handle all flows. The contractor shall handle all sewage necessary to bypass or otherwise cause sewage flow to be harmless to the work and adjoining public and private property. Raw sewage shall not be allowed to contaminate groundwater. The contractor shall provide all energy required for power equipment; temporary installation of bypass pipes under the pavement of cross streets as may be required for traffic; repaving of cross streets after removal of temporary bypass pipes; and all other related labor, equipment and materials required to bypass sewage until completion of the sewer rehabilitation and maintenance hole replacement process in accordance with these specifications and bid documents.

Bypassed sewage shall only be discharged into a downstream sanitary sewer maintenance hole.

Diversion of sewage or groundwater by means of diesel or gasoline pumps will only be allowed during daylight hours. No pumps, except City approved electrical pumps are to be operated at night.

If sewage backup occurs and enters residences or buildings, the Contractor shall be responsible for clean-up, repair, property damage, cost and claims.

If trench dewatering is required to rehabilitate the sewer main, a Colorado State Construction Dewatering Discharge Permit will be required if water is discharged into a storm sewer, channel, irrigation ditch or any waters of the United States. Contractor shall be responsible for obtaining a dewatering permit from Colorado Department of Health (CDOH) if required by CDOH before construction begins.

MEASUREMENT AND PAYMENT: No separate measurement or payment will be made for dewatering, bypassing sewage or obtaining a state Construction Dewatering Discharge Permit. This shall be considered subsidiary to the cost of sewer main rehabilitation and shall not be a separate pay item.

SC-B-10 **TRENCHLESS POINT REPAIRS:** The measurement for payment of this item will be the actual number of trenchless point repairs required in locations where the existing pipe is fully deteriorated, damaged or blocked and where rehabilitation by installation of the CIPP cannot be completed without first performing a trenchless point repair. Only those sections authorized by the Engineer shall be repaired and measured for payment.

Prior to starting this work, contractor shall submit in writing the exact method he proposes to employ. Such submittal shall be approved by the Engineer prior to commencement of this item of work. In addition, samples of materials for this item may be required to be submitted for approval by the Engineer prior to starting this work. The contractor shall have previously employed the method he intends to use or a similar method of trenchless point repair and provide documentation of previous successful repair installations.

MEASUREMENT AND PAYMENT: The unit price bid for each trenchless point repair shall include, but not be limited to, inspection of the fully deteriorated pipe by means of closed circuit television, removal of all foreign material from the sewer pipe wall, remote expansion and restoration of the existing deformed pipe to its original

circular shape and diameter, installation of a supporting sleeve or other structural means to maintain roundness of the pipe and all other related labor, equipment and materials required to complete this item in accordance with these specifications and bid documents.

If it is deemed necessary by the Engineer that a maintenance hole or other structure should be repaired, removed or replaced, a cost will be negotiated for the repair or removal and replacement and a field or change order will be issued.

SC-B-11 **OPEN CUT POINT REPAIRS:** The measurement for payment of this item will be the actual number of point repairs required in locations where the existing pipe is fully deteriorated, damaged or blocked and where rehabilitation by installation of CIPP cannot be completed. Each point repair shall be measured on the basis of a maximum installation of 10 feet of pipe. Pipe installed in excess of this amount shall be prorated to compensate for the extra length of pipe. Only those sections authorized by the Engineer shall be open cut repaired and measured for payment.

MEASUREMENT AND PAYMENT: The unit price bid for each open cut point repair shall include, but not be limited to, excavation, removal of existing features including concrete, curb, gutter, sidewalk, fences, landscaping, asphalt paving, removal and disposal of the existing damaged pipe, utility relocations, replacement and installation of pipe using SDR 35 PVC and appropriate couplers, pipe bedding, backfill, select backfill, replacement of asphalt paving, pavement striping and markings, concrete, curb, gutter, sidewalk, landscaping, fences or other features that are removed or damaged by this construction, and all other related labor, equipment and materials required to complete this item in accordance with these specifications and bid documents.

SC-B-12 **CURED IN PLACE PIPE (CIPP):** CIPP rehabilitation of pipelines and conduits shall be the installation of a resin-impregnated flexible tube which is inverted into the original conduit by use of a hydrostatic head. The resin is cured by circulating hot water or steam within the tube. When cured, the finished pipe (CIPP) will be continuous and tight fitting.

The work shall consist of cleaning, TV inspecting, and preparing the sewer, by-pass pumping as required, installing and curing the resin-impregnated tube, testing the installed CIPP, and reconnecting all live service lines.

The work shall consist of furnishing all labor, material, tools, equipment, and incidentals necessary to complete the project.

MATERIAL:

1. **Tube:** The tube material shall meet the requirements of ASTM F-1216, Section 5.1 and ASTM D-5813. The tube shall have a uniform thickness that when compressed at installation pressures will equal the specified nominal tube thickness. The tube shall be fabricated to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during inversion. The outside layer of the tube (before inversion) shall be translucent plastic coated with a flexible material that clearly allows inspection of the resin impregnation (wet-out) procedure. The plastic coating shall not be subject to de-lamination after curing of the CIPP. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No materials shall be included in the tube that is subject to delamination of the cured CIPP. The wall color of the interior pipe surface of the CIPP after installation shall be white or light brown so that a clear detail examination with closed circuit television inspection equipment may be made.
2. **Resin:** The resin system shall meet the requirements of ASTM F-1216 and ASTM D-5813. The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with an additional 5% to 10% allowance for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used to uniformly distribute the resin throughout the tube.

STRUCTURAL REQUIREMENTS: The CIPP shall be designed in accordance with ASTM F-1216, Appendix XI. The design shall assume no bonding to the original pipe wall. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers cleanly with a pointed probe; nor shall

separation of the layers occur during testing as required by this specification. The CIPP shall conform to the minimum structural properties as listed in Table 1 of ASTM F1216 and requirements of ASTM D-5813. The cured pipe material (CIPP) shall conform to the minimum structural standards, as listed below:

- Flexural Stress (ASTM D-790) 4,500 psi
- Modulus of Elasticity (ASTM D-790) 250,000 psi
- Chemical Resistance (ASTM D-453) loss not to exceed values for required strength

The Proposer shall determine the actual lengths of the material needed by field verification.

MEASUREMENT AND PAYMENT: The unit price bid per linear foot for this item shall include, but not be limited to, furnishing and setting up all equipment, labor and materials necessary for the construction process; furnish water and energy required for the pipe process; furnish and apply thermal setting resin and impregnating the CIPP pipe material; curing and trimming; testing and laboratory costs; inspection of pipelines and videotaping (before and after CIPP installation) and sewer line cleaning as referenced in other sections of these specifications; and all other related and necessary labor, equipment and materials required to complete this item in accordance with these specifications, the City of Arvada *Engineering Code of Standards and Specifications* and these bid documents.

SC-B-13 **INSPECTION AND TESTING:** CIPP samples shall be prepared, and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed the values listed in Table 1 of the applicable ASTM standard. The results shall be submitted to the Owner.

Wall thickness of samples shall be determined as described in Paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 95% of the minimum design wall thickness as calculated in paragraph 5.6 of ASTM F1743.

If the deviation in thickness of the finished CIPP is less than 5%, no adjustment in payment will be made. If the deviation in thickness is measured to be between 5% and 10%, a 10% reduction in the CIPP unit cost will be applied. If the deviation in thickness is greater than 10% the entire run will be rejected and the line segment shall either be relined or replaced at the contractor's cost at the discretion of the Engineer.

SC-B-14 **SEWER LINE CLEANING:** No separate measurement or payment shall be made for sewer line cleaning of lines to be rehabilitated using trenchless technology but shall be considered a part of the unit price bid per linear foot of CIPP installed.

Sewer line cleaning shall include, but not be limited to, furnishing and setting up all the equipment and labor necessary to clean the sewer to be rehabilitated; to furnish water for jetting; furnish energy required for derooting equipment; and other power cleaning machines' removal of all foreign material from the sewer pipe walls that will prevent the proper installation of the CIPP; transporting sediment for proper disposal; payment of any and all landfill fees; and all other related labor, equipment and materials required to complete this item in accordance with these specifications and bid documents. If hazardous materials are encountered during the sewer line cleaning and testing, a cost will be negotiated for handling of these materials, and a field order or change order will be issued.

SC-B-15 **INSPECTION OF PIPE LINES AND VIDEOTAPING:** No separate measurement or payment shall be made for pre and post construction inspection and videotaping of pipelines to be restored using trenchless technology but shall be considered a part of the unit price bid per lineal foot of CIPP installed. Post construction videos shall be submitted weekly showing the segments completed the previous week.

Inspection of pipelines and videotaping both prior to and after installation of the CIPP shall include, but not be limited to, furnishing and setting up all equipment and labor necessary to inspect the sewer to be rehabilitated by closed circuit television, record on video tape the TV inspections; determine, identify and locate live sewer taps; determine extended sewer taps that require trimming; locate and identify structural deficient pipe sections that may be considered for point repairs; supply energy required for all equipment and all other related labor, equipment and materials required to complete this item in accordance with these specifications and bid documents. The video camera rate of travel shall not exceed 30 feet per minute.

Leakage testing of the CIPP shall be accomplished during cure while under positive head. CIPP products in

which the pipe wall is cured while not in direct contact with the pressurizing fluid (e.g., a removable bladder) must be tested by an alternative method of an acceptable low pressure air or water exfiltration test at 4 to 5 psi above the groundwater pressure.

SC-B-16 **PROTRUDING TAPS:** The measurement and payment of this item will be the actual number of existing sanitary sewer service taps that are protruding in the existing sanitary sewer main and require cutting in order to properly install the CIPP. These taps shall be verified by the Engineer by inspection of the video tape prior to cutting.

The unit price bid shall include, but not be limited to, furnishing and setting up all equipment, labor and materials necessary for locating the existing protruding sanitary sewer service taps, cutting the protruding tap, removal and disposal of all debris, and all other related and necessary labor, equipment and materials required to complete this item in accordance with these specifications and bid documents.

SC-B-17 **SEWER SERVICE RECONNECTIONS:** The measurement and payment of this item will be the actual number of sanitary sewer service taps to be cut and reactivated as determined to be active per the video tape inspection.

The unit price bid shall include, but not be limited to, furnishing and setting up all equipment, labor and materials necessary for locating and reactivating existing active sanitary services, cutting the CIPP to reactivate the sewer service connections, removal and disposal of all debris and all other related and necessary labor, equipment and materials required to complete this item in accordance with these specifications and bid documents.

No service connection shall remain out of service for more than 12 hours at a time unless the contractor, at his expense, has provided temporary facilities or hotel accommodations for the affected citizens.

In no event shall the contractor cut and reactivate a dry service tap unless receiving prior approval by the Engineer. It will be the responsibility of the contractor, by dye test or whatever other means he deems appropriate, to determine if the service tap is active or not. Such determination shall be considered subsidiary to this item of work and no separate payment shall be made.

Any damage to the liner or lateral while reinstating services will be repaired by a hat or injection sealing method, no grouting will be allowed and no separate payment shall be made for such repair.

SC-B-18 **ACCESS TO MAINTENANCE HOLES:** Under certain circumstances, it may be necessary for the contractor to remove and replace obstructions in order to gain access to a maintenance hole. Prior to any construction, the contractor shall be responsible for discussing and obtaining permission from the appropriate property owners for gaining access to a maintenance hole and for any obstruction removals and replacements that may be necessary on the property. Obstruction removals and replacements may include, but not be limited to, removing and replacing landscaping, sod, decorative rock and fences. The contractor shall replace an obstruction to existing or better conditions, unless otherwise approved by the property owner, in writing. Costs for gaining access to maintenance holes and removing and replacing any obstructions shall be considered a subsidiary obligation of the contract and no separate payment shall be made.

SC-B-19 **SANITARY SEWER UNDERDRAINS:** The Contractor shall be responsible for verifying underdrain piping within any maintenance hole used for bypassing and/or the upstream maintenance hole(s) of any sewer line that is plugged. If underdrain piping is present within the maintenance hole a temporary riser may need to be installed if sewage levels are set to exceed the pipe opening elevation. The temporary riser will need to be set at a higher elevation than that expected for sewage levels during bypassing or plugging.

A permanent 18" riser with a cap must be installed at each underdrain pipe found within any maintenance hole accessed on the project.

MEASUREMENT AND PAYMENT: Each (EA) - Shall include all materials, labor, and equipment needed for temporary and permanent riser and cap installation.

C. OBLIGATIONS TO PUBLIC

SC-C-1 **DRIVEWAY ACCESS:** Contractor shall coordinate the work and minimize inconveniences to citizens and

affected property owners. Residents shall be notified by the contractor 24 hours prior to the time that access must be denied to their driveway or when driveway will be blocked for any period of time. Residents shall be provided access to their driveways between 5:00 pm and 7:30 am, and at all times on weekends or holidays or when work is not occurring.

SC-C-2 **SERVICE INTERRUPTION:** The contractor shall notify all parties that will be affected, a minimum of forty-eight (48) hours prior to the time he will disconnect or interrupt known sewer or water service or immediately upon the interruption of a service not shown on the plans. All services interrupted or damaged shall be immediately repaired and service restored. No services shall be left inoperative overnight.

The City of Arvada Utilities Division will operate all existing water valves, hydrants, blowoffs, and curb stops. No valve or other control on the existing water system shall be operated for any purpose by the contractor. The contractor shall advise all water customers prior to interrupting flows, so they may make provisions to store sufficient water for their interim needs. Service termination periods shall not exceed four (4) hours. Interruption of water service shall be limited to the hours between 8:30 am and 3:00 pm unless prior approval is received from the Engineer.

SC-C-3 **NOTIFICATION OF ADJACENT PROPERTY OWNERS AND MANAGERS:** The contractor shall notify property managers, owners, tenants, or responsible parties that work or dwell in buildings adjacent to the construction site, in writing, not less than seven days prior to construction of the impending construction activity.

The contractor shall prepare a written notification describing the method, location and likely duration of construction. It shall also include both a phone number where a representative of the contractor can be reached during normal business hours and the name and telephone number of City's project engineer and municipal inspector. The written notice shall be approved by the project engineer prior to distribution. Distribution shall be coordinated with the City's municipal inspector.

Contractor shall also provide written notification to residents 24 hours prior to the start of construction on each street and also notify residents once individual sewer service laterals are reinstated. The contractor shall also notify residents as necessary should the construction schedule change due to unforeseen circumstances.

PAYMENT: Prorated payment of the contract amount bid for citizen notification will be made monthly. The percentage paid shall be equal to the percentage of total contract dollar amount completed that month. In no case will payment be more than 100% of the amount bid for Citizen Notification.

BID BOND

We, the undersigned _____ as Principal,
and _____ as Surety, are hereby held and firmly bound unto the City of
Arvada, Colorado, in the penal sum of _____ for the
payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

THE CONDITION of this obligation is such that whereas the Principal has submitted to the City of Arvada, Colorado the accompanying Bid Proposal, and hereby made a part hereof to enter into a Contract Agreement for the construction of City of Arvada Project No. 23-SR-02, Project Title 2023 Trenchless Sewer Main Replacement
WHEREAS, the City, as a condition for receiving said Bid Proposal, requires the Principal to deposit with the City a Bid Proposal Guaranty, equivalent to not less than 5 Percent of the amount of said Bid Proposal.

NOW THEREFORE,

- (A) If said Bid Proposal shall be rejected; or in the alternate,
- (B) If said Bid Proposal shall be accepted and the Principal shall execute and deliver a Contract Agreement (properly completed in accordance with said Bid Proposal) and shall furnish a Performance and Payment Bond upon the forms prescribed by the City for the faithful performance of said Contract; and for the payment of all persons performing labor or furnishing materials in connection therewith; and shall in all other respects perform the agreement created by the acceptance of said Bid Proposal;

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the City may accept such Bid and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, this ____ day of _____, 20__, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL

SURETY

Name: _____

Address: _____

By: _____

By: _____

Title: _____

Title: _____

Attorney-in-Fact:

(SEAL)

NOTE: Surety Companies executing bonds must be authorized to transact business in the State of Colorado and be acceptable to the City.

BID PROPOSAL

TO: City of Arvada, Colorado (hereinafter called "CITY").

FROM: _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as (a corporation), (a partnership), (an individual).

The Bidder, in compliance with your Advertisement for Bids, hereby proposes to perform all Work in strict accordance with the Contract Documents, for the construction of City of Arvada Project No. **22-SR-02** entitled **2022 Trenchless Sewer Main Replacement** within the time set forth therein, and at the prices stated on the included Bid Schedule as totaled herein.

By submission of this Bid Proposal, each Bidder certifies, and in the case of a joint venture each party thereto certifies as to his/her own organization, that this Bid Proposal has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid Proposal with any other Bidder or with any competitor.

Bidder acknowledges receipt of **Addendum Nos.** Initials: _____

Bidder states that their:

Major Material Suppliers are:

Material They Will Supply

Major Subcontractors are:

Work They Will Perform

CONTRACT TIME AND LIQUIDATED DAMAGES: All work shall be completed, including clean-up, within **150 consecutive** days after the date to be specified in the Notice to Proceed. A Notice to Proceed is anticipated to be issued on or about December 4, 2023. The Contractor shall agree to pay to the Owner, as liquidated damages, the sum as identified in section 1121.07 Time for Completion and Liquidated Damages of the City of Arvada Engineering Code of Standards and Specifications 2023 to Present, for each consecutive calendar day that the work exceeds the allotted contract time. Contract time may be adjusted by Change Order.

Total from included Bid Schedule:

TOTAL BID \$ _____

SUBMITTED BY:

Company Name: _____

Contact Names: _____

Address: _____

Phone: (_____) _____ Email(s): _____

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the Contractor;
- He/she has read all Terms and Conditions and technical specifications made available in conjunction with this solicitation and fully accept and acknowledge this bid is consistent with the specifications and terms and conditions.
- The bid 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

PAYMENT TERMS: The City standard is net thirty (30) days but every effort is made to meet net fifteen (15) days after the approved partial payment date when the contractor is satisfactorily performing the contract. The final 5% of total payment will be paid once the contract is completed satisfactorily, advertisement for final settlement is complete, and the project is accepted by the City. Payment is the date of the check mailing or date of the credit card transaction.

2023 Trenchless Sewer Main Replacement
23-ENG-096 Project No. 23-SR-02

Sample Bid Schedule Only - Please use the Excel File Attached.



BID SCHEDULE

Contractor:

Address, City, Zip:

Telephone: Bid Prepared By:

M&P	ITEM	TOTAL Quantity	Unit	Unit Cost	Extension
PIPE					
1 SC-B-8	CIPP for 6" VCP	434.00	LF		\$0.00
SC-B-12	Sanitary Sewer Main				
2 SC-B-8	CIPP for 8" VCP	25,065.00	LF		\$0.00
SC-B-12	Sanitary Sewer Main				
3 SC-B-8	CIPP for 10" VCP	2,676.00	LF		\$0.00
SC-B-12	Sanitary Sewer Main				
4 SC-B-8	CIPP for 12" VCP	1,284.00	LF		\$0.00
SC-B-12	Sanitary Sewer Main				
INCIDENTALS					
5 SC-B-10	Trenchless Point Repair	5.00	EA		\$0.00
6 SC-B-11	Open Cut Point Repair	5.00	EA		\$0.00
7 SC-B-16	Protruding Taps	20.00	EA		\$0.00
8 SC-B-17	Sewer Service Reconnections	308.00	EA		\$0.00
9 SC-B-19	Underdrain Risers	164.00	EA		\$0.00
PRORATA					
9 SC-C-2,3	Citizen Notification	1.00	LS		\$0.00
10 149.00	Traffic Control	1.00	LS		\$0.00
SC-B-5					
11 1124.00	Mobilization	1.00	LS		\$0.00
REVISIONS, ADDITIONS					
12 SC-A-7	Minor Contract Revisions	1.00	EA	\$25,000.00	\$25,000.00

TOTAL BID \$ 25,000.00

REQUIRED CONTRACTOR SUBMITTAL FORM

SUBMITTAL CHECKLIST:

Bid Proposals shall be submitted in the order listed below with each section clearly identified. **Missing information or required documents may result in submission being deemed non-responsive.**

- ☐ Submit completed City Submittal Forms including this sheet, Bid Bond, Bid Proposal, Bid Schedule, Performance Measures Form, and any other attachments requested.
- ☐ Submit implementation timeline and warranties, if applicable.
- ☐ Attach Contractor's Licensing, if applicable.
- ☐ Insurance – Checking this box accepts that the insurance requirements listed by the City are acceptable.
- ☐ Evidence of Minimum Contractor qualifications (see **SC-A-1** of Special Provisions, Page 9)
- ☐ Please initial to acknowledge Addenda, if any, have been considered in your proposal:

#1_____ #2_____ #3_____

REFERENCES:

- ☐ Check here if Contractor'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: _____

VENDOR NAME: _____

SOLICITATION #: 23-ENG-096

2023 Trenchless Sewer Main Replacement

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 the City will monitor and report on the Vendor's 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 be evaluated by the City per these defined metrics 2 months prior to contract renewal. The department will review with the vendor any measures needing improvement.

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 be considered when renewing or awarding a contract with a vendor.

PERFORMANCE AND PAYMENT BOND

Bond No. _____

(Firm) _____

(Address) _____

(an Individual), (a Partnership), (a Corporation), hereinafter called Principal; and

(Firm) _____

(Address) _____

hereinafter called Surety, are held and firmly bound unto the City of Arvada, a Colorado municipal corporation, 8101 Ralston Road, Arvada, Colorado 80002, hereinafter called the City, in the penal sum of _____, Dollars, _____, in lawful money of the United States, for the payment of such sum will and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that the Principal entered into a certain Contract with the City, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part hereof, for the performance of City of Arvada Project No.'s _____.

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the City, with or without Notice to the surety and during the life of the guaranty period, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the City from all cost and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the City all outlay and expense which the City may incur in making good any default, and if he shall promptly make payment to all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, repairs on machinery, equipment and tools, consumed, rented or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between City and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20____.

IN PRESENCE OF:

PRINCIPAL _____

By _____

Address _____

(Corporate Seal)

OTHER PARTNERS

(Surety Seal)

SURETY _____

Attorney _____ in _____ Fact _____

Address _____

Note: If Contractor is Partnership, all partners should execute Bond.

Important: Surety Company must be authorized to transact business in the State of Colorado and be acceptable to the City.

NOTICE OF AWARD

Date _____

Company _____
Address _____
City, State Zip _____

RE: Project No. _____, _____

Dear Representative of _____:

The City of Arvada, Colorado (hereinafter called "City") has considered the Bid Proposals submitted for referenced work in response to its Advertisement for Bids dated _____ and Information for Bidders.

You are hereby notified that your Bid Proposal has been accepted, for items and prices stated in the Bid Schedule, in the amount of \$ _____.

You are required to execute the Contract, the Insurance Certificates and a Performance and Payment Bond within seven (7) days from the date of this Notice to you.

The Performance and Payment Bond needs to be filled out, returned (one original must be returned to the City), and accompanied by the Power of Attorney from your surety company. Also, please make sure that the insurance certificate is in the minimum amounts set forth in the Contract Documents and the City of Arvada is named as an additional insured for the specific Project Number and Title. An Additional Insured endorsement certificate should also be attached.

If you fail to execute said Contract and furnish the necessary Insurance Certificates and Bond within the time allotted from this date, the City will be entitled to consider all your rights arising out of the City's acceptance of your Bid Proposal as abandoned and as a forfeiture of your Bid Bond. The City will be entitled to such other rights as may be granted bylaw.

You are required to return an acknowledged copy of this Notice of Award and enclosures to the Project Engineer.

CITY OF ARVADA, COLORADO

City Engineer

BIDDER

Company _____

Receipt of above Notice of Award accompanied with a Performance and Payment Bond form and a copy of the Contract is hereby acknowledged.

This _____ day of _____, 20____.

By: _____

Name: _____

Title: _____

NOTICE TO PROCEED

Date

Company
Address
City, State Zip

RE: Project No. _____, _____

Dear Representative of _____:

You are hereby notified to commence work on referenced Project, in accordance with the Contract dated _____
on or before _____, and you are to complete the Work, including cleanup within _____ calendar days thereafter.

The date of completion of all Work is therefore _____.

CITY OF ARVADA, COLORADO

City Engineer

BIDDER

Receipt of this Notice to Proceed is hereby acknowledged this _____ day of _____, 20____.

Company

By: _____

Title: _____

CHANGE ORDER

No. ____

TO:

Upon Contractor acceptance and City approval, the work and Contract Documents for City of Arvada, Project No._____, entitled _____ will be adjusted to include the following:

<u>Item</u>	<u>Description</u>	<u>Qty.</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Add/Delete</u>
--------------------	---------------------------	--------------------	--------------------	-------------------------	--------------------------

- 1.
- 2.
- 3.
- 4.

TOTAL ADD

\$

Adjustments to Contract Price & Time

Contract
Dollars

Calendar
Days

Contract Totals through and including

\$

Previous Change Orders

Adjustments this Change Order

\$

(Increase)

Contract Totals to Date – Including

Change Order No. _

\$

Contract Time Expires on:

APPROVED FOR CITY

ATTEST:

8101 Ralston Road
Arvada, CO 80002

City Clerk

ACCEPTED FOR CONTRACTOR

APPROVED AS TO FORM:

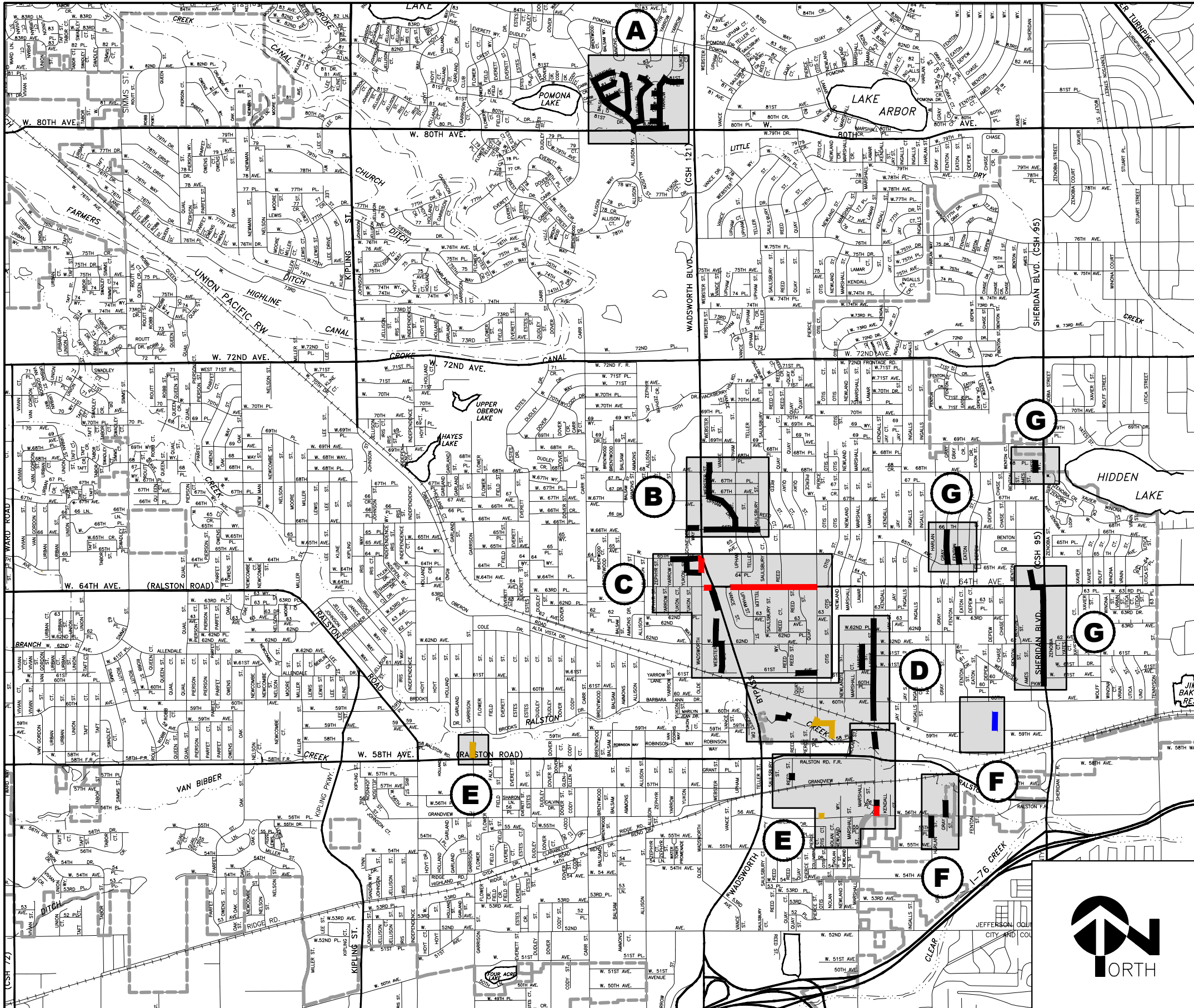
For Rachael Morris, City Attorney

By: _____

Title: _____

Date: _____

By: _____



KEY	DESCRIPTION	PAGE
	COVER SHEET	1
A	BETWEEN W. 80TH AVENUE & W. 82ND PLACE AND POMONA DRIVE & W. 81ST PLACE	2
B	BETWEEN WADSWORTH BLVD. & SAULSBURY STREET AND W. 66TH AVENUE & W. 68TH AVENUE	3
C	BETWEEN W. 61ST AVENUE & W. 65TH AVENUE & OTIS STREET & YARROW STREET	4
D	BETWEEN W. 58TH PLACE & W. 62ND PLACE & WADSWORTH BLVD & LAMAR STREET	5
E	BETWEEN W. 56TH AVE & UNION PACIFIC RAILROAD REED STREET & LAMAR STREET GARRISON ST AT RALSTON ROAD	6
F	W. 56TH AVE BETWEEN GRAY ST. & HARLAN ST. 5550 W. 60TH AVE	7
G	SHERIDAN BLVD BETWEEN WELLINGTON PKWY. & W. 64TH AVE FENTON, GRAY ST. BETWEEN W. 65TH AVE. TO W. 66TH AVE. AMES WAY BETWEEN W. 68TH AVE. & W. 68TH PL.	8

LEGEND:

- 6" PROPOSED CIPP SEWER MAIN
- 8" PROPOSED CIPP SEWER MAIN
- 10" PROPOSED CIPP SEWER MAIN
- 12" PROPOSED CIPP SEWER MAIN

GENERAL NOTES:

- All contractors and subcontractors shall be licensed with the City of Arvada Engineering Division and obtain individual no charge public improvement permits from the city of Arvada.
- The Engineering Division shall be notified (720-898-7640) a minimum of 24 hours prior to any construction along with the traffic division (720-898-7740).
- The contractor is responsible for all project safety including, but not limited to, trench excavation and shoring, traffic control and security.
- The contractor is to coordinate the operation of all valves, fire hydrants and other appurtenances with the City Water Division, through the City's inspector.
- All construction shall be to current City of Arvada Standard Specifications.
- The contractor shall have a set of approved drawings and current City of Arvada Standard Specifications on site at all times.
- Contractor shall notify all affected parties, City Utility and Engineering Divisions, a minimum of 24 hours prior to any water or sewer service interruption.
- Pipe lengths shown are actual laying lengths. Stationing is based on manhole centerlines.
- As built drawings shall be submitted to the City prior to the start of any warranty period.
- All dry service connections are not to be re-established.
- The Engineer assumes no responsibility for buried utilities. Utility lines indicated on the plans have been plotted using the best available information and do not necessarily reflect all utilities which may be encountered during construction or the exact location of all utilities which may be encountered during construction. The contractor is responsible to verify the location of all existing utilities prior to construction and to protect them during construction.

COMPLETE SET 8-16-2023

APPROVED BY: *Jenny Wolschlag PE.*
CITY ENGINEER

8/23/23
DATE

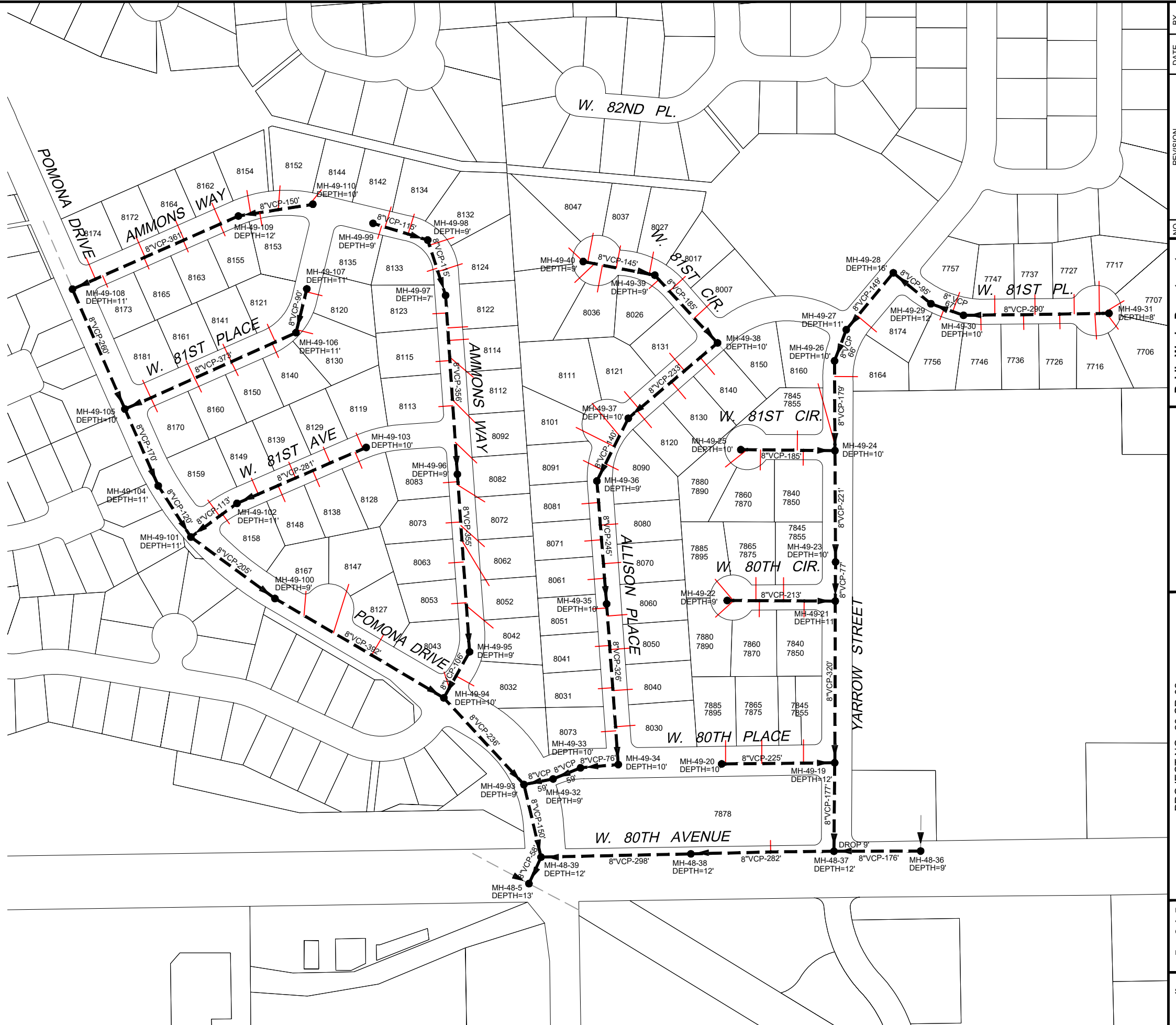


LEGEND:

- | | |
|------|---|
| | 8" PROPOSED CIPP SEWER MAIN |
| | SERVICES LATERALS TO BE RECONNECTED TO NEW CIPP |
| 7764 | ADDRESS OF SERVICES TO BE RECONNECTED TO NEW CIPP |

SUMMARY OF APPROX. QUANTITIES:
(THIS SHEET ONLY)

- 8494 LF 8" VCP SEWER MAIN
118 EA SERVICE RECONNECTION



SHEET	2
OF	8
ENGINEER JDM	
CHECKED BY	
DESIGN BY	
2023 TRENCHLESS SEWER MAIN REPLACEMENT	
PROJECT NO. 23-SR-02	
BETWEEN W. 80TH AVENUE & W. 82ND PLACE AND POMONA DRIVE & W. 81ST PLACE	
CITY OF ARVADA	
Engineering Division	
Public Works Department	8101 Ralston Road
	Arvada, Colorado 80002
	Phone 720-898-7640
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NOT TO SCALE

LEGEND:

- 8" PROPOSED CIPP SEWER MAIN
- SERVICES LATERALS TO BE RECONNECTED TO NEW CIPP
- 7764 ADDRESS OF SERVICES TO BE RECONNECTED TO NEW CIPP

SUMMARY OF APPROX. QUANTITIES:
(THIS SHEET ONLY)

3410	LF	8"	VCP SEWER MAIN
28	EA		SERVICE RECONNECTION

W. 67TH AVE.

WADSWORTH BLVD.

W. 68TH AVE.

W. 67TH PLACE

W. 67TH AVE.

W. 66TH AVE.

Utility Dedication
See Dedication in
Del Ray Subdivision Plat



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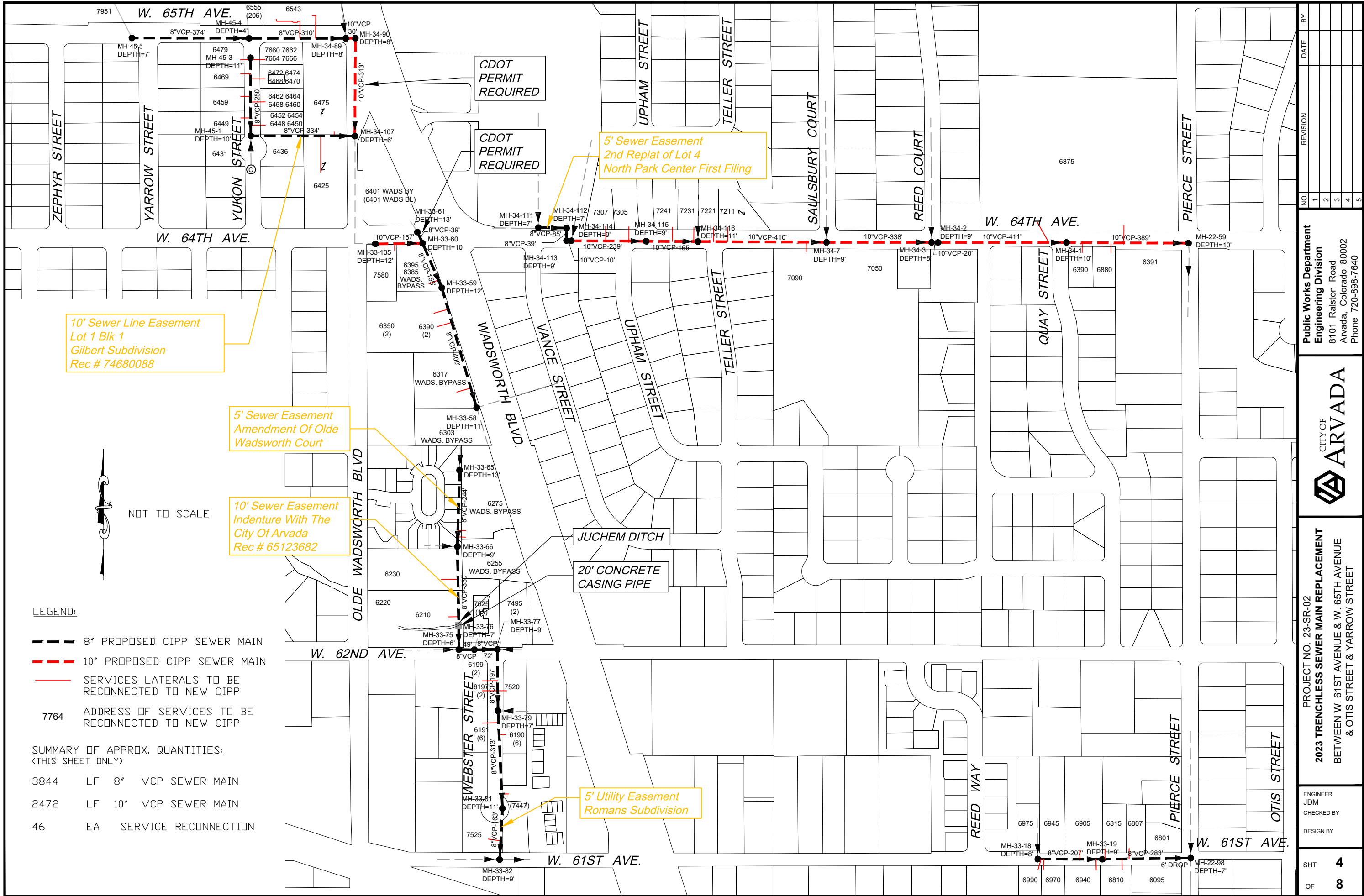
Public Works Department Engineering Division	
8101 Ralston Road	
Arvada, Colorado 80002	
Phone 720-898-7640	

CITY OF ARVADA	
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PROJECT NO. 23-SR-02	
2023 TRENCHLESS SEWER MAIN REPLACEMENT	
BETWEEN WADSWORTH BLVD. & SAULSBURY STREET AND W. 66TH AVENUE & W. 68TH AVENUE	

ENGINEER JDM	
CHECKED BY	
DESIGN BY	

SHT	3
OF	8



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NOT TO SCALE

LEGEND:

- 8" PROPOSED CIPP SEWER MAIN
- 12" PROPOSED CIPP SEWER MAIN
- SERVICES LATERALS TO BE RECONNECTED TO NEW CIPP
- 7764 ADDRESS OF SERVICES TO BE RECONNECTED TO NEW CIPP

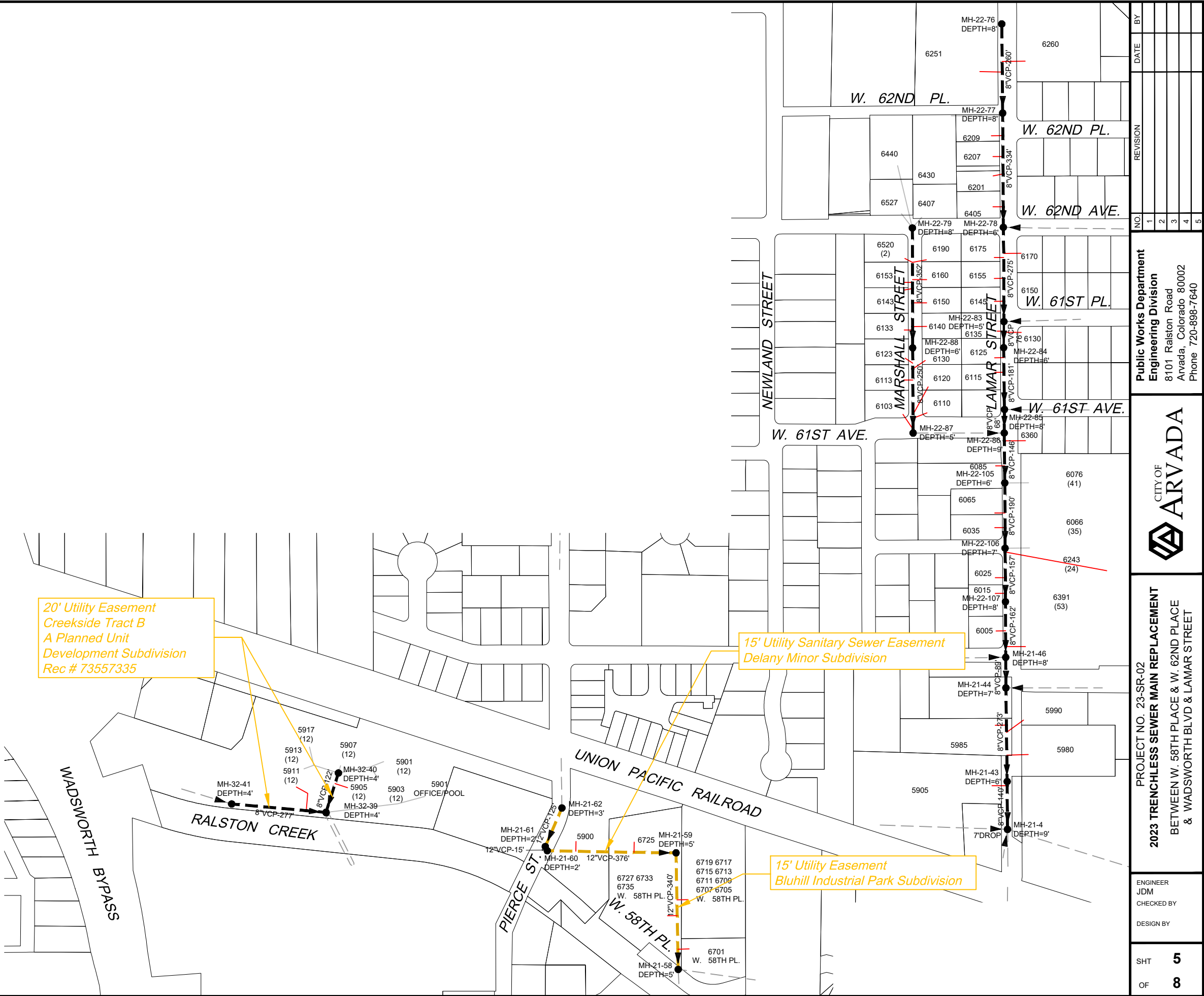
SUMMARY OF APPROX. QUANTITIES:
(THIS SHEET ONLY)

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856	LF	12"	VCP SEWER MAIN
48	EA		SERVICE RECONNECTION

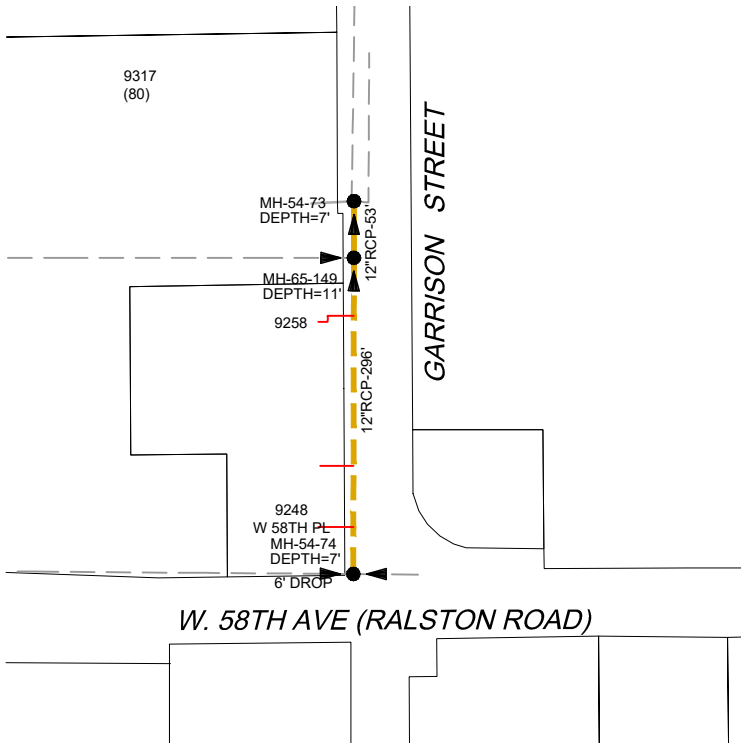
20' Utility Easement
Creekside Tract B
A Planned Unit
Development Subdivision
Rec # 73557335

15' Utility Sanitary Sewer Easement
Delany Minor Subdivision

15' Utility Easement
Bluhill Industrial Park Subdivision



REVISION		NO.		DATE		BY	
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Public Works Department Engineering Division 8101 Ralston Road Arvada, Colorado 80002 Phone 720-898-7640							
CITY OF ARVADA							
PROJECT NO. 23-SR-02 2023 TRENCHLESS SEWER MAIN REPLACEMENT BETWEEN W. 58TH PLACE & W. 62ND PLACE & WADSWORTH BLVD & LAMAR STREET							
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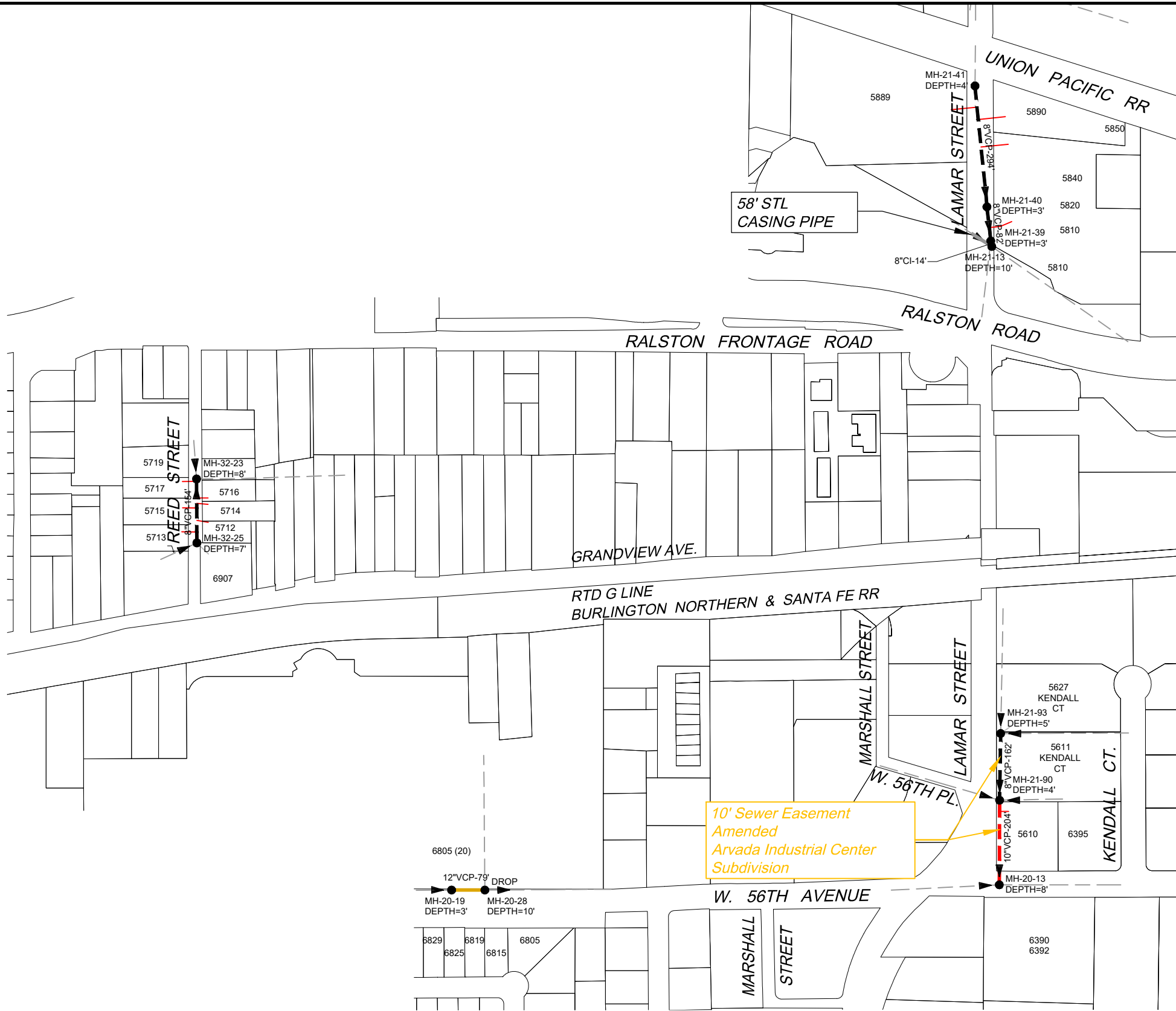
NOT TO SCALE

LEGEND:

- 8" PROPOSED CIPP SEWER MAIN
- 10" PROPOSED CIPP SEWER MAIN
- 12" PROPOSED CIPP SEWER MAIN
- SERVICES LATERALS TO BE RECONNECTED TO NEW CIPP
- 7764 ADDRESS OF SERVICES TO BE RECONNECTED TO NEW CIPP

SUMMARY OF APPROX. QUANTITIES:
(THIS SHEET ONLY)

706	LF	8"	VCP SEWER MAIN
204	LF	10"	VCP SEWER MAIN
428	LF	12"	VCP SEWER MAIN
14	EA		SERVICE RECONNECTION



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Public Works Department Engineering Division 8101 Ralston Road Arvada, Colorado 80002 Phone 720-898-7640
PROJECT NO. 23-SR-02 2023 TRENCHLESS SEWER MAIN REPLACEMENT BETWEEN W. 56TH AVE & UNION PACIFIC RAILROAD REED STREET & LAMAR STREET GARRISON ST AT RALSTON ROAD
ENGINEER JDM CHECKED BY DESIGN BY
SHT 6 OF 8

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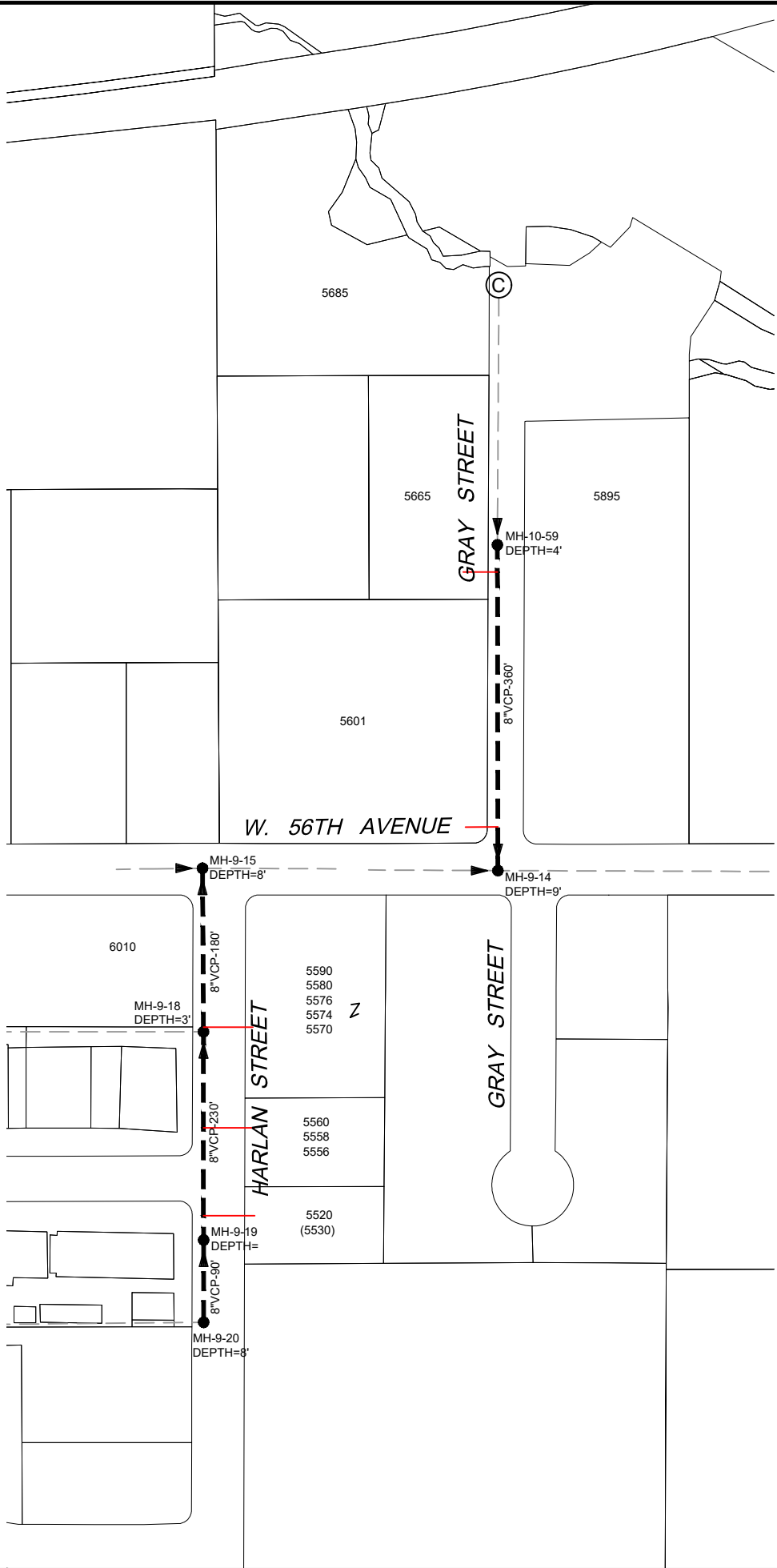
NOT TO SCALE

LEGEND:

- 6" PROPOSED CIPP SEWER MAIN
- 8" PROPOSED CIPP SEWER MAIN
- SERVICES LATERALS TO BE RECONNECTED TO NEW CIPP
- 7764 ADDRESS OF SERVICES TO BE RECONNECTED TO NEW CIPP

SUMMARY OF APPROX. QUANTITIES:
(THIS SHEET ONLY)

434	LF	6"	VCP SEWER MAIN
860	LF	8"	VCP SEWER MAIN
6	EA		SERVICE RECONNECTION



W. 59TH AVE.

W. 60TH AVENUE

10' Sanitary Sewer Easement
Rec # 73542773

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Public Works Department Engineering Division 8101 Ralston Road Arvada, Colorado 80002 Phone 720-898-7640	CITY OF ARVADA	PROJECT NO. 23-SR-02 2023 TRENCHLESS SEWER MAIN REPLACEMENT W. 56TH AVE BETWEEN GRAY ST. & HARLAN ST. 5550 W. 60TH AVE	ENGINEER JDM CHECKED BY DESIGN BY
			SHT 7 OF 8

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10' Sanitary Sewer Easement
Rec # 73602637



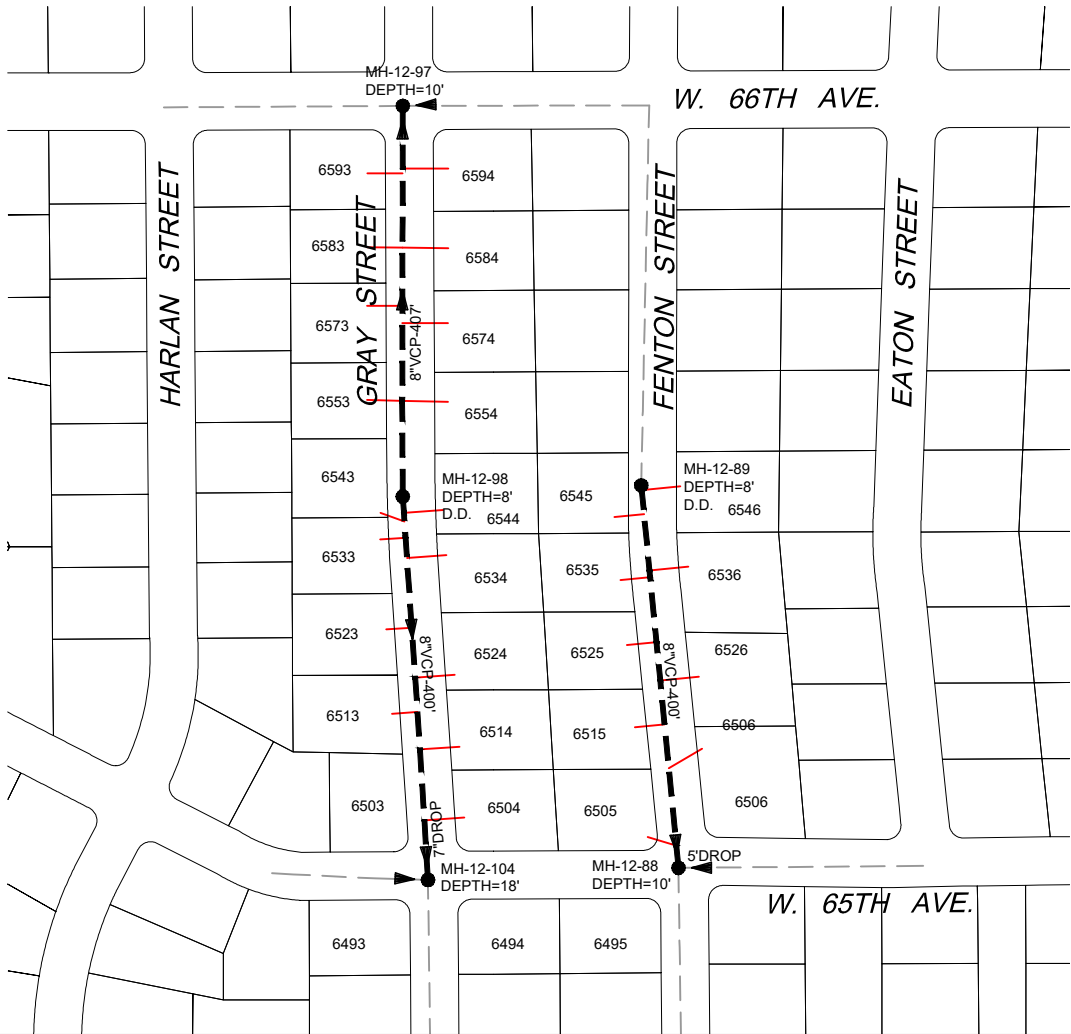
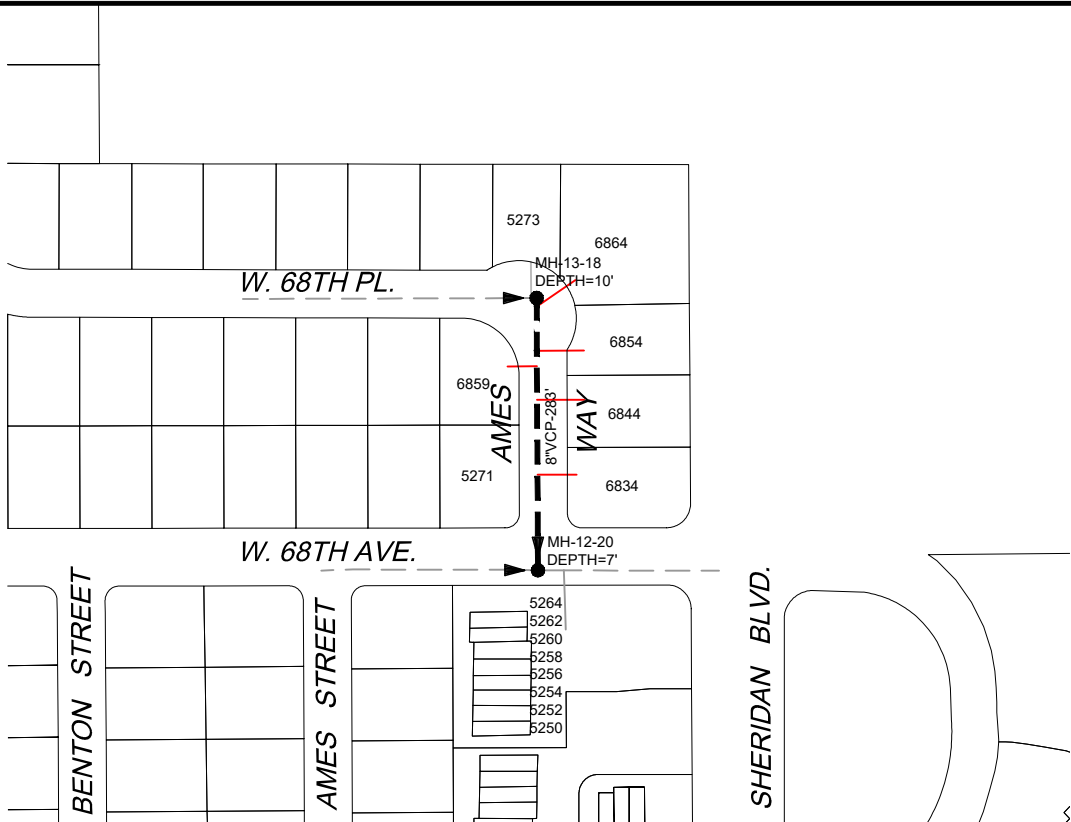
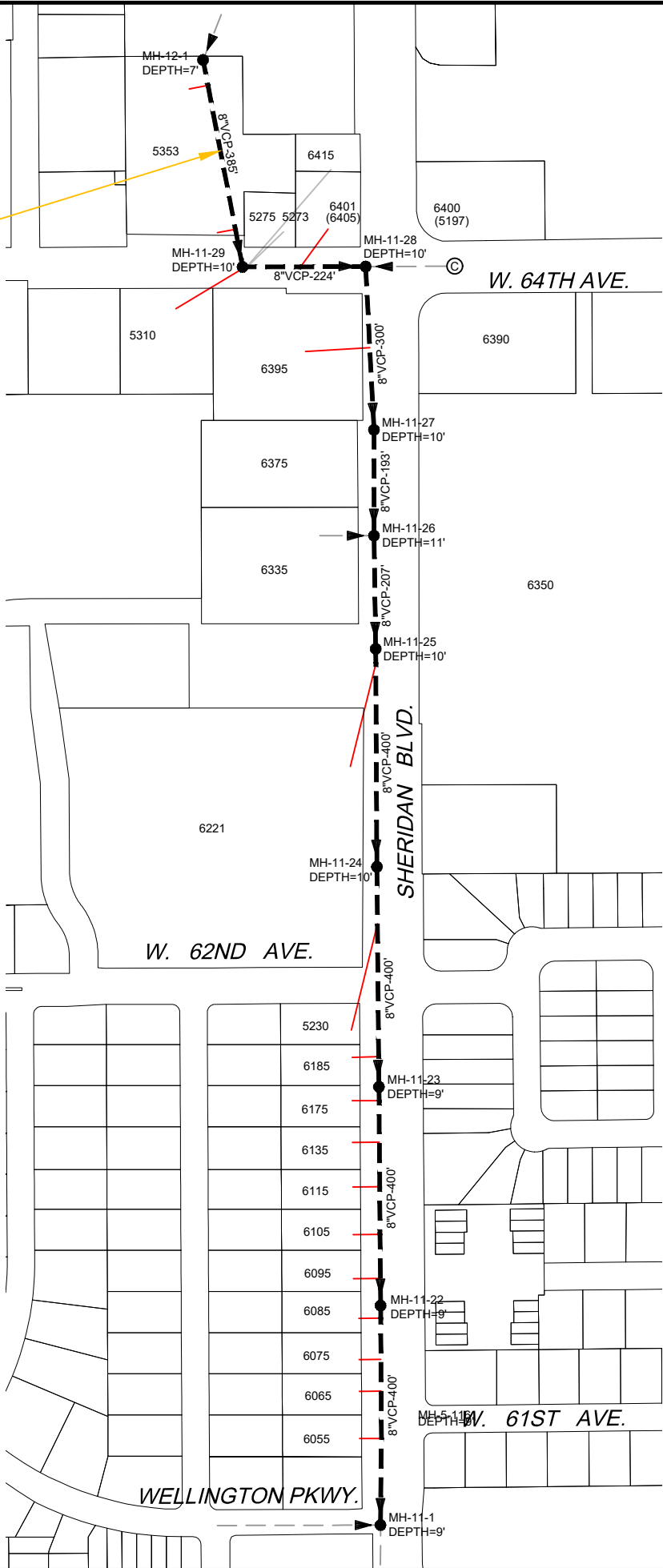
NOT TO SCALE

LEGEND:

- 8" PROPOSED CIPP SEWER MAIN
- SERVICES LATERALS TO BE RECONNECTED TO NEW CIPP
- 7764 ADDRESS OF SERVICES TO BE RECONNECTED TO NEW CIPP

SUMMARY OF APPROX. QUANTITIES:
(THIS SHEET ONLY)

- 4399 LF 8" VCP SEWER MAIN
- 48 EA SERVICE RECONNECTION



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Public Works Department	
Engineering Division	
8101 Ralston Road	
Arvada, Colorado 80002	
Phone 720-898-7640	

PROJECT NO. 23-SR-02	
2023 TRENCHLESS SEWER MAIN REPLACEMENT	
SHERIDAN BLVD BETWEEN WELLINGTON PKWY. & W. 64TH AVE	
FENTON, GRAY ST. BETWEEN W. 65TH AVE. TO W. 66TH AVE.	
AMES WAY BETWEEN W. 68TH AVE. & W. 68TH PL.	

ENGINEER	JDM
CHECKED BY	
DESIGN BY	

SHT	8
OF	8

Addendum No. 1
23-ENG-096 Trenchless Sanitary Sewer
Main Replacement

An Agreement By And Between The City Of Arvada And
Insituform Technologies, LLC For The 2023 Trenchless
Sewer Main Replacement Project No. 22-SR02 In An Amount
Not To Exceed \$1,633,898.00



CITY OF ARVADA

PURCHASING DIVISION
FACSIMILE: 720-898-7098 ▲ TDD: 720-898-7869
PHONE: 720-898-7099

REQUEST FOR PROPOSALS- ADDENDUM No. 1

Proposal #: 23-ENG-096
Title: 2023 Trenchless Sewer Main Replacement
RFP Issued: 11/14/2023
Addendum #: 1
Today's Date: 12/01/2023
Proposals Due By: 12/13/2023 **2:00 PM** MDT (NO CHANGE)
Questions Deadline: 11/29/2023 **2:00 PM** MDT (NO FURTHER QUESTIONS ARE BEING ACCEPTED)
Solicitation and all related addenda and communications are available at WWW.BIDNETDIRECT.COM.

The following clarifications are provided to be incorporated into the Request for Proposals.
All other information shall remain unchanged.

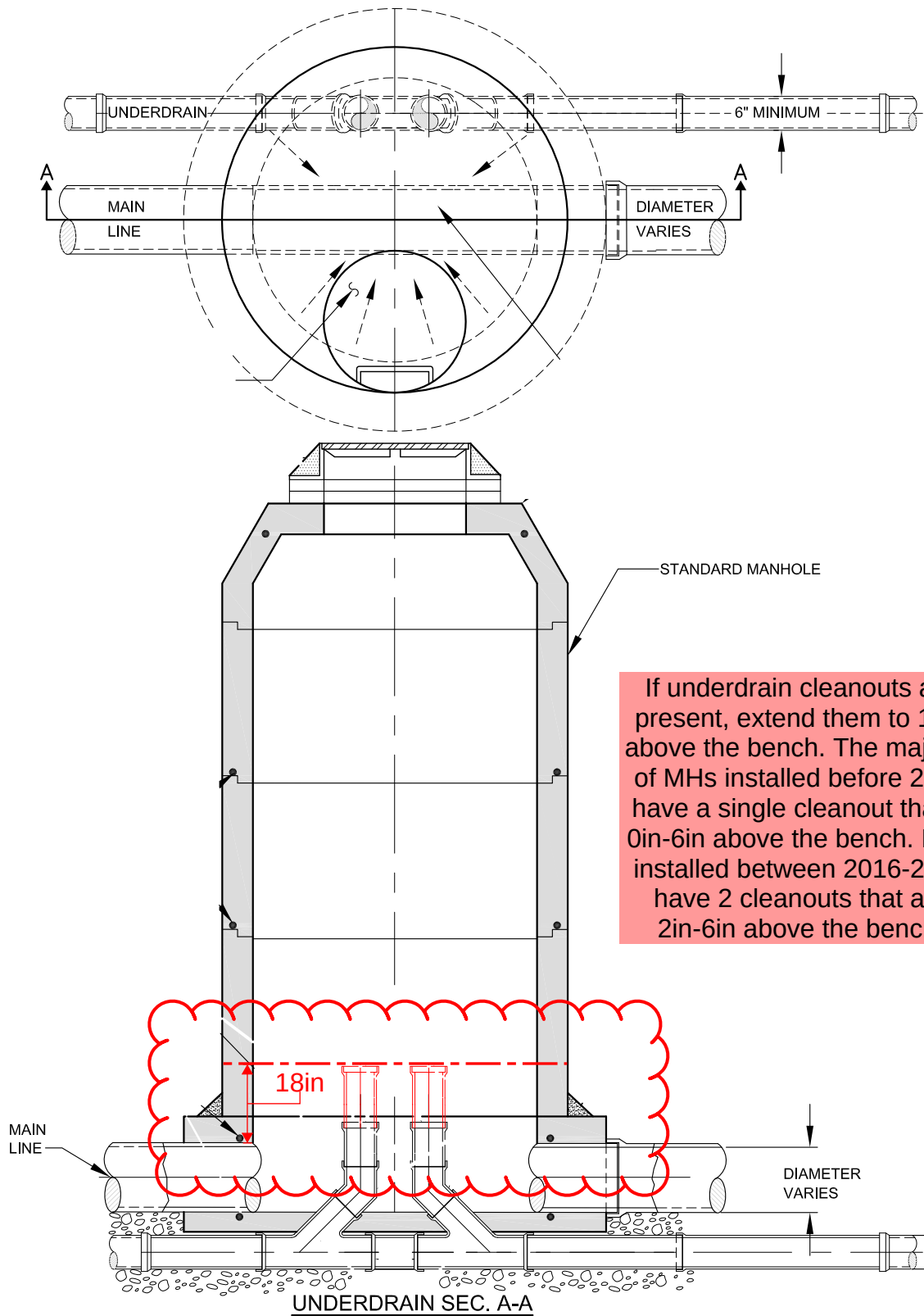
- 1. Questions/Answers:**
- 2. Underdrain Riser Detail**

Questions & Answers - 1

Project 23-ENG-096 - Trenchless Sanitary Sewer Main Replacement
Buying Organization City of Arvada

No	Question/Answer	Question Date
Q1	Question: Trenchless Point Repairs What is the footage and diameter for the trenchless point repairs? Answer: These will be a case by case since they are unknown, but if there are any they should be less than 5 feet at 8 inches diameter.	11/15/2023
Q2	Question: Test Samples How many CIPP test samples does the City require? Answer: In Section SC-B-13, all samples shall be prepared in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method. The exact number of samples will be determined after the Bid has been awarded.	11/17/2023
Q3	Question: Warranty Term What is the warranty term on this project? Answer: Please see Section 200 - Acceptance Procedures and Section 220.00 - Initial Warranty Acceptance of the City of Arvada Code of Engineering Standards and Specifications for Warranty Terms.	11/27/2023
Q4	Question: Notice to Proceed Bid Proposal form says "A Notice to Proceed is anticipated to be issued on or about December 4, 2023." Bid is due December 13, 2023; please advised corrected anticipated NTP. Answer: The Notice to Proceed will be issued within seven (7) calendar days of the execution of the Contract Agreement by the City and the awarded bidder. A specific date cannot be provided at this time until a bidder has been notified and a contract has been established.	11/27/2023
Q5	Question: Videos Available Can a link to the Videos be provided? Or can a USB drive be picked up with the videos on it? Answer: Video can be provided once a qualified bidder has been awarded the project. Please see SC-A-11, for coordination information to view video footage.	11/28/2023
Q6	Question: Leakage/Air Testing Will leakage/air testing be required? This will add significant time to each install increase unit pricing. Answer: Please refer to SC-B-15 for testing requirements.	11/28/2023
Q7	Question: Minimum Liner Thickness What is the purpose of the minimum liner thickness of 0.21" (5.34mm) when CIPP design call for less than 5mm? Answer: Please refer to SC-B-8, as well as ASTM F1216 for the specifics on liner thickness.	11/28/2023

No	Question/Answer	Question Date
Q8	Question: Citizen Notifications What are the limits for Citizen Notifications? The pay item is not specific on how far from work areas that homeowners or businesses need to be notified. Answer: Citizen notifications are required for any area that contains a service connection connected to the where work will be performed.	11/28/2023
Q9	Question: Manhole Identification Can the manhole with underdrains in them be identified for accurate pricing, or can a template for pricing be provided? Answer: Please see the Bid Schedule, Line 9, SC-B-19. In the Bid Schedule, there is a quantity of 164 underdrain risers which is assuming all maintenance holes throughout the project. This will either be equal to or less than the total number of maintenance holes. Each maintenance hole will need to be evaluated prior to installing pipe lining and prior to any plugging. Please see the attached specification drawing regarding maintenance holes and underdrains.	11/28/2023
Q10	Question: Traffic Control Force Account item for incidentals Since trenchless repairs, open cut point repairs and underdrain risers in the "Incidentals" bid category are at unknown locations and some may not be needed on the project, it is difficult to determine traffic control costs for these bid items. In an effort to control costs for the City, a Traffic Control Force Account bid item for these incidentals would provide a more consistent bid price between bidders and could be adjusted once quantities and locations of the incidentals are known. Would the City be willing to add a traffic control Force Account to the "Incidentals" category? Answer: The City code does not allow for Force Accounts and the traffic control is expected to be included for each of the maintenance holes throughout the project for the short time required to install a riser. The contractor may chose to install the risers at the time of each segment lining or may chose to do the risers as a group. Traffic control for point repairs shall be paid on a time and materials basis with full documentation with a bid quantity of \$0.00.	11/29/2023
Q11	Question: Qualifications The Special Provisions (page 9 of the bid documents) list minimum qualifications of at least 100,000 lineal feet of CIPP in the Front Range of Colorado in each of the last three calendar years. To our knowledge, this would significantly reduce competition on this bid to maybe a couple contractors. Is your intent to short-list contractors or would you please consider removing this geographic restriction to open up the competition to more bids from other qualified CIPP contractors? We have successfully installed well over 10 million lineal feet of CIPP across the country and can submit qualifications with the bid or after the bid, if necessary. Please advise. Answer: An exception can be made if all of the following conditions are met: -100,000 lineal feet or more for each of the last three calendar years (does not have to be in the Front Range) -2 projects (of any length) in the Front Range that included point repairs in the last 3 years -2 projects (of any length) in the Front Range including CDOT Permits and CDOT approved traffic control in the last 3 years -Proof of successful cold weather installation	11/29/2023



F:\DWG\PW-Eng\ENGR SPECS\ENGR Specs 2015\SS-Sanitary Sewer\SS-6.dwg 4/28/2015

					Underdrain Riser		
NO	DWN	DATE	REVISION		SCALE: NTS		

**Addendum Description**

Addendum No 1 Questions and Answers

Notice Modifications

Notice Information	From Value	To Value
No entries		

Category Modifications

Added Categories
No Categories Added

Removed Categories
No Categories Removed

Added Documents[A]

Document	Size	Uploaded Date	Language
Addendum No 1 23-ENG-096 [pdf]	251 Kb	12/01/2023 12:05 PM MST	English

**Insituform Technologies Bid_12-13-2023
23-ENG-096 2023 Trenchless Sewer Main
Replacement**

An Agreement By And Between The City Of Arvada And
Insituform Technologies, LLC For The 2023 Trenchless
Sewer Main Replacement Project No. 22-SR02 In An Amount
Not To Exceed \$1,633,898.00



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.3.

TO: THE HONORABLE CITY COUNCIL

DATE: January 22, 2024

SUBJECT: R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00.

Report in Brief

The 2021 Water Main Improvements Project is part of the annual CIP/Maintenance program which includes the construction, rehabilitation, and improvement of the City of Arvada's aging water distribution system. The 2021 Project will improve areas which have condition and capacity concerns across Arvada and will include methods such as slip lining, directional drilling, open excavation, and pipeline abandonment. The locations selected for improvement in 2021 include areas that will present an assortment of difficulties during construction, including canal crossings, private and commercial property acquisition, and a trenchless crossing of Wadsworth Blvd.

The Arvada team recommends that the City Council approve R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00.

Financial Impact

CIP Project: 2021 Water Main Improvements Project

Financial Impact: \$4,199,999.00

This is a one-time request for Project Construction costs.

Funding Source: Water Bonds

CIP Account Number: 97618

Background

The 2021 Water Main Replacement project will address aging utility infrastructure that is nearing the end of its design life. Annually, the Utilities team conducts an analysis in order to rank the replacement priorities that takes into account leak/break history, infrastructure age, condition, and system resiliency. The sections of waterline identified as part of the 2021 Water Main Improvements Project include five areas which are listed below:

- Area C: Installation and replacement of 10-inch, 18-inch, and 24-inch PVC and fusible PVC pipe via open cut and slip lining on Carr Street between 72nd Ave and 74th Ave. Includes a crossing of Croke Canal via open-cut and removal of an aerial crossing.
- Area D: Installation of 16-inch steel pipe inside PRV vault on Jellison St between 72nd Ave and 74th Ave. Abandonment of PRV vault.
- Area E: Installation of 12-inch PVC via open cut at 72nd Ave and Kendrick Street. Includes a crossing of Farmer's Highline Canal.
- Area F: Installation of 8-inch PVC via open cut along the southernmost eastbound lane of traffic in 72nd Ave.
- Area G: Miscellaneous installations, replacements, and abandonments. Includes installation of 8-inch PVC via open-cut and HDPE via HDD as well as abandonment of 8-inch AC pipe.

SUBJECT: R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00.

PAGE: 2
ITEM: 8.A.3.

Completion of this Project will improve the resiliency of the existing water distribution system, ensure critical crossings are in good condition for years to come, and improve existing locations in accordance with the City's Level of Service Standards.

Discussion

The project locations included in the 2021 annual improvements are expected to be challenging to construct. For this reason, the City included minimum qualifications in the Competitive Sealed Bid that was published to BidNet on October 31, 2023. The City team received six (6) bids on December 5, 2023.

Bids submitted ranged in cost from \$2,245,174.83 to \$6,187,350.00. The lowest bid was submitted by RCD Construction, whose bid met all minimum qualifications. RCD Construction withdrew the bid due to a clerical/computational error that resulted in the low bid listed above being approximately \$1.5M under the actual cost proposed. SMH West was the next highest bid at \$4,199,999 and SMH qualifications exceed the minimum qualifications set forth in the published CSB.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

The recommended action aligns with the Infrastructure Priority Area within the City Council Strategic Plan. Specifically, the recommended action is consistent with the following principle included in 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 in the Comprehensive Plan. This includes maintaining utility rates at the lowest practical levels with accurate billing that supports replacement of aging infrastructure in order to maintain robust utility systems.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00.

Suggested Motion:

I move that R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00, be (approved) (rejected).

Prepared by:
Amber Brooks, Civil Engineer II

Reviewed by:

SUBJECT: R24-013, A Resolution Authorizing an Agreement by and Between the City of Arvada and SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an Amount Not to Exceed \$4,199,999.00.

PAGE: 3
ITEM: 8.A.3.

Approved by:

Mary Stahl, Senior Civil Engineer	12/26/2023
Jenny Wolfschlag, City Engineer	12/26/2023
Jacqueline Rhoades, Public Works Director	1/3/2024
Bryan Archer, Director of Finance	1/4/2024
Tammy Hedlund, Legal Specialist	1/5/2024
Jessica Morales, Assistant City Attorney	1/10/2024
Rachel Morris, City Attorney	1/11/2024
Don Wick, Deputy City Manager	1/11/2024
Lorie Gillis, City Manager	1/11/2024

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R24-013

A RESOLUTION AUTHORIZING AN AGREEMENT BY AND BETWEEN THE CITY OF ARVADA AND SMH WEST, LLC FOR THE 2021 WATER MAIN IMPROVEMENTS, PROJECT NO. 21-WA-02, IN AN AMOUNT NOT TO EXCEED \$4,199,999.00

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 SMH West, LLC for the 2021 Water Main Improvements, Project No. 21-WA-02, in an amount not to exceed \$4,199,999.00.

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

APPROVED AND ADOPTED this 22nd day of January, 2024.

Lauren Simpson, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

**AN AGREEMENT BY AND BETWEEN THE CITY OF ARVADA AND
SMH WEST, LLC FOR THE 2021 WATER MAIN IMPROVEMENTS,
PROJECT NO. 21-WA-02, IN AN AMOUNT NOT TO EXCEED \$4,199,999.00**

This Agreement made this ____ day of _____, 2024, by and between the City of Arvada, a home rule municipal corporation (“Arvada” and/or “City”) and SMH West, LLC, a Colorado Limited Liability Company (“Contractor”).

WITNESSETH: That for and in consideration of the covenants, promises, and payments hereinafter mentioned:

WITNESSETH:

WHEREAS, Arvada solicited proposals from interested construction professionals for the provision of construction services related to its 2021 Water Main Improvements, Project No. 21-WA-02, as described in the Contract Documents (the “Project” or the “Work”); and

WHEREAS, based on Contractor’s submissions, Arvada has selected Contractor for the Project; and

WHEREAS, Arvada and Contractor desire to enter into this Agreement regarding the construction of the Project.

NOW, THEREFORE, for and in consideration of the covenants, promises, and payments hereinafter mentioned, the parties agree as follows:

ARTICLE 1. GENERAL DESCRIPTION OF SERVICES

- 1.1. **The Services.** Contractor agrees to furnish or arrange for the construction services set forth in the Contract Documents and required for the completion of the Project within the timeframe provided in the Contract Documents. Contractor represents that it is thoroughly familiar with, and understands, the requirements of the Project’s scope and is experienced in the construction of projects of the type and scope contemplated by the Contract Documents. Contractor represents to Arvada that Contractor has all necessary education, skill, knowledge, expertise and experience required for construction of the Project, and will maintain, at all times during the term of this Agreement, such personnel on its staff to provide the services contemplated hereby within the time periods required hereby. In addition, Contractor represents that it or Arvada-approved subcontractors or subconsultants performing services under this Agreement have all applicable licenses required by the State of Colorado to perform such services and all required insurance coverage as required by this Agreement and by law.
- 1.2. **Cooperation.** The Contractor shall endeavor to develop, implement and maintain, a spirit of cooperation, collegiality, and open communication with Arvada, Arvada’s Consultants, and Arvada’s residents so that the goals and objectives of each are clearly

understood, potential problems are resolved promptly, and upon completion, the Project is deemed a success by all interested parties.

- 1.3. **Preparation/Sufficiency of Site.** Before commencing the Project, the Contractor shall (i) visit and thoroughly inspect the Project Site and any structure(s) or other man-made features to be modified and become familiar with local conditions under which the Project will be constructed and operated; (ii) familiarize itself with the survey, including the location of all existing buildings, utilities, conditions, streets, equipment, components and other attributes having or likely to have an impact on the Project; (iii) familiarize itself with Arvada's engineering and design requirements, design objectives, and budget for the Project; (iv) familiarize itself with pertinent Project dates and programming needs, including the Project schedule; (v) review and analyze all Project geotechnical, environmental, and construction materials tests, investigations and recommendations, (vi) review all specifications; and (vii) gather any other information necessary for a thorough understanding of the Project. Claims by Contractor resulting from Contractor's failure to familiarize itself with the Site or pertinent documents shall be deemed waived.
- 1.4. **Contract Documents.** The Contract Documents are incorporated herein by reference. The term "Contract Documents" means and includes the following:
 - A. Arvada's solicitation entitled Competitive Sealed Bid # 23-PW-091, 2021 Water Main Improvements (21-WA-02)–Re-issue, including all exhibits and/or addenda ("CSB");
 - B. Contractor's Response to CSB, Advertisement for Bid, Bid Proposal, Bid Schedule, Bid Bond ("Contractor's Response");
 - C. Notice of Award;
 - D. Performance and Payment Bond;
 - E. Notice(s) to Proceed;
 - F. Change Orders (if any);
 - G. City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements dated October 2, 2023;
 - H. Requests for Information and Responses (if any);
 - I. All supplementary requirements regarding wage rates, E.E.O., affirmative action and all other Federal-State requirements as outlined in the specifications (if applicable).
- 1.5. **Interpretation of Contract Documents.** In the event of conflicts or discrepancies among the Contract Documents, the documents shall govern in the following order: (1) this Agreement; (2) Arvada's CSB; (3) City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements; (4) Contractor's Response; (5) Change Orders; (6) Requests for Information and Response.

ARTICLE 2. ARVADA'S DUTIES, OBLIGATIONS AND RESPONSIBILITIES

- 2.1. **Project Information.** Contractor acknowledges that Arvada has provided Contractor with information regarding Arvada's requirements for the Project as set forth in the Contract Documents, including Project Specifications.
- 2.2. **Arvada's Budget.** Arvada has established, and will update, an overall budget for the Project, including amounts allocated for construction, Arvada's other costs, and reasonable contingencies related to these costs as appropriate.
- 2.3. **Arvada's Representative.** Arvada will designate a representative authorized to act on Arvada's behalf with respect to the Project.
- 2.4. **Purpose of Arvada's Review.** Arvada's review, inspection, or approval of any work, Testing Documents, Applications for Payment, or other submittals shall be solely for the purpose of determining whether the same are generally consistent with Arvada's standards, policies and requirements. No review, inspection, or approval by Arvada of such work or documents shall relieve Contractor of its responsibility for the performance of its obligations under the Agreement or the accuracy, adequacy, fitness, suitability, or coordination of its construction services. Approval by any governmental or other regulatory agency or other governing body of any work, Testing Document, or the Construction Documents shall not relieve Contractor of responsibility for the performance of its obligations under this Agreement. Payment by Arvada pursuant to the Agreement shall not constitute waiver of any of Arvada's rights under the Agreement or at law, and Contractor expressly accepts the risk that defects in its performance, if any, may not be discovered until after payment, including final payment, is made by Arvada. Notwithstanding the foregoing, reasonable notice shall be given by Arvada to the Contractor if Arvada becomes aware of any fault or defect in the Project or non-conformance with the Contract Documents.

ARTICLE 3. CONSTRUCTION SERVICES REQUIREMENTS AND STANDARDS

- 3.1. **Quality of Construction Services.** Contractor shall be responsible for the quality, completeness, accuracy, and coordination of the Work. Contractor shall provide construction services that meet all industry standards, including all environmental and regulatory requirements. Arvada will provide and be responsible for all material testing and all other testing if needed.
- 3.2. **Arvada's Right to Carry Out the Work.** If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven calendar day period after written notice from Arvada to commence and continue correction of such default or neglect with diligence and promptness, Arvada may after such seven-day period, without prejudice to other remedies Arvada may have, correct such deficiencies. In such a case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for any consultant's additional services and expenses made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor

shall pay the difference to Arvada within ten days of receipt of an invoice for such amounts from Arvada.

- 3.3. **Legal Standard.** Contractor shall furnish construction services in accordance with industry standards currently practiced by construction professionals on projects similar in size, complexity and cost to the Project.
- 3.4. **Construction Standards.** Contractor shall perform all services in accordance with requirements of governmental agencies having jurisdiction over the Project, City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements, and the requirements set forth in the Contract Documents. In addition, the Contractor's work shall comply with all applicable building codes, accessibility laws and regulations, environmental regulations, and other applicable legal requirements in effect at the time of the work. To the extent Arvada's standards exceed applicable legal requirements, such standards shall be met unless Contractor obtains a variance from Arvada in writing.
- 3.5. **Permits.** Contractor shall be responsible for obtaining all necessary permits and other governmental approvals necessary for the development of the Project and shall obtain the same at the times necessary to meet the Project schedule. Contractor's responsibility includes providing environmental services and permitting coordination as further described in the Contract Documents.
- 3.6. **Notice of Non-Compliance.** Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Arvada, and shall at once report to Arvada any errors, inconsistencies or omissions discovered as well as any foreseeable constructability issues arising from the project specifications and/or site conditions. If the Contractor performs any construction activity knowing or should have known it involves an error, inconsistent, omission or constructability issue in the Contract Documents without such notice to Arvada, the Contractor shall assume full responsibility for such performance and shall bear the full costs for correction, including reimbursement for any delay caused to the Project.

ARTICLE 4. CHANGES TO THE WORK

- 4.1. **Field Engineered Changes.** Arvada may modify the construction plans including changing the slope and alignment of flow lines and appurtenances or modifying other improvements as necessary to accommodate construction around existing utilities or other field conditions. No additional compensation shall be made for minor costs and inconveniences incurred while performing field engineering changes as directed by Arvada or its Consultant. No additional compensation shall be made for any down time encountered while Arvada determines what field engineered changes would be appropriate to accommodate construction around existing utilities or other field conditions. Reasonable time must be allowed for Arvada or its Consultant to design field engineered changes. Any additional costs for performing field engineered construction changes to accommodate existing utilities or other field conditions and for also allowing

Arvada reasonable time to design field engineered changes as necessary to complete the work shall be considered a subsidiary obligation of the contract.

- 4.2. **Pre-Construction Meetings.** Contractor agrees to assist in the preparation for and to participate in any pre-construction meetings with Arvada.
- 4.3. **Arvada Change Orders.** Arvada may, by written order signed by Arvada, at any time, and without notice to any surety, and subject to all appropriate adjustments, make changes within the general scope of this Contract in any one or more of the following: (a) changes in scope of services; (b) completion date; (c) contract amount; (d) any applicable material modifications; and, (e) any other matters that the parties deem necessary.
- 4.4. **Contractor Requested Change Orders.** The Contractor may request a Change in the Work ("Requested Change Order"), including one or more of the following: (a) changes in scope of services; (b) completion date; (c) contract amount; (d) any applicable material modifications; and, (e) any other matters that the parties deem necessary.
- 4.5. **Change Order Contents.** Any Requested Change Order shall include (a) a detailed description of the requested change to the original contract; (b) itemized documentation of any subcontractor costs; (c) the total costs associated with the proposed change; (d) the impact on the project completion date, if any, associated with the proposed change; and (e) a statement of the contractual basis for the requested change.
- 4.6. **Basis for Change Order Requests.** The following may be considered a valid basis for requesting a Change Order: (a) Contract Document error or omission; (b) Arvada induced enhancement; (c) unforeseeable constructability issue; (d) unforeseeable geotechnical issue. The following will not be considered a valid basis for requesting a Change Order absent extraordinary circumstances: (a) utility relocation; (b) utility conflicts; (c) foreseeable geotechnical issue; (d) foreseeable constructability issue; (e) defective construction.
- 4.7. **Written Authorization Required.** The Contractor shall not proceed with any change in the Work without the appropriate written authorization.

ARTICLE 5. SUPERVISION AND CONSTRUCTION PROCEDURES

- 5.1. **Supervision.** The Contractor shall supervise and direct the Work using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under this Contract, unless Contract Documents give other specific instructions concerning these matters.
- 5.2. **Acts and Omissions of Subcontractors and Agents.** The Contractor shall be responsible to Arvada for acts and omission of the Contractor's employees, Subcontractors, and their agents and employees, and other persons performing portions of the Work under a contract with the Contractor

- 5.3. **Inspection and Subsequent Work.** The Contractor shall be responsible for inspection or portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

ARTICLE 6. COMPENSATION.

- 6.1. **Completion of Services.** Contractor will furnish all material, supplies, tools, equipment, labor, and other services necessary for the completion of the Work within Arvada's timeframe and monetary limitations set forth below:
- 6.1.1. Contractor shall commence the Work required by the Contract Documents within seven calendar days after the date of the Notice to Proceed unless otherwise mutually agreed-upon by the Parties in writing;
 - 6.1.2. Contractor shall complete the Work required by the Contract Documents, including cleanup, within **14 months** after the date to be specified in the Notice to Proceed, unless the contract time is adjusted by change order; and
 - 6.1.3. Compensation Amount. Contractor agrees to perform the Work for an amount not to exceed **\$4,199,999.00**.
- 6.2. **Term.** This contract shall commence on the date of Arvada's execution of the Agreement and shall remain in effect until such time as the commodities, equipment and/or services acquired in conjunction with this Agreement have been accepted by the City's authorized representative, unless otherwise agreed to in writing by the parties, subject to availability of funds, or Arvada's termination for convenience under the Contract Documents. Any required warranty period which exceeds this term shall remain in full force for the duration of the warranty period.
- 6.3. **Additional Services.** While Arvada has listed its major requirements for its solicitation in the Contract Documents, Arvada may, during the term of this Agreement, wish to purchase other related services identified and offered by Contractor, based upon the Bid Schedule amounts contained in Contract Documents. Arvada reserves the right to award these ancillary items to Contractor. This option, if exercised, in no way obligates Arvada to pursue additional services with Contractor.
- 6.4. **Payment for Services.** At least 20 calendar days before the date established for each monthly progress payment, the Contractor shall submit to Arvada an itemized Application for Payment for construction completed in accordance with the Bid Schedule. Such application shall be supported by such data substantiating the Contractor's right to payment as Arvada may require, such as copies of invoices or requisitions from subcontractors and material suppliers and reflecting retainage. Arvada shall pay NET 30 for services performed in accordance with the Bid Schedule and with this Agreement, but in no event shall the total Contract Amount exceed \$4,199,999.00 absent a properly executed Change Order. Measurement of the work performed and monthly payment shall

be made in accordance with requirements of the Measurement and Payment Section in the Contract Documents unless otherwise specifically provided herein.

- 6.5. **Non-Conforming Materials or Construction.** Where materials installed or the finished product fails to meet minimum requirements of the Contract Documents, the basis of determining final payment to the Contractor shall be determined by the Arvada project manager.
- 6.6. **Retainage Requirements.** Contractor agrees to submit monthly invoices together with any retainage requirements as prescribed by Colorado state statutes (*see e.g., C.R.S. § 24-91-101 et seq*). Payment from Arvada will be paid NET 30 days. Invoices will accurately reflect actual work completed by Contractor and its subconsultants or subcontractors.

ARTICLE 7. MISCELLANEOUS.

- 7.1. **Waiver.** No provision of this Agreement may be waived except by written agreement of the parties. A waiver of any provision on one occasion shall not be deemed a waiver of that provision on any subsequent occasion, unless specifically stated in writing. A waiver of any provision shall not affect or alter the remaining provisions of this Agreement.
- 7.2. **Strict Compliance.** No failure of Arvada to insist upon strict compliance by the Contractor with any provision of the Contract Documents shall operate to release, discharge, modify, change or affect any of the Contractor's obligations.
- 7.3. **Successors and Assigns.** Arvada and Contractor, respectively, bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement and to the partners, successors and assigns of such other parties with respect to all covenants of this Agreement. Contractor shall not assign (whether partially or wholly) this Agreement whether by operation of law or otherwise, without the written consent of Arvada. If Contractor makes an assignment in accordance with this provision, Contractor shall nevertheless remain legally responsible for all obligations arising under the Agreement, unless otherwise agreed in writing by Arvada.
- 7.4. **Additional Documents.** The parties agree to execute any additional documents and to take any additional action that is necessary to carry out this Agreement.
- 7.5. **Binding Effect.** This Agreement shall inure to the benefit of, and be binding upon, the parties, their respective legal representatives, successors, heirs, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise expressly authorized herein. All provisions of this Agreement which contain continuing obligations shall survive its expiration or termination.
- 7.6. **Paragraph Captions.** The paragraph captions in this Agreement are set forth only for the convenience and reference of the parties and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.

- 7.7. **Integration, Amendment, and Severability.** This Agreement represents the entire agreement between the parties, and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties. If any other provision of this Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Agreement shall continue in full force and effect if the essential terms and conditions of this Agreement for both parties remain valid, legal, and enforceable.
- 7.8. **Notices.** Any notice or notification required or permitted by the Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent electronically, or by certified mail or registered mail, postage and fees prepaid, addressed to the party to whom such notice is to be given at the address set forth on the signature page below, or at such other address as has been previously furnished in writing, to the other party or parties. Such notice or notification shall be deemed to have been given when electronically sent or when deposited in the United States mail.
- 7.9. **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.
- 7.10. **Preferences in Employment of Colorado Labor.** To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:
- 7.10.1. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- 7.10.2. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement which shall be deemed an original on the date first above written.

(Signatures on next page.)

DATED this _____ day of _____, 2024.

CITY OF ARVADA, a Colorado home
rule municipal corporation

Lauren Simpson
Mayor
8101 Ralston Road
Arvada, CO 80002

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris

By: _____

SMH WEST, LLC, a Colorado Limited
Liability Company

Robert J. Richardson
Division Manager
900 Castleton Road, Suite 125
Castle Rock, CO 80109
Email: rob.richardson@smhwest.com

Arvada CSB & Addendum

An Agreement By And Between The City Of Arvada And
SMH West, LLC For The 2021 Water Main Improvements,
Project No. 21-Wa-02, In An Amount Not To Exceed
\$4,199,999.00

CITY OF ARVADA

COMPETITIVE SEALED BID

BID #: 23-PW-091

Title: 2021 Water Main Improvements (21-WA-02) – Re-issue

Issue Date: 10/31/2023

Questions Deadline: 11/17/2023 - 2:00 PM MDT

Bid Due Date: 11/30/2023 - 2:00 PM MDT

Virtual Opening Information: Join Zoom Meeting:
<https://us06web.zoom.us/j/82724618259?pwd=FSneUCImU5noZ7TdFr4F9cwC1wXcfe.1>
Meeting ID: 827 2461 8259
Passcode: 393991

Delivery Date: 14 months after notice to proceed

Bid Delivery address: **Electronic Submissions must be submitted online at BidNetDirect.com**
Questions and submission documents must be uploaded to Bidnetdirect.com unless otherwise directed. Submit as one PDF and your company name must start the uploaded file name.
Late responses will not be considered for award.

For additional administrative information NOT related to the project, contact: Cheryl Dye, cdye@arvada.org

Documents included in this Bid

Cover Page	page 1
Advertisement for Bids	page 2
General Terms and Conditions	page 3
Special Terms and Conditions for Bids	page 5
Insurance Requirements	page 7
Project Special Provisions	page 9
Submittal Forms to be Completed and Returned	
• Bid Bond	page 22
• Bid Proposal	page 23
• Bid Form (Excel document)	page 24
Submittal Checklist and References to be Completed and Returned	page 25
Preview of Documents if Awarded	page 26
ATTACHMENTS: 2021 Water Main Improvements Project - Signed	

ARVADA'S VISION MISSION AND VALUES

VISION: We dream big and deliver.

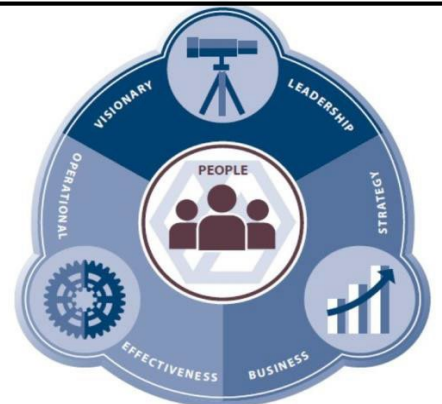
MISSION: We are dedicated to delivering superior services to enhance the lives of everyone in our community.

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.



ADVERTISEMENT FOR BIDS

Submit bids electronically on Bidnetdirect.com for the construction of City of Arvada, Project No 21-WA-02, Project Title: 2021 Water Main Improvements Project.

The BID DOCUMENTS, consisting of Advertisement for Bids, General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, Addendum when issued, Bid Bond, Bid Proposal, Bid Form, Performance and Payment Bond, Submittal Checklist and References, Sample documents, and the Project Drawings may be examined at the following location: www.bidnetdirect.com.

This project is a part of the annual improvement of the City's potable water main network. This phase will improve areas of condition and capacity concerns across Arvada and will include methods such as slip lining, HDD, and open cut as follows.

- Area C: Installation and replacement of 10-inch, 18-inch, and 24-inch PVC and fusible PVC pipe via open cut and slip lining on Carr Street between 72nd Ave and 74th Ave. Includes a crossing of Croke Canal via open-cut and removal of an aerial crossing.
- Area D: Installation of 16-inch steel pipe inside PRV vault on Jellison St between 72nd Ave and 74th Ave. Abandonment of PRV vault.
- Area E: Installation of 12-inch PVC via open cut at 72nd Ave and Kendrick Street. Includes a crossing of Farmer's Highline Canal.
- Area F: Installation of 8-inch PVC via open cut along the southernmost eastbound lane of traffic in 72nd Ave.
- Area G: Miscellaneous installations, replacements, and abandonments. Includes installation of 8-inch PVC via open-cut and HDPE via HDD as well as abandonment of 8-inch AC pipe.

No cost bid documents may be obtained at www.bidnetdirect.com on or after 10/31/2023.

Bidders, Subcontractors, and suppliers must be familiar with the current City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements, dated October 2, 2023, which will be combined with the Bid Documents to form the Contract Documents for the Project. A copy of the Standards may be obtained from the office of the City Engineer upon a non-refundable payment of \$50.00. Holders will be notified when supplemental revisions and additions are available as they are adopted. The Standards are also available at no cost on the City's web site at <https://www.arvadaco.gov/167/Engineering-Code>. Holders are responsible for keeping current their City of Arvada Engineering Code of Standards and Specifications.

Date: 10/31/23

CITY OF ARVADA



Jenny Wolfschlag
City Engineer
8101 Ralston Road
Arvada, Colorado 80002

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GENERAL TERMS AND CONDITIONS

1. PAYMENTS TO CONSTITUTE CURRENT EXPENDITURES. Financial obligations of the City of Arvada, if any, after the current fiscal year are contingent on funds for that purpose being appropriated, budgeted and otherwise made available by the City Council for the City of Arvada. The City of 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 the City of Arvada within the meaning of Article X, Section 20 of the Colorado Constitution.

2. TAXES. The City of Arvada is not subject to taxation. Contractor shall not invoice Arvada for any state, federal or local taxes whatsoever. Upon written notification by the City of Arvada, Contractor shall reimburse the City of Arvada in a timely manner for any taxes erroneously paid by the City of Arvada. The Colorado Department of Revenue, Certification of Exemption for Colorado State Sales/Use Tax account number for the City of Arvada is 98-01789-0000. An exemption certificate will be provided, where applicable, upon request.

3. NO INDEMNIFICATION BY ARVADA. The City of Arvada is prohibited by Article XI, Section 1, Colorado Constitution, from indemnifying anyone. Therefore, notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, the City of Arvada does not indemnify Contractor or anyone else under this Agreement.

4. INDEMNIFICATION OF CITY.

A. Contractor: Notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, Contractor agrees to investigate, defend, indemnify and hold harmless Arvada, its elected officials, officers, employees, agents, insurers, and representatives from and against any claims, costs, losses, expenses, demands, actions, or causes of action, including reasonable attorney fees and other costs and expenses of litigation, which may be asserted against or incurred by Arvada or for which Arvada may be liable, arising from the negligence, willful misconduct, or other fault of Contractor or its employees, agents, or Subcontractors in performance of the Agreement. Nothing herein is intended to constitute a covenant, promise, or agreement to indemnify and hold harmless Arvada from any liability or damages directly caused by or attributable to Arvada's own negligence. Nothing herein intended to be nor may be construed as a waiver of the immunities, protections, or limitations on damages provided to Arvada by the Colorado Governmental Immunity Act, C.R.S. §§ 24-10-101 *et seq.*, as it may from time to time be amended.

5. NO OPINION OF COUNSEL LETTERS. Pursuant to Section 8.1 of the Arvada City Charter, the City Attorney provides advice to the City Council and City Officials in matters relating to their official powers and duties, and will perform such other duties as City Council may prescribe by ordinance or resolution. The City Attorney will not issue opinion of counsel letters, memoranda or statements to third parties, including, but not limited to that any contract or lease is binding on the public entity, enforceable, etc.

6. CONFIDENTIAL DOCUMENTS. Contractors 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 Contractor 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 Contractor. By its submission of the Proposal/Response, Contractor 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, Contractor 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 Contractor's objection.

7. 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 the City of Arvada or others.

8. ASSIGNMENT. Contractor shall not assign the Agreement without the prior written consent of the City of Arvada, which will not be unreasonably withheld, conditioned, or delayed. Contractor may assign the Agreement to any successor to the business of the party by merger, consolidation, or sale of assets. No assignment shall be permitted that enlarges any duty, responsibility or obligation of the City of Arvada, or that limits, curtails, or diminishes any right or privilege of the City of Arvada without the City of Arvada's express written consent.

9. NO THIRD PARTY BENEFICIARIES. It is expressly understood and agreed that enforcement of the terms and conditions of the Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to Arvada and Contractor and nothing contained in the Agreement shall give or allow any such claim or right of action to any other third party on the Agreement.

It is the express intention of Arvada and Contractor that any person other than Arvada or Contractor receiving services or benefits under the Agreement shall be deemed to be an incidental beneficiary only.

10. INDEPENDENT CONTRACTOR. Contractor and Arvada hereby represent that Contractor is an independent Contractor for all purposes hereunder. As such, Contractor is not covered by any worker's compensation insurance or any other insurance maintained by Arvada except as would apply to members of the general public. Contractor shall not create any indebtedness on behalf of Arvada.

11. SUBCONTRACTING. Contractor shall not award work to Subcontractor(s) in excess of fifty percent of the total contract price without Arvada's prior written approval. Contractor shall be responsible for any failure by any Subcontractor or Subcontractor personnel to perform in accordance with the Agreement or to comply with any duties or obligations imposed on Contractor under the Agreement to the same extent as if such failure to perform or comply was committed by Contractor or Contractor's personnel. Contractor shall be Arvada's sole point of contact regarding the services, including with respect to payment.

12. NO WAIVER OF GOVERNMENTAL IMMUNITY. Nothing contained in this or any of the exhibits attached thereto shall be construed as a waiver of any of the immunities, limitations, privileges, rights, procedures, or requirements contained in the Colorado Governmental Immunity Act, C.R.S. §§24-10-101 *et seq.*

13. RIGHT TO TERMINATE. The City of 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 thereof. In the event of termination by the City of Arvada for convenience, Contractor will be paid for requested work performed up until the time of termination by the City of Arvada, not to exceed the total amount of the contract price agreed upon by the parties.

14. COMPLIANCE WITH ALL LAWS. All of the services performed under this Agreement by Contractor shall comply with all applicable laws, rules, regulations and codes of the United States and State of Colorado, and with the charter, ordinances, rules and regulations of the City of Arvada.

15. WAIVER OF BREACH. A waiver by any party to the Agreement or the breach of any term or provision of the Agreement shall not operate or be construed as a waiver of any subsequent breach by either party.

16. GOVERNING LAW AND VENUE. Notwithstanding any provision in the response to solicitation or proposed contract, lease, escrow agreement or any other type of agreement to the contrary, the Agreement shall be governed by the laws of the State of Colorado. Venue for any action arising under the Agreement or for the enforcement of the Agreement shall be in the appropriate court for Jefferson County, Colorado.

17. FORCE MAJEURE. Any delays in or failure of performance by any party of its obligations under the Agreement shall be excused if such delays or failure are a result of acts of God, fires, floods, strikes, labor disputes, 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.

18. BINDING ARBITRATION PROHIBITED. The City of Arvada does not agree to binding arbitration by any extra-judicial body or person. Any provision to the contrary in response to the solicitation, or incorporated by reference, shall be null and void.

19. EQUAL EMPLOYMENT OPPORTUNITY. Contractor shall not refuse to hire, discharge, promote or demote, or discriminate in matters of compensation against any person otherwise qualified solely because of race, creed, sex, color, national origin or ancestry, religion, disability, age, sexual orientation, gender identity, veteran status, or any other basis prohibited by federal, state, or local law.

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, has been properly acknowledged by attestation, notary acknowledgment, or both, 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.

20. PREFERENCES IN EMPLOYMENT OF COLORADO LABOR. To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:

- a. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- b. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.

21. RETAINAGE REQUIREMENTS. Contractor agrees to submit monthly invoices together with any retainage requirements as prescribed by Colorado state statutes (see e.g., C.R.S. §§24-91-101 *et seq.*). Payment from Arvada will traditionally be paid NET (15) days but no later than NET thirty (30) days. Invoices will accurately reflect actual work completed by Contractor.

22. ACCESSIBILITY COMPLIANCE.

- 22.1 Arvada is obligated to comply with the Colorado Anti-Discrimination Act (C.R.S. §§24-34-300 *et seq.*) ("CADA"), which requires all digital and online platform and content providers to comply with the minimum *Accessibility*

Standards for Individuals with a Disability, adopted by the Colorado Office of Information Technology ("OIT") under C.R.S §24-85-103(2.5). Contractor has been advised to familiarize itself with CADA.

- 22.2 To the extent the Work or any of Contractor's services provided under the Agreement involves digital, technological components, including but not limited to software, websites, applications, digital documents (the "Material"), all Material shall comply with the OIT's currently adopted minimum *Accessibility Standards for Individuals with a Disability* at all times.
- 22.3 Contractor shall indemnify, save, 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) incurred by any of the Indemnified Parties in relationship to Contractor's failure to comply with Section (23.2) above.
- 22.4 Upon Arvada's request, Contractor shall certify to Arvada that its service(s) and digital documents are compliant with Section (23.2) above. Arvada may require Contractor's compliance to the OIT's currently adopted minimum standards of accessibility to be determined by a third party selected by Arvada to attest to Contractor's compliance.

SPECIAL TERMS AND CONDITIONS FOR BIDS

1. RECEIPT AND OPENING OF BIDS. Bids submitted electronically on the BidnetDirect.com web site only become available to the City of Arvada after the Bid closes.

Bidder shall assume full responsibility for timely upload of bid to the Bidnetdirect web site. The City reserves the right, where its best interest will be served, to accept or reject any conditional or qualified Bid.

2. QUANTITY AND NATURE OF THE WORK. Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Form by examination of the site and a review of the drawings and specifications including Addendum. After Bids have been submitted the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

3. CONTENTS OF BID. Contractors are required to submit Bids with the following conditions:

- 1) Contractors shall make all investigations necessary to inform themselves of the sites affected and the work 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 Bids. A copy of such addenda will be publicly posted with the original CSB 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. BID SECURITY. Each Bid must be accompanied by a PHOTO of the Bid Bond, on the form attached to these contract documents, payable to the City for five (5) percent of the total amount of the Bid. As soon as the bid Prices have been compared, the City will notify intent to award on the Bidnetdirect.com web site. The vendor who is named as the intent to award Contractor must submit the physical Bid Bond within 10 days or the intent to award may be revoked. The Bid Bond of the successful Bidder will be retained until the Payment and Performance Bond has been executed and approved after which it will be returned. A certified check may be used in lieu of a Bid Bond.

5. POWER OF ATTORNEY. Attorneys-in facts who sign Bid Bonds or Payment and Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

6. QUALIFICATION OF BIDDER. The City may make such investigation as it deems necessary to determine the ability of the Bidder to perform the work. The City reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the City that such Bidder is properly qualified to carry out the obligation of the Contract Agreement and to complete the work contemplated therein. The City reserves the right, before awarding the contract, to require a Contractor 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.

7. AWARD OF CONTRACT. Bids shall be awarded to the lowest-priced responsible and most responsive bidder whose bid meets the requirements and criteria set forth in the CSB within the limits of funds available and that best serves the City's interest. The City, within seven (7) calendar days of receipt of acceptable Contract Security and triplicate copies of the Contract Agreement, signed by the Bidder to whom the Contract was awarded, shall sign the Contract Agreement and return to the Bidder an executed copy of the Contract Agreement. Should the City not execute the Contract Agreement within such period, the Bidder may, by written notice, withdraw their signed Contract Agreement. Such notice of withdrawal shall be effective upon receipt of the written notice by the City.

8. NOTICE OF AWARD AND FAILURE TO ENTER INTO CONTRACT. The party to whom the Contract is to be awarded will be required to execute the Contract Agreement in triplicate, obtain Certificates of Insurance and a Performance and Payment

Bond, as Contract security, within five (5) calendar days from the date the Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the Contract Agreement and the necessary Performance and Payment Bond forms. In case of failure of the bidder to execute the Contract Agreement and provide satisfactory Insurance and Contract Security, the City may at their option, consider the Bidder in default, in which case the Bid Bond accompanying the Proposal shall become the property of the City.

9. CONTRACT DOCUMENTS. The Contract Documents consisting of the Bid Documents, which include the Advertisement for Bids, Information for Bidders, General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, Addendum, Bid Bond, Bid Proposal, Bid Form, Vendor Submittal Form, Construction Drawings, Supplemental Specifications and the City of Arvada Engineering Code of Standards and Specifications, dated July 26, 2022, which include the Measurement and Payment specifications, and the attached Notice of Award form, Contract Agreement form, Performance and Payment Bond form, Notice to Proceed form, and Change Order form, when combined, contain the provisions required for the construction of the Project. Information obtained from an agent or employee of the City or any other person shall not affect the risks or obligations assumed by the Contractor or relieve them from fulfilling any of the conditions of the contract.

10. TERM OF CONTRACT. This contract shall commence on the date of the purchase order or contract execution and shall remain in effect until such time as the commodities, equipment and/or services acquired in conjunction with this Bid have been accepted by the City's authorized representative. Any required warranty period which exceeds this term shall remain in full force for the duration of the warranty period.

11. PRICING SHALL BE FIXED AND FIRM. The prices offered by the Contractor shall remain fixed and firm for at least 90 ninety days. No changes in the Bid shall be allowed after the date and time of the Bid deadline due to error by the Contractor.

12. CONTRACT SECURITY. A Performance and Payment Bond, on the form attached to these contract documents, in the amount of 100% of the Contract price, with a corporate surety approved by the City, will be required for the faithful performance of the Contract.

13. NOTICE TO PROCEED. The Notice to Proceed shall be issued within seven (7) calendar days of the execution of the Contract Agreement by the City. Should there be reason why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the City and the Contractor. In the event the Notice to Proceed has not been issued within the seven day period or within the period mutually agreed upon the Contractor may terminate the Contract Agreement without further liability on the part of either party.

14. MODIFICATION OR WITHDRAWAL OF BIDS BY CONTRACTOR.

Modifications to Bids- Changes to the Bid after the submission deadline shall be allowed only when the Contractor 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 Contractor's name, address, Solicitation Number and title included.

Withdrawal of Bids- If a Bid is withdrawn by Contractor after the Bid Opening, the City may, at its option, suspend the Contractor for a six (6) month period following the withdrawal. Withdrawal of the Bid after the Bid Opening will result in the Contractor forfeiting the provided Bid Bond.

15. REJECTION OF OFFERS BY CITY.

- A. The City may reject a Bid, in whole or in part, for reasons including, but not be limited to:
 - 1) The Contractor misstates or conceals any material fact in its Proposal;
 - 2) The Contractor's Bid does not strictly conform to the law or requirements of the Solicitation;
 - 3) The Bid expressly requires or implies a conditional award that conflicts with the method of award stipulated in the Special Conditions;
 - 4) The Bid does not include documents which are required for submission with the Bid; or
 - 5) The Bid has not been executed by the Contractor through an authorized signature.
- B. The City may, at its sole and absolute discretion:
 - 1) Reject all or parts of Bids submitted by prospective Contractors;
 - 2) Re-advertise this Solicitation;
 - 3) Postpone or cancel the Solicitation;
 - 4) A Bid 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.

16. 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. Contractors 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 Contractor's Bid, it shall be agreed that the Contractor's Bid fully complies with all conditions identified in this Solicitation.

17. ELIGIBILITY OF CONTRACTORS: MUST BE ENGAGED IN SUPPLYING PRODUCTS OR SERVICES RENDERED. Bids 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. Contractors 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 Contractor 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.

18. ELECTRONIC PAYMENT METHODS - CITY OF ARVADA SINGLE USE ACCOUNT.

Contractors are encouraged to consider the following method of payment.

Single Use Account: The City incorporates the use of Single User Accounts as an option to seamlessly process payment of larger dollar purchase orders and contracts to vendors/Contractors/providers. A secure, one-time payment transaction account processes to pay invoices via the Contractor's merchant bank. Invoice payments have an enhanced speed-of-pay cycle that can significantly benefit cash flow.

19. CONDITIONS OF WORK AND OBLIGATION OF BIDDER. Each Bidder is responsible for independently inspecting the site and for reading and being thoroughly familiar with the Contract Documents and for providing the names of major suppliers and Subcontractors in the space provided on the Bid Proposal form. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve the Bidder from any obligation in respect to their Bid Proposal.

20. CONTRACTOR LICENSE. The Contractor to whom the contract is awarded and any Subcontractors employed by the Contractor must have or acquire the appropriate Contractor's license issued by the City of Arvada Engineering Division, including submittal of license bond, necessary insurance certificate, and license fee before initiating any work. The Contractor and any subcontractors will also be required to obtain a no charge Public Improvements Permit from the City of Arvada Engineering Division prior to initiating any and all work on this project.

21. PERFORMANCE MEASUREMENTS FOR SERVICES MORE THAN \$15,000.

The City has incorporated Performance Management into its organizational culture. The City will monitor and report on the following performance measures. These measures will determine, in part, renewals and eligibility for future awards. Measures include: (a) safety as defined by observation and OSHA reportable injuries, (b) quality of contracted work, (c) work completed within required schedule, (d) administration and coordination of estimates, RFIs, ASIs, change orders, pay requests and close out documents, (e) fair and justifiable change orders, (f) responsiveness and follow through on requests.

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.

22. PREPARATION AND SUBMISSION.

Bids 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) Contractors 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) The only authorized version of this Bid is posted on WWW.BIDNETDIRECT.COM. Registration is available to receive email notification of new solicitations, addenda, and communications.

INSURANCE REQUIREMENTS

The following listed insurance requirements shall be carried by the selected Contractor 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 \$1,000,000.00 for bodily injury and property damage for each occurrence and not less than \$2,000,000.00 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 \$1,000,000.00 per accident.
3. ☒ **Automobile Liability** for limits not less than \$1,000,000.00 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 \$5,000,000.00, following form to the Commercial General Liability.

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.

- 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.
- 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 Contractor fails to submit the required insurance documents within 15 calendar days after notice to submit such policies is given to the Contractor by a City representative, the Contractor 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.
- The City, through its Risk Manager, reserves the right to require additional insurance coverage and other requirements.

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SPECIAL PROVISIONS

City of Arvada CSB # 23-PW-091 - Project No. 21-WA-02, 2021 Water Main Improvements Project.

Conditions peculiar, but essential, to the successful performance and acceptance of the work on this project are itemized below. As such, they shall take precedence over the included Contract Documents in the following order:

1. Project Specifications
2. Project Drawings
3. City of Arvada Engineering Code of Standards and Specifications, 2022 Edition.
4. Special Provisions

A. GENERAL CONSIDERATIONS

SC-A-1 **MINIMUM REQUIRED QUALIFICATIONS:** Evidence of these qualifications must be submitted.

1. Successful installation of an average of 10,000 LF or more of 8-24 inch waterline in the Front Range of Colorado in each of the last three calendar years. Front Range Colorado is defined as Fort Collins to Pueblo.
2. Three references: two of which must be on projects for the proposed Project Manager and one of which must be on projects for the proposed superintendent. All references must be from Colorado entities.
3. Resumes for the proposed superintendent and project manager must be provided.
4. At least five years of experience in similar slip lining and annular grouting methods to those proposed for use on this job.
5. At least five (5) installations via Horizontal Directional Drilling (HDD) of at least 2-inch nominal diameter HDPE with a minimum of 250 feet each and that have been installed within the last five (5) years in the Front Range of Colorado.

SC-A-2 **CONTRACT TIME AND LIQUIDATED DAMAGES:** This project is to be completed, including cleanup, within 14 months after the date to be specified in the Notice to Proceed, unless the contract time is adjusted by change order. The Contractor shall agree to pay to the Owner, as liquidated damages, the sum of \$1400.00 for each consecutive calendar day that the work exceeds the allotted contract time.

SC-A-3 **MEASUREMENT AND PAYMENT:** Measurement of the work performed and payment, at the unit or lump sum price quoted in the Bid Form, shall be made in accordance with requirements of the Measurement and Payment Section of the Contract Documents.

SC-A-4 **NON-CONFORMITY OF MATERIAL OR FINISHED PRODUCT:** Where materials installed or the finished product fails to meet the minimum requirements of these Contract Documents, the basis of determining final payment to the Contractor shall be determined in accordance with the current section 134.01 of the City's Engineering Code of Standards and Specifications.

SC-A-5 **TAXES:** The City of Arvada is exempt from Colorado State Sales and Use Taxes on materials and equipment to be incorporated in the work. Said taxes shall not be included in the Contract Price.

SC-A-6 **OSHA REQUIREMENTS:** Observing the rules and regulations required by the Occupational Health and Safety Administration (OSHA) is the responsibility of the Contractor on this project.

SC-A-7 **CITY HOLIDAYS:** There shall be no construction during City observed holidays. Arvada observed holidays generally include: New Year's Day, Martin Luther King, Jr. Day, President' Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Thanksgiving Day, Day After Thanksgiving, Christmas Day.

The Contractor, when performing work on a City holiday, Saturday, Sunday, or in excess of ten (10) hours on a weekday, in accordance with Section 27-174(b)(2) of the Code of the City of Arvada, agrees to reimburse the Owner for the Inspector's time at the following rate:

First 2 hours, or fraction thereof: \$100.00

Each additional 2 hours or fraction thereof: \$100.00

Payment shall be made payable to the City of Arvada within ten days of the date of invoice from the Owner.

SC-A-8 **CDH or CDOT SPECIFICATIONS:** References made to CDH or CDOT Specifications on the plans or in the Special Contract Provisions shall mean the State of Colorado, Division of Highways, Standard Specifications for Road and Bridge Construction, adopted 2021 now known as the Colorado Department of Transportation and any subsequent revisions.

SC-A-9 **SUBSIDIARY OBLIGATIONS** The following items shall be considered subsidiary obligations of the contract. No separate payment will be made for furnishing, installing and removing temporary plugs for pressure testing, temporary connections made from new mains to existing mains, temporary base course or cold mix trench surfacing placed at Contractor's option, temporary blow offs for pressure testing, temporary water service to customers as required, cutting and plugging existing lines to facilitate new pipe installation, and furnishing and installing detector wire. The Contractor shall protect or remove and replace, all shrubs, decorative rock, sod, underground sprinklers, signs, landscaping, fences, or other private or public improvements, adjacent to the construction area. Disturbed areas shall be restored to a condition equal to or better than that which existed prior to construction. All sod shall be replaced unless approved by the municipal Inspector to re-use existing sod. Re-sodding of affected areas around new fire hydrants shall be considered a subsidiary obligation of the new hydrant installation.

Asphalt pavement, concrete curb, gutter, sidewalk and cross pans, etc., along the trench shall be protected unless identified by the plans for removal and replacement. Any concrete not scheduled for removal and replacement that is damaged by the Contractor shall be replaced by the Contractor at no cost to the City.

As a subsidiary obligation, Contractor shall be responsible for notifying adjacent property owners and managers prior to construction of any potential service interruptions and maintaining water access in accordance with the Special Provisions SC-C-1, SC-C-2, and SC-C-3 and the Contract Specifications.

SC-A-10 **FIELD ORDERS:** An authorized representative of the Contractor shall acknowledge receipt of field orders by promptly signing all written field orders delivered to the job site. Verbal field orders given by the Project Engineer will be recorded in writing in the municipal Inspector's daily report that is to be signed by the Contractor's authorized representative.

SC-A-11 **PROJECT MEETINGS:** Meetings shall be held between the City, Contractor, and other applicable entities at a standard time and place, established during the Preconstruction Meeting. Meetings are to be typically held on at least a weekly basis unless otherwise mutually agreed to by the Parties. The City shall require the attendance of Contractor's Superintendent and any other person(s) deemed necessary, including Subcontractors and or suppliers, at these meetings. The meetings shall be conducted by the Project Engineer for the following purposes:

1. Review the overall progress of the Work and the current status of the Schedule of Work
2. 3-Week Lookahead for upcoming Work
3. Identification and resolution of problems which are or may be impeding the planned progress of the Work.
4. Coordination of the efforts of concerned Parties so that the Work progresses per the Schedule of Work
5. Maintenance of lines of communication, including sound working relationships between the City and Contractor, and a mutual understanding of requirements of the Contract Documents.

The City or City's Representative shall be responsible for the preparation and distribution of the meeting agenda, and the written minutes of these meetings to all attendees and other concerned or impacted parties. The Contractor shall be responsible for the preparation and distribution of a three week lookahead schedule prior to the meeting. The Contractor shall distribute the three week lookahead schedule a minimum of two (2) business days before the meeting. The City or their Representative shall distribute meeting minutes within two (2) Business Days of the meeting and shall incorporate modifications and/or corrections into the meeting minutes as deemed appropriate by the City, and the revised meeting minutes will be re-distributed to all attendees by Project Engineer.

SC-A-12 **CHANGE OF METHOD:** Any cost due to a change in construction method will be the responsibility of the Contractor.

SC-A-13 **PRORATED PAYMENT ITEMS:** The following payment items will be prorated throughout the project based on the dollar amount of the total project completed each month divided by the total contract dollar amount. In no case shall payment exceed 100% of the bid amount on each item.

Citizen Notification
Traffic Control
Trench Maintenance and Project Site Cleanup
Erosion Control

SC-A-14

COMPACTION AND MATERIALS TESTING: The Contractor shall complete field testing in accordance with the following schedule. Additional source material testing shall be completed as necessary to establish the basis of field tests. The frequency of testing listed in this schedule lists the minimum number of tests per quantity of work.

Material to be Tested	Payment Responsibility for Initial Testing	Minimum Testing Frequency
Trench Backfill	OWNER	As required. See Section 322.00 – Minimum Testing Requirements.
Asphalt Concrete	OWNER	As required when placed. See detailed requirements in Section 922.00 – Asphalt Sampling and Testing.
Cement Concrete	OWNER	As required when placed. See Section 825.00 – Concrete Testing.
Waterline – Hydrostatic testing	CONTRACTOR	As required. See Section 421.13 – Disinfection and Flushing of Water Lines and Section 421.14 – Leakage
Waterline – Disinfection	OWNER	As required – See Section 421.13 – Disinfection and Flushing of Water Lines and Section 421.14 – Leakage

SC-A-15

CONSTRUCTION STAKING: On City projects, the City shall furnish all land surveys and establish all base lines for locating the principal component parts of the work together with a suitable number of benchmarks adjacent to the work shown in the Contract Documents, unless otherwise stated in the Special Conditions for the project.

If necessary, all construction staking required on this project will be performed by City of Arvada survey personnel. The Contractor is required to have their own surveyor available to meet the survey requirements when the City of Arvada Surveyors are not available. The Contractor shall carefully preserve benchmarks, reference points, and stakes installed by the City survey team and, in case of willful or careless destruction, Contractor shall be charged by the City with the resulting expense for replacement and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance on City projects.

SC-A-16

SUPERINTENDENTS AND COOPERATION OF CONTRACTOR: The Contractor shall, at their expense and within the contract price, keep on the work during its progress a competent project manager, foreman or superintendent and any necessary assistants. The project manager, foreman or superintendent shall represent the Contractor in the Contractor's absence and all directions given to those who represent the Contractor (either verbally or in writing) shall be binding as if given to the Contractor. Any person or subcontractor employed on the work, who shall be deemed by the Project Engineer to be incompetent, careless, insubordinate, or otherwise objectionable by their acts, shall at once be removed from any of the work and shall not perform future work on the project except by written permission from the Project Engineer.

SC-A-17

CONSTRUCTION WATER: All construction water will be provided by the City free of charge through existing City owned fire hydrants per Section 142.00 Use of Arvada Water in the Arvada Engineering Code of Standards and Specifications. Contractor will be required to obtain a hydrant meter from the City Utilities division which will require a \$2,000 refundable meter deposit upon return of the meter in acceptable working condition.

SC-A-18

STORMWATER CONSTRUCTION PERMIT: As a subsidiary obligation of the contract, the Contractor shall obtain a Stormwater Construction Permit from the Colorado Department of Public Health and Environment, Water Quality Control Division, Permit Enforcement Section, prior to clearing, grading, or excavating a site of one (1) acre or more. A copy of the approved permit must be submitted to the City of Arvada Engineering Division prior to the start of clearing, grading or excavating of the site. A copy of the approved permit must also be available on the project site at all times during construction. Contractor shall also obtain a Colorado state Construction Dewatering Discharge Permit from the Colorado Department of Public Health and Environment for all areas where trench dewatering is required and water is discharged into a storm sewer, channel, irrigation ditch or any waters of the United States. A copy of the approved permit must be submitted to the Project Engineer prior to the start of any dewatering. A copy of the approved permit must also be available on the project site at all times during construction.

In addition, the Contractor shall be required to obtain a City of Arvada Site Development Permit from the Arvada Stormwater Utility Division. For permit requirements go to arvadaco.gov/101/services and click on Permits and Licenses. Contractor shall implement best management practices that include inlet protection for all inlets affected by the work as well as stockpile protection in order to control runoff from stockpiles. Contractor shall also be required to perform daily street sweeping to limit tracking from the work site. Uncontrolled releases of dirt or silt from the project into drainage ways, which includes the gutter or stormwater inlets, constitutes a violation of Arvada Ordinance punishable by up to \$999 per day per incident. No additional payment will be made for obtaining a City of Arvada Site Development Permit. Refer to section SC-G-3 for erosion control and best management practice requirements.

SC-A-19 **APPROVED METHODS:** All bidders on this project must construct the slip lining pipe installation, horizontal direction drill pipe installation, and open cut pipe installation with a process that has been approved by the Project Engineer. All approved methods must meet the Contract Specifications, Contract Drawings, the City of Arvada Engineering Code of Standards and Specifications, and these Special Conditions in that order.

The approval of other processes as equal to that specified will only be made in writing in the form of an Addendum issued by the Project Engineer.

If an alternate process is approved, the Contractor shall accept the responsibility for the performance of the installation and if it does not meet the intent or standard of the specified process/installer the City reserves the right to have the installation removed and reinstalled or corrected at the Contractor's expense.

SC-A-20 **SECTION 144.00 PERMISSION AND PERMITS REQUIRED BY OTHER AGENCIES** of the City of Arvada Engineering Standard and Specifications is hereby revised for this project as follows:

Section 144.00 shall include the following:

The permits the Contractor is expected to obtain include, but are not limited to, the following:

- City of Arvada Site Development Permit
- City of Arvada Site Disturbance Permit
- City of Arvada Right of Way and Wet Utility Permit
- City of Arvada Hydrant Meter Permit
- CDPHE HAZARDOUS WASTE – 6 CCR 1007-2
- Colorado of Transportation (CDOT) Permit
- RTD Approval for Bus Route Service Interruption

B. CONSTRUCTION CONSIDERATIONS

SC-B-1 **LOCATIONS AND PRIORITIES:** The cover sheet of the project drawings includes descriptions of the various locations. Priorities for the work shall be established by the City and are as noted on the sheet GN-1 of the project drawings. The city reserves the right to add, delete, or modify construction locations, priority order and portions of the work without change in the contract agreement prices, per subsection 1121.05 Changes in Contract Price of the Arvada Engineering Code of Standards and Specifications.

SC-B-2 **PRE-CONSTRUCTION AND SCHEDULING:** A pre-construction meeting will be scheduled prior to the start of work. Attendance by the Contractor's project manager and/or construction superintendent will be required. A construction schedule shall be submitted by the Contractor to the Project Engineer at least three (3) days prior to the pre-construction meeting. The schedule shall be in bar chart form and shall at a minimum indicate the start and completion dates of work at each construction location. The Contractor shall also provide the City with an after-hours emergency contact phone number at the pre-construction meeting.

SC-B-3 **MINIMIZING WORK ZONE DAMAGES:** During all phases of construction including cleanup, Contractor shall operate all equipment and utilize personnel so as to minimize or prevent damages to public or private property. Contractor shall limit operation of heavy equipment to safe and prudent speeds and minimize operation of equipment over concrete sidewalks, curbs and gutters. Contractors shall also conduct operations to avoid dings, nicks, gouges, scrapes, hairline cracks, etc., on streets and concrete curb, gutter and sidewalks as well as other facilities in the area. Tracked vehicles are not permitted on paved surfaces unless specific precautions are taken to protect the surface. Should Contractor's operations cause damage, Contractor shall be fully responsible for repairs at no cost to the City.

All public or private property damaged during the construction process must be repaired within two weeks of street clean-up. Should repair items not be completed within two weeks, City may initiate and complete the repair work; deducting costs to complete the work from total contract.

SC-B-4 **LIMITATION ON CONSTRUCTION ZONE:** Installation of the water main shall be completed in segments such as detailed in the design documents. These limitations include all aspects of construction including, but not limited to, asphalt removal, excavation, backfill, temporary trench resurfacing, pressure testing and flushing, service connections and cleanup. Open trenches shall be protected by the Contractor at all times during Construction. Adverse weather may delay the construction process. No additional locations may be opened beyond the above limit should weather cause delays.

SC-B-5 **TRAFFIC CONTROL AND STREET RESTRICTIONS:** Traffic control methods shall conform to Arvada Engineering Code of Standards and Specifications and the FHA Manual for Uniform Traffic Control Devices and Colorado Supplement thereto. When working in State Highway right-of-way, traffic control methods shall meet the requirements of the Colorado Department of Transportation (CDOT). Contractor's traffic control plan is subject to CDOT approval prior to commencing work on State Highway right-of-way. No hand painted traffic control devices will be permitted. After award of the contract and prior to the start of construction, Contractor shall submit via Trakit the traffic control plans for approval encompassing all locations of the project. The Contractor shall modify the installation to meet requirements of the City of Arvada Traffic Department, if so required.

The Contractor shall notify the Project Engineer in writing of all closures, either partial or complete, of any public street, road, highway or alley per Section 185.00 of Arvada's Engineering Code of Standards and Specifications. All streets in the project will be considered for closure to thru traffic (local traffic only allowed) except for the following:

1. West 72nd Avenue – between Kipling Street and Carr Street
2. West 52nd Avenue and Wadsworth Boulevard

The above streets are classified as arterial and collector streets. All other streets in the project are classified as local streets. Work hours shall be as outlined below.

SC-B-6 **STREET CLOSURE AND RESTRICTIONS:** Lane closures in various street classifications are as follows:

ARTERIAL STREETS:	Lane Closures 8:30am – 3:30pm only Construction Activities 8:30am – 3:30pm only Must maintain one lane each way at all times
COLLECTOR STREETS:	Lane Closures 8:30am – 3:30pm only Construction Activities 8:30am – 3:30pm only Must maintain one lane with adequate flagging at all times
LOCAL STREETS:	Lane Closures 7:00am – 7:00pm only Construction Activities 7:00am – 7:00pm only Must remain open to thru traffic unless otherwise noted

The majority of construction will occur during regular working hours as detailed above. The Contractor should be aware that certain construction activities will need to be performed outside regular working hours. These activities will be identified by the Project Engineer in accordance with the needs of affected third-parties. An exception to the above restrictions will be made at 72nd Ave for segment F.

There shall be no shutdowns or tie-ins on Fridays. Existing tie-in locations shall be visualized by test holing prior to the scheduled tie-in date. Flushing operations shall take place on Fridays only if they have begun prior to 8:00 am. High chlorine tests shall take place on Fridays only if they have begun prior to 9:00 am. Pressure testing on Fridays requiring Water Operations Staff support shall begin before 9:00 am. Pressure testing not requiring Water Operations Staff support shall be at the discretion of the City's Inspector.

The Contractor shall submit a written request to the Project Engineer to perform overtime work outside of allowable working hours. Requests for work outside regular working hours shall be received a minimum of five working days prior to the proposed date of the work. The Contractor shall complete the necessary reviews and obtain the appropriate

approvals to comply with Arvada Municipal Code. This does not include construction work that is scoped to occur outside regular working hours.

If Contractor violates these working time limitations, Project Engineer may give written notice to stop work on the project at the beginning of the next day's work and work may not resume until Contractor provides written explanation for the violation and assurance to the City that there will not be a recurrence of the violation. If subsequent working time violations occur, Project Engineer will notify Contractor in writing that there will be a price reduction for each incidence of violation in accordance with this specification. Price reduction will not be imposed where changed contract conditions are encountered during the specific period or the violation in question was a result of circumstances beyond Contractor or subcontractor's control. The price reduction will not constitute a penalty but will be considered a failure to perform traffic control in accordance with the contract.

An incident is any violation up to 30 minutes in duration. Each 30 minutes or increment thereof will be considered an incident. A price reduction will be assessed for each successive or cumulative 30 minute period in violation of the working time limitations, as determined by the Project Engineer. The price reduction for each incident will increase at a progressive rate starting with \$150 for the second incident and increasing to \$600 for the fourth and subsequent incidents in accordance with the following schedule. A 15 minute grace period will be allowed at the beginning of the second incident on the project before the price reduction is applied. The 15 minute grace period applies only to the second incident. The number of incident charges will be accumulative throughout the duration of the contract.

PRICE REDUCTION SCHEDULE

INCIDENT	INCIDENT RATE	TOTAL PRICE REDUCTION
1	Notice to Stop Work	\$0
2	\$150	\$150
3	\$300	\$450
4	\$600	\$1050
5	\$600	\$1650
6	\$600	\$2250
ETC.	\$600	\$2850
	ETC.	ETC.

SC-B-7

COORDINATION WITH UTILITIES AND DITCH COMPANIES: Utility lines indicated on the plans have been plotted using the best available information provided by City and third party survey and do not necessarily reflect all utilities or the exact location of all utilities which may be encountered during construction. The Contractor shall be responsible for submitting a SUE request prior to the commencement of construction for the entirety of the affected area. The Contractor shall be responsible for prompt repair of any damage caused to these or other utilities not shown on the plans. In no way will additional payment be made for down time for the repair of utilities that are damaged during construction whether properly marked or unmarked (in the case that the utility is not City-owned). Contract time only may be adjusted to account for delays due to utility repair. Should a delay in utility repair be significant enough that the Contractor decides to demobilize from the project site, no additional payment shall be made for remobilization to the project site once the utility line has been repaired.

It shall be the Contractor's responsibility to make all arrangements with the utility owner(s) for utility relocations or adjustments and to coordinate the sequence of such work to eliminate possible conflict with construction progress. The Contractor shall provide any advance notice required by the utility owner(s) prior to commencing any work affecting said utility(ies).

Should the Contractor desire and/or choose to perform any additional excavation work required for utility repairs on behalf of the utility owner in order to expedite construction and minimize delays and down time, the City shall in no way be responsible for costs associated with this additional work done for the utility owner.

Work involving changes in, or interference with, utility service shall be done at such times and in such a manner that it will cause the least possible interference with the utility service to the receiving customers. See section SC-C-3 for reference to necessary schedule changes to accommodate customer service.

Should the Contractor desire to have any rearrangement made in any utility facility for their convenience in order to facilitate their construction operations, which rearrangement is in addition to, or different from the rearrangements indicated on the plans or in the special provisions, they shall make whatever arrangements are necessary with the owners of such utility for such rearrangement and bear all expenses in connection therewith.

Attention is directed to the possible existence of underground facilities not known to the City and therefore not shown on the plans or in a location different from that which is indicated on the plans or in the special provisions. The Contractor shall take reasonable steps to ascertain the exact location of all underground facilities prior to doing work that may damage such facilities or interfere with their service. If the Contractor discovers underground facilities not indicated on the plans or in a different location than indicated on the plans and that will be in conflict with the new construction, they shall immediately give the Project Engineer and the utility owner written notification of the existence of such facilities and coordinate the rearrangement of the facility as necessary or request a Field Engineered Change as described in SC-B-10 below.

No additional payment will be made for field verifying all utility locations whether shown or not shown on the plans, coordination with utility companies, utility relocations or down time due to utility relocations or repairs, but shall be considered a subsidiary obligation of the contract.

The Contractor shall provide backfill plans to Farmers Reservoir and Irrigation Company (FRICO) at all FRICO owned and operated ditch crossings demonstrating that the backfilled material is keyed in to the undisturbed canal fill around the new waterline installation such that there shall not be differential settling. Slip lining pits must remain outside of FRICO ROW at all times. Any communication between the Contractor and FRICO involving critical project decisions or inspections should include the City project team. Please refer to Appendix C of the Contract Specifications for additional requirements.

SC-B-8 **UTILITY PROTECTION:** In many locations, existing gas mains, water and sewer service lines, power poles and other utilities are in close proximity to the construction work. The Contractor may be required to perform excavation with hand shovels and/or provide temporary utility line support and/or reschedule construction so that utility owners can relocate their lines. The Contractor's costs to protect and/or support and/or coordinate construction with owners of existing utilities shall be considered a subsidiary obligation of the contract. No separate payment shall be made. As a subsidiary obligation, the Contractor shall also be responsible for protecting existing sections of piping not scheduled for removal that are adjacent to pipe scheduled for removal as part of the work. No separate payment shall be made.

SC-B-9 **CONNECT TO EXISTING:** The Connect to Existing bid item shall include all items outlined in section 1146.02 Connections to Existing Facilities of the Arvada Engineering Code of Standards and Specifications as well as the following: additional bends required to achieve vertical and horizontal alignment between the new mains and the existing mains and removal of existing tees and replacement with solid sleeve on existing water mains where called for; piping between new and existing tees when the total length between tees is less than or equal to 10 feet. Any length above this will be paid for under the applicable pipe size unit price bid item. Temporary plugs on existing mains to be abandoned (where required to maintain water service or as called for on the drawings) shall also be included in the Connect to Existing bid item. Concrete plugs shall be placed in all abandoned pipe ends when the main will be permanently abandoned and won't need to be temporarily placed back in service.

SC-B-10 **FIELD ENGINEERED CHANGES:** The City shall reserve the right to make minor changes to the depth and alignment of pipeline sections and appurtenances to accommodate existing utilities (gas, electric, telephone, cable television, etc.) and also including existing water and sewer mains and/or services or other field conditions.

City survey crews are available to assist the Contractor in verifying existing elevations from Contractor excavated potholes if required prior to pipe placement.

The Contractor shall install the new pipeline and appurtenances as directed by the Project Engineer.

No additional compensation beyond the unit prices bid for the actual work performed shall be made for performing field engineered changes or for down time during the design of field engineered changes as directed by the Project Engineer.

Reasonable time must be allowed for the Project Engineer to design field engineered changes. The additional costs for performing field engineered construction changes and allowing the Project Engineer reasonable time to design field engineered changes as necessary to complete the work shall be included in the Contractor's unit price bid for pipe and appurtenances.

SC-B-11 **TEST HOLING:** The Contractor shall be required to locate all utility crossings to Subsurface Quality Engineering (SUE) Quality Level A (QL-A) in accordance with ASCE C-I-38-02, Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data, along proposed construction areas to determine exact size, type, location and depth prior to installation of the improvements.

Contractor shall visualize all existing water mains that will be connected to the new water main via test holing prior to the planned tie-in date, and with enough advanced notice for Contractor to plan for tie-in, including procurement of specialty parts, if needed.

SC-B-12 **PROTECTION AND RESTORATION OF EXISTING LANDSCAPING:** The Contractor shall protect or remove and replace, all shrubs, decorative rock, sod, underground sprinklers, signs, landscaping, fences or other private or public improvements within or adjacent to the project area. Disturbed areas shall be restored to condition equal to or better than that which existed prior to construction. All sod shall be new unless approved by the municipal Inspector to re-use existing sod.

If branches of trees or shrubs will be in the path of the proposed construction, as verified by the municipal Inspector prior to construction, the Contractor shall prune these branches under the supervision of the City Forester. Also, if tree or shrub roots are exposed in the construction area, the Contractor shall saw cut the roots within 24 hours after the roots are exposed. The Contractor shall not cut the roots with the backhoe. If the roots are improperly cut or exposed longer than 24 hours, then the tree or shrub will be considered as damaged, and the Contractor will be responsible for replacement at their cost.

SC-B-13 **ASBESTOS-CEMENT PIPE CROSSINGS AND CONNECTIONS:** Contractor shall be fully responsible for the proper removal and disposal of all AC pipe encountered on the project that is required to be removed in order to complete the work. Removal of AC pipe is considered to be a Class II Asbestos removal according to OSHA standards. Contractor shall be responsible for considering the regulations and procedures carefully and proceeding accordingly. Contractor may consider having a certified asbestos removal Contractor perform this part of the work, or otherwise must follow all OSHA regulations in the removal process. Contractor shall also be responsible for following any of the Colorado Department of Public Health and Environment's (CDPHE) Asbestos Regulations or Jefferson County Health Department standards that apply to AC pipe removal.

The Contractor shall be responsible for test holing to determine the AC pipe outside diameter prior to construction. The Contractor shall submit an AC crossing and connection plan a minimum of 10 days prior to the actual work for review by the Project Engineer. The plan shall include:

1. Outside diameter of AC pipe potholed
2. Date and Time of work to take place
3. Contractor, City, and Project Engineer emergency contact information
4. Safety measures in accordance with State and Federal regulations
5. Valve closures required for AC pipe crossings and times of valve closure
6. Transition fittings to be used
7. Emergency Plan of Action
8. Alternative methods of Crossing AC Pipe if desired

The Contractor shall be responsible for scheduling a meeting with the City and Project Engineer a minimum of 5 days prior to crossing to review field conditions. It shall be the responsibility of the Contractor to follow State and Federal regulations (including, but not limited to CDPHE, Regulation 8 Part B) as they apply to asbestos materials.

At all AC pipe crossings, the trench shall be backfilled with Controlled Low Strength Material (CLSM) "flowable fill" per MGPEC Section 19.

SC-B-14 **CONTRACTOR'S SCHEDULE OF WORK:** The Contractor shall submit for review by the City of Arvada, within fourteen (14) Calendar Days from Notice of Award, its baseline Schedule of Work in graphic bar chart form (e.g., Gantt Chart). This Schedule of Work shall be the Contractor's working schedule and shall be used to plan, organize, and execute the Work, record and report the progress of the Work, and forecast remaining Work. The Contractor shall be responsible for assuring that all Subcontractor Work and acquisition and delivery of Materials and Equipment, as well as its own Work, are included in the Schedule of Work and that the Schedule of Work represents a coordinated plan of Work. The Schedule of Work shall be periodically updated as required herein.

The Schedule of Work shall clearly show all intermediate Milestone Dates, Substantial Completion of the Work, procurement, fabrication, and construction activities, activity descriptions and durations, activity start and finish dates, specified phasing and sequencing requirements, and the proposed sequence of activities required for the orderly performance and completion of all elements of the Work. The selection and number of activities shown on the Schedule of Work shall be subject to the City's review and acceptance. Activity durations shall be in Calendar Days, and in general, shall not be less than one (1) Calendar Day nor exceed fourteen (14) Calendar Days. Seasonal weather conditions, holidays, long lead time procurements, and other contingencies shall be considered in the planning and scheduling of the Work.

Acceptance of the Schedule of Work by the City shall be a Condition Precedent to the making of any progress payments to the Contractor. Acceptance of the Schedule of Work by the City shall not relieve the Contractor of its sole responsibility for the accuracy or feasibility of the Schedule of Work, or of its sole responsibility to complete the Work in accordance with the Contract Documents, nor does such acceptance by the City warrant, acknowledge or admit the reasonableness of durations, sequence, or logic of the Schedule of Work.

The Schedule of Work shall be monitored on a weekly basis and updated on a bi-weekly basis during Construction progress meetings to incorporate actual start and finish dates, to record actual progress achieved during the reporting period, and to provide a more accurate schedule of the next period's Work. The Schedule of Work shall be accompanied by a written narrative if the schedule has been impacted by Change Orders, delaying events, or if any activities are behind schedule, and actions that are being taken to improve progress and attain compliance with the Contract Time for completion of the Work.

SC-B-15 **SUBMITTAL PROCEDURES:** Within fourteen (14) Calendar Days from Notice of Award, the Contractor shall submit a Submittal Log indicating the Contractor's proposed submittal date and the time allotted for the Project Engineer's review and approval of each Submittal if sooner than specified for each required submittal. This Submittal Log shall be consistent with the Contractor's Schedule of Work. The Contractor shall thoroughly review the Submittal Log to ensure that all of the Project submittal requirements are listed and in the appropriate order of operations for their proposed construction schedule.

SC-B-16 **RECORD DRAWINGS:** The Contractor shall adhere to section 222.00 of the City of Arvada Engineering Code of Standards and Specifications for record drawings procedures. All as-builts should be updated and submitted with each pay application by the Contractor. A complete set of as-built construction drawings shall be submitted to the City at the completion of construction activity for each segment.

C. OBLIGATIONS TO PUBLIC

SC-C-1 **NOTIFICATION OF ADJACENT PROPERTY OWNERS AND MANAGERS PRIOR TO CONSTRUCTION:** The City shall prepare an official notice to be distributed to property owners and customers adjacent to the affected area prior to the start of construction, which will be prepared as a postcard or door hanger to be delivered to all customers affected by Construction activity.

SC-C-2 **SERVICE INTERRUPTION & NOTIFICATION:** The Contractor shall notify, in person, all parties that will be affected a minimum of twenty-four (48) hours prior to the time the Contractor will disconnect or interrupt known sewer or water service or immediately upon the interruption of a service not shown on the plans. All services interrupted or damaged

shall be immediately repaired and service restored. NO SERVICES SHALL BE LEFT INOPERATIVE OVERNIGHT. Contractor must provide, install, and maintain all temporary piping and fittings required to provide temporary overnight water service to residents during installation of cured in place pipe. All water delivered to residents must meet CDPHE and City drinking water standards. Notification for water shutoffs on Monday shall be made by 4:00 p.m. the previous Friday. The City will provide the Contractor with notification card door hangers to leave in the event no one can be contacted in person at the residence or business. The City will also provide shut off lists to the Contractor for each required shut off so that all residents who will be affected during a particular shut off are notified.

The City of Arvada Utilities Division will operate all existing valves, hydrants, blow offs, and curb stops. NO VALVE OR OTHER CONTROL ON THE EXISTING SYSTEM SHALL BE OPERATED FOR ANY PURPOSE BY THE CONTRACTOR. ONCE A CITY OF ARVADA OPERATOR HAS FILLED A LINE UP TO A NEWLY INSTALLED VALVE, THAT VALVE ALSO MAY NOT BE OPERATED BY THE CONTRACTOR FOR ANY PURPOSE. The Contractor shall advise all water customers prior to interrupting flows so they may make provisions to store sufficient water for their interim needs. Service termination periods shall not exceed four (4) hours and interruption of service shall be limited to the hours between 8:30 a.m. and 3:00 p.m., unless prior approval is received from the Project Engineer. The Utilities Division will not shut down water mains for tie-ins after 11:00 a.m. in order for water to be turned back on by 3:00 p.m. Contractor must be within 60 minutes of cutting into the water main based on the judgment of the City's Municipal Inspector and/or Water Utility Division personnel before existing mains will be isolated. Contractor shall provide sufficient cuts or openings in existing pipe to allow timely drainage of water for tie-ins where fire hydrants or blow offs are not available to drain the line. Should an unintended service interruption occur as a result of the work, Contractor shall immediately notify all parties not previously notified.

SC-C-3 **MAINTAINING WATER SERVICE:** Water service to all customers shall be a priority item of this work. Water service to schools, businesses, hospitals, medical centers and all other commercial enterprises and those other customers that indicate a need for uninterrupted water service shall not be interrupted during school or business hours. In certain instances, work may need to be done overnight in order to meet this requirement. Overnight work must be approved in writing by the City Manager prior to commencement. If necessary that an interruption be made or if an unintentional interruption occurs, Contractor shall provide the necessary temporary piping, hoses, etc., to provide temporary water service to those customers. This includes night work as required in the Contract Documents. All water delivered shall meet CDPHE and City drinking water standards. This work shall also be coordinated through the City's Water Utility Division.

This work shall be considered a subsidiary obligation of water main installation contract work. No separate payment shall be made for supplying temporary water service to any customer during this work or for completing work during overnight hours in order to maintain an uninterrupted water supply during school or business hours where necessary.

SC-C-4 **FILLING AND FLUSHING WATER MAINS:** City forces will operate all valves required to fill and flush the new water mains in order to put them into service. Mains shall be installed whenever possible (in accordance with the construction drawings) so that the new main can be filled from the low point of the new line in order to allow air to be released from the high point of the new line and avoid air pockets. Contractor must provide 24-hour notice for scheduling of chlorine residual test prior to flushing. Chlorine tablets must be in contact with water a minimum of 24 hours prior to chlorine level testing and flushing of the new water main.

SC-C-5 **BACTERIOLOGICAL ANALYSIS OF NEW WATER MAINS:** Bacteriological testing to be performed by City water quality team members shall only occur Monday through Thursday.

SC-C-6 **USE OF PRIVATE LAND:** Certain portions of this project require working near existing structures and property within private easements. It is the Contractor's responsibility to conduct its operations and limit the size of equipment used in such a manner to prevent damage to existing property from excessive vibration or from other direct or indirect Contractor operations. The cost associated with repairing or replacing the property that is damaged by the Contractor's operations shall be the responsibility of the Contractor.

SC-C-7 **DRIVEWAY ACCESS:** Contractor shall coordinate the work and minimize inconveniences to citizens and affected property owners. Residents shall be notified by the Contractor 24 hours prior to the time that access must be denied to their driveway or when driveway will be blocked for any period of time. Residents shall be provided access to their driveways between 5:00 pm and 7:30 am, and at all times on weekends or holidays or when work is not occurring.

SC-C-8 **PARKING RESTRICTIONS:** Contractor shall coordinate the work and minimize inconveniences to citizens, affected property owners and the traveling public. Residents shall be notified 24 hours prior to the time that access must be denied

to their parking spaces when access to said residential parking lots will be blocked for a period in excess of one (1) hour. Residents shall be provided access to their parking lots between 5:00 P.M. and 7:30 A.M., and at all times on weekends and holidays or when work is not underway.

D. WATER MAIN PIPE, VALVES AND APPURTENANCES

SC-D-1 **FIRE HYDRANTS:** As a correction to section 420.10 Fire Hydrants in the Engineering Code of Standards and Specifications fire hydrants shall open right.

Extra labor, equipment, and materials required to install fire hydrant extensions or shorter barrel hydrants shall be considered a subsidiary obligation of the contract.

SC-D-2 **PRESSURE TESTING (TEMPORARY) BLOW OFF:** When a temporary blow off is used for pressure testing purposes, that blow off can be equipped, by the Contractor, with a 2" ball valve with standard iron pipe threads or with the American AVK resilient seat gate valve that is required on permanent blow offs. The assembly shall be installed as shown on the City standard blow off detail (400-11) with a buried valve to prevent freezing in cold temperatures and to allow backfill over the blow off in traffic areas. The valve and threads shall be maintained in good working order. Temporary blow offs are considered a subsidiary obligation of the water main installation bid items.

SC-D-3 **PIPE DETECTOR WIRE/GROUND RODS:** The Contractor shall furnish and install pipe detector wire that shall be taped to the exterior top of each section of pipe in a straight line during installation. The wire shall be AWG size #12, type UF or USE cable, with single copper conductor, and shall be white in color. The wire shall be UL listed. Please refer to the fusible PVC section of the Project Specifications for tracer wire requirements in fusible PVC. The City will use this wire to electronically locate pipe in the future.

Splices due to breaks in wire continuity shall be made by stripping insulation from each wire end with wire stripper pliers. Wires shall be joined with a solderless connector (Dry Conn Direct Bury Lug) in accordance with the manufacturer's instructions. The splice shall then be installed in a Dry Conn Direct Bury Lug or approved equal.

Electrical continuity in the wire must be restored and maintained. City will test for electrical continuity and alignment after trench backfill is complete and after permanent asphalt surfacing is installed, as a condition of warranty acceptance.

The wire shall form a continuous electrical circuit throughout all new piping installed and shall be grounded at branch lines and fire hydrant laterals as shown on City Standard Detail Drawing 400-5.

Wire used for CP test stations shall be blue in color. Wire shall be looped only and not cut and connected to leads of test station as shown on City Standard Detail Drawing 400-5. Test station shall be a CP Test Services, Glenn Series Glenn-4 with locking lid, 3 1/2 x 4, or approved equal.

SC-D-4 **PVCO (C909):** Where possible, C909 pipe is preferred by the City over C900. Please refer to AWWA C909 requirements for use on the subject project.

E. SERVICE CONNECTIONS

SC-E-1 **TAP MAIN AND INSTALL CORPORATION STOP, ALL SIZES:**

Tapping Procedure: The tapping machine should be in good condition. The boring bar should have no wobble. The tapping tool must be clean and sharp, threaded for AWWA service. Lubricate the cutting and tapping edges of the tool with lubricant recommended by the tool manufacturer and compatible with the pipe material. Do not force drill. A test tap should be performed with the machine prior to actually tapping a live main to verify the boring bar stop mark. When the corporation stop is inserted and tightened into the saddle, there should be a minimum of one thread and a maximum of three threads showing. It is recommended that Teflon Tape be used on the corporation stop prior to installation. Do not use pipe dope. Do not tap PVC in an area which appears to be discolored or sunburned. Taps installed on opposite sides of the main shall be separated by at least eighteen (18) inches as measured along pipe center line. All taps require the use of a service saddle. The saddle shall be installed so that the pipe is not distorted when the saddle is tightened. All service connections should be installed so that the outlet forms a 45-degree angle above the projected horizontal plane through the pipe center line. All tapping methods shall be in strict compliance with the pipe manufacturer's recommendations and Uni-Bell Publication UNI-B8. Tapping saddles for PVC pipe shall be bronze with double stainless steel straps (A.Y. McDonald 3845, Ford 202BS, Mueller BR2S, or Romac 202BS or equivalent approved by the Project Engineer). Corporation stops shall be Mueller B25000 (flare ends) or B25008 (compression ends) or equivalent ball valve type corporation stop. Taps will be made only after release of main by the City Engineering Division and following submittal of health release certifications, successful pressure testing, and installation of the service pipe from main to curb stop or meter pit. Dry tapping is strictly prohibited. No tapping shall be performed when the ambient air temperature is less than 40°F unless a portable heater is installed in the excavated area and the tapping procedure is approved by the City representative in the field.

The City reserves the right to add or delete all or any portion of main tapping from the contract and utilize City forces to perform all or any portion of the taps in accordance with Arvada's Engineering Code of Standards and Specifications.

SC-E-2 **REPLACEMENT OF NON-COPPER WATER SERVICE LINE/INSTALLATION OF COPPER WATER SERVICE LINE:**
Any water service pipe encountered other than copper, such as lead, galvanized pipe, cast iron, etc., shall be replaced from the corporation stop to the meter pit or curb stop. All service pipes shall be installed at four (4) feet minimum depth of cover.

SC-E-3 **RECONNECT WATER SERVICE:** All water service connections shall be transferred from the old main to the new main after the new main has been chlorinated, pressure tested and flushed. The reconnection shall include furnishing and installing additional Type K copper pipe and couplings (flared couplings, Mueller 110 compression couplings or Ford Quick Joint compression) necessary to transfer the service from the old to the new main as well as the required excavation, dewatering (if required), backfill and compaction.

F. REMOVE, REPLACE, SALVAGE, ABANDON

SC-F-1 **REMOVE FIRE HYDRANT:** City personnel will salvage all desirable parts from existing fire hydrants that are to be removed as part of the work after the hydrants have been permanently removed from service. The remaining hydrant head and barrel shall be removed and disposed of by the Contractor to a minimum depth of 18 inches below finished grade. The remaining hydrant barrel shall then be plugged with a minimum 6" depth of concrete and then filled with squeegee bedding material prior to surface restoration to match the surrounding surface area. Fire hydrant valve boxes shall be removed and disposed of (during the course of salvaging the fire hydrant) if the fire hydrant valve is located outside of the limits of the paved street area. This work shall be considered a subsidiary obligation of removing the existing fire hydrant. Fire hydrant valve boxes shall be abandoned (paid for as "Abandon Valve Box") if they are located in the paved street area only. Fire hydrant parts that may be removed and salvaged include upper and lower barrels, shoe and related appurtenances.

G. BEDDING, BACKFILL, TRENCH MAINTENANCE, AND PATCHING

SC-G-1 **TEMPORARY ASPHALT SURFACING:** During construction, the City may require temporary asphalt patching on some segments of the work at high traffic volume areas. These locations shall be at the discretion of the municipal Inspector and Project Engineer. Thickness of the temporary asphalt patch shall be a minimum of two (2) inches.

SC-G-2 **RESEEDING/RESODDING:** Reseeding or resodding of any affected trench or other areas disturbed during construction shall be considered a subsidiary obligation of the contract and shall be completed in accordance with Section 1000 of the Arvada Engineering Code of Standards and Specifications. Resodding of affected areas around new fire hydrants shall be considered a subsidiary obligation of the new hydrant installation. Payment shall only include a maximum width of 50 feet of disturbed area centered along the trench. Seed to be used shall comply with Grass Specifications 1030.00 of Arvada's Engineering Code of Standards and Specifications any alternatives must be approved by the Project Engineer. Any slopes greater than 3:1 and any areas identified in contract documents shall have straw/coconut fabric erosion control blankets installed as part of restoration in accordance with CDOT Standards. Disturbed state highway right-of-way area, where applicable, must be topsoiled, fertilized, mulched and reseeded with Colorado Department of Transportation Specifications grass seed mix. All resodded areas are to have a six (6) inch layer of topsoil placed beneath the new sod.

SC-G-3 **BEST MANAGEMENT PRACTICES (BMPs) FOR STORMWATER MANAGEMENT:** This section provides a set of criteria and technical guidance for erosion and sediment control and material management at utility construction sites. Erosion control measures limit erosion of soil from disturbed areas including stockpiled material at the construction site. Sediment control measures prevent the transport of sediment off-site to downstream properties and stormwater conveyances. Materials management is the practice of containing and controlling all materials used in order to eliminate potential pollutants from leaving the site. Due to the fast paced nature of utility projects, the site's erosion and sediment controls and material management BMPs must be inspected and maintained by the owner/operator daily.

Site Development Permit (SDP):

In accordance with the City of Arvada's permit criteria, Contractors performing underground utility construction including the installation, maintenance and repair of all utilities under hard-surfaced roads, streets or sidewalks must acquire a City Site Development Permit and implement and maintain erosion control, sediment entrapment, and material management BMPs.

Initial documentation required:

- Completed SDP Application
- Application fee (waived for City funded projects)
- Escrow/LOC (waived for City funded projects)
- Site Map
- Potential pollutant list
- BMP specification details

SDP – Required Documentation:

A site map including construction boundaries, all proposed locations of BMPs, stockpiles, staging areas, portable restrooms, concrete containment, construction material storage and waste material storage must be prepared by the Contractor and provided to the City's Stormwater Division for approval prior to beginning work. This site map must be updated daily by the Contractor to reflect the site's condition.

Potential pollutants must be listed and BMPs prescribed for each individual pollutant. If onsite fueling or maintenance will be conducted, a spill plan must be provided to the Stormwater Division prior to beginning work and a copy must be retained by fueling/maintenance personnel during operations.

A copy of these requirements including BMP specifications and details must remain on site and be referred to by any personnel installing, maintaining, repairing, repositioning or inspecting BMPs.

A daily log of BMP inspections, installation, repair and maintenance must be kept on site. This log must contain the date, name, location of BMP, and nature of work. It must also include that the site map was revised.

SDP – Enforcement Policy:

If it is determined by the City Inspector that BMPs are not inspected, installed and maintained daily, payment to the Contractor may be withheld. If BMPs are not installed or maintained for a period of three consecutive days, a separate company will be contracted to do the work whereas costs incurred will be 100% reimbursed to the City with an inclusion of an additional 50% for administrative fees.

Site Development Permit BMP Requirements for Underground Utilities:

- ✓ All paved surfaces, gutters and sidewalks affected by utility work must be cleared at the end of each day.
- ✓ Where consistent with safety and space considerations, excavated material is to be placed on the uphill side of trenches.
- ✓ Trench dewatering discharges must be filtered and not allowed to come in contact with stockpiles or soils remaining on paved surfaces or in gutters. Site dewatering permits must be obtained from the Colorado Department of Public Health and Environment.
- ✓ Water main flushing discharges must be routed around disturbed areas and stockpiles. Water must not come in contact with soil stockpiles or soils remaining on paved surfaces or in gutters.
- ✓ All inlets within and downstream of work areas must be protected.
- ✓ Curb check dams must be installed at all locations downstream of work areas where stormwater flows may potentially come in contact with dirt and exit the work area.
- ✓ An area must be designated for construction material waste. All waste materials must be placed into waste containers and covered immediately.
- ✓ Portable toilets must be provided on site and an area designated for their placement.
- ✓ A portable concrete washout basin must be provided on site should any type of concrete work be conducted. If small amounts of concrete are to be prepared on site, containment is required.
- ✓ Staging areas must be designated and employ appropriate BMPs. Staging areas (whether on public or private property) must be restored to a condition equal to or better than that which existed prior to construction, including necessary re-vegetation.
- ✓ Stockpiles must, at all times, have a perimeter BMP installed at the downstream side, and all material dragged from a stockpile during operations must be swept back into the pile at the end of each day.
- ✓ All erosion and sediment control practices shall be maintained and repaired by the owner/operator during the construction phase, as needed, to assure continued performance of their intended function. All BMPs must be inspected, maintained and replaced daily if necessary.
- ✓ After all work has been completed, including asphalt and re-vegetation, clean out and remove all temporary construction BMPs within 48 hours.

REQUIRED CONTRACTOR SUBMITTAL FORM

SUBMITTAL CHECKLIST:

Bids shall be submitted in the order listed below with each section clearly identified. **Missing information or required documents may result in submission being deemed non-responsive.** Imbedded links for required information are NOT acceptable.

- ☐ Submit completed City Submittal Forms including this sheet, Bid Bond, Bid Proposal, Bid Form, and any other attachments requested.
- ☐ **MINIMUM REQUIRED QUALIFICATIONS:** Evidence of these qualifications must be submitted. (see page 10 SC-A-1)
- ☐ Submit implementation timeline and warranties, if applicable.
- ☐ Attach Contractor's Licensing, if applicable.
- ☐ Insurance – Checking this box accepts that the insurance requirements listed by the City are acceptable.
- ☐ Please initial to acknowledge Addenda, if any, have been considered in your proposal:

#1 _____ #2 _____

REFERENCES:

- ☐ Check here if Contractor'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: _____

BID PROPOSAL

TO: City of Arvada, Colorado (hereinafter called "CITY").

FROM: _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as (a corporation), (a partnership), (an individual).

The Bidder, in compliance with your Advertisement for Bids, hereby proposes to perform all Work in strict accordance with the Contract Documents, for the construction of City of Arvada Project No. **21-WA-02** entitled **Water Main Improvements Project** within the time set forth therein, and at the prices stated on the included Bid Form as totaled herein.

By submission of this Bid Proposal, each Bidder certifies, and in the case of a joint venture each party thereto certifies as to his/her own organization, that this Bid Proposal has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid Proposal with any other Bidder or with any competitor.

Bidder acknowledges receipt of **Addendum Nos.** Initials: _____

Bidder states that their:

Major Material Suppliers are:

Material They Will Supply

Major Subcontractors are:

Work They Will Perform

CONTRACT TIME AND LIQUIDATED DAMAGES: All work shall be completed, including clean-up, within **365** working days after the date to be specified in the Notice to Proceed. A Notice to Proceed is anticipated to be issued beginning of November 2023. The bidder shall agree to pay the owner the sum of \$1,400 for each calendar day that the work exceeds the allotted contract time. Contract time may be adjusted by Change Order.

Total from included Bid Form: **TOTAL BID \$** _____

SUBMITTED BY:

Company Name: _____

Contact Names: _____

Address: _____

Phone: (_____) _____ Email(s): _____

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the Contractor;
- He/she has read all Terms and Conditions and technical specifications made available in conjunction with this solicitation and fully accept and acknowledge this bid is consistent with the specifications and terms and conditions.
- The bid 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

PAYMENT TERMS: The City standard is net thirty (30) days but every effort is made to meet net fifteen (15) days after the approved partial payment date when the Contractor is satisfactorily performing the contract. The final 5% of total payment will be paid once the contract is completed satisfactorily, advertisement for final settlement is complete, and the project is accepted by the City. Payment is the date of the check mailing or date of the credit card transaction.

City of Arvada
23-PW-091 2021 Water Main Improvements
Project Number: 263334-271511
City of Arvada Project Number: 21-WA-02
Bid Workbook (Only complete the prices in yellow cells)

Use the Excel spreadsheet
document for Bid Submittal.

Contractor: _____ Date: _____

Prepared By: _____

Item No.	Description	Quantity	Unit	Unit Price	Total Price
BASE BID ITEMS - WATER MAIN REPLACEMENT AT C-SEGMENT, D-SEGMENT, E-SEGMENT, F-SEGMENT, G-SEGMENT					
1	MOBILIZATION	1	LS	\$0.00	\$0
2	TRAFFIC CONTROL	1	LS	\$0.00	\$0
3	EROSION CONTROL	1	LS	\$0.00	\$0
4	CONNECT TO EXISTING 8" PIPE	7	EA	\$0.00	\$0
5	CONNECT TO EXISTING 10" PIPE	1	EA	\$0.00	\$0
6	CONNECT TO EXISTING 12" PIPE	2	EA	\$0.00	\$0
7	CONNECT TO EXISTING 18" PIPE	2	EA	\$0.00	\$0
8	CONNECT TO EXISTING 24" PIPE	2	EA	\$0.00	\$0
9	8" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	2505	LF	\$0.00	\$0
10	10" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	30	LF	\$0.00	\$0
11	12" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	300	LF	\$0.00	\$0
12	18" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	600	LF	\$0.00	\$0
13	24" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	270	LF	\$0.00	\$0
14	DIRECTIONAL DRILL HDPE WATER MAIN AND CASING PIPE, ASSOCIATED CONNECTIONS AND RESTORATION - SHEET G-4A	1	LS	\$0.00	\$0
15	DIRECTIONAL DRILL HDPE WATER MAIN AND CASING PIPE, ASSOCIATED CONNECTIONS AND RESTORATION - SHEET G-4B	1	LS	\$0.00	\$0
16	18" FUSIBLE PVC WATER MAIN	645	LF	\$0.00	\$0
17	SLIP LINING ACCESS PITS	2	EA	\$0.00	\$0
18	SLIP LINING SERVICE RECONNECTIONS	2	EA	\$0.00	\$0
19	24" STEEL CASING PIPE	90	LF	\$0.00	\$0
20	36" STEEL CASING PIPE	110	LF	\$0.00	\$0
21	REMOVAL OF EXISTING AERIAL CROSSING (SEGMENT C)	1	LS	\$0.00	\$0
22	JELLISON STREET VAULT MODIFICATIONS	1	LS	\$0.00	\$0
23	8" GATE VALVE W/ BOX	5	EA	\$0.00	\$0
24	10" GATE VALVE W/ BOX	1	EA	\$0.00	\$0
25	12" GATE VALVE W/ BOX	3	EA	\$0.00	\$0
26	18" BUTTERFLY VALVE W/ BOX	1	EA	\$0.00	\$0
27	24" BUTTERFLY VALVE W/ BOX	1	EA	\$0.00	\$0
28	SINGLE AIR RELEASE VALVE ASSEMBLY W/ VAULT	3	EA	\$0.00	\$0
29	DUAL AIR RELEASE VALVE ASSEMBLY W/ VAULT	1	EA	\$0.00	\$0
30	W. 74TH AVE AT CARR STREET VAULT PIPING REPLACEMENT	1	LS	\$0.00	\$0
31	CARR ST DRAIN MANHOLE PIPING REPLACEMENT	1	LS	\$0.00	\$0
32	CONCRETE CUT-OFF WALL (SEGMENT C)	2	EA	\$0.00	\$0
33	CONCRETE CUT-OFF WALL (SEGMENT E)	2	EA	\$0.00	\$0
34	ASPHALT ROADWAY OPEN CUT R&R	4055	SY	\$0.00	\$0
35	CONCRETE SIDEWALK R&R	100	SY	\$0.00	\$0
36	CURB & GUTTER R&R	2100	LF	\$0.00	\$0
37	SOD REPLACEMENT	170	SY	\$0.00	\$0
38	SEEDING/LANDSCAPING	255	SY	\$0.00	\$0
39	BED ROCK EXCAVATION	185	CY	\$0.00	\$0
40	FIRE HYDRANT ASSEMBLY	5	EA	\$0.00	\$0
41	DISCONNECT EXISTING METER (SHEET F-5)	1	LS	\$0.00	\$0
42	CAP EXISTING WATER MAIN AND ABANDON IN PLACE	4	EA	\$0.00	\$0
43	ABANDON IN PLACE EXISTING 12" WATER MAIN	38	LF	\$0.00	\$0
44	ABANDON IN PLACE EXISTING 24" WATER MAIN	508	LF	\$0.00	\$0
45	CROKE CANAL BYPASS (SHEET C-1)	1	LS	\$0.00	\$0
46	FARMERS HIGHLINE CANAL BYPASS (SHEET E-1)	1	LS	\$0.00	\$0
47	8" LINE STOP (SHEET G-2)	1	LS	\$0.00	\$0
48	RIVER ROCK AND LANDSCAPE REPLACEMENT (SHEET G-3)	1	LS	\$0.00	\$0
49	COSTCO AC PIPE REMOVAL (SHEET G-5)	1	LS	\$0.00	\$0
50	HOME DEPOT SURFACE AND LANDSCAPE RESTORATION (DETAIL B, SHEET CD-8)	1	LS	\$0.00	\$0
51	CROKE CANAL AND FARMERS HIGHLINE CANAL BED RESTORATION	195	SY	\$0.00	\$0
52	TEST HOLING	1	LS	\$0.00	\$0
53	DEWATERING - C SHEETS	1	LS	\$0.00	\$0
54	DEWATERING - E SHEETS	1	LS	\$0.00	\$0
55	DEWATERING - F SHEETS	1	LS	\$0.00	\$0
56	DEWATERING - G SHEETS	1	LS	\$0.00	\$0
57	CITIZEN NOTIFICATION	1	LS	\$0.00	\$0
58	CATHODIC PROTECTION	1	LS	\$0.00	\$0
TOTAL BASE BID					\$0

BID BOND

We, the undersigned _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto the City of Arvada, Colorado, in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

THE CONDITION of this obligation is such that whereas the Principal has submitted to the City of Arvada, Colorado the accompanying Bid Proposal, and hereby made a part hereof to enter into a Contract Agreement for the construction of City of Arvada Project No. 21-WA-02, Water Main Improvements Project.

WHEREAS, the City, as a condition for receiving said Bid Proposal, requires the Principal to deposit with the City a Bid Proposal Guaranty, equivalent to not less than 5 Percent of the amount of said Bid Proposal.

NOW THEREFORE,

- (B) If said Bid Proposal shall be rejected; or in the alternate,
- (C) If said Bid Proposal shall be accepted and the Principal shall execute and deliver a Contract Agreement (properly completed in accordance with said Bid Proposal) and shall furnish a Performance and Payment Bond upon the forms prescribed by the City for the faithful performance of said Contract; and for the payment of all persons performing labor or furnishing materials in connection therewith; and shall in all other respects perform the agreement created by the acceptance of said Bid Proposal;

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the City may accept such Bid and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, this _____ day of _____, 2023, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL

SURETY

Name: _____

Address: _____

By: _____

By: _____

Title: _____

Title: _____

Attorney-in-Fact:

(SEAL)

NOTE: Surety Companies executing bonds must be authorized to transact business in the State of Colorado and be acceptable to the City.

PERFORMANCE AND PAYMENT BOND

Bond No. _____

(Firm) _____

(Address) _____

(an Individual), (a Partnership), (a Corporation), hereinafter called Principal; and

(Firm) _____

(Address) _____

hereinafter called Surety, are held and firmly bound unto the City of Arvada, a Colorado municipal corporation, 8101 Ralston Road, Arvada, Colorado 80002, hereinafter called the City, in the penal sum of _____, Dollars, _____, in lawful money of the United States, for the payment of such sum will and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION are such that the Principal entered into a certain Contract with the City, dated the _____ day of _____, 2023, a copy of which is hereto attached and made a part hereof, for the

performance of City of Arvada Project No.'s **21-WA-02** entitled **2021 Water Main Improvements Project**.

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the City, with or without Notice to the surety and during the life of the guaranty period, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the City from all cost and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the City all outlay and expense which the City may incur in making good any default, and if he shall promptly make payment to all persons, firms, Subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, repairs on machinery, equipment and tools, consumed, rented or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by Subcontractors or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between City and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2023.

IN PRESENCE OF:

PRINCIPAL

By _____

Address _____

(Corporate Seal)

OTHER PARTNERS

(Surety Seal)

SURETY _____

Attorney _____ in _____ Fact _____

Address _____

Note: If Contractor is Partnership, all partners should execute Bond.

Important: Surety Company must be authorized to transact business in the State of Colorado and be acceptable to the City.

NOTICE OF AWARD

Date

Company
Address
City, State Zip

RE: Project No. 21-WA-02, Water Main Improvements Project

Dear Representative of _____:

The City of Arvada, Colorado (hereinafter called "City") has considered the Bid Proposals submitted for referenced work in response to its Advertisement for Bids dated _____ and Information for Bidders.

You are hereby notified that your Bid Proposal has been accepted, for items and prices stated in the Bid Form, in the amount of \$ _____.

You are required to execute the Contract, the Insurance Certificates and a Performance and Payment Bond within seven (7) days from the date of this Notice to you.

The Performance and Payment Bond needs to be filled out, returned (one original must be returned to the City), and accompanied by the Power of Attorney from your surety company. Also, please make sure that the insurance certificate is in the minimum amounts set forth in the Contract Documents and the City of Arvada is named as an additional insured for the specific Project Number and Title. An Additional Insured endorsement certificate should also be attached.

If you fail to execute said Contract and furnish the necessary Insurance Certificates and Bond within the time allotted from this date, the City will be entitled to consider all your rights arising out of the City's acceptance of your Bid Proposal as abandoned and as a forfeiture of your Bid Bond. The City will be entitled to such other rights as may be granted bylaw.

You are required to return an acknowledged copy of this Notice of Award and enclosures to the Project Engineer.

CITY OF ARVADA, COLORADO

Jenny Wolfschlag

City Engineer

BIDDER

Company

Receipt of above Notice of Award accompanied with a Performance and Payment Bond form and a copy of the Contract is hereby acknowledged.

This _____ day of _____, 20____.

By: _____

Name: _____

Title: _____

NOTICE TO PROCEED

Date

Company
Address
City, State Zip

RE: Project No. 21-WA-02, Water Main Improvements Project

Dear Representative of _____:

You are hereby notified to commence work on referenced Project, in accordance with the Contract dated _____
on or before _____, and you are to complete the Work, including cleanup within _____ calendar days thereafter.

The date of completion of all Work is therefore _____.

CITY OF ARVADA, COLORADO

City Engineer

BIDDER

Receipt of this Notice to Proceed is hereby acknowledged this _____ day of ____, 20 ____.

Company

By: _____

Title: _____

**AN AGREEMENT BY AND BETWEEN THE CITY OF ARVADA AND
FOR
IN AN AMOUNT NOT TO EXCEED \$_____.00**

This Agreement made this _____ day of _____, 20____ by and between the City of Arvada, a home rule municipal corporation (“Arvada” and/or “City”) and _____, a _____ (“Contractor”).

WITNESSETH: That for and in consideration of the covenants, promises, and payments hereinafter mentioned:

1. Contractor will commence and complete the _____ described in the Contract Documents relating to CSB-_____, issued _____, 20____, (“the Work”).
2. Contractor will furnish all material, supplies, tools, equipment, labor, and other services necessary for the completion of the Work.
3. Contractor will commence the work required by the Contract Documents within ten (10) calendar days after the date of Notice to Proceed.
4. Contractor will complete the work required by the Contract Documents by _____ after the date of the Notice to Proceed unless the period for completion is extended otherwise by the Contract Documents.
5. Contractor agrees to perform all of the work described in the Contract Documents for an amount not to exceed \$_____ .00 for the Work.
6. The term “Contract Documents” means and includes the following:
 - A. Arvada’s Request for [Project Title], CSB-_____ (“CSB”);
 - B. CSB Exhibits (if any);
 - C. CSB Addenda (if any);
 - D. Contractor’s Response to CSB-_____, Advertisement for Bid, Bid Proposal, Bid Form, Bid Bond, Certificate of Insurance;
 - E. Notice of Award;
 - F. Performance and Payment Bond;
 - G. Notice to Proceed;
 - H. Change Orders (if any);
 - I. City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements;
 - J. Project special provisions prepared or issued by City of Arvada (or its Consultant if applicable);
 - K. Detail drawings and Bid Documents prepared or issued by City of Arvada (or its Consultant if applicable);
 - L. Specification Illustrations and attachments; and
 - M. All supplementary requirements regarding wage rates, E.E.O., affirmative action and all other Federal-State requirements as outlined in the specifications.
7. INVOICES AND COMPENSATION. Contractor will follow Bid Form and partial payments will be made accordingly NET 15 but no later than NET 30.
8. GENERAL TERMS AND CONDITIONS, SPECIAL TERMS AND CONDITIONS, INSURANCE

REQUIREMENTS, PROJECT SPECIAL PROVISIONS, AND OTHER CSB REQUIREMENTS. Contractor affirms that it has read and is familiar with the Contract Documents, including but not limited to the General Terms and Conditions, Special Terms and Conditions, Insurance Requirements, Project Special Provisions, and other CSB requirements, and agrees to be bound by those terms and conditions.

9. CHANGE ORDERS. Contractor shall perform the Work as described in the Contract Documents or as amended by the mutual consent of the parties in writing. Should the parties agree in writing to a change in the scope of services, then the parties will timely execute any applicable Change Order, which will address changes in scope of services, completion date, contract amount, any applicable material modifications, and any other matters that the parties deem necessary.

10. PREFERENCES IN EMPLOYMENT OF COLORADO LABOR. To the extent that obligations and responsibilities may be established by C.R.S. § 8-17-101 *et seq.*, as amended, with respect to certain public entities and those contracting therewith as to the procurement of services:

- a. Colorado labor shall be employed to perform eighty percent (80%) of the work.
- b. Any waiver of this requirement must comply with C.R.S. § 8-17-101 *et seq.*, as amended.

11. PERFORMANCE MEASURES. The Performance Measures for this Agreement shall be those outlined by Arvada in Section 22 of Special Terms and Conditions for Bidders in the CSB, which are included in the Contract Documents that are exhibits to this agreement.

12. 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.

13. BINDING EFFECT. This Agreement shall inure to the benefit of, and be binding upon, the parties, their respective legal representatives, successors, heirs, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise expressly authorized herein.

14. PARAGRAPH CAPTIONS. The paragraph captions in this Agreement are set forth only for the convenience and reference of the parties and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.

15. INTEGRATION, AMENDMENT, AND SEVERABILITY. This Agreement represents the entire agreement between the parties, and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties. If any other provision of this Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Agreement shall continue in full force and effect if the essential terms and conditions of this Agreement for both parties remain valid, legal, and enforceable.

16. NOTICES. Any notice or notification required or permitted by the Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent by certified mail or registered mail, postage and fees prepaid, addressed to the party to whom such notice is to be given at the address set forth on the signature page below, or at such other address as has been previously furnished in writing, to the other party or parties. Such notice or notification shall be deemed to have been given when deposited in the United States mail.

17. 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, has been properly acknowledged by attestation, notary acknowledgment, or both, 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.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement which shall be deemed an original on the date first above written.

CITY OF ARVADA, COLORADO

8101 Ralston Road
Arvada, CO 80002

ATTEST/WITNESS:

City Clerk

APPROVED AS TO FORM:

For Rachael Morris, City Attorney

By: _____

CONTRACTOR

Name:

Title:

CHANGE ORDER

No. _____

TO:

Upon Contractor acceptance and City approval, the work and Contract Documents for City of Arvada, Project No. _____, entitled _____ will be adjusted to include the following:

<u>Item</u>	<u>Description</u> <u>ADD</u>	<u>Qty.</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Add/Delete</u>
--------------------	--	--------------------	--------------------	-------------------------	--------------------------

1.
2.
3.
4.

TOTAL ADD

\$

Adjustments to Contract Price & Time

Contract
Dollars

Calendar
Days

Contract Totals through and including
Previous Change Orders
Adjustments this Change Order
(Increase)
Contract Totals to Date – Including
Change Order No. _

\$
\$
\$

Contract Time Expires on:

APPROVED FOR CITY

8101 Ralston Road
Arvada, CO 80002

ATTEST:

City Clerk

ACCEPTED FOR CONTRACTOR

By: _____
Title: _____
Date: _____

APPROVED AS TO FORM:

For Rachael Morris, City Attorney

By: _____

Questions & Answers - 1

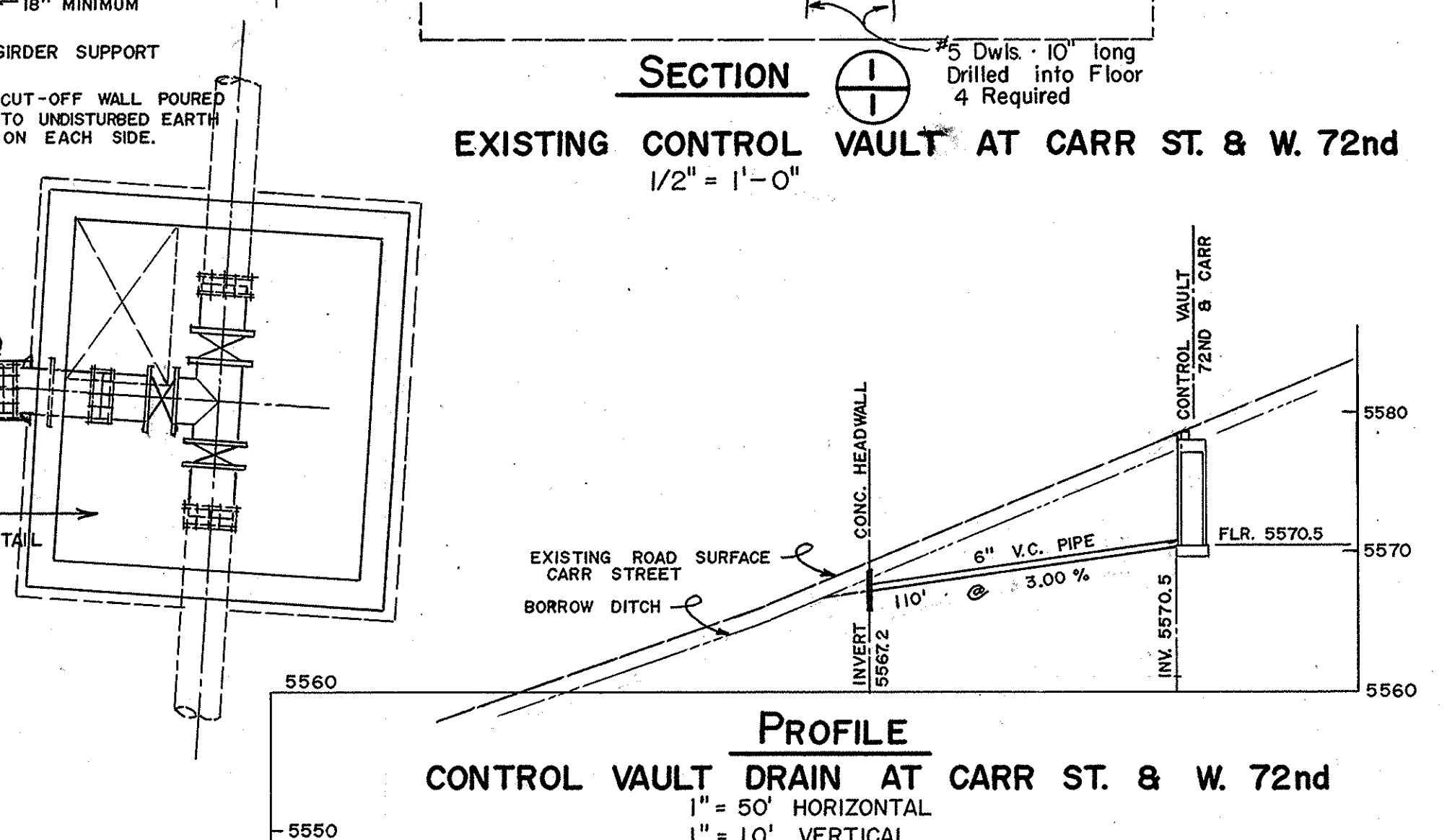
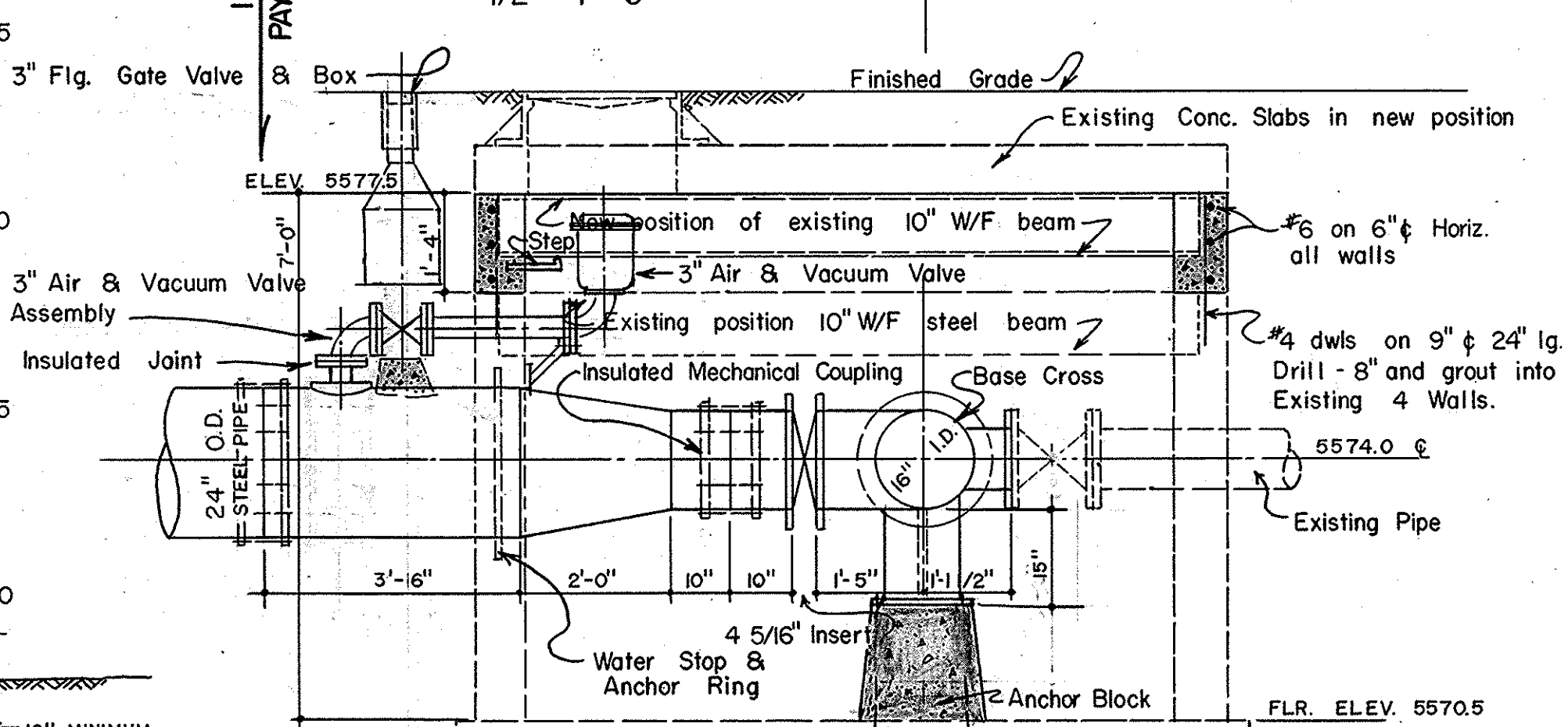
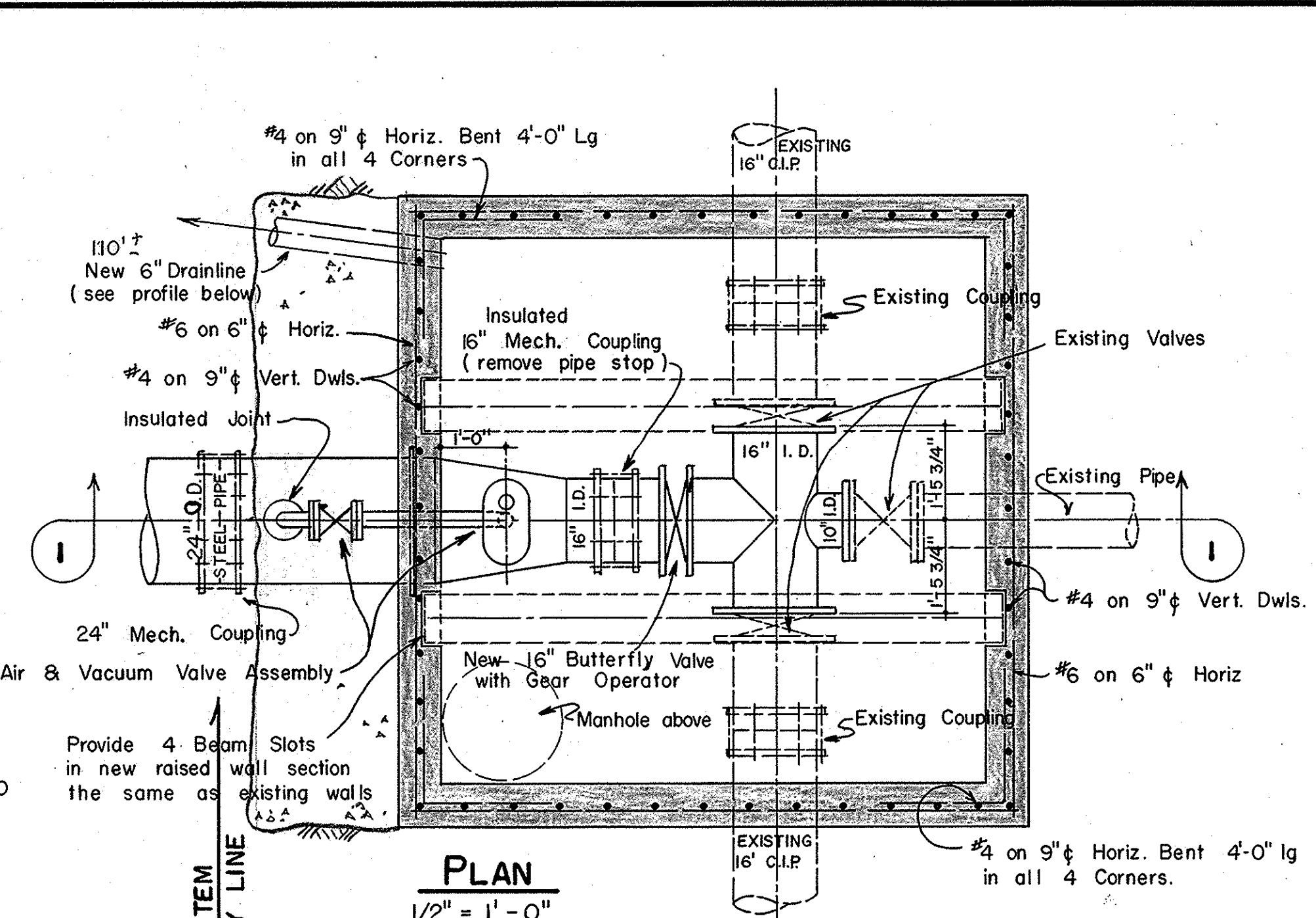
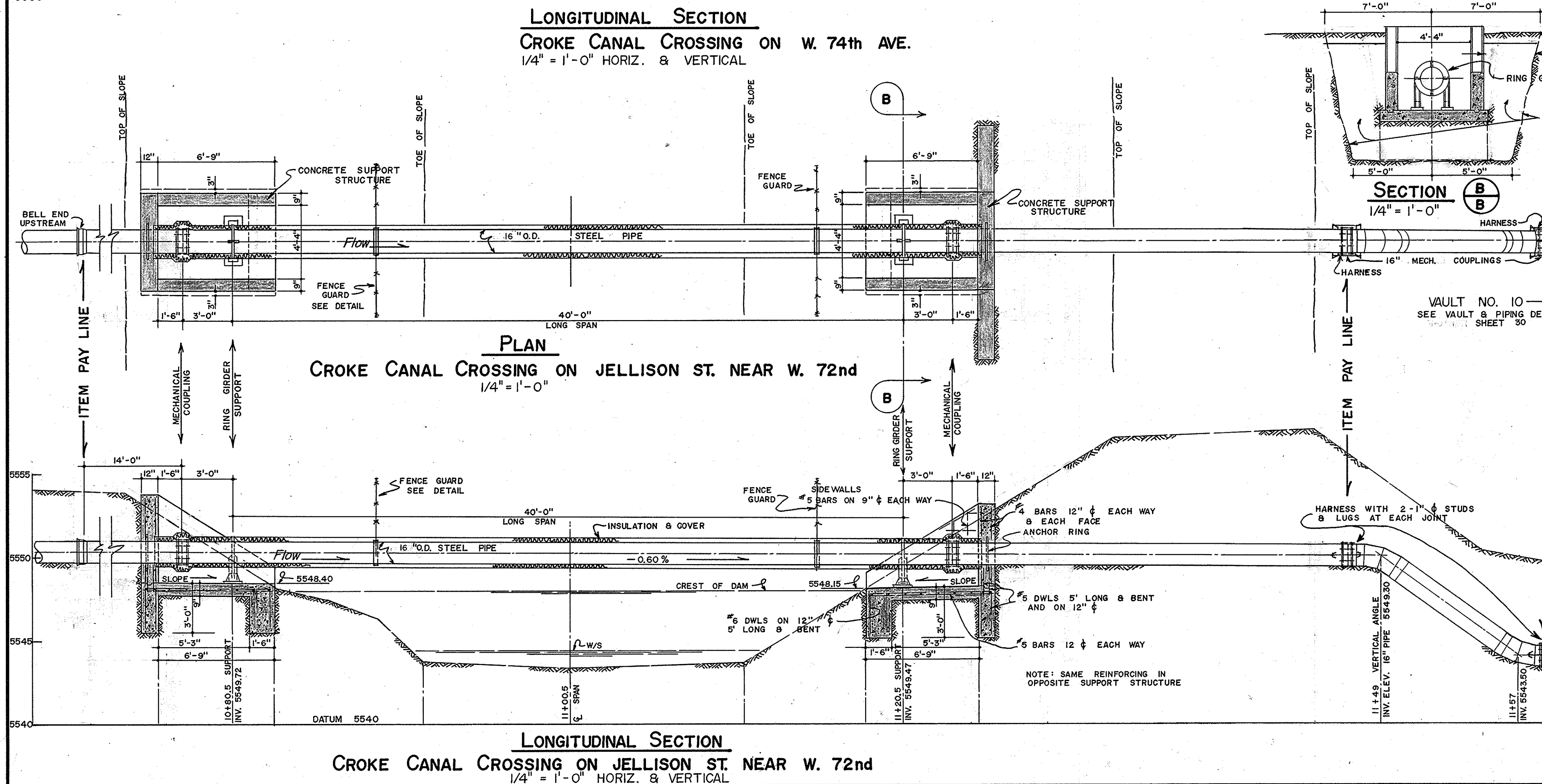
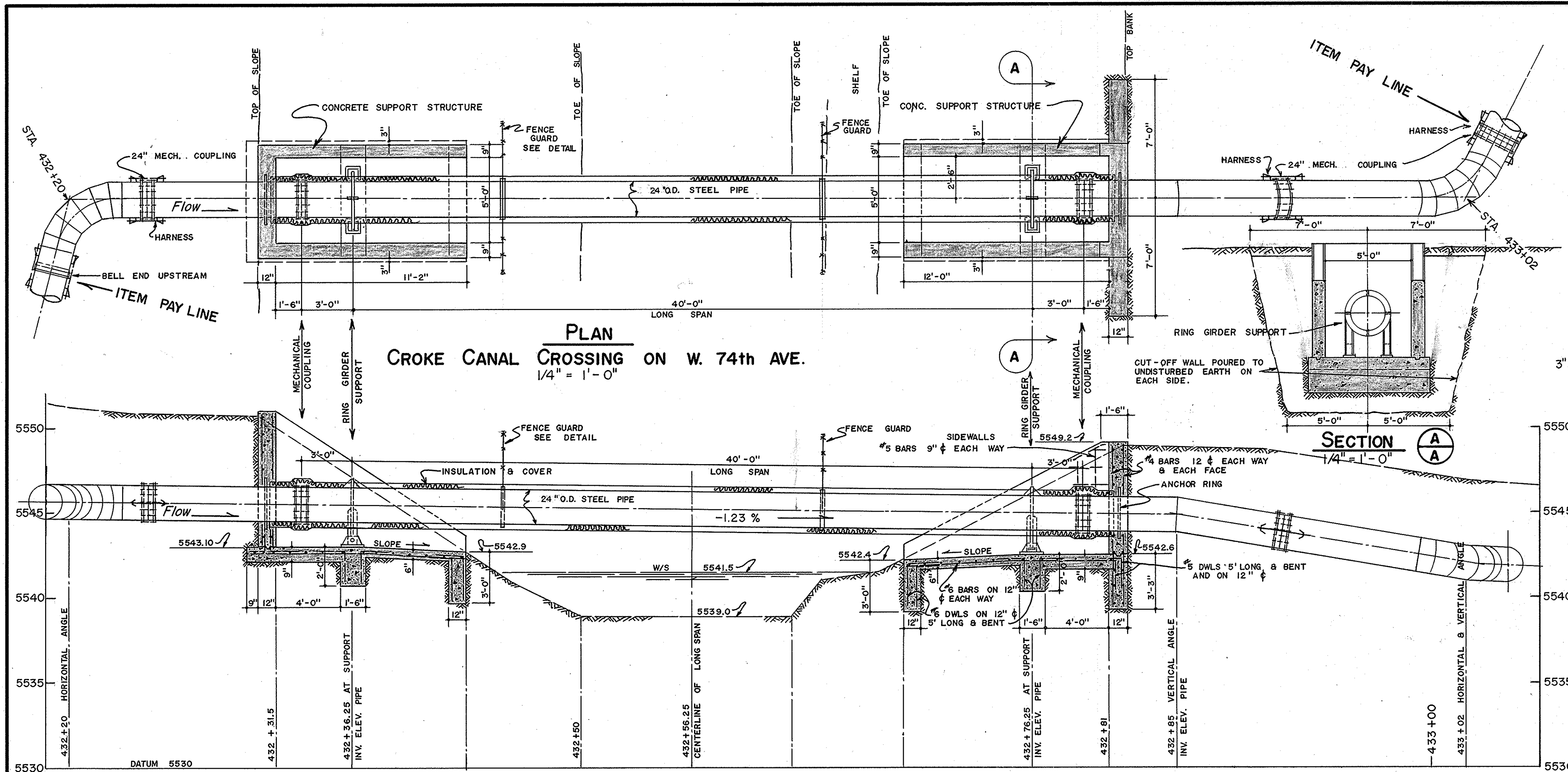
Project 23-PW-091 - 2021 Water Main Improvements Project (Re-Issue)
Buying Organization City of Arvada

No	Question/Answer	Question Date
Q1	Question: 74 Ave Closure Will the contractor be able to close 74th Ave to through traffic while performing the work in that area? Answer: The City's intent is to keep one lane of traffic open at all times. Closure procedures may be followed for adherence to crew and public safety. Please adhere to the City Standards and Specifications for construction working hours on a collector street.	11/14/2023
Q2	Question: 72nd Ave Work Area Will the contractor be allowed to move all traffic onto the westbound side of 72nd Ave while operating in the eastbound side of the road? Answer: Yes. This will be allowed	11/14/2023
Q3	Question: Pressure and Bacteria Tests Will the city require pressure and bacteria tests before connecting the services? Answer: Yes. This will be required.	11/14/2023
Q4	Question: Backfill Materials Will the city require Class 6 base or flowfill backfill in the city right-of-way? Answer: Please see City Standards and Specifications, Section 364.00 Trenching, Backfilling, and Compacting	11/14/2023
Q5	Question: Abandon Water Main Does the abandonment of existing lines require them to be flow filled through the entire line or just capped? Answer: Please see City Standards and Specifications, Section 332.00 Pipe and Appurtenances.	11/14/2023
Q6	Question: Certified Payroll Is there any Davis-Bacon or certified payroll requirements for this project? Answer: No requirements.	11/14/2023
Q7	Question: Buy America Requirements Are there any requirements for American steel or other materials? Answer: No requirements	11/14/2023
Q8	Question: Materials Testing Are materials testing, as in compaction tests and concrete cylinder tests, on the contractor? Or is the City contracting directly with the testing agency? Answer: Test report submittal requirements are included in Section 013300, 1.7.G and are the responsibility of the contractor.	11/14/2023

No	Question/Answer	Question Date
Q9	Question: Landscaping Maintenance Is there a maintenance period on the landscaping and if so how long would that extend to? Answer: Yes. Please see City Standards and Specifications.	11/14/2023
Q10	Question: Section 013526 1) Would a Professional Engineer who is qualified as a Health & Safety Officer be considered instead of a Certified Industrial Hygienist for the development of a Health and Safety Plan? CDPHE asbestos regulations do not require a CIH prepare a health and safety plan for abatement or asbestos management. 2) Does the City have knowledge of previously landfilled ash containing PAHs, arsenic, lead, and dioxin at the project site? Or is this information in the specs (pg. 013526-1) from an unrelated project? Answer: 1) Yes. 2) Based on CDM Smith's environmental assessment during design, there is no knowledge of previously landfilled ash containing PAHs, arsenic, lead, and dioxin at the project site.	11/15/2023
Q11	Question: Public Information On the spec item 57 it states: Citizen notification, as required, for commencement of work as shown in the contract documents. Payment will be made at the contract lump sum unit price as stated in the proposal for Citizen Notification and shall include all items for notification including coordination, printing, delivery, labor, and materials. However, the detailed specs states the city will do the public outreach. NOTIFICATION OF ADJACENT PROPERTY OWNERS AND MANAGERS PRIOR TO CONSTRUCTION: The City shall prepare an official notice to be distributed to property owners and customers adjacent to the affected area prior to the start of construction, which will be prepared as a postcard or door hanger to be delivered to all customers affected by Construction activity. Please clarify the public information requirements for this project. Answer: The City provides the template for a door hanger, the Contractor is expected to distribute the door hanger. City expects superintendent to meet with commercial property owner/site manager when working on/adjacent to commercial property.	11/16/2023

No	Question/Answer	Question Date
Q12	Question: Various Items 1.) Are fees waived for City of Arvada Permits? 2.) How is the AC pipe removal paid on sheet G-2 & C-1? How much is to be removed at each location? 3.) Can a detail be provided for the 8" line stop bid item? 4.) Where is the 10" water main removal and 25sf kick-block paid as shown on sheet C-1. 5.) How is the removal of 24" steel pipe paid? 6.) Can native material be used for trench backfill? IF not how will select backfill be paid? Answer: 1) Yes. 2) The cost of AC pipe removal shall be included in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). Existing 10-inch AC pipe on Sheet C-1 is between stations 1+00 and 1+50 and existing 8-inch AC pipe on Sheet G-2 is between stations 3+00 and 3+19. 3) Existing water main and concrete kick-block removal is paid for in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). The following shall be added to the Measurement and Payment description for these bid items: "This pay item shall also include removal of existing pipeline and concrete kickblocks necessary for installation of new pipeline where indicated in the contract documents. AC pipe removal and all associated health and safety precautions, as well as hazardous material disposal is also included in the cost of water main installation." 4) Existing water main and concrete kick-block removal is paid for in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). The following shall be added to the Measurement and Payment description for these bid items: "This pay item shall also include removal of existing pipeline and concrete kickblocks necessary for installation of new pipeline where indicated in the contract documents. AC pipe removal and all associated health and safety precautions, as well as hazardous material disposal is also included in the cost of water main installation." 5) The cost of pipe removal shall be included in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). 6) Requirements for backfill are summarized on Detail C/CD-3. Native material for trench backfill may only be used following approval by project engineer.	11/17/2023
Q13	Question: Segment F Water Line Can a profile be provided for the work on Holand Court? Also how is the re-connection of the fire hydrant at Holand Court paid for? Answer: No. Profile is not required for the construction along Holand Ct. All existing utilities along Holand Ct (gas + electrical included) shall be investigated/field located/and protected by the contractor prior to and during construction. Hydrant reconnection will be paid for in Bid Item No. 40 (Fire Hydrant Assembly) and is reflected in the current quantity.	11/17/2023
Q14	Question: Segment C AC Pipe Rem Can an Item be created for the AC Pipe removal shown on sheet C-1 and is there any information on the size and length of this removal?? Answer: The cost of AC pipe removal shall be included in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). Existing 10-inch AC pipe on Sheet C-1 is between stations 1+00 and 1+50 and existing 8-inch AC pipe on Sheet G-2 is between stations 3+00 and 3+19.	11/17/2023

No	Question/Answer	Question Date
Q15	Question: Channel Flows Farmers Highline Canal Are the low flow periods and flow in the Farmers Highline canal expected to be similar as to what is noted in the plans for the croke canal on sheet C-1 Note: 12 Answer: Please see page E-1, note 7 and page GN-1, Construction Sequencing	11/17/2023
Q16	Question: Croke Canal Drawings Are there Existing Structure Drawings (As-Builts) of the Croke Canal Aerial Crossing Structure. Answer: Please see attached document, "Croke Canal @ 74th Aerial Crossing."	11/22/2023



8/24/66	AS BUILT	WGP
DATE	REVISIONS	BY
DESIGN	HEL	SUBMITTED BY
DRAWN	WGP	ENGINEER
CHECKED	DC	APPROVED BY
CITY OF ARVADA, COLORADO		
PROJECT NO. 64-W-2		
NORTH ARVADA WATER TRANSMISSION LINE		
CROKE CANAL LONG-SPAN CROSSINGS & DETAILS		
COWAN & LOOMIS, CONSULTING ENGINEERS		DATE JULY 1965
P.O. BOX 83, ARVADA, COLORADO		SHEET 31 OF 31



CITY OF ARVADA

PURCHASING DIVISION
FACSIMILE: 720-898-7098 ▲ TDD: 720-898-7869
PHONE: 720-898-7099

REQUEST FOR PROPOSALS- ADDENDUM No. 1

Proposal #: 23-PW-091
Title: 2021 Water Main Improvements
Addendum #: 1
Today's Date: 11/22/2023
Questions Deadline: 11/16/2023 2:00 PM MDT (NO CHANGE)
Proposals Due By: 12/05/2023 2:00 PM MDT (NO CHANGE)

Solicitation and all related addenda and communications are available at WWW.BIDNETDIRECT.COM.

The following clarifications are provided to be incorporated into the Request for Proposals. . All other information shall remain unchanged.

Questions & Answers:

Q1 Will the contractor be able to close 74th Ave to through traffic while performing the work in that area?

A1 The City's intent is to keep one lane of traffic open at all times. Closure procedures may be followed for adherence to crew and public safety. Please adhere to the City Standards and Specifications for construction working hours on a collector street.

Q2 Will the contractor be allowed to move all traffic onto the westbound side of 72nd Ave while operating in the eastbound side of the road?

A2 Yes

Q3 Will the city require pressure and bacteria tests before connecting the services?

A3 Yes.

Q4 Will the city require Class 6 base or flow fill backfill in the city right-of-way?

A4 Please see City Standards and Specifications, Section 364.00 Trenching, Backfilling, and Compacting.

Q5 Does the abandonment of existing lines require them to be flow filled through the entire line or just capped?

A5 Please see City Standards and Specifications, Section 332.00 Pipe and Appurtenances.

Q6 Is there any Davis-Bacon or certified payroll requirements for this project?

A6 No.



CITY OF ARVADA

PURCHASING DIVISION

FACSIMILE: 720-898-7098 ▲ TDD: 720-898-7869

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Q7 Are there any requirements for American steel or other materials?

A7 No.

Q8 Are materials testing, as in compaction tests and concrete cylinder tests, on the contractor? Or is the City contracting directly with the testing agency?

A8 Test report submittal requirements are included in Section 013300, 1.7.G and are the responsibility of the contractor.

Q9 Is there a maintenance period on the landscaping and if so how long would that extend to?

A9 Yes. Please see City Standards and Specifications

Q10 Would a Professional Engineer who is qualified as a Health & Safety Officer be considered instead of a Certified Industrial Hygienist for the development of a Health and Safety Plan? CDPHE asbestos regulations do not require a CIH prepare a health and safety plan for abatement or asbestos management?

A10 Yes

Q11 Would a Professional Engineer who is qualified as a Health & Safety Officer be considered instead of a Certified Industrial Hygienist for the development of a Health and Safety Plan? CDPHE asbestos regulations do not require a CIH prepare a health and safety plan for abatement or asbestos management?

A11. The City provides the template for a door hanger, the Contractor is expected to distribute the door hanger. City expects superintendent to meet with commercial property owner/site manager when working on/adjacent to commercial property.

Q12 Are fees waived for City of Arvada Permits?

A12 Yes.

Q12a. How is the AC pipe removal paid on sheet G-2 & C-1? How much is to be removed at each location?

A12a. The cost of AC pipe removal shall be included in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). Existing 10-inch AC pipe on Sheet C-1 is between stations 1+00 and 1+50 and existing 8-inch AC pipe on Sheet G-2 is between stations 3+00 and 3+19.

Q12b. Can a detail be provided for the 8" line stop bid item?

A12b. Contractor to use InsertaValve / HydraStop or equivalent. Selected method/product should be approved by the Project Engineer.

Q12c. Where is the 10" water main removal and 25sf kick-block paid as shown on sheet C-1

A12c. Existing water main and concrete kick-block removal is paid for in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). The following shall be added to the Measurement and Payment description for these bid items:

"This pay item shall also include removal of existing pipeline and concrete kickblocks necessary for installation of new pipeline where indicated in the contract documents. AC pipe removal and all associated health and safety precautions, as well as hazardous material disposal is also included in the cost of water main installation."



CITY OF ARVADA

PURCHASING DIVISION
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Q12d. How is the removal of 24" steel pipe paid?

A12d The cost of pipe removal shall be included in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints).

Q12e. Can native material be used for trench backfill? IF not how will select backfill be paid?

A12e. Requirements for backfill are summarized on Detail C/CD-3. Native material for trench backfill may only be used following approval by project engineer.

Q13 Can a profile be provided for the work on Holand Court?

A13 No. Profile is not required for the construction along Holand Ct. All existing utilities along Holand Ct (gas + electrical included) shall be investigated/field located/and protected by the contractor prior to and during construction.

Q13a. How is the re-connection of the fire hydrant at Holand Court paid for?

A13a. Hydrant reconnection will be paid for in Bid Item No. 40 (Fire Hydrant Assembly) and is reflected in the current quantity.

Q14. Can an Item be created for the AC Pipe removal shown on sheet C-1 and is there any information on the size and length of this removal?

A14. The cost of AC pipe removal shall be included in Bid Item No. 9-13 (Water Main with Fittings and Restrained Joints). Existing 10-inch AC pipe on Sheet C-1 is between stations 1+00 and 1+50 and existing 8-inch AC pipe on Sheet G-2 is between stations 3+00 and 3+19.

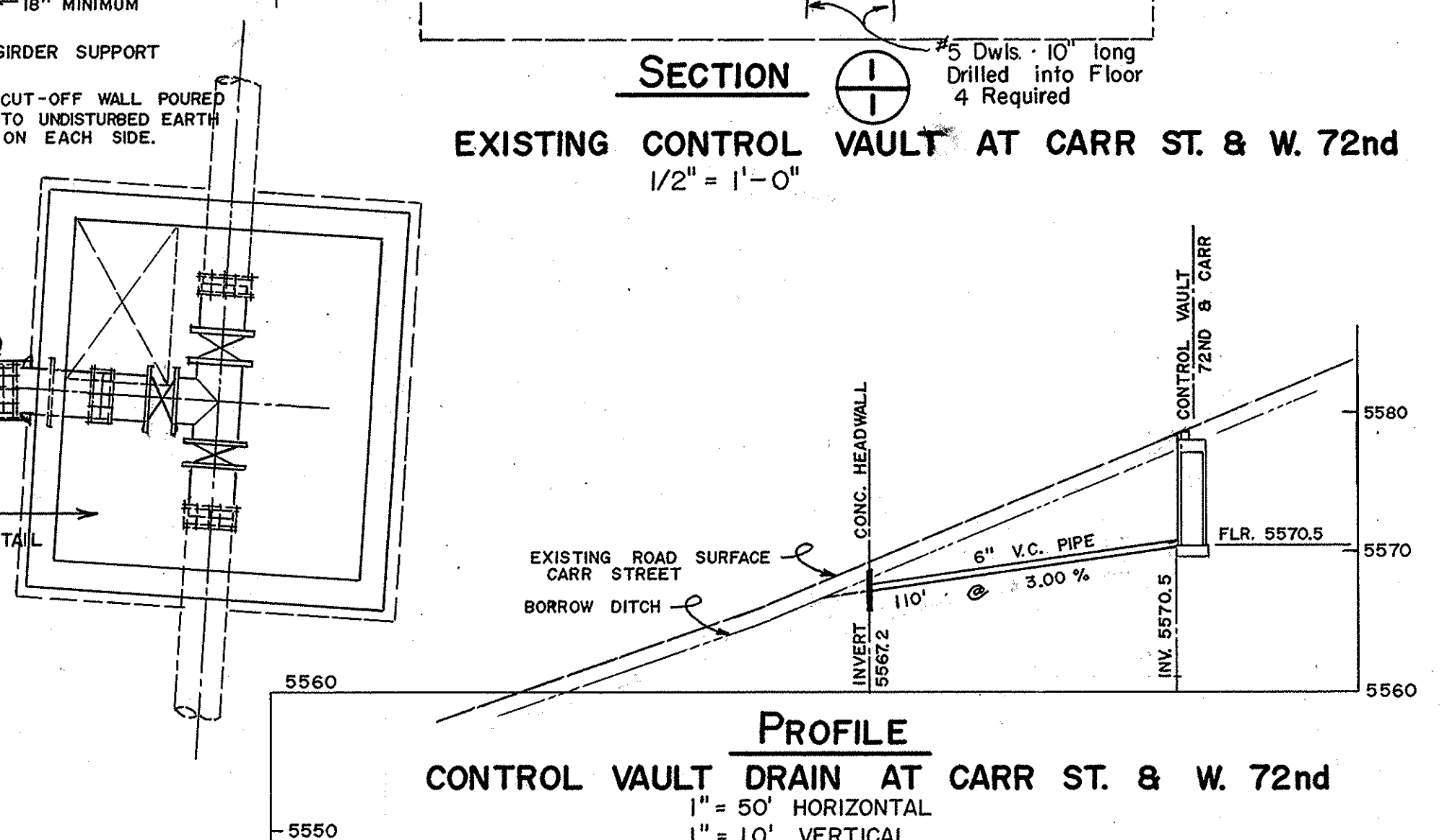
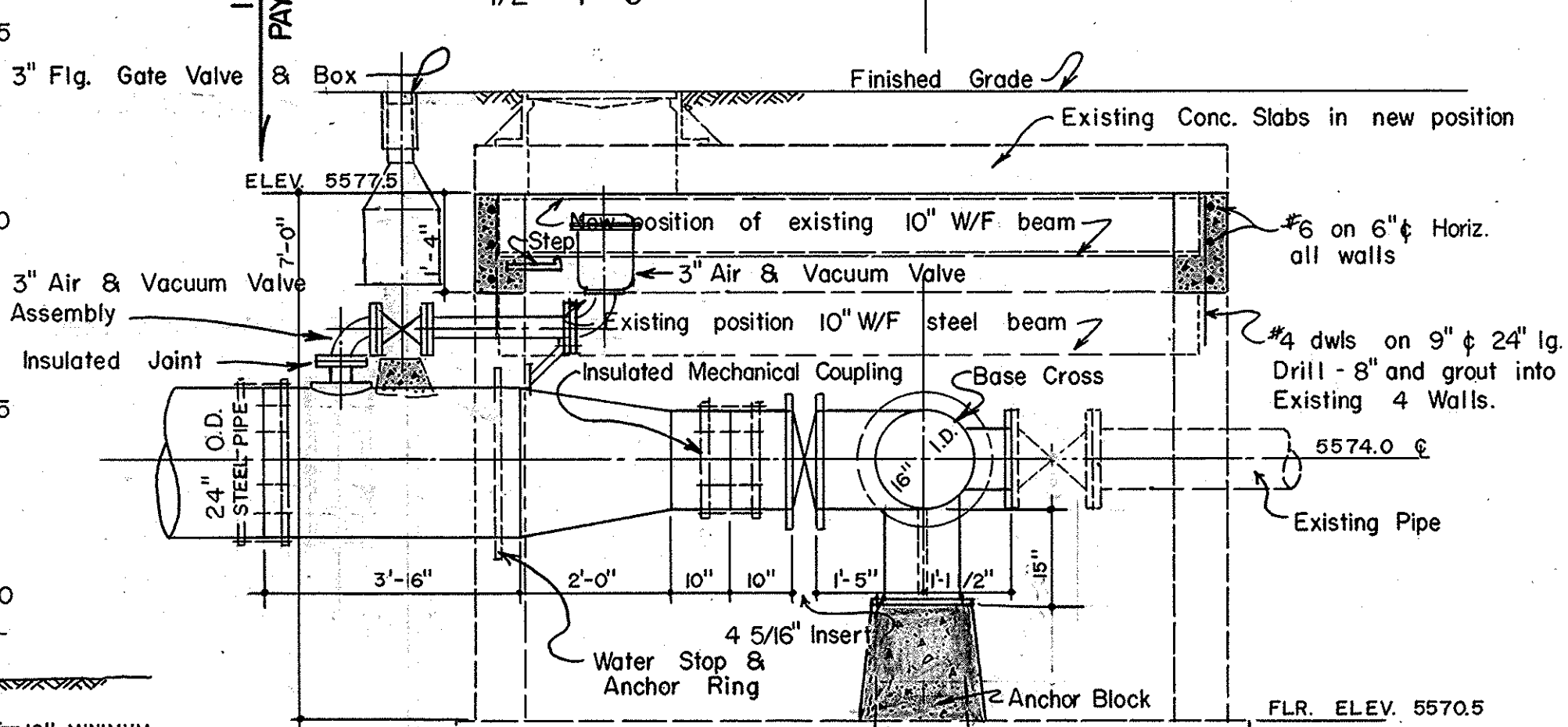
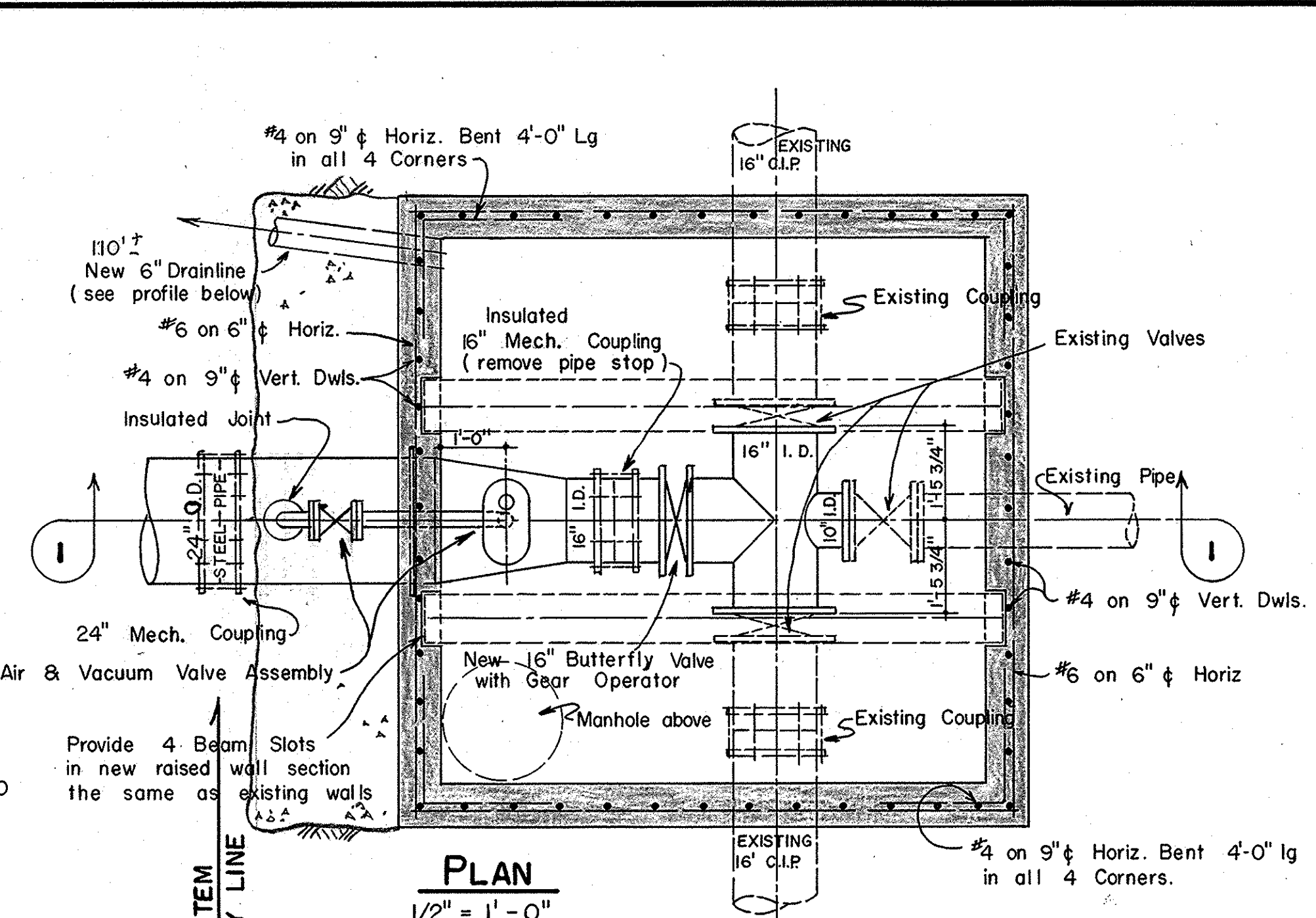
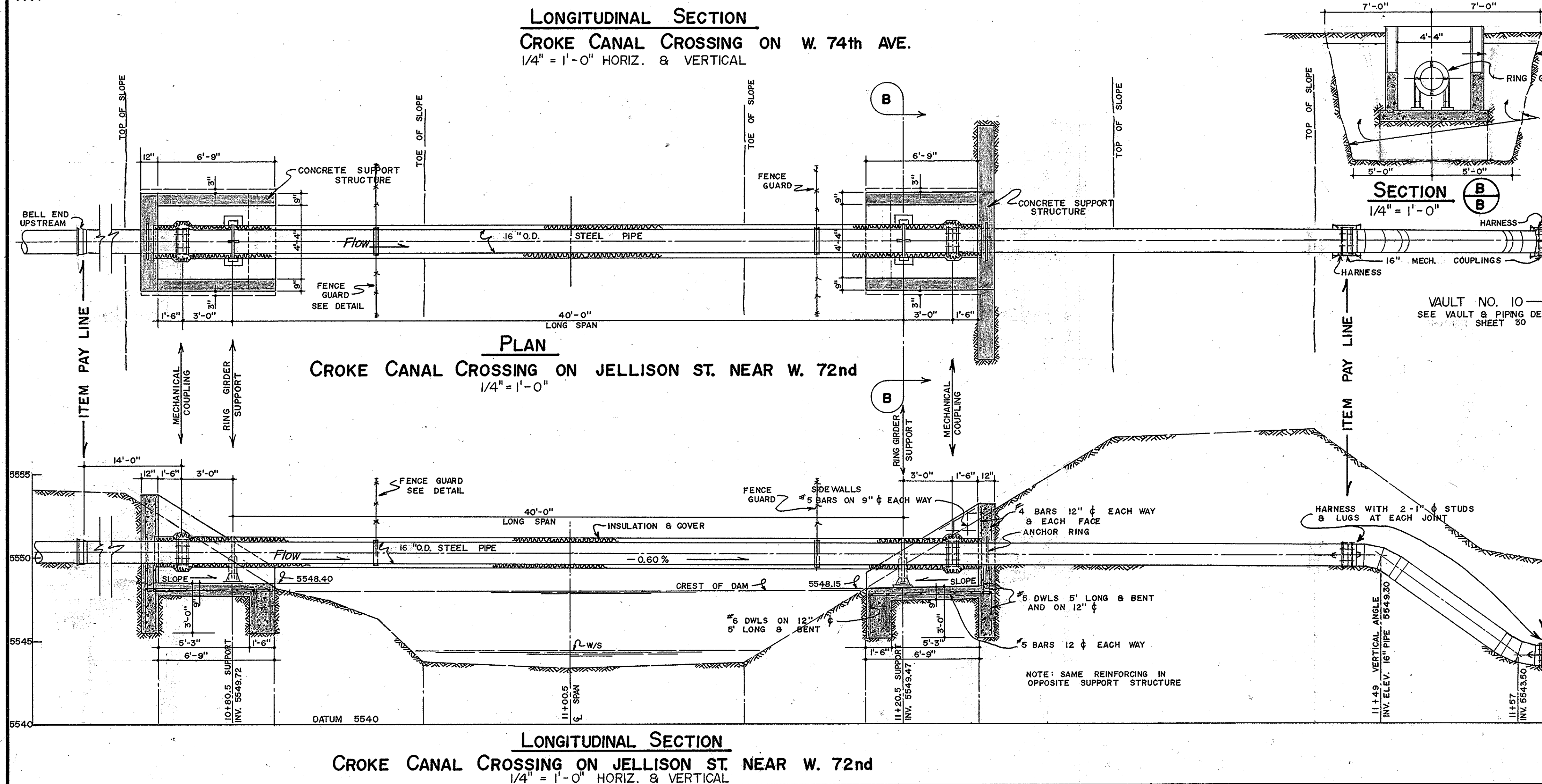
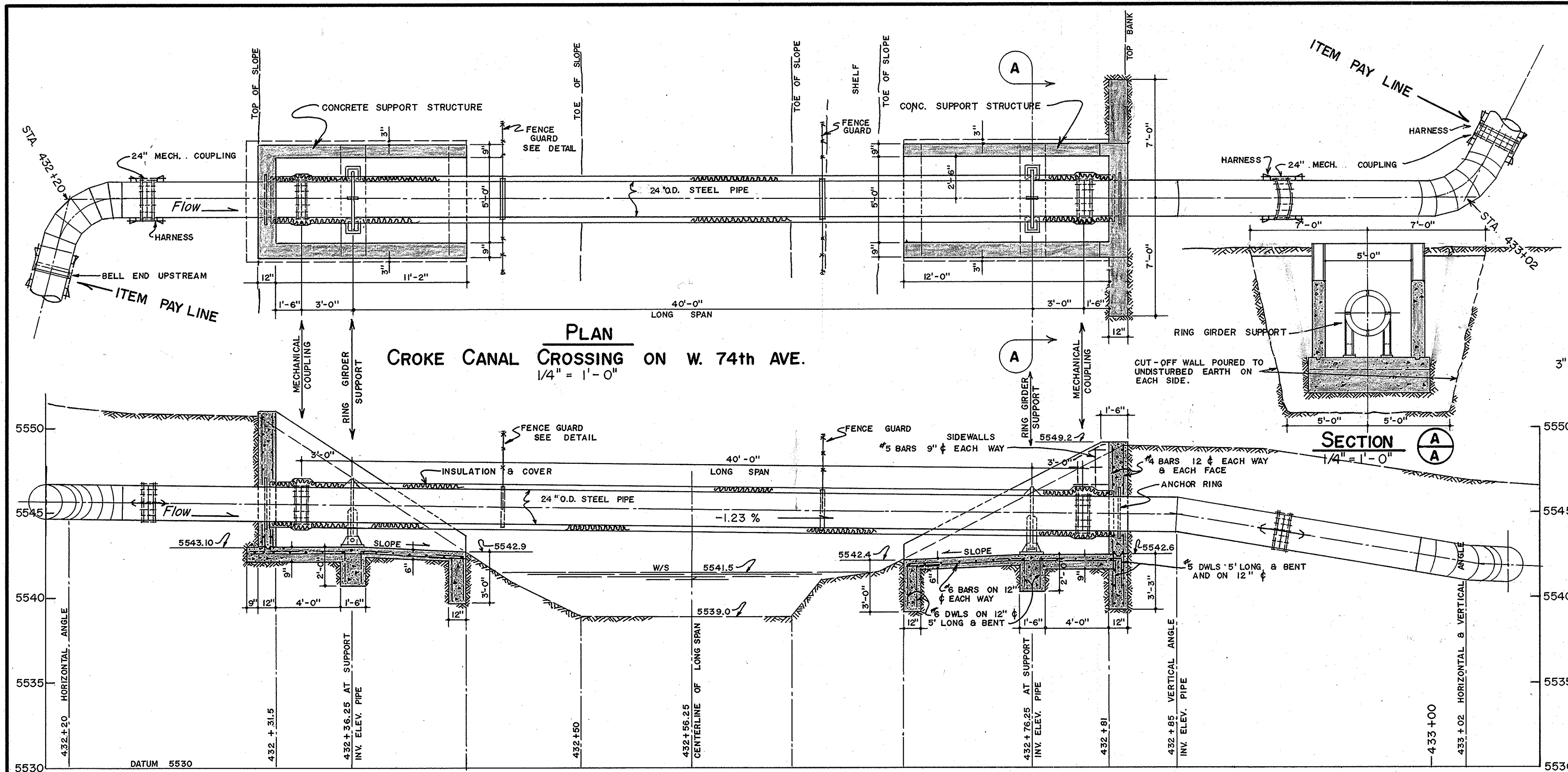
Q15 Are the low flow periods and flow in the Farmers Highline canal expected to be similar as to what is noted in the plans for the Croke canal on sheet C-1 Note: 12

A15 Please see page E-1, note 7 and page GN-1, Construction Sequencing.

Q16 Are there Existing Structure Drawings (As-Builts) of the Croke Canal Aerial Crossing Structure.

A16 Please see attached document, "Croke Canal @ 74th Aerial Crossing."

End of Addendum #1



8/24/66	AS BUILT	WGP
DATE	REVISIONS	BY
DESIGN	HEL	SUBMITTED BY
DRAWN	WGP	APPROVED BY
CHECKED	DC	CITY OF ARVADA
CITY OF ARVADA, COLORADO		
PROJECT NO. 64-W-2		
NORTH ARVADA WATER TRANSMISSION LINE		
CROKE CANAL LONG-SPAN CROSSINGS & DETAILS		
COWAN & LOOMIS, CONSULTING ENGINEERS		DATE JULY 1965
P.O. BOX 83, ARVADA, COLORADO		SHEET 31 OF 31

**Addendum Description**

A2 - Due to the holiday and lots of Q&A the City has decided to extend the due date to 12/05/23 at 3:00 PM .

Notice Modifications

Notice Information	From Value	To Value
Closing Date	11/30/23 2:00 PM MST/MDT	12/5/23 3:00 PM MST/MDT

Category Modifications

Added Categories
No Categories Added

Removed Categories
No Categories Removed

**Addendum Description**

A3 - Bid Schedule in Excel -unprotected

Notice Modifications

Notice Information	From Value	To Value
No entries		

Category Modifications

Added Categories
No Categories Added

Removed Categories
No Categories Removed

Added Documents[A]

Document	Size	Uploaded Date	Language
A3 - Bid Schedule [xlsx]	17 Kb	12/04/2023 10:24 AM MST	English

Bid Set

**CITY OF ARVADA, CO
2021 Water Main Improvements Project**

**Contract Documents and
Technical Specifications**



Prepared for:
City of Arvada

Issue Date:
October 2023

**CDM
Smith**

TABLE OF CONTENTS

Division	Section Title
----------	---------------

SPECIFICATIONS GROUP

General Requirements Subgroup

DIVISION 00 – ARVADA FRONT ENDS

DIVISION 01 - GENERAL REQUIREMENTS

011000	Summary
012200	Measurement and Payment
013100	Project Management and Coordination
013200	Construction Progress Documentation
013233	Photographic Documentation
013300	Submittal Procedures
013526	Governmental Safety Requirements
014200	References
015000	Temporary Facilities and Controls
015639	Temporary Tree and Plant Protection
016000	Product Requirements
017300	Execution

Facility Construction Subgroup

DIVISION 03 - CONCRETE

033010	Miscellaneous Cast-in-Place Concrete
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Site and Infrastructure Subgroup

DIVISION 31 - EARTHWORK

312323.33	Flowable Fill
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DIVISION 33 - UTILITIES

330509.33	Thrust Restraint for Utility Piping
330513	Manholes and Structures
330523	Horizontal Directional Drilling
330531.16	Polyvinyl Chloride Pressure Pipe for Water Service
330531.19	Fusible Polyvinyl Chloride (fPVC) Pressure Pipe
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Appendix A – Geotechnical Investigation Report

Appendix B – SWMP 2021 Water Main Improvements

Appendix C – FRICO Approval Letter and Contractor Requirements

END OF TABLE OF CONTENTS

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SECTION 011000 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. These specifications are intended to be supplemental to the City of Arvada Engineering Code of Standards and Specifications. All sections and information not addressed directly by these specifications shall be covered by the City of Arvada Engineering Code of Standards and Specifications. In cases of conflict Project Specifications, Project Drawings, City of Arvada Engineering Code of Standards and Specifications, Project Special provisions shall rule.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Contractor's use of site and premises.
 - 4. Coordination with occupants.
 - 5. Work restrictions.
 - 6. Specification and Drawing conventions.
 - 7. Miscellaneous provisions.

1.3 PROJECT INFORMATION

- A. Project Identification: Project No. 21-WA-02.
 - 1. Project Location:
 - a. Segment C – Carr Street and 74th Ave
 - b. Segment D – Jellison Street and 74th Ave
 - c. Segment E – W 72nd Ave west of Indiana Street
 - d. Segment F – W 72nd Ave between Kipling and Wadsworth
 - e. Segment G – Wadsworth at W 52nd Ave

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
 - 1. Removal and replacement of existing water main.
 - 2. Installation of new water main including stub outs for future connections.

3. Connection to existing water main, including connections to existing asbestos cement pipe.
4. Slip-lining of existing water main.
5. Horizontal directional drilling new water main.
6. Open cutting across Farmers Highline and Croke canal.
7. Installation of water main, casing pipe, and cut-off walls within Farmers Highline and Croke canal.
8. Demolition of existing aerial creek crossings and associated concrete structures.
9. Demolition of existing vault.
10. Installation of air release valves and vaults.
11. Installation and removal of fire hydrants.
12. Replacement of valves and piping within existing vault.
13. Removal and replacement of asphalt pavement.
14. Removal and replacement of sidewalk and curb and gutter.
15. Reinstallation of street signage and pavement striping and marking.
16. Coordination with property owners, general public, and residents.
17. Sodding and landscaping restoration.
18. Maintenance of traffic.
19. Erosion and sedimentation control.
20. Coordination with utility owners, utility protection, and minor utility adjustment as required for completion of the work.
21. Coordination with City of Arvada survey crews. City of Arvada will be the lead survey crew for this project. The contractor will be responsible for all coordination between the City survey crews and the contractor's personnel to ensure that all survey requirements are met in a smooth and efficient manner.
22. Preparation of as-builts.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Unrestricted Use of Site: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
 - 3. Ensure temporary water services have been cleaned/tested and are prepared for operation in advance of proposed utility interruptions.
- C. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 - 3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
 - 4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 012200 – MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. City of Arvada Engineering Code of Standards and Specifications, Section 1100.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 MEASUREMENT AND PAYMENT TABLE

Item No.	Item	Description	Measurement and Payment
1	Mobilization (LS)	City of Arvada item 1124.00	See City of Arvada Standards item 1124.00
2	Traffic Control (LS)	City of Arvada item 1181.00	See City of Arvada Standards item 1181.00
3	Erosion Control (LS)	City of Arvada item 1136.00	See City of Arvada Standards item 1136.00
4, 5, 6, 7, 8	Connections to Existing Facilities 8", 10", 12", 18", 24" (EA)	City of Arvada item 1146.02	See City of Arvada Standards item 1146.02
9, 10, 11, 12, 13	Water Main with Fittings and Restrained Joints (8", 10", 12", 18", 24") (LF)	City of Arvada item 1146.00.	See City of Arvada Standards item 1146.00 However, please note that dewatering is covered in pay items 59-63 and will not be included in the cost of pipe installation.

Item No.	Item	Description	Measurement and Payment
14	Directional Drill HDPE Water Main and Casing Pipe, Associated Connections and Restoration - Sheet G-4A (LS)	Installation of HDPE water main and casing pipe via directional drill, connections to existing piping, and all surface restoration and work shown on sheet G-4A.	Directional Drill HDPE Water Main and Associated Connections and Restoration. Sheet G-4A shall be lump sum. Payment will be made at the contract lump sum unit price as stated in the proposal for Directional Drill HDPE Water Main and Associated Connections and Restoration - Sheet G-4A and shall include all labor, materials, and equipment necessary for a complete directional drill pipe installation and testing including protection of existing utilities, pipe, fittings, valves, pipe connection assemblies and appurtenances, mechanical restraint, metallic tracer wire, drilling mud, sodding, testing, disinfection, restoration, and clean-up. This pay item shall also include all maintenance of traffic, coordination with existing property owners, surface restoration, connections to existing utilities, and all other work required to complete the work shown on sheet G-4A.
15	Directional Drill HDPE Water Main and Casing Pipe, Associated Connections and Restoration - Sheet G-4B (LS)	Installation of HDPE water main and casing pipe via directional drill and open cut, connections to existing piping, and all surface restoration and work shown on sheet G-4B.	Directional Drill HDPE Water Main and Associated Connections and Restoration. Sheet G-4B shall be lump sum. Payment will be made at the contract lump sum unit price as stated in the proposal for Directional Drill HDPE Water Main and Associated Connections and Restoration - Sheet G-4B and shall include all labor, materials, and equipment necessary for a complete directional drill pipe installation and open cut pipe installation and testing including protection of existing utilities, pipe, fittings, valves, pipe connection assemblies and appurtenances, mechanical restraint, metallic tracer wire, drilling mud, sodding, testing, disinfection, restoration, and clean-up. This pay item shall also include all maintenance of traffic, coordination with existing property owners, surface restoration, fire hydrant removal, connections to existing utilities, and all other work required to complete the work shown on sheet G-4B.

Item No.	Item	Description	Measurement and Payment
16	Fusible PVC Water Main (18") (LF)	City of Arvada item 1146.07	See City of Arvada Standards item 1146.07
17	Slip Lining Access Pits (EA)	City of Arvada item 1146.07	See City of Arvada Standards item 1146.07
18	Slip Lining Service Reconnections (EA)	City of Arvada item 1146.07	See City of Arvada Standards item 1146.07
19, 20	Steel Casing Pipe (24", 36") (LF)	City of Arvada item 1145.00	See City of Arvada Standards item 1145.00
21	Removal of Existing Aerial Crossing (Segment C) (LS)	City of Arvada item 1134.00	See City of Arvada Standards item 1134.00
22	Jellison Street Vault Modifications (LS)	Replacement of existing piping, pressure release valve, and appearances within the existing vault, as shown on Detail D on Sheet CD-7.	Measurement for this pay item is lump sum. Payment of the applicable Contract unit price shall be full compensation for furnishing all labor, materials, and equipment necessary to remove existing pipe, pressure release valve, and appurtenances, and replace with new steel pipe. Payment for this item shall include pipe supports, excavation, sheeting, shoring, bracing, dewatering, backfill, compaction, grading, restoration and all other items required for a complete, acceptable and operable installation.
23, 24, 25	8", 10", 12" Gate Valve with Box (EA)	City of Arvada item 1142.00	See City of Arvada Standards item 1142.00
26, 27	18", 24" Butterfly Valve with Box (EA)	City of Arvada item 1142.00	See City of Arvada Standards item 1142.00

Item No.	Item	Description	Measurement and Payment
28	Single Air Release Valve Assembly with Vault (EA)	Installation of single air release valve and 60-inch vault and connection to proposed pipeline, as shown on Detail E on Sheet CD-2	Measurement for Air Release Valve Assembly and Vault shall be made per actual number of air release valves with vaults satisfactorily furnished and installed to provide a complete and functional unit. Payment for the Air Release Valve Assembly and Vault shall be made based on the authorized quantity at the unit price indicated in the Bid. Payment of the applicable Contract unit price shall be full compensation for furnishing all labor, materials and equipment necessary to install the valve including saddle, fittings, pipe, concrete pad, pre-cast vault or enclosure, excavation, sheeting, shoring, bracing, dewatering, backfill, compaction, grading, restoration and all other items required for a complete, acceptable and operable installation.
29	Dual Air Release Valve Assembly with Vault (EA)	Installation of dual air release valves and 72-inch vault and connection to proposed pipeline, as shown on Detail D on Sheet CD-2	Measurement for Air Release Valve Assembly and Vault shall be made per actual number of air release valves with vaults satisfactorily furnished and installed to provide a complete and functional unit. Payment for the Air Release Valve Assembly and Vault shall be made based on the authorized quantity at the unit price indicated in the Bid. Payment of the applicable Contract unit price shall be full compensation for furnishing all labor, materials and equipment necessary to install the valve including saddle, fittings, pipe, concrete pad, pre-cast vault or enclosure, excavation, sheeting, shoring, bracing, dewatering, backfill, compaction, grading, restoration and all other items required for a complete, acceptable and operable installation.

Item No.	Item	Description	Measurement and Payment
30	W. 74 th Ave at Carr Street Vault Piping Replacement (LS)	Replacement of existing piping, tap, and appearances within the existing vault, as shown on Detail F on Sheet CD-7.	Measurement for this pay item is lump sum. Payment of the applicable Contract unit price shall be full compensation for furnishing all labor, materials and equipment necessary to install the piping, fittings, link seals, and valves including, tap, pipe supports, excavation, sheeting, shoring, bracing, dewatering, backfill, compaction, grading, restoration and all other items required for a complete, acceptable and operable installation.
31	Carr Street Drain Manhole Piping Replacement (LS)	Replacement of existing drain piping up to and within existing vault as shown on Detail G on Sheet CD-7.	Measurement for this pay item is lump sum. Payment of the applicable Contract unit price shall be full compensation for furnishing all labor, materials and equipment necessary to install the piping, fittings, link seals, and valves including, pipe supports, excavation, sheeting, shoring, bracing, dewatering, backfill, compaction, grading, restoration and all other items required for a complete, acceptable and operable installation. This pay item shall also include disposal of hazardous material in accordance with City and State standards.

Item No.	Item	Description	Measurement and Payment
32, 33	Concrete Cut-Off Walls (Segment C, E) (EA)	Installation of concrete cut-off walls to meet the Canal standards.	Measurement for Concrete Cut-Off Walls shall be made per actual number of concrete cut-off walls satisfactorily furnished and installed to provide a complete and functional unit. Payment for the Concrete Cut-Off Walls shall be made based on the authorized quantity at the unit price indicated in the Bid. Payment of the applicable Contract unit price shall be full compensation for furnishing all labor, materials and equipment necessary to install the cut-off walls including concrete, rebar, forms, excavation, sheeting, shoring, bracing, dewatering, backfill, compaction, grading, restoration and all other items required for a complete, acceptable and operable installation.
34	Asphalt Roadway Open Cut, Removal and Replacement (SY)	City of Arvada item 1171.00	See City of Arvada Standards item 1171.00
35	Concrete Sidewalk Removal and Replacement (SY)	City of Arvada item 1151.00	See City of Arvada Standards item 1151.00
36	Curb and Gutter Removal and Replacement (LF)	City of Arvada item 1151.00	See City of Arvada Standards item 1151.00
37	Sod Replacement (SY)	City of Arvada item 1194.00	See City of Arvada Standards item 1194.00
38	Seeding/Landscaping (SY)	City of Arvada item 1194.00	See City of Arvada Standards item 1194.00

Item No.	Item	Description	Measurement and Payment
39	Bedrock Excavation (CY)	Removal and disposal of bedrock encountered within limits of work.	Bedrock removal shall be measured in actual cubic yards of rock removed and disposed of for all areas as specified on the drawings. Payment will be made at the contract unit price bid per cubic yard as stated in the proposal for Redrock Removal and shall include all labor, materials, and equipment necessary to remove and dispose of existing rock. Work exceeding the quantity in the bid form will be compensated on an identical and scaled unit cost (\$/cy). Maximum volume measurement will be based on City standard for trench width and depth as shown on the drawings.
40	Fire Hydrant Assembly (EA)	City of Arvada item 1143.00	See City of Arvada Standards item 1143.00
41	Disconnect Existing Meter (Sheet F-5) (LS)	Disconnection of existing meter and all associated work shown on sheet F-5.	Disconnecting existing meter shall be lump sum. Payment will be made at the contract lump sum unit price as stated in the proposal for Disconnection of existing meter and shall include all labor, materials, and equipment necessary for a complete meter disconnection, including testing, protection of existing utilities, pipe, fittings, valves, pipe connection assemblies and appurtenances, mechanical restraint, metallic tracer wire, drilling mud, sodding, testing, disinfection, restoration, and clean-up. This pay item shall also include all maintenance of traffic, coordination with existing property owners, surface restoration, connections to existing utilities, and all other work required to complete the work shown on sheet F-5.

Item No.	Item	Description	Measurement and Payment
42	Cap Existing Water Main and Abandon in Place (EA)	Cap and abandonment of existing water mains as noted on the plans using City of Arvada Standard abandonment approach described in Section 420.03.01 of the City Standards.	Abandon-in-Place Pipe shall be measured in actual quantity of existing water main ends capped and abandoned in place, regardless of pipe size or material. Payment for the cap and abandonment shall be based on the authorized quantity at the unit price indicated in the Bid and shall include all labor, materials, and equipment to excavate, backfill and compact; sheet, shore, and brace; dewater; completely drain and properly dispose of pipe contents and hazardous material; grout fill, and plug or cap existing pipes of all services and sizes designated "to be abandoned" on the Drawings. This pay item shall also include disposal of hazardous material in accordance with City and State standards.
43, 44	Abandon in Place Existing 12", 24" Water Main (LF)	Cap and abandonment of existing water mains as noted on the plans using City of Arvada Standard abandonment approach described in Section 332 of the City Standards.	Abandon-in-Place Pipe shall be measured in linear feet of existing 24" water main abandoned in place, regardless of pipe material. Payment for the abandonment shall be based on the authorized quantity at the unit price indicated in the Bid and shall include all labor, materials, and equipment to excavate, backfill and compact; sheet, shore, and brace; dewater; completely drain and properly dispose of pipe contents and hazardous material; grout fill, and plug or cap existing pipes of all services and sizes designated "to be abandoned" on the Drawings. This pay item shall also include disposal of hazardous material in accordance with City and State standards.

Item No.	Item	Description	Measurement and Payment
45, 46	Croke Canal/Farmers Highline Canal Bypass (LS)	Provide provisions for bypassing flow in Croke/Farmers Highline Canal (if necessary) during open cut pipe installation on Sheet C-1, Sheet D-1, and Sheet E-1.	Bypass activities for Croke/Farmers Highline Canal crossings on Sheets C-1, D-1, and E-1 shall be lump sum. Payment will be made at the contract lump sum unit price as stated in the proposal for Croke/Farmers Highline Canal Bypass and shall include all labor, materials, and equipment necessary for a complete canal bypass, including canal dam, testing, protection of existing utilities, pumps, pipe, fittings, valves, pipe connection assemblies and appurtenances, drilling mud, earthwork, sodding, testing, restoration, and clean-up. This pay item shall also include all coordination with FRICO/Farmers Highline, coordination with private property owner, surface restoration, and all other work required to complete the work shown on Sheet C-1, Sheet D-1, and Sheet E-1.
47	8" Line Stop (Sheet G-2)	Provide temporary 8" line stop in existing 8" AC watermain and associated pipe appurtenances in accordance with Note 1 on Sheet G-2	8" line stop as shown on Sheet G-2 shall be lump sum. Payment will be made at the contract lump sum unit price for 8" line stop. This shall include all labor, materials, and equipment necessary to install and later remove the temporary 8" line stop shown on Sheet G-2. This pay item shall also include all maintenance of traffic, coordination with existing property owners, surface restoration, connections to existing utilities, and disposal of hazardous material in accordance with City and State standards.

Item No.	Item	Description	Measurement and Payment
48	River Rock and Landscape Replacement (Sheet G-3) (LS)	Removal and replacement of river rock, shrubs, and other landscape features, including irrigation repair and coordination with Costco for final restoration.	Removal and replacement of river rock and landscaping as shown on Sheet G-3 shall be lump sum. Payment will be made at the contract lump sum unit price for river rock and landscape replacement. This shall include all labor, materials, and equipment necessary for removal and replacement of decorative rock, shrubs, and landscaping, including irrigation system repair and coordination with Costco for final restoration. This pay item shall not include items measured elsewhere in the bid such as asphalt, sod, and sidewalk restoration.
49	Costco AC Pipe Removal (Sheet G-5) (LS)	Replacement and abandonment of existing AC pipe and all other work noted on Sheet G-5, including restoration.	Costco AC pipe replacement and abandonment; valve removal, and restoration and shown on Sheet G-5 shall be lump sum. Payment will be made at the contract lump sum unit price as stated in the proposal for removal of existing AC Pipe, installation of new PVC water main, valve removal, pipe abandonment, and all restoration required to return site to preconstruction conditions. This shall include all labor, materials, and equipment necessary for a complete pipe installation and testing including protection of existing utilities, pipe, fittings, valves, pipe connection assemblies and appurtenances, mechanical restraint, metallic tracer wire, drilling mud, sodding, testing, disinfection, restoration, and clean-up. This pay item shall also include all maintenance of traffic, coordination with existing property owners, surface restoration, connections to existing utilities, disposal of hazardous material in accordance with City and State standards, and all other work required to complete the work shown on sheet G-5.

Item No.	Item	Description	Measurement and Payment
50	Home Depot Surface and Landscape Restoration (Detail B, Sheet CD-8) (LS)	Removal and replacement of curb and gutter, landscaping, decorative rock, and tree as shown on Detail B, Sheet CD-8.	Home Depot surface restoration, as shown in Detail B on Sheet CD-8 shall be lump sum. Payment will be made at the contract lump sum unit price as stated in the proposal for Home Depot Surface and Landscape Restoration. This shall include all labor, materials, and equipment necessary for removal and replacement of curb and gutter, decorative rock, landscaping, trees, bollards, and signs. This pay item shall also include all maintenance of traffic and coordination with the property owner, as required, to complete work as shown in Detail B on Sheet CD-8. Asphalt removal and replacement shall not be included in this bid item.
51	Croke Canal and Farmers Highline Canal Bed Restoration	Removal and replacement of canal bed material and landscaping.	Payment will be made at the contract lump sum unit price as stated in the proposal for Croke Canal and Farmers Highline Canal Bed Restoration and shall include all labor, materials, and equipment necessary for a complete canal restoration, clay replacement, seeding, sodding, compaction, and testing. This pay item shall also include all coordination with FRICO/Farmers Highline, coordination with private property owner, and all other work required to complete the canal property restoration work shown on sheet C-1, Sheet D-1, and Sheet E-1.

Item No.	Item	Description	Measurement and Payment
52	Test Holing (LS)	The Contractor shall be required to locate all utility crossings to Subsurface Quality Engineering (SUE) Quality Level A (QL-A) in accordance with ASCE C-I-38-02, Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data, along proposed construction areas to determine exact size, type, location and depth prior to installation of the improvements. Contractor shall visualize all existing water mains that will be connected to the new water main via test holing prior to the planned tie-in date, and with enough advanced notice for Contractor to plan for tie-in, including procurement of specialty parts, if needed.	Payment will be made at the contract lump sum unit price as stated in the proposal for Test Holing and shall include all permitting, labor, materials, and equipment necessary to complete Test Holing as noted in the document.
53, 54, 55, 56	Dewatering – C Sheets, E Sheets, F Sheets, G Sheets	Removal of groundwater to allow for pipe installation.	Payment will be made at the contract lump sum unit price as stated in the proposal for Dewatering by location and shall include all permitting, labor, materials, and equipment necessary to complete dewatering as noted in the City of Arvada Standards. Note that nuisance flows will not be considered dewatering and their removal will be included in the pay item for installation of pipe.
57	Citizen Notification	Citizen notification, as required, for commencement of work as shown in the contract documents.	Payment will be made at the contract lump sum unit price as stated in the proposal for Citizen Notification and shall include all items for notification including coordination, printing, delivery, labor, and materials.

Measurement and Payment

Item No.	Item	Description	Measurement and Payment
58	Cathodic Protection	Cathodic protection of metallic pipe at all segments where noted in the contract documents.	Payment will be made at the contract lump sum unit price as stated in the proposal for cathodic protection and shall include all labor, materials, and equipment necessary to install cathodic protection systems as shown in the contract documents and required in the City of Arvada Standards, item 420.19.

END OF SECTION 012200

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. RFIs.
 - 3. Digital project management procedures.
 - 4. Web-based Project management software package.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Owner, Construction Manager, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities, list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors and direction of Project coordinator to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.6 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Project Engineer will return without response those RFIs submitted to Engineer by other entities controlled by Contractor.
 - 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
 2. Owner name.
 3. Owner's Project number.
 4. Name of Engineer and Construction Manager.
 5. Engineer's Project number.
 6. Date.
 7. Name of Contractor.
 8. RFI number, numbered sequentially.
 9. RFI subject.
 10. Specification Section number and title and related paragraphs, as appropriate.
 11. Drawing number and detail references, as appropriate.
 12. Field dimensions and conditions, as appropriate.
 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 14. Contractor's signature.
 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716.
1. Attachments shall be electronic files in PDF format.
- D. Project Engineer's Action: Project Engineer will review each RFI, determine action required, and respond. Allow seven days for Project Engineer's response for each RFI. RFIs received by Project Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Engineer's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Project Engineer's action may include a request for additional information, in which case Project Engineer's time for response will date from time of receipt by Project Engineer of additional information.
 3. Project Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 5 days of receipt of the RFI response.

- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Project Engineer.
 - 4. RFI description.
 - 5. Date the RFI was submitted.
 - 6. Date Project Engineer's response was received.
 - 7. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 8. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- F. On receipt of Project Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.

1.7 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Design Engineer's Digital Data Files: Digital data files of Design Engineer's CAD drawings will be provided by Design Engineer for Contractor's use during construction.
 - 1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
 - 2. Design Engineer makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 - 3. Digital Drawing Software Program: Contract Drawings are available in AutoCAD.
- B. PDF Document Preparation: Where PDFs are required to be submitted to Engineer, prepare as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Project Engineer of scheduled meeting dates and times a minimum of 10 working days prior to meeting.

2. Agenda: City or City's representative to prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: City or City's representative will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within three days of the meeting.
- B. Preconstruction Conference: Per City of Arvada Standards 1121.03, a meeting of City project personnel, Contractor project personnel and other stakeholders will be held prior to the beginning of construction of all projects, at which topics pertinent to the successful prosecution of the work will be discussed.
1. Attendees: Authorized representatives of Owner Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of web-based Project software.
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - k. Procedures for processing Applications for Payment.
 - l. Distribution of the Contract Documents.
 - m. Submittal procedures.
 - n. Sustainable design requirements.
 - o. Preparation of Record Documents.
 - p. Use of the premises.
 - q. Work restrictions.
 - r. Working hours.
 - s. Owner's occupancy requirements.
 - t. Responsibility for temporary facilities and controls.
 - u. Procedures for moisture and mold control.
 - v. Procedures for disruptions and shutdowns.
 - w. Construction waste management and recycling.
 - x. Parking availability.
 - y. Office, work, and storage areas.
 - z. Equipment deliveries and priorities.
 - aa. First aid.
 - bb. Security.
 - cc. Progress cleaning.
 - dd. List of major subcontractors and suppliers.
 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

- C. Preinstallation Conferences: Prior to commencement of construction activity in each area, conduct a preinstallation conference at Project site.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Project Engineer of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Project Engineer, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software site data files.
 - d. Submittal of written warranties.
 - e. Requirements for completing sustainable design documentation.
 - f. Requirements for preparing operations and maintenance data.
 - g. Requirements for delivery of material samples, attic stock, and spare parts.
 - h. Requirements for demonstration and training.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment including final change order.
 - k. Submittal procedures.
 - l. Coordination of separate contracts.
 - m. Owner's partial occupancy requirements including certificate of occupancy and closeout of permits.
 - n. Installation of Owner's furniture, fixtures, and equipment.
 - o. Responsibility for removing temporary facilities and controls.
 - p. Final cleaning.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Project Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.

- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Status of sustainable design documentation.
 - 6) Deliveries.
 - 7) Off-site fabrication.
 - 8) Access.
 - 9) Site use.
 - 10) Temporary facilities and controls.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) Status of RFIs.
 - 16) Status of Proposal Requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
- 4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Unusual event reports.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
1. Working electronic copy of schedule file.
 2. PDF file.
- B. Startup construction schedule.
1. Submittal of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, latest allowable start date, latest allowable finish date, status (where critical) and total float and free float in calendar days.
1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 3. Total Float Report: List of activities sorted in ascending order of total float.
 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.
- G. Daily Construction Reports: Submit at weekly intervals.

- H. Material Location Reports: Submit at weekly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.
- J. Unusual Event Reports: Submit at time of unusual event.
- K. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Engineer's request.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including phasing work stages area separations interim milestones and partial Owner occupancy.
 - 4. Review delivery dates for Owner-furnished products.
 - 5. Review schedule for work of Owner's separate contracts.
 - 6. Review submittal requirements and procedures.
 - 7. Review time required for review of submittals and resubmittals.
 - 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
 - 10. Review and finalize list of construction activities to be included in schedule.
 - 11. Review procedures for updating schedule.
 - 12. Submit at this conference a preliminary network defining the planned operation during the first 60 calendar days after the Notice to Proceed.

1.6 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Program Description

1. A Critical Path Method (CPM) construction schedule shall be used to control the Work and to provide a basis for determining job progress. The construction schedule shall be prepared and maintained by the Contractor. All work shall be done in accordance with the established CPM schedule. The Contractor and all subcontractors shall cooperate fully in developing the construction schedule and in executing the work in accordance with the CPM schedule.
2. The construction schedule shall consist of a computerized CPM network (diagram of activities) presented in a time-scaled graphic (print-out) with reports, as specified herein.

B. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

1. Use Microsoft Project for current Windows operating system.

C. Qualifications:

1. The Contractor shall have the capability of preparing and utilizing the specified CPM schedule or engage the services of a specialized scheduling professional to do so. Within seven days of the award of contract, provide a résumé or qualifications statement for the individual within the Contractor's organization, or the outside consultant, who is being proposed as the responsible party for development and maintenance of the CPM schedule. The résumé or qualifications statement shall demonstrate that the proposed responsible party has successfully developed and maintained CPM schedules for at least three construction projects of the same size or greater than this project. The proposed responsible party for the CPM schedule is subject to approval by the Engineer and Owner. If the proposed responsible party for the CPM schedule is not approved by the Engineer and/or Owner, Contractor shall resubmit a more-appropriate candidate for approval.

D. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

E. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Engineer.
2. Activities to facilitate the Work: Indicate start and completion dates for the following as applicable:
 - a. Securing of approvals and permits required for performance of the Work.
 - b. Temporary facilities.
 - c. Construction of mock-ups, prototypes and samples.
 - d. Owner interfaces and furnishing of items.
 - e. Interfaces with Separate Contracts.
 - f. Regulatory agency approvals.
 - g. Punch list.

3. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 4. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 5. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 6. Commissioning Time: Include no fewer than 15 days for commissioning.
 7. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
 8. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.
- F. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use-of-premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.

- j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.
 - n. Commissioning.
- 8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.
- G. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- H. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
- I. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and the Contract Time.
- J. Acceptability
 - 1. Submit the CPM schedule submittals, as specified, and resubmit as needed, until they are in compliance with Contract requirements.
 - 2. The Project Engineer's review of the Contractor's construction schedule submittals will only be for conformance with the Contract requirements – including but not limited to contract time and work sequences specified in the contract documents. The Project Engineer's review of the schedule shall not include the Contractor's means and methods of construction or safety. The Project Engineer's concurrence, acceptance, or approval of the Contractor's schedule submittals will not relieve the Contractor from responsibility for complying with the Contract Scope, Contract Time or any other contract requirement. Any indication of concurrence, acceptance, or approval of the Contractor's schedule will only indicate a general conformance with the Contract Requirements.
 - 3. Project Engineer's review of the Contractor's construction schedule submittals shall not relieve the Contractor from responsibility for any deviations from the Contract Documents unless the Contractor has in writing called Project Engineer's attention to such deviations at the time of submission and Project Engineer has given written concurrence to the specific deviations, nor shall any concurrence by the Project Engineer

- relieve Contractor from responsibility for errors and omissions in the submittals. Concurrence of the CPM Activity Network by the Engineer is advisory only and shall not relieve the Contractor of responsibility for accomplishing the Work within the Contract completion date(s).
4. Concurrence, acceptance, or approval of the Contractor's CPM schedule by the Project Engineer in no way makes the Project Engineer an insurer of the CPM schedule's success, nor liable for time or cost overruns resulting therefrom.
 5. Failure to include any element of work required for the performance of this Contract will not excuse the Contractor from completing all Work required within the Contract completion date(s), notwithstanding the review of the network by the Project Engineer.
 6. CPM schedules that contain activities with negative float, or which extend beyond the contract completion date, will not be acceptable.
 7. Except where earlier completions are specified, CPM schedules which show completion of all work prior to the contract completion date may be indicated; however, in no event shall they constitute a basis for claim for delay by the Contractor.
- K. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Final Completion percentage for each activity. Activities shall not be considered to be complete until they are in fact 100 percent complete.
 4. Submit a narrative report based on the CPM schedule evaluation, in a format agreed upon by the Contractor and the Project Engineer. The report shall include a description of the progress during the previous period in terms of completed activities, an explanation of each activity which is showing a delay, a description of problem areas, current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates and an explanation of corrective action taken or proposed.
- L. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- M. The contract completion time will be adjusted only for causes specified in this Contract. In the event the Contractor requests an extension of any contract completion date, the Contractor shall furnish such justification and supporting evidence as the Project Engineer may deem necessary to determine whether the Contractor is entitled to an extension of time under the provisions of this Contract. The Project Engineer will, after receipt of such justification and supporting evidence, make findings of fact and will advise the Contractor in writing thereof. If the Project Engineer finds that the Contractor is entitled to any extension of any contract completion date, the Project Engineer's determination as to the total number of days extension shall be based upon the currently approved CPM schedule and on all data relevant to the extension. Such data shall be included in the next updating of the schedule. Actual delays in activities which,

according to the CPM schedule, do not affect any contract completion date shown by the critical path in the network will not be the basis for a change therein.

- N. Distribution: Distribute copies of approved schedule to Project Engineer and Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.8 STARTUP CONSTRUCTION SCHEDULE

- A. Gantt-Chart Schedule: Submit startup, horizontal, Gantt-chart-type construction schedule within seven days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

1.9 GANTT-CHART SCHEDULE REQUIREMENTS

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice to Proceed.
 - 1. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.10 CPM SCHEDULE REQUIREMENTS

- A. Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates.
 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and inspection.
 - j. Commissioning.
 - k. Punch list and Final Completion.
 - l. Activities occurring following Final Completion.
 - m. Maintenance of existing facilities.
 - n. Contract milestones.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
 5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Project Engineer's

approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.

- a. Each activity cost shall reflect an appropriate value subject to approval by Engineer.
 - b. Total cost assigned to activities shall equal the total Contract Sum.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
 1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

- a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
- b. Submit value summary printouts one week before each regularly scheduled progress meeting.

1.11 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages, and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Work Change Directives received and implemented.
 17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
- B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
 1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or

effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:

1. Aerial and preconstruction photographs.
2. Concealed Work photographs.
3. Periodic construction photographs.
4. Final Completion construction photographs.
5. Preconstruction video recordings.
6. Periodic construction video recordings.
7. Construction webcam.

1.3 INFORMATIONAL SUBMITTALS

- A. Digital Photographs: Submit image files weekly.

1. Submit photos digitally or on thumb-drive. Include copy of key plan indicating each photograph's location and direction.
2. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point, and direction.
 - g. Unique sequential identifier keyed to accompanying key plan.

- B. Video Recordings: Submit video recordings within seven days of recording.

1. Submit video recordings digitally or on thumb drive. Include copy of key plan indicating each video's location and direction.
2. Identification: With each submittal, provide the following information in file metadata tag:
 - a. Name of Project.
 - b. Name and address of photographer.

- c. Name of Engineer.
- d. Name of Contractor.
- e. Date video recording was recorded.
- f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

1.4 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels. Use flash in low light levels or backlit conditions.
- B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full high-definition mode. Provide supplemental lighting in low light levels or backlit conditions.
- C. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- D. Metadata: Record accurate date and time and GPS location data from camera.
- E. File Names: Name media files with date Project area and sequential numbering suffix.
- F. Usage Rights
 - 1. Obtain and transfer copyright usage rights from photographer and videographer to Owner for unlimited reproduction of photographic and videographic documentation.

1.5 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs with maximum depth of field and in focus.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Preconstruction Photographs: Before commencement of the Work take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Engineer.
 - 1. Flag excavation areas before taking construction photographs.
 - 2. Take 20 or more photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take 20 or more photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- C. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, have an inspection by Owner or Project Engineer completed, then take photographs

sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:

1. Underground utilities.
 2. Underslab services.
 3. Piping.
 4. Electrical conduit.
 5. Waterproofing and weather-resistant barriers.
- D. Periodic Construction Photographs: Take 20 or more photographs per project area weekly coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- E. Final Completion Construction Photographs: Take 20 or more photographs per project area after date of Substantial Completion for submission as Project Record Documents. Project Engineer will inform photographer of desired vantage points.
- F. Additional Photographs: Project Engineer or Construction Manager may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum or in the allowance for construction photographs.
1. Three days' notice will be given, where feasible.
 2. In emergency situations, take additional photographs within 24 hours of request.
 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs shall be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs.
 4. Owner may send their representative to take their own photographs at any time for no additional cost.

1.6 CONSTRUCTION VIDEO RECORDINGS

- A. Narration: Describe scenes on video recording by audio narration by microphone while or dubbing audio narration off-site after video recording is recorded. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
1. Confirm date and time at beginning and end of recording.
 2. Begin each video recording with name of Project, Contractor's name, videographer's name, and Project location.

- B. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from video recording opposite the corresponding narration segment.
- C. Periodic Construction Video Recordings: Record video recording monthly coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last video recordings were recorded. Minimum recording time shall be 30 minutes(s).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Submittal schedule requirements.
 - 2. Administrative and procedural requirements for submittals.

- B. Related Requirements:

- 1. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
 - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 013233 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs, and Final Completion construction photographs.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Project Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Project Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. Mass Submittals: Six or more submittals or items in one day or 20 or more submittals or items in one week.

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required

for making corrections or revisions to submittals noted by Project Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Project Engineer's final release or approval.

1.5 SUBMITTAL FORMATS

- A. Numbering System: Utilize the following example submittal identification numbering system to identify submittals and as file names for PDF submissions:

1. First Identifier - Alphabet Character: D, S, M or I which represents Shop Drawing (including working drawings and product data), Sample, Manual (Operating & Maintenance) or Informational, respectively.
2. Second Identifier - Next 6 or 8 Digits: Applicable Specification Section Number. Do not mix submittals from different specification sections into a single submittal.
3. Third Identifier - Next Three Digits: Sequential number of each separate item or drawing submitted under each Specification Section, in chronological order submitted, starting at 001.
4. Fourth Identifier - Last Alphabet Character: A to Z, indicating the submission (or resubmission) of the same submittal, i.e., "A" = 1st submission, "B" = 2nd submission, "C" = 3rd submission, etc.
5. EXAMPLE: D-033000.13-008-B.
 - a. D = Shop Drawing.
 - b. 03 30 00.13 = Section; use only 6 digits for sections that do not include 8 digits.
 - c. 008 = the eighth different submittal under this Section.
 - d. B = the second submission (first resubmission) of that particular shop drawing.

- B. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Project Engineer.
4. Name of Construction Manager.
5. Name of Contractor.
6. Name of firm or entity that prepared submittal.
7. Names of subcontractor, manufacturer, and supplier.
8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
9. Category and type of submittal.
10. Submittal purpose and description.
11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
12. Drawing number and detail references, as appropriate.
13. Indication of full or partial submittal.
14. Location(s) where product is to be installed, as appropriate.
15. Other necessary identification.
16. Remarks.
17. Signature of transmitter.

- C. Options: Identify options requiring selection by Project Engineer.
- D. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Project Engineer on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- E. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Email: Prepare submittals as PDF package and transmit to Project Engineer by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Project Engineer.
 - a. Project Engineer will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 2. Document Management System – Submittals may be submitted through a Contractor owned or managed Document Management System in addition to email alerts/coordination. Owner/Contractor/Project Engineer to agree on submittal management process before beginning use of a Document Management System.

- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Project Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Project Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 20 days for initial review of each submittal (and 45 days for multi-discipline reviews). Allow additional time if coordination with subsequent submittals is required. Project Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Project Engineer's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Project Engineer and to Project Engineer's consultants, allow 30 days for review of each submittal. Submittal will be returned to Project Engineer before being returned to Contractor.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Project Engineer.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Project Engineer's action stamp.
 4. Repetitive Reviews: Shop drawings, O&M manuals, and other submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at

the Contractor's expense. Reimburse the Owner for all costs invoiced by Project Engineer for the third and subsequent reviews.

- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Project Engineer's action stamp.

1.7 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.

- f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
- C. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 - 2. Manufacturer and product name, and model number if applicable.
 - 3. Number and name of room or space.
 - 4. Location within room or space.
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- E. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- F. Certificates:
 - 1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 - 2. Contractor's Certification: Each shop drawing, working drawing, product data, and sample shall have affixed to it the following Certification Statement:
 - a. "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements. "
 - 3. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 - 4. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 - 5. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
 - 6. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
 - 7. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.

G. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.8 PROPOSED PRODUCT LIST

- A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.9 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Project Engineer.
- B. Contractor Responsible for:

1. Determination and verification of materials including manufacturer's catalog numbers.
 2. Determination and verification of field measurements and field construction criteria.
 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 4. Determination of accuracy and completeness of dimensions and quantities.
 5. Confirmation and coordination of dimensions and field conditions at Site.
 6. Construction means, techniques, sequences, and procedures.
 7. Safety precautions.
 8. Coordination and performance of Work of all trades.
 9. Other requirements enumerated in Contract Documents.
- C. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
1. Project Engineer will not review submittals received from Contractor that do not have Contractor's review and approval.

1.10 PROJECT ENGINEER'S REVIEW

- A. Do not make mass submittals (grouped submittals of large numbers of unrelated shop drawings) to Project Engineer. If mass submittals are received, Project Engineer's review time stated above will be extended as necessary to perform proper review. Project Engineer will review mass submittals based on priority determined by Project Engineer after consultation with Owner and Contractor.
- B. Action Submittals: Project Engineer will review each submittal, indicate corrections or revisions required, and return.
1. PDF Submittals: Project Engineer will indicate, via markup on each submittal, the appropriate action.
- C. Informational Submittals: Project Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Project Engineer will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Project Engineer.
- E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- F. Project Engineer will discard submittals received from sources other than Contractor.
- G. Submittals not required by the Contract Documents will be returned by Project Engineer without action.
- H. Shop drawings will be returned to the Contractor with one of the following codes.

1. "APPROVED" - This code is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.
2. "APPROVED AS NOTED" - This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
3. "APPROVED AS NOTED/RESUBMIT" - This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. The resubmittal is to address all comments, omissions and non-conforming items that were noted. An additional box is checked to indicate whether the resubmission is for the complete package, or for parts of the package. If no box is checked, a complete resubmittal shall be provided. Review code may designate if a partial or full submittal is required. If full submittal is required, a complete resubmittal package addressing all comments shall be provided. If a partial submittal is designated, resubmittal shall only include information pertaining to those items noted in review comments requiring clarification and any portions of submittal impacted as a result of the response. Resubmittal is to be received by the Project Engineer within 30 calendar days of the date of the Project Engineer's transmittal requiring the resubmittal.
4. "REJECTED" - This code is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.
5. "RECEIPT ACKNOWLEDGED (Not subject to Project Engineer's Approval)" - This code is assigned to acknowledge receipt of a submittal that is not subject to the Project Engineer's approval. This code is generally used with submittals involving the Contractor's means and methods of construction work plans, and health and safety plans.

1.11 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 1. Use of files is solely at receiver's risk. Project Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Project Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.

4. Receiver shall not hold Project Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
5. Receiver shall understand that even though Project Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
6. Receiver shall not hold Project Engineer responsible for such viruses or their consequences and shall hold Project Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013300

SECTION 013526 - GOVERNMENTAL SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:

- 1. Preparing and implementing a Health and Safety (H&S) Plan to establish in detail the protocols necessary for protecting workers from potential hazards during the work specified in the Contract Documents.

- B. Related Requirements:

- 1. Potential chemical hazards include asbestos, lead-based paint, PCBs, mercury, oils, and incinerator ash. Potential biological hazard includes pigeon guano (avian excrement).
 - 2. Laboratory analysis of previously landfilled ash indicates the presence of PAHs, arsenic, lead and dioxin above MCP Method 1 standards.

1.3 DEFINITIONS

- A. CIH is a Certified Industrial Hygienist.

- B. SSHO is the site safety & health officer. The Contractor shall provide a responsible individual, competent through experience and training, to be able to identify hazards associated with the Contractor's Work and has overall responsibility for the safety and health performance of contractor's activities, including lower tier subcontractors. The person shall be present on-site during all contractor activities and shall ensure that the requirements of the Project Specific Safety and Health Plan are fully implemented. This person shall also:

- 1. Attend pre-work conferences and site safety and health orientations and briefings. The Contractor is expected to supplement the site orientation with information related to the Contractor's scope of work.
 - 2. Document weekly tool box safety meetings for the Contractor's employees onsite.
 - 3. Submit weekly safety and health inspection reports of the construction site as it relates to the Contractor's scope of work. Record hazards identified, and corrective actions taken. The weekly inspection report shall be provided to the Site Manager.
 - 4. Report all job-related accidents/illness related to the Contractor's employees and lower tier subcontractors as soon as practical to the Site Manager and perform site accident and incident investigations associated with the Contractor's scope of work and fully cooperate with any other accident or incident investigations which may be required.

5. Maintain safety and health statistical information and provide monthly reports to the Site Manager. Reports shall include, employee hours worked, the number of first aid cases, the number of medical treatment cases, the number of restricted and lost workday cases as defined by the US Occupational Health and Safety Administration. These reports shall include statistical information related to all of the Contractor's activities and the activities of lower tier subcontractors.
6. Provide Site Manager with the immediate notification of any regulatory inspection and a copy of all resulting citations or notice of deficiencies.

1.4 ACTION SUBMITTALS

- A. Qualifications of the CIH and the SSHO.
- B. Prior to commencing work at the jobsite, Contractor must file with the Project Engineer all required documents, such as: A copy of the **Contractor's Project Specific Safety and Health Plan** and copies of employee training certificates, insurance certificates, construction permits, blasting permits, crane certifications and operator licenses, Steam Boiler Certifications, Elevator Certifications and any approved "OSHA Variances," or other approvals as required to safely and legally perform the Contractor's Scope of Work. The **Contractor's Project Specific Safety and Health Plan** shall as a minimum include the following:
 1. Letter of corporate commitment to Safety and Health signed by CEO or President of the contractor's organization.
 2. Brief description of the contractor's scope of work.
 3. Project safety and health organization, responsibilities and accountability procedures.
 4. Project safety and health goals and objectives.
 5. Project hazard communication and safety training. (This section shall include a minimum requirement for a site hazard communication program and weekly safety meetings.)
 6. Activity hazard analyses covering activities within the contractor's scope of work describing the steps of each principle activity, the hazards associated with each activity and procedures to be used to eliminate or control the hazards.
 7. Personal protective equipment. (Note: Minimum site PPE requirements shall include hard hats, safety glasses with side shields and sturdy work boots.)
 8. Specialized medical surveillance and/or air monitoring procedures, if required.
 9. Safe work procedures. These may be incorporated by reference to the Contractor's Corporate Safety and Health Program.
 10. Safety inspections and audits.
 11. Project emergency response and preparedness procedures including provisions for providing first aid and notification of emergency services.
 12. The Contractor (and any of its subcontractors), must submit, a Hazardous Waste Management Plan that addresses the handling, labeling, transpiration and disposal of hazardous waste. The Contractor shall be held solely responsible for compliance with the provisions of all applicable regulations associated with hazardous waste generated as a consequence of the Contractor's activities.

1.5 INFORMATIONAL SUBMITTALS

- A. Listed below are general conditions related to Safety and Health which the Contractor is required to comply with.

1. Should a specific interpretation be required concerning special and/or unusual safety, fire protection, or environmental concerns not covered by, the National Fire Protection Association Codes, and current OSHA/EPA or other local regulations the contractor shall contact the Site Manager's Safety and Health Representative or Corporate Safety and Health Office for guidance.
2. The practices, procedures, and requirements set forth in this Appendix shall apply equally to all Contractors, and it is mandatory that each Contractor inform and enforce the provisions of this Appendix in all contracts with its Subcontractors.
3. The Site Manager shall have the right to direct the removal from the jobsite any Contractor or Contractor personnel for violation of safety, health, fire protection, or environmental rules and regulations.
4. Fighting or horseplay is strictly prohibited and shall be considered grounds for removal from the project.
5. The illegal use, possession, purchase, sale or diversion of a drug or controlled substance is prohibited. The use or possession of alcoholic beverages at the jobsite is prohibited.
6. The Site Manager shall have the right to direct the removal from the jobsite any defective tools and equipment, the use of which may create a hazardous situation.
7. The Site Manager reserves the right to delete, modify, or supplement these procedures at any time without prior notice, but in such event, will notify all contractors affected by such change in procedures.
8. The Site Manager reserves the right to evaluate the Contractor's, and any of its subcontractor's, overall safety performance, compliance with these procedures, and any established supplements, at intervals the Site Manager deems appropriate.
9. Prior to starting work in any jobsite area, each Contractor must first obtain permission and instructions from the Site Manager, or designee.

1.6 TRAINING

- A. Certify that all Contractor personnel assigned for the purpose of performing or supervising work in accordance with the provisions of the H&S plan have received appropriate safety training in accordance with 29 CFR 1926.65. Training shall consist of a minimum of 40 hours of health and safety training and 8 hours refresher training annually. In addition, Contractor's supervisory personnel shall have a minimum of 8 hours additional specialized training for managing hazardous waste operations.
- B. Additionally, the Contractor shall be responsible for, and shall guarantee that, only personnel successfully completing the required training are permitted to enter designated areas of the site where worker protection is required.

1.7 MEDICAL SURVEILLANCE

- A. Certify that the services of an occupational physician will be provided and utilized to provide the minimum medical examinations and surveillance specified herein for all workers performing or supervising work in accordance with the provisions of the H&S plan.
- B. The entire medical surveillance program shall meet the requirements of OSHA standard 29 CFR 1926.65(f) including the provision requiring the Contractor to obtain a physician's written medical opinion based on site specific information furnished by the Contractor.

- C. Maintain all medical surveillance records in accordance with 29 CFR 1926.65 and make these records available to the Engineer or other regulatory agencies as required.

1.8 DESCRIPTION OF REQUIREMENTS

- A. This Section describes the minimum health and safety requirements for this project. Develop a detailed H&S Plan using this Section as a basis and delineating additional details and requirements as deemed necessary. The H&S plan shall establish in detail the protocols necessary for protecting workers from potential hazards encountered during demolition activities.
- B. Utilize the services of a certified industrial hygienist (CIH) by the American Board of Industrial Hygienists (ABIH) to develop and implement the H&S plan, including any on-site air monitoring program, conducting initial site-specific training and provide continued support for all health and safety activities as needed, including the upgrading or downgrading of the level of personnel protection.
- C. In addition, a Site Safety and Health Officer (SSHO) shall assist and represent the CIH in the continued implementation and enforcement of the H&S Plan. The SSHO shall be assigned to the site on a full-time basis during performance of activities covered by the H&S plan and shall be either the Contractor's employee or a subcontractor who reports to the Contractor and the CIH in matters pertaining to site safety and health.
- D. The H&S Plan shall include but not necessarily be limited to, the following components as required by OSHA 29 CFR 1926.65(b)(4) and 1926.65(p)(1)(2):
 - 1. Site Description and Evaluation.
 - 2. Names of key personnel and alternate responsible for site safety and health (responsibilities and chain of command).
 - 3. Safety and health hazard assessment and risk analysis for each site task and operator (Accident Prevention Plan).
 - 4. Education and Training.
 - 5. Personnel Protective Equipment.
 - 6. Medical Surveillance.
 - 7. Air Monitoring (Environmental).
 - 8. Standard Operating Procedures, Engineering Controls and Work Practices.
 - 9. Site Control Measures (Work Zones, Communications and Security).
 - 10. Personnel Hygiene and Decontamination.
 - 11. Equipment Decontamination.
 - 12. Logs, Reports and Record Keeping.
 - 13. Heat/Cold Stress Monitoring.
 - 14. Pre-emergency planning.
 - 15. Personnel roles, lines of authority, training and communication.
 - 16. Emergency recognition and prevention.
 - 17. Safe distances and places of refuge.
 - 18. Site security and control.
 - 19. Evacuation routes and procedures.
 - 20. Decontamination.
 - 21. Emergency Medical treatment and first aid.
 - 22. Emergency alerting and response procedures.

23. Critique of response and follow-up.
24. Personnel Protection Equipment and emergency equipment.

1.9 REGULATORY REQUIREMENTS

- A. The Contractor is responsible for awareness, knowledge and full compliance with all applicable rules, regulations, laws and practices applicable to the Contractor's Scope of Work, including lower tier subcontractors, prescribed by the site owner, and any other government or agency governing the safety and health of employees, other site personnel, the general public and protection of the environment. Within the United States and its Territories these include, but are not limited to regulations promulgated by the following:
 1. Occupational Safety and Health Administration (OSHA)
 2. Environmental Protection Agency (EPA)
 3. Department of Transportation (DOT)
 4. Department of Energy, Nuclear Regulatory Commission (NRC)
 5. Mine Safety and Health Administration (MSHA)
- B. Additional rules required by the Site Manager include:
 1. Each Contractor has the responsibility for instructing its employees in safe practices for the operation of tools and equipment and for the maintenance of safe conditions.
 2. Contractors shall furnish for their employees' personal safety equipment such as, ANSI Z89.1 approved hard hats, ANSI Z87.1 approved eye protection with fixed side shields, ear protection, foot protection, NIOSH approved respiratory protection, fall protection and other equipment as required for safe performance of their particular work assignment. All personnel on the job site shall be required at a minimum to wear hard hats, safety glasses with side shields and proper and sturdy footwear.
 3. Danger tags and locks shall be utilized to prevent personal injury and equipment damage in accordance with project electrical and mechanical tagging procedures.
 4. Scaffolding and other structures utilized for elevated work platforms shall have the required decking, handrails, mid-rails, toe boards, proper access, and nets or screens.
 5. Catwalks shall conform to a two-plank width minimum and, if elevated, shall have handrails and toe boards.
 6. Areas in which "overhead" work is to be performed shall be blocked, decked, barricaded, netted, posted, or evacuated as instructed by project supervision.
 7. Pits, trenches, and other excavations shall be shored/shielded or sloped to the proper angle of repose, barricaded, and provided with proper access.
 8. When not in use, blades of bulldozers and buckets of front-end loaders shall be lowered to the ground. Also, beds of dump trucks shall be lowered when traveling or not in use. Project parking and traffic regulations shall be complied with.
 9. Crane booms shall be lowered at the end of single shifts or secured against movement by attaching the hoist line to a fixed structure.
 10. Specific air sampling shall be performed to determine the presence of toxic materials or dusts, flammable atmosphere and adequate oxygen content, in accordance with project procedures. Respirators, safety harnesses, lifelines, standby personnel, and permits shall be used when appropriate.
 11. Personnel involved in activities which require the use of an Air Purifying Respirator (APR) shall not have facial hair which interferes with the respirator's face seal.

12. The Contractor shall provide to the Site Manager a copy of MSDSs for all hazardous materials prior to their use at the site.
13. Back-up alarms shall be provided on all construction vehicles and equipment and shall alarm continuously while the vehicle or equipment is in reverse motion. For equipment not equipped with a back-up alarm, a spotter shall be used.
14. All portable generators shall have frames externally grounded or other means to ensure there is no potential for circuit to frame conductivity.
15. All electrical services used in conjunction with field activities shall be equipped with Ground Fault Circuit Interrupters (GFCI).
16. Compliance with the following fire prevention measures is mandatory:
 - a. Smoking is permitted only in specific areas as designated in project rules and procedures.
 - b. Open fires are prohibited. Temporary gas-fired heaters shall not be used in enclosed areas. Only UL and NFPA approved petroleum and/or electrically fired heating devices will be authorized for use.
 - c. Hot work permits shall be required for all flame and spark producing work tasks.
 - d. Debris, scrap, and refuse shall be segregated and controlled in metal containers and removed at appropriate intervals. Any potential fire hazard shall be controlled.
 - e. Each Contractor is responsible for maintaining and cleaning their work area. All walkways shall be kept clean and free of obstructions. Broken/spilled, scrap or other waste materials shall be placed in appropriate containers or waste areas as soon as practical after they are generated.
 - f. Flammable liquids shall be kept in UL approved safety containers and properly labeled as to contents.
 - g. Flammable and combustible materials shall be stored in designated locations that meet Federal, State and local regulations.
 - h. All equipment such as cranes, trucks, bulldozers, graders, loaders and backhoes shall be equipped with proper fire extinguishers.
 - i. The use of heavy equipment with internal combustion engines is prohibited within enclosed areas.
17. Only the number of persons provided with proper seats shall ride in a vehicle. No one shall ride on running boards, stand on moving equipment or ride on a vehicle other than in a proper seated position.
18. The swing radius of all heavy equipment such as cranes, back hoes, etc. shall be clearly barricaded.
19. The contractor shall provide 100% fall protection for fall exposures greater than 6 ft in accordance with project procedures.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CERTIFICATION OF COMPLIANCE WITH OSHA SEC. 1926.62 LEAD

- A. Execute the following form as required by this Specification.

CERTIFICATION OF COMPLIANCE WITH OSHA SEC. 1926.62 LEAD

The undersigned hereby certifies that he/she is certified as an industrial hygienist (CIH) by the American Board of Industrial Hygiene and that he/she has been employed by (Name of Contractor) _____ to perform an exposure assessment and develop a compliance program in accordance with OSHA Sec. 1926.62 Lead for the (Name of Project) _____.

The undersigned further certifies that he/she has performed the exposure assessment and developed and implemented the compliance program in strict accordance with OSHA Sec. 1926.62 and in conformance with all applicable local, state and federal codes, rules and regulations and that his/her signature has been affixed to all documents required.

The undersigned hereby agrees to make available all originals of the exposure assessment, compliance program including but not limited to training documentation, lead removal work plan and any other records/documents required to comply with OSHA Sec. 1926.62 to the (Insert Name of Owner) _____ or Owner's representative within seven (7) days following written request therefor by the Owner.

Certified Industrial Hygienist

Signature

Address

Contractor's Name

Signature

Title

Address

END OF SECTION 013526

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SECTION 014200 – REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 1. AABC - Associated Air Balance Council; www.aabc.com.
 - 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
 - 3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
 - 4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
 - 5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
 - 6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
 - 7. ABMA - American Boiler Manufacturers Association; www.abma.com.
 - 8. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org
 - 9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
 - 10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
 - 11. AF&PA - American Forest & Paper Association; www.afandpa.org.
 - 12. AGA - American Gas Association; www.aga.org.
 - 13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
 - 14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 - 15. AI - Asphalt Institute; www.asphaltinstitute.org.
 - 16. AIA - American Institute of Architects (The); www.aia.org.
 - 17. AISC - American Institute of Steel Construction; www.aisc.org.
 - 18. AISI - American Iron and Steel Institute; www.steel.org.
 - 19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
 - 20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
 - 21. ANSI - American National Standards Institute; www.ansi.org.
 - 22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
 - 23. APA - APA - The Engineered Wood Association; www.apawood.org.
 - 24. APA - Architectural Precast Association; www.archprecast.org.
 - 25. API - American Petroleum Institute; www.api.org.
 - 26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
 - 27. ARI - American Refrigeration Institute; (See AHRI).

28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CE - Conformite Europeenne; <http://ec.europa.eu/growth/single-market/ce-marking/>
51. CEA - Canadian Electricity Association; www.electricity.ca.
52. CEA - Consumer Electronics Association; www.ce.org.
53. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
54. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
55. CGA - Compressed Gas Association; www.cganet.com.
56. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
57. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
58. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
59. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
60. CPA - Composite Panel Association; www.pbmdf.com.
61. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
62. CRRC - Cool Roof Rating Council; www.coolroofs.org.
63. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
64. CSA - CSA Group; www.csagroup.com.
65. CSA - CSA International; www.csa-international.org.
66. CSI - Construction Specifications Institute (The); www.csinet.org.
67. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
71. DHI - Door and Hardware Institute; www.dhi.org.
72. ECA - Electronic Components Association; (See ECIA).

73. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
74. ECIA - Electronic Components Industry Association; www.eciaonline.org.
75. EIA - Electronic Industries Alliance; (See TIA).
76. EIMA - EIFS Industry Members Association; www.eima.com.
77. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
78. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
79. ESTA - Entertainment Services and Technology Association; (See PLASA).
80. ETL - Intertek (See Intertek); www.intertek.com.
81. EVO - Efficiency Valuation Organization; www.evo-world.org.
82. FCI - Fluid Controls Institute; www.fluidcontrolsintstitute.org.
83. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
84. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
85. FM Approvals - FM Approvals LLC; www.fmglobal.com.
86. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
87. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarroof.com.
88. FSA - Fluid Sealing Association; www.fluidsealing.com.
89. FSC - Forest Stewardship Council U.S.; www.fscus.org.
90. GA - Gypsum Association; www.gypsum.org.
91. GANA - Glass Association of North America; www.glasswebsite.com.
92. GS - Green Seal; www.greenseal.org.
93. HI - Hydraulic Institute; www.pumps.org.
94. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
95. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
96. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
97. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
98. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
99. IAS - International Accreditation Service; www.iasonline.org.
100. ICBO - International Conference of Building Officials; (See ICC).
101. ICC - International Code Council; www.iccsafe.org.
102. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
103. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
104. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
105. IEC - International Electrotechnical Commission; www.iec.ch.
106. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
107. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
108. IESNA - Illuminating Engineering Society of North America; (See IES).
109. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
110. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
111. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
112. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
113. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
114. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
115. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).

116. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
117. ISO - International Organization for Standardization; www.iso.org.
118. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
119. ITU - International Telecommunication Union; www.itu.int/home.
120. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
121. LMA - Laminating Materials Association; (See CPA).
122. LPI - Lightning Protection Institute; www.lightning.org.
123. MBMA - Metal Building Manufacturers Association; www.mbma.com.
124. MCA - Metal Construction Association; www.metalconstruction.org.
125. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
126. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
127. MHIA - Material Handling Industry of America; www.mhia.org.
128. MIA - Marble Institute of America; www.marble-institute.com.
129. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
130. MPI - Master Painters Institute; www.paintinfo.com.
131. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
132. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
133. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
134. NADCA - National Air Duct Cleaners Association; www.nadca.com.
135. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
136. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
137. NBI - New Buildings Institute; www.newbuildings.org.
138. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
139. NCMA - National Concrete Masonry Association; www.ncma.org.
140. NEBB - National Environmental Balancing Bureau; www.nebb.org.
141. NECA - National Electrical Contractors Association; www.necanet.org.
142. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
143. NEMA - National Electrical Manufacturers Association; www.nema.org.
144. NETA - InterNational Electrical Testing Association; www.netaworld.org.
145. NFHS - National Federation of State High School Associations; www.nfhs.org.
146. NFPA - National Fire Protection Association; www.nfpa.org.
147. NFPA - NFPA International; (See NFPA).
148. NFRC - National Fenestration Rating Council; www.nfrc.org.
149. NHLA - National Hardwood Lumber Association; www.nhla.com.
150. NLGA - National Lumber Grades Authority; www.nlga.org.
151. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
152. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
153. NRCA - National Roofing Contractors Association; www.nrca.net.
154. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
155. NSF - NSF International; www.nsf.org.
156. NSPE - National Society of Professional Engineers; www.nspe.org.
157. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
158. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
159. NWFA - National Wood Flooring Association; www.nwfa.org.
160. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
161. PDI - Plumbing & Drainage Institute; www.pdionline.org.

162. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
163. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
164. RFCI - Resilient Floor Covering Institute; www.rfci.com.
165. RIS - Redwood Inspection Service; www.redwoodinspection.com.
166. SAE - SAE International; www.sae.org.
167. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
168. SDI - Steel Deck Institute; www.sdi.org.
169. SDI - Steel Door Institute; www.steeldoor.org.
170. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
171. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
172. SIA - Security Industry Association; www.siaonline.org.
173. SJI - Steel Joist Institute; www.steeljoist.org.
174. SMA - Screen Manufacturers Association; www.smainfo.org.
175. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
176. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
177. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
178. SPIB - Southern Pine Inspection Bureau; www.spib.org.
179. SPRI - Single Ply Roofing Industry; www.spri.org.
180. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
181. SSINA - Specialty Steel Industry of North America; www.ssina.com.
182. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
183. STI - Steel Tank Institute; www.steeltank.com.
184. SWI - Steel Window Institute; www.steelwindows.com.
185. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
186. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
187. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
188. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
189. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
190. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
191. TMS - The Masonry Society; www.masonrysociety.org.
192. TPI - Truss Plate Institute; www.tpinst.org.
193. TPI - Turfgrass Producers International; www.turfgrasssod.org.
194. TRI - Tile Roofing Institute; www.tilerroofing.org.
195. UL - Underwriters Laboratories Inc.; <http://www.ul.com>.
196. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
197. USAV - USA Volleyball; www.usavolleyball.org.
198. USGBC - U.S. Green Building Council; www.usgbc.org.
199. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
200. WA - Wallcoverings Association; www.wallcoverings.org.
201. WASTEC - Waste Equipment Technology Association; www.wastec.org.
202. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
203. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
204. WDMA - Window & Door Manufacturers Association; www.wdma.com.
205. WI - Woodwork Institute; www.wicnet.org.

206. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
 207. WWPA - Western Wood Products Association; www.wwpa.org.
- C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. DIN - Deutsches Institut für Normung e.V.; www.din.de.
 2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 3. ICC - International Code Council; www.iccsafe.org.
 4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 4. DOD - Department of Defense; www.quicksearch.dla.mil.
 5. DOE - Department of Energy; www.energy.gov.
 6. EPA - Environmental Protection Agency; www.epa.gov.
 7. FAA - Federal Aviation Administration; www.faa.gov.
 8. FG - Federal Government Publications; www.gpo.gov/fdsys.
 9. GSA - General Services Administration; www.gsa.gov.
 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
 12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 13. SD - Department of State; www.state.gov.
 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
 15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
 16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
 17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
 18. USP - U.S. Pharmacopeial Convention; www.usp.org.
 19. USPS - United States Postal Service; www.usps.com.
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.

3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from DLA Document Services;
www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.
 6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
 3. CDHS; California Department of Health Services; (See CDPH).
 4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
 5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
 6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
 7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservation.tamu.edu.
 8. CDPHE; Colorado Department of Public Health & Environment
<https://cdphe.colorado.gov/>

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" and City of Arvada Standards for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Project Engineer, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.
- E. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use with metering. Provide connections and extensions of services and metering as required for construction operations.
- F. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use with metering. Provide connections and extensions of services and metering as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
 - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 - 3. Indicate methods to be used to avoid trapping water in finished work.
- F. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the Owner. Include the following:
 - 1. Methods used to meet the goals and requirements of the Owner.
 - 2. Concrete cutting method(s) to be used.
 - 3. Location of construction devices on the site.
 - 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
 - 5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with the Owner.
 - 6. Indicate locations of sensitive areas or other areas requiring special attention as identified by Owner. Indicate means for complying with Owner's requirements.
- G. Protection Plan: per Note 14 on Sheet C-1, contractor shall submit conceptual plan for protecting pedestrian bridge during construction. Work shown on Sheet C-1 shall not commence until approval of conceptual bridge protection plan.

1.5 QUALITY ASSURANCE

- A. Temporary facilities shall comply with all applicable state and local ordinances, codes and regulations.
- B. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- D. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts.
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.
- C. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain-link fence, sized to height of fence, in color selected by Engineer from manufacturer's standard colors.
- D. Wood Enclosure Fence: Plywood, 6 feet (1.8 m) high, framed with four 2-by-4-inch (50-by-100-mm) rails, with preservative-treated wood posts spaced not more than 8 feet (2.4 m) apart.
- E. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- F. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches (914 by 1524 mm).

- G. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See City of Arvada Standards for disposition of salvaged materials that are designated as Owner's property.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service, if approved by Owner.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Water Service: If approved, connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Final Completion, restore these facilities to condition existing before initial use.
- E. Sanitary Facilities: Provide temporary toilets and drinking water for use of construction personnel.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated on Drawings.
 - 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- B. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain

temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas accordance with City of Arvada Standards.
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with City of Arvada Standards.

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Provide temporary offsite parking areas for construction personnel.

E. Storage and Staging: Provide temporary offsite area for storage and staging needs.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings. Signs shall be constructed of A-A Ext – APA grade plywood, 1-in thick. Posts and braces shall be of pressure treated lumber.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touch up signs, so they are legible at all times.

H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

I. Retain "Lifts and Hoists" Paragraph below for construction of more than two stories.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified City of Arvada Standards.
- D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- F. Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."
- G. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- I. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

- J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- K. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide, install and maintain signage directing occupants to temporary egress.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Clear snow and ice from all drives, walks and stairs to maintain safe vehicle and pedestrian access to the site and facilities as directed by the Project Engineer.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Final Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Final Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 - 3. Just prior to Final Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in City of Arvada Standards.

END OF SECTION 015000

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SECTION 015639 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
- B. Related Requirements:
 - 1. Section 015000 "Temporary Facilities and Controls" for temporary site fencing.

1.3 DEFINITIONS

- A. Caliper: Diameter of a trunk measured by a diameter tape or the average of the smallest and largest diameters at a height 6 inches (150 mm) above the ground for trees up to and including 4-inch (100-mm) size at this height and as measured at a height of 12 inches (300 mm) above the ground for trees larger than 4-inch (100-mm) size.
- B. Caliper (DBH): Diameter breast height; diameter of a trunk as measured by a diameter tape or the average of the smallest and largest diameters at a height 54 inches (1372 mm) above the ground line for trees with caliper of 8 inches (200 mm) or greater as measured at a height of 12 inches (300 mm) above the ground.
- C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.
- E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

- a. Tree-service firm's personnel, and equipment needed to make progress and avoid delays.
- b. Arborist's responsibilities.
- c. Quality-control program.
- d. Coordination of Work and equipment movement with the locations of protection zones.
- e. Trenching by hand or with air spade within protection zones.
- f. Field quality control.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.
 2. Detail fabrication and assembly of protection-zone fencing and signage.
 3. Indicate extent of trenching by hand or with air spade within protection zones.
- C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
 1. Species and size of tree.
 2. Location on site plan. Include unique identifier for each.
 3. Reason for pruning.
 4. Description of pruning to be performed.
 5. Description of maintenance following pruning.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For arborist and tree service firm.
- B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
 1. Use sufficiently detailed photographs or video recordings.
 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

- E. Quality-control program.

1.7 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA.
- B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
- C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing and signage, the arborist and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.8 FIELD CONDITIONS

- A. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Moving or parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill Soil: Stockpiled soil mixed with planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
 - 1. Mixture: Well-blended mix of two parts stockpiled soil to one part planting soil.
- B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood.
 2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.
 3. Color: Natural.
- C. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements:
1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch (50-mm) opening, 0.148-inch- (3.76-mm-) diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch- (60-mm-) OD line posts, and 2-7/8-inch- (73-mm-) OD corner and pull posts and 0.177-inch- (4.5-mm-) diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
 - a. Height: 72 inches
- D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering and as follows:
1. Lettering: 3-inch- (75-mm-) high minimum, black characters on white background noting the fenced area to be a tree protection zone.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Flag each tree trunk at 54 inches (1372 mm) above the ground.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.
 1. Apply 2-inch (50-mm) uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches (150 mm) of tree trunks.

3.3 PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.
 - 1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
 - 2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Engineer.
 - 3. Access Gates: Install; adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Engineer. Install one sign spaced approximately every 50 feet (15 m) on protection-zone fencing, but no fewer than four signs with each facing a different direction.
- C. Maintain protection zones free of weeds and trash.
- D. Maintain protection-zone fencing and signage in good condition as acceptable to Engineer and remove when construction operations are complete, and equipment has been removed from the site.
 - 1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
 - 2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earthwork" unless otherwise indicated.
- B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.
- C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not

practical, cut roots approximately 3 inches (75 mm) back from new construction and as required for root pruning.

- D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

- A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows:
 - 1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 - 2. Cut Ends: Do not paint cut root ends.
 - 3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 - 4. Cover exposed roots with burlap and water regularly.
 - 5. Backfill as soon as possible according to requirements in Section 312000 "Earthwork."
- B. Root Pruning at Edge of Protection Zone: Prune tree roots 12 inches (300 mm) outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.
- C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 REGRADING

- A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.
 - 1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.
- C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- D. Minor Fill within Protection Zone: Where existing grade is 2 inches (50 mm) or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.7 FIELD QUALITY CONTROL

- A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.8 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Project Engineer.
 - 1. Submit details of proposed pruning and repairs.
 - 2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
 - 3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Arvada Land Development Code Division 4-6-2 Tree Preservation and Replacement and coordinate with Project Engineer.
- B. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch (50-mm) uniform thickness to remain.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 015639

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SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for Contractor requirements related to Owner-furnished products.
 - 2. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. City of Arvada Approved Materials List: List of materials and manufacturers approved by the City of Arvada. Any reference to this list shall reference the latest version available.
- B. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycle contract materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in PART 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- C. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- D. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
- E. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 2. Data indicating compliance with the requirements specified in PART 2 "Comparable Products" Article.
- F. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."
- G. Substitution: Refer to City of Arvada Standards for definition and limitations on substitutions.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 1. Resolution of Compatibility Disputes between Multiple Contractors:
 - a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

1.5 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.
- C. Storage:
 1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
 2. For pipe storage, refer to City of Arvada Standards Section 421.05.1.
 3. Store products to allow for inspection and measurement of quantity or counting of units.
 4. Store materials in a manner that will not endanger Project structure.
 5. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection for wind.
 6. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.

7. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
8. Protect stored products from damage and liquids from freezing.
9. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Project Engineer will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Engineer in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Engineer, whose determination is final.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Project Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Project Engineer may return requests without action, except to record noncompliance the following requirements:
 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects, with project names and addresses and names and addresses of Project Engineers and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 016000

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SECTION 017300 – EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for coordination and limits on use of Project site.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
 - 1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Project Engineer of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
 - a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.

- c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.
2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.
 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- C. Certified Surveys: Coordinate certified surveys with the City of Arvada survey crews.

1.6 CLOSEOUT SUBMITTALS

- A. Final Property Survey: Submit 5 copies showing the Work performed and record survey data, coordinating the submittal with the City of Arvada's survey crews who will be the primary surveyors for the project.

1.7 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements, whose structural function is

- not known, notify Project Engineer of locations and details of cutting and await directions from Project Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Project Engineer for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work, including Specification Section number and paragraphs, and Drawing sheet number and detail, where applicable.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Project Engineer in accordance to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Engineer promptly.
- B. Engage the City of Arvada's land surveyor experienced in laying out the Work, using the following accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Project Engineer when deviations from required lines and levels exceed allowable tolerances.

7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Project Engineer before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, coordinate with City of Arvada to prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Coordinate with City of Arvada land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Project Engineer. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items onsite and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Engineer. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.

3.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in City of Arvada Standards.
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.

- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Project Engineer. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
 - B. Site: Maintain Project site free of waste materials and debris.
 - C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
 - E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
 - F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
 - G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Three paragraphs below reduce or eliminate the need for similar provisions in other Sections. Insert other provisions needed because of unusual Project conditions. Specify unusual provisions for specific work in the individual Section.
 - H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
 - I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
 - J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- 3.8 STARTING AND ADJUSTING
- A. Coordinate startup and adjusting of equipment and operating components with requirements in City of Arvada Engineering Standards and Specifications.
 - B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
 - C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in City of Arvada Standards.

3.9 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Repair Work previously completed and subsequently damaged during construction period
Repair to like-new condition.
- C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- D. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

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SECTION 033010 – MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, joint materials, and finishes.
- B. This section is applicable to cast-in-place cut off walls, collars, or vaults. All other flatwork shall be governed by the City of Arvada Standards.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with fly ash or ground granulated blast furnace slag; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - 2. Review construction, joints; forms and form removal limitations; cold- and hot-weather concreting procedures; curing procedures; concrete finishes and finishing; concrete repair procedures, and concrete protection.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Concrete Design Mixtures: Design Mixtures: For each formulation of concrete proposed for use, submit constituent quantities per cubic yard (cubic meter), water cementitious ratio, air content, concrete slump, type and manufacturer of cement and type and manufacturer of fly ash or ground granulated blast furnace slag. Provide either:
 - 1. Standard deviation data for each proposed concrete mix based on statistical records.
 - 2. Water cementitious ratio curve for concrete mixes based on laboratory tests.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, spacing, lengths, material, grade, bar schedules, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, and supports for concrete reinforcement. Reference bars to be the same identification marks shown on the bar bending details.
- D. Material Certificates: For each of the following:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Curing compounds.
 - 6. Bonding agents.
- E. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates: Conformance to ASTM standards, including sieve analysis, mechanical properties, deleterious substance content, mortar bar expansion test results, and proof that the aggregate non-reactive.
 - 2. Mill Test Reports: Conformance to ASTM standards, including chemical analysis and physical tests.
 - a. Cementitious materials.
 - b. Steel Reinforcing.
- F. Special Waterstops: Product data including location of use, sample, catalogue cut, technical data, storage requirements, splicing methods, installation instructions, and conformity to CRD, ASTM or FS standards, as applicable.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For independent testing agency responsible for concrete design mixtures.
- B. Certifications:
 - 1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.

- 2. Certificate of conformance for concrete production facilities from the NRMCA.
- C. Field quality-control reports.
- D. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Provide reinforcement free from mill scale, rust, mud, dirt, grease, oil, ice, or other foreign matter that will reduce or destroy bond. Deliver, store, and handle steel reinforcement to prevent bending and damage. Store reinforcement off the ground, protect from moisture, and keep out of standing water, and free from rust, mud, dirt, grease, oil, ice, or other contaminants and deleterious matter that will reduce or destroy bond.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions. Limit total storage time from date of manufacture to date of installation to six months or the manufacturer's recommended storage time, whichever is less.
- D. Remove immediately from the site material which becomes damp, contains lumps, or is hardened and replace with acceptable material.
- E. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location.
 - 2. Provide additional protection according to manufacturer instructions.

1.9 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average of the highest and lowest temperature from midnight to midnight is expected to fall below 40 deg F for three successive days, maintain delivered concrete temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENT

- A. Product Experience: Provide expansive waterstops products specifically manufactured for intended purpose and have five years' successfully experience in similar applications.

2.2 MATERIALS - SPECIAL WATERSTOPS

- A. Preformed Expansion Type Hydrophilic Rubber Strips:
 - 1. Installation Adhesives: Use with expansive waterstops as recommended by waterstop manufacturer.
 - 2. Acceptable Manufacturers: Provide products manufactured by one of the following or equal:
 - a. Adeka: Adeka Ultraseal MC-2010MN.
 - b. GCP Applied Technologies Inc: ADCOR 500S.

2.3 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.
 - 2. ACI 117.

2.4 FORM-FACING MATERIALS

- A. Surface Finish 2.0 Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- C. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces. Form-release agent to comply with Federal, State and local VOC limitations.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- D. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete, heavy high frequency vibration of the concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to retaining walls.

2.5 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, new deformed bars.
- B. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M, Grade 60, deformed bars, assembled with clips.

2.6 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete of greater compressive strength than the specified concrete strength, according to CRSI's "Manual of Standard Practice," and as follows:
 - 1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
- B. Tie wires for reinforcement: 16 gauge or heavier black annealed wire to tie uncoated reinforcing.

2.7 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C150/C150M, Type II. Total equivalent alkali content of the cement used not to exceed 0.60 percent as provided in the Optional Chemical Requirements of ASTM C150.
 - 2. Fly Ash: ASTM C618, Class F.
 - 3. Ground Granulated Blast Furnace Slag: ASTM C989/C989M, Grade 100 or 120.
- C. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: As indicated by concrete mixtures specified herein.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. ASTM C260/C260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
- F. Water: ASTM C94/C94M and potable.

2.8 CURING MATERIALS

- A. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1-D, Class B, dissipating.

2.9 RELATED MATERIALS

- A. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types V, load bearing, for bonding freshly mixed concrete to hardened concrete.

2.10 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: limit percentage, by weight, of cementitious materials (Portland cement alone or in combination with fly ash or Ground Granulated Blast Furnace Slag) in concrete as follows:
 - 1. Fly Ash: 25 percent.
 - 2. Ground Granulated Blast Furnace Slag: 50 percent.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture in concrete, for placement and workability.

2.11 CONCRETE MIXTURES

- A. Structural Concrete 10-in or greater in thickness:
 - 1. Minimum Compressive Strength: 4500 psi at 28 days.
 - 2. Maximum W/C Ratio: 0.42.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch.
 - 4. Air Content: 4 percent, plus or minus 1.5 percent at point of delivery.
 - 5. Coarse Aggregate: ASTM C33, size 57.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94/C94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Erect, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Use form-facing materials as required to meet the surface finishes (SF) requirements of ACI 301, unless otherwise specified provide as-cast form finishes per ACI 301 as follows.
 - 1. Surface Finish (SF-2.0)
- D. Construct forms tight to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where necessary. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, ice, snow and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations must be maintained.
 - 1. Leave formwork for structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing materials are not acceptable for exposed surfaces. Re-apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Project Engineer.

3.4 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose mill scale, rust, mud, dirt, grease, oil, ice, and other foreign materials that reduce or destroy the bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum clear concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Splicing:
 - 1. Lengths and locations of splices as indicated on the Drawings.
 - 2. If not indicated on Drawings, locate reinforcement splices at point of minimum stress.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Project Engineer.
- C. Identify water to be withheld at concrete batch plant to be added at Project site with high-range water-reducing admixtures. Constant quantity of water to be withheld from each batch of concrete. A maximum of 10 gallons of water may be withheld from each batch of concrete.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid “cold” joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
 - 4. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

3.6 INSTALLATION SPECIAL WATERSTOPS

- A. Install special waterstops at joints only where specifically indicated on Drawings. Provide waterstops continuous around corners and intersections to provide a continuous seal.
- B. Use waterstops of maximum practicable length to provide a minimum number of joints, connections, or splices. Make joints, connections, and splices conforming to manufacturer's recommendations.
- C. Terminate waterstops 2 inches below exposed top of walls.
- D. Expansive Type Waterstops:
 - 1. Clean and prepare joint surfaces, install primers or adhesives, and install expansive waterstops on dry surfaces in accordance with manufacturer's instructions, including concrete cure, temperature conditions, and splices.
 - 2. Use adhesive or tape to secure, expansive waterstops to previously placed vertical and overhead concrete surfaces and other locations, as recommended by manufacturer. Protect installed waterstops from moisture and keep dry until subsequent placement of concrete.

3.7 FINISHING SURFACES

- A. Finish concrete surfaces according to ACI 318.
- B. Surface Finish 2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to view.
- C. Float Finish: Apply float finish per ACI 301 prior to broom finish or trowel finish.
- D. Broom Finish: After concrete has received a float finish, apply to smooth-formed-finished as-cast concrete surfaces subject to pedestrian traffic. Provide broom finish perpendicular to direction of pedestrian traffic.
- E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and chamfers.

3.9 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing.
- B. Formed Surfaces: Cure formed concrete surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

- a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

3.10 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing and inspection agency to perform field tests and inspections and prepare test reports.
- B. Notify the Owner when the reinforcing is complete and ready for inspection, at least six working hours prior to the proposed concrete placement. Do not cover reinforcing steel with concrete until the installation of the reinforcement, including the size, spacing and position of the reinforcement has been inspected by the Owner's inspection agency and the Owner's inspection agency release to proceed with the concreting has been obtained. Keep forms open until the Owner's inspection agency has completed inspection of the reinforcement.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements by the Owner's testing agency:
 1. Testing Frequency: One composite sample for each day's placement of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 2. Slump: ASTM C143/C143M; one test at point of discharge for each composite sample, but not less than one test for each day's placement of each concrete mixture. Additional tests will be performed when concrete consistency appears to change.
 3. Air Content: ASTM C231/C231M, pressure method, for concrete; one test for each composite sample at the point of placement, but not less than one test for each day's placement of each concrete mixture.
 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C31/C31M.
 - a. Cast and cure one set of five 6 inch x 12 inch long standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at 7 days, test one specimen at 14 days, test two specimens at 28 days. The fifth may be used to verify strength after 28 days if the 28-day test results are low.

7. Strength of each concrete mixture will be satisfactory if every average of any three-consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
8. Test results shall be reported in writing to Project Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break.
9. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Project Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Project Engineer.
10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033010

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SECTION 312323.33 - FLOWABLE FILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Flowable fill for:
 - a. Structure backfill.
 - b. Utility bedding.
 - c. Utility backfill.
 - d. Filling abandoned utilities.
 - e. Filling annular space for slip-lining.

1.3 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, manhole, tank, or cable.
- B. Excavatable Flowable Fill: Lean cement concrete fill used where future excavation may be required, such as fill for utility trenches, bridge abutments, and culverts.
- C. Non-excavatable Flowable Fill: Lean cement concrete fill used where future excavation is not anticipated, such as fill below structure foundations and filling abandoned utilities.

1.4 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- B. Field Quality-Control Submittals:
 - 1. Mix Design:
 - a. Furnish flowable fill mix design for each specified strength.
 - b. Furnish separate mix designs when admixtures are required for the following:
 - 1) Flowable fill Work during hot and cold weather.
 - 2) Air entrained flowable fill Work.

- c. Identify design mix ingredients, proportions, properties, admixtures, and tests.
 - d. Sieve analysis of aggregate.
- 2. Furnish test results to certify flowable fill mix design properties meet or exceed specified requirements.
- C. Delivery Tickets:
 - 1. Furnish duplicate delivery tickets indicating actual materials delivered to Project Site.
- D. Qualifications Statements:
 - 1. Submit qualifications for supplier.

1.5 QUALITY ASSURANCE

- A. Perform Work according to CDOT and City of Arvada standards.
- B. All testing and inspection services required, unless otherwise specified, are paid for by the Contractor. Testing necessary to establish the mix shall be performed by and at the expense of the Contractor. Methods of testing shall comply with the latest applicable ASTM Methods except as specified herein.

1.6 QUALIFICATIONS

- A. Supplier:
 - 1. Company specializing in supplying products specified in this Section with minimum three years' experience.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Store or stockpile fly ash, aggregate and cement in conformity with the recommendations of ACI 301.
- B. Minimum Conditions: Do not install flowable fill during inclement weather or when ambient temperature is less than 40 degrees F.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements before installing flowable fill to establish quantities required to complete the Work.

PART 2 - PRODUCTS

2.1 FLOWABLE FILL

- A. Furnish materials according to CDOT and City of Arvada standards.
- B. Flowable fill mix designs shall be from the City and County of Denver Approved CLSM list and submitted to the Project Engineer prior to placement.
- C. Flowable fill comprehensive strength shall not exceed 150 psi to allow for excavation without pneumatic equipment.
- D. Cellular grout is acceptable for use filling annular space in slip-lining applications. Cellular grout shall have a minimum strength of 100 psi.

2.2 MIXES

- A. Mix and deliver flowable fill according to ASTM C94/C94M, Option C.
- B.
- B. Provide water content in design mix to produce self-leveling, flowable fill material at time of placement.
- C. Design mix air entrainment and unit mass are for laboratory design mix and source quality control only.

2.3 SOURCE QUALITY CONTROL

- A. Test and analyze properties of flowable fill design mix and certify results for the following:
 - 1. Design mix proportions by weight of each material.
 - 2. Aggregate: ASTM C33 for material properties and gradation.
 - 3. Properties of plastic flowable fill design mix including:
 - a. Temperature.
 - b. Slump.
 - c. Air entrainment.
 - d. Wet unit mass.
 - e. Yield.
 - f. Cement factor.
 - 4. Properties of hardened flowable fill design mix including:
 - a. Compressive strength at 1 day, 7 days, and 28 days. Report compressive strength of each specimen and average specimen compressive strength.
 - b. Unit mass for each specimen and average specimen unit mass at time of compressive strength testing.

B. Prepare delivery tickets containing the following information:

1. Project designation.
2. Date.
3. Time.
4. Class and quantity of flowable fill.
5. Actual batch proportions.
6. Free moisture content of aggregate.
7. Quantity of water withheld.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify utility installation is complete and tested before placing flowable fill.
- B. Verify excavation is dry and dewatering system is operating.

3.2 PREPARATION

- A. Support and restrain utilities to prevent movement and flotation during installation of flowable fill.
- B. Protect structures and utilities from damage caused by hydraulic pressure of flowable fill before fill hardens.
- C. Protect utilities to prevent intrusion of flowable fill.

3.3 INSTALLATION - FILL, BEDDING, AND BACKFILL

- A. Project Engineer approval required for the condition of subgrade and method of placement.
- B. Remove all debris and foreign matter from the excavation before depositing flowable fill.
- C. Do not place flowable fill in water or submerge within 24 hours after placing.

3.4 INSTALLATION - FILLING ABANDONED UTILITIES

- A. Verify pipes and conduits are not clogged and are sufficiently empty to permit gravity installation of flowable fill for entire length indicated to be filled.
- B. Seal lower end of pipes and conduits by method to contain flowable fill and to vent trapped air caused by filling operations.

- C. Place flowable fill using method to ensure there are no voids.
 - 1. Fill pipes and conduits from high end.
 - 2. Fill manholes, tanks, and other structures from grade level access points.
- D. After filling pipes and conduits seal both ends.

3.5 FIELD QUALITY CONTROL

- A. Perform inspection and testing according to ASTM C94/C94M.
 - 1. Take samples for tests for every 150 cu yd of flowable fill, or fraction thereof, installed each day.
 - 2. Sample, prepare and test four compressive strength test cylinders per ASTM D4832. Test one specimen at 3 days, one at 7 days, and two at 28 days.
 - 3. Measure temperature at point of delivery when samples are prepared.
- B. Perform in place penetration (density) tests using hand held penetrometer to measure penetration resistance of hardened flowable fill according to ASTM C403.
- C. Defective Flowable Fill: Fill failing to meet the following test requirements or fill delivered without the following documentation.
 - 1. Test Requirements:
 - a. Minimum temperature at point of delivery.
 - b. Compressive strength requirements for each type of fill.
 - 2. Documentation: Duplicate delivery tickets.

3.6 CLEANING

- A. Remove spilled and excess flowable fill from Project Site.
- B. Restore facilities and Site areas damaged or contaminated by flowable fill installation to existing condition before installation.

END OF SECTION 312323.33

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SECTION 330509.33 - THRUST RESTRAINT FOR UTILITY PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Tied joint restraint system.

1.3 PREINSTALLATION MEETINGS

- A. See Section 013100 "Project Management and Coordination" for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.4 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer catalog information for restrained joint details and installation instructions.
- B. Shop Drawings:
 - 1. Restrained joint details and materials being used.
 - 2. Layout drawings showing piece numbers and locations.
 - 3. Restrained joint locations.

1.5 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- B. Manufacturer Instructions: Detailed instructions on installation requirements, including storage and handling procedures.
- C. Qualifications Statement: Qualifications for manufacturer, fabricator, and licensed professional.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of joint restraints.

1.7 QUALITY ASSURANCE

- A. Perform Work according to AWWA, City of Arvada and CDPHE standards.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
- B. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store materials according to manufacturer instructions.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.10 FIELD CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 APPROVED PRODUCTS

- A. Refer to City of Arvada list of Approved Products, latest edition for approved restraint systems.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Provide pressure pipeline with restrained joints at each bend, tee, line valve and change in direction.

2.3 TIED JOINT RESTRAINT SYSTEMS

A. Tie Bolts:

1. Mechanical Joints on 2 and 3 inch Pipe:
 - a. Size: 5/8 inch.
 - b. Comply with ASTM A588/A588M, Grade B.
 - c. Comply with ASTM A325, Type 3, except increase tensile strength of full body threaded section to 40,000 lb. minimum for 5/8 inch and 60,000 lb. minimum for 3/4 inch by heat-treating (quenching and tempering) to manufacturer's reheat and hardness specifications.
2. Mechanical and Flanged Joints on 4 to 12 inch Pipe:
 - a. Size: 3/4 inch.
 - b. Comply with ASTM A588/A588M, Grade B.
 - c. Comply with ASTM A325, Type 3, except increase tensile strength of full body threaded section to 40,000 lb. minimum for 5/8 inch and 60,000 lb. minimum for 3/4 inch by heat-treating (quenching and tempering) to manufacturer's reheat and hardness specifications.
3. Mechanical Joints on 14 to 24 inch Pipe:
 - a. Size: 3/4 inch.
 - b. Comply with ASTM A588/A588M, Grade B and ASTM A325, Type 3.
4. Mechanical and Flanged Joints on 30 inch and Larger Pipe:
 - a. Size: 1 inch.
 - b. Comply with ASTM A588/A588M, Grade B.
 - c. Comply with ASTM A325, Type 3, except increase tensile strength of full body threaded section to 100,000 lb minimum by heat-treating (quenching and tempering) to manufacturer's reheat and hardness specifications.

B. Tie Nut:

1. Description: Hex nut for each tie bolt and tie rods.
2. Comply with ASTM A563, Grade C3.

C. Tiepin:

1. Bends and Hydrants: 3/4 inch round bar stock.
2. Size and Shape: 6 inch hairpin.
3. Comply with ASME B1.1 and ASTM A588/A588M.

D. Tie Coupling:

1. Description: Extension of continuous-threaded rods.
2. Provide with center stop to aid installation.
3. Comply with ASTM A588/A588M.

E. Tie Clamp:

1. Description: Retainer clamp for ductile iron, asbestos-cement, and PVC push-on pipe.
2. Location: In front of bell.
3. Comply with ASTM A36/A36M, ASTM A307, Grade A, and ASTM A563, Grade A.

F. Tie Rod:

1. Description: Continuous-threaded rod for cutting to desired lengths.
2. Comply with ASTM A588/A588M, Grade B, ASTM A325, Type 3, and ASME B1.1.

G. Tie Bar:

1. Description: Steel bar used to restrain push-in plugs.
2. Comply with ASTM A36/A36M.

H. Tie Washer:

1. Description: Round flat washers.
2. ASTM A588/A588M, ASTM F436, Type 1.

2.4 MATERIALS

A. Steel:

1. High-Strength Low-Alloy Steel: Comply with ASTM A588/A588M.
2. Carbon Steel: Comply with ASTM A36/A36M.

2.5 FINISHES

- A. Zinc Plating: Factory applied. Comply with ASTM B633.
- B. Galvanizing: Factory applied. Comply with ASTM A153/A153M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Section 017300 "Execution" for installation examination.
- B. Verify that pipe and fittings are ready to receive Work.
- C. Field measure and verify conditions for installation of Work.

3.2 PREPARATION

- A. See Section 017300 “Execution” for installation preparation.
- B. Clean surfaces of pipe and fittings that are to receive tied joint restraint systems.

3.3 INSTALLATION

- A. Install joint restraint system according to AWWA C600 such that joints are mechanically locked together to prevent joint separation and State of Colorado Department of Transportation standards and Municipality of Arvada Department of Public Works standards and standards set by authorities having jurisdiction.

3.4 TOLERANCES

- A. See City of Arvada Standards for tolerances.
- B. Torque 5/8 inch nuts on mating threaded fasteners from 45 to 60 ft lbf as recommended by the joint restraint manufacturer.
- C. Torque 3/4 inch nuts on mating threaded fasteners from 75 to 90 ft lbf as recommended by the joint restraint manufacturer.
- D. Torque 1 inch nuts on mating threaded fasteners from 100 to 120 ft lbf as recommended by the joint restraint manufacturer.

END OF SECTION 330509.33

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SECTION 330513 - MANHOLES AND STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Modular precast concrete manhole and structures with tongue-and-groove joints covers, anchorage, and accessories.
 - 2. Bedding and cover materials.

1.3 ACTION SUBMITTALS

- A. Section 013300 "Submittal Procedures" for submittals requirements.
- B. Product Data: Submit cover and frame construction, features, configuration, and dimensions.
- C. Shop Drawings: Indicate manhole locations, elevations, piping, sizes and elevations of penetrations.

1.4 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificate: Products meet or exceed specified requirements.
- B. Manufacturer Instructions: Detailed instructions on installation requirements, including storage and handling procedures.
- C. Field Quality-Control Submittals: Results of Contractor-furnished tests and inspections.
- D. Qualifications Statements: Qualifications for manufacturer.

1.5 QUALITY ASSURANCE

- A. Perform Work according to City of Arvada Standards.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Unload, store, and handle precast manholes according to manufacturer instructions.
- B. Storage: Store precast concrete manholes as to prevent damage to Owner's property or other public or private property.
 - 1. Repair property damaged from materials storage.

1.8 AMBIENT CONDITIONS

- A. Subsequent Conditions: Maintain materials and surrounding air temperature at minimum 50 degrees F prior to, during, and 48 hours after completion of masonry Work.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Equivalent strength: Based on structural design of reinforced concrete as outlined in ACI 318 (318M).
- B. Design of Lifting Devices for Precast Components: According to ASTM C913.
- C. Design of Joints for Precast Components:
 - 1. According to ASTM C913.
 - 2. Maximum Leakage: 0.025 gal. per hour per foot of joint at 3 feet of head.
- D. Shaft Construction: Concentric with eccentric cone top section; lipped male/female joints; sleeved to receive pipe sections.
- E. Shape: Cylindrical.
- F. Clear Inside Dimensions: As indicated on Drawings.
- G. Design Depth: As indicated on Drawings.
- H. Clear Cover Opening: As indicated on Drawings.
- I. Pipe and Conduit Entry: Furnish openings as indicated on Drawings.

2.2 MANHOLES AND STRUCTURES

A. Manhole and Structure Sections: Reinforced precast concrete according to ASTM C478

1. Gaskets: According to ASTM C923.

2.3 FRAMES AND COVERS

A. Manufacturers (24"):

1. Deeter 1258
2. Neenah R-1706
3. Nennah R-1741
4. East Jordan Iron Works 2420
5. East Jordan Iron Works 2405-C with 2420 Z1 ring
6. East Jordan Iron Works 3624 Castings, Inc. 550-31 aluminum only

B. See City of Arvada Approved Product List for Additional Details

2.4 MATERIALS

A. Bedding and Cover:

1. Bedding: See City of Arvada Standards.
2. Cover: See City of Arvada Standards.

2.5 ACCESSORIES

A. Manhole and Structure Steps: Per City of Arvada Standard Details.

B. Base Pad: Leveled top surface..

C. Strap Anchors: Bent galvanized unfinished steel shape.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017300 "Execution" for installation examination requirements.

B. Verify that items provided by other Sections of Work are properly sized and located.

C. Verify that built-in items are in proper location and ready for roughing into Work.

D. Verify correct size of manhole and structure excavation.

3.2 PREPARATION

- A. Section 017300 “Execution” for installation preparation requirements.
- B. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers as indicated on Drawings to indicate its intended use.
- C. Coordinate placement of inlet and outlet pipe or duct sleeves required by other Sections.
- D. Do not install structures where Site conditions induce loads exceeding structural capacity of structures.
- E. Inspect precast concrete structures immediately prior to placement in excavation to verify structures are internally clean and free from damage; remove and replace damaged units.

3.3 INSTALLATION

- A. Excavation and Backfill:
 - 1. Provide clearance around sidewalls of structure for construction operations.
 - 2. When groundwater is encountered, prevent accumulation of water in excavations; place manholes and structures in dry trench.
 - 3. Where possibility exists of watertight structure becoming buoyant in flooded excavation, anchor structure to avoid flotation as approved by Project Engineer.
- B. Base Pad:
 - 1. Place base pad.
 - 2. Trowel top surface level.
- C. Place manhole and structure sections plumb and level, trim to correct elevations, and anchor to base pad.
- D. Backfill excavations for manholes and structures as specified by City of Arvada standards.
- E. Form and place manhole and structures cylinder plumb and level and to correct dimensions and elevations.
- F. Cut and fit for pipe.
- G. Grout base of shaft sections to achieve slope to exit piping, trowel smooth, and contour as indicated on Drawings.
- H. Set cover frames and covers level without tipping and to correct elevations.
- I. Coordinate with other Sections of Work to provide correct size, shape, and location.

J. Precast Concrete Manholes and Structures:

1. Lift precast components at lifting points designated by manufacturer.
2. When lowering manholes and structures into excavations and joining pipe to units, take precautions to ensure that interior of pipeline and structure remains clean.
3. Set precast structures bearing firmly and fully on crushed stone bedding, compacted as specified in City of Arvada Standards or on other support system as indicated on Drawings.
4. Assemble multi-section structures by lowering each section into excavation; set level and firmly position base section before placing additional sections.
5. Remove foreign materials from joint surfaces and verify sealing materials are placed properly.
6. Maintain alignment between sections by using guide devices affixed to lower section.
7. Joint sealing materials may be installed on Site or at manufacturer's plant.
8. Verify that installed manholes and structures meet required alignment and grade.
9. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe; fill annular spaces with mortar.
10. Cut pipe flush with interior of structure.
11. Shape inverts through manhole and structures as indicated on Drawings.

3.4 FIELD QUALITY CONTROL

A. Test concrete manhole and structure sections according to ASTM C497.

B. Test cast-in-place concrete as specified in Section 033000 "Cast-in-Place Concrete."

C. Vertical Adjustment of Existing Manholes and Structures:

1. If required, adjust top elevation of existing manholes and structures to finished grades as indicated on Drawings.
2. Reset existing frames, grates, and covers that were carefully removed and cleaned of mortar fragments to required elevation according to requirements specified for installation of castings.
3. When removal of existing concrete wall is required, remove concrete without damaging existing vertical reinforcing bars, clean concrete from vertical bars, and bend into new concrete top slab or splice to required vertical reinforcement as indicated on Drawings.
4. Clean and apply sand-cement bonding compound on existing concrete surfaces to receive cast-in-place concrete as specified in Section 033000 – Cast-in-Place Concrete.

D. Leakage Tests:

1. Performed on every manhole with Project Engineer observing.
2. Preparation:
 - a. Prior to placing the shelf and invert, and pointing the horizontal joints, fill all lifting holes within 6 feet of ground surface with approved non-shrinking mortar.
 - b. Lower groundwater table as required.
 - c. Plug all pipes and other openings into manhole.

3. Test:
 - a. Fill water to top of cone section.
 - b. Observe for visible water in the excavated area.
 - c. If area around manhole is backfilled or the test is unsatisfactory, repeat the test allowing for suitable time for absorption of water in the excavated area.
 - d. At the end of the absorption period, refill manhole and wait 8 hours.
 - e. Refill the cone at the end of 8 hours, measuring the amount required to refill.
 - f. Extrapolate to determine 24-rate of leakage. Do not allow leakage to exceed 1 gallon per vertical foot in a 24-hour period.
 - g. Project Engineer will perform visual inspection along with the Contractor.
4. Repair:
 - a. If leakage is less than 3 gallons per vertical foot per 24 hours, make approved repairs to the manhole and retest, if it is determined the leakage is due to defects in the joints or sections.
 - b. If leakage is 3 gallons or more, then replace the entire manhole, including all joints and sections at the Contractor's expense. Retest the new manhole as described above.

E. A vacuum test may be substituted for a leakage test as follows:

1. The filling and pointing of exterior joints are not required where the excavation has not been backfilled.
2. Inflate to affect a seal between the vacuum base and the top of the manhole.
3. Connect the vacuum pump to the outlet port with the valve open and a vacuum of 10" Hg (20" of Hg absolute) drawn.
4. Close the valve.
5. The following test criteria shall apply to 4-ft and 5-ft diameter manholes:
 - a. Allowable drops in pressure:
 - 1) Manholes 0 – 10 ft. deep:
 - a) Drop of 1" Hg over 2 minutes.
 - 2) Manholes 10 -15 ft. deep:
 - a) Drop of 1" Hg over 2-1/2 minutes.
 - 3) Manholes 15 - 30 feet:
 - a) Drop of 1" Hg over 3 minutes.
6. If the pressure drop exceeds the acceptable limits, make necessary repairs as approved by the Project Engineer, and:

- a. Re-test the manhole.
 - b. If the manhole fails to meet the minimum requirements of the vacuum test retest using the leakage test.
- 7. Upon completion of a successful vacuum test, the interior and exterior joints shall be filled and pointed.

3.5 CLEANING

- A. Clean all new manholes to be free of silt, debris and foreign matter of any kind, prior to final inspection.

3.6 ATTACHMENTS

- A. Storm Sewer Manholes: Precast concrete sections, galvanized steel steps, not less than 48 inches inside dimension, to depth indicated, with bolted lid.
- B. Electric Service Manholes: Prefabricated FRP sections, integral molded steps, 60 inches inside dimension, to depth indicated.

END OF SECTION 330513

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SECTION 330523 - HORIZONTAL DIRECTIONAL DRILLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section presents requirements for the approximate 268-foot-long and 137-foot-long Horizontal Directional Drilling (HDD) installation of the City of Arvada Water Department's 2-inch HDPE and 3-inch HDPE Site G crossing of Wadsworth Boulevard in Arvada, Colorado. The Contractor shall perform, but is not limited to the following tasks:
 - 1. Arrange and conduct a project kick-off meeting with the Owner, Project Engineer, General Contractor, and HDD Subcontractor prior to the initiating HDD construction.
 - 2. Review and confirm the HDD design for the proposed alignment meets the Contractor's selected means and methods.
 - 3. Transport all suitable equipment, labor and materials to and from the job site.
 - 4. Install the Carrier Pipe using Horizontal Directional Drilling including drilling the Pilot Bore and Reaming a suitable diameter Borehole for the installation of the Carrier Pipe into the Borehole. The selected materials must meet all project requirements and be approved by the Project Engineer.
 - 5. Cleanup and perform final restoration of all work areas.
- B. Related Sections:
 - 1. 012200 – Measurement and Payment.
 - 2. 331213 – Water Service Connections.

1.3 BASIS OF MEASUREMENT AND PAYMENT

- A. As specified in Section 01 22 00 – Measurement and Payment.

1.4 REFERENCES

- A. Technical Report TR-46, Guidelines for Use of Mini-Horizontal Directional Drilling.
- B. ASTM D3035-21, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
- C. Geotechnical Investigation Report, Lithos Engineering, Arvada 2021 Waterlines Replacement, Arvada, Colorado, February 2023.

- D. Plan and Profile Drawings, Arvada 2021 Waterlines Replacement, Arvada, Colorado, August 2022, G4 and G4B, February 2023.
- E. National Utility Contractors Association (NUCA): NUCA – HDD Installation Guidelines.
- F. North American Society for Trenchless Technology (NASTT).
 - 1. HDD Good Practices Guidelines – 2017 (4th Edition).

1.5 DEFINITIONS

- A. REAMER: A tool that connects to drill pipe and is designed to enlarge the Borehole after the Pilot Bore has been established.
- B. BORE OR BOREHOLE: The elongated cavity created through the drilling process. The Borehole is not a void, but rather a hole filled and stabilized with Drilling Fluids mixed with native soil/formation.
- C. CARRIER PIPE: Final product waterline Carrier Pipe; 2-inch HDPE ISP SDR11 HDPE and 3-inch HDPE ISP SDR11 HDPE.
- D. CASING PIPE: Pipe installed along the designed trenchless alignment that also serves as the Initial Support
- E. COA: City of Arvada.
- F. CONTRACTOR: Specialty HDD subcontractor in charge of installing the carrier pipe using HDD.
- G. DRILL HEAD: Tooling used to facilitate steering and to excavate soil or rock at the face of the Bore.
- H. DIMENSION RATIO (DR): The ratio of Carrier Pipe diameter to wall thickness; $DR = D/t$ where “D” is the outside diameter and “t” is the pipe wall thickness.
- I. DRILLING FLUIDS: Fluids consisting of water, bentonite and any Project Engineer approved additives such as environmentally safe polymers, lubricants, and viscosifiers.
- J. FILTER CAKE: The wall cake that forms from the platelets in bentonite-based Drilling Fluid. Filter Cake is the barrier between the Borehole and the formation, this can help protect the Borehole from lost circulation.
- K. HORIZONTAL DIRECTIONAL DRILLING (HDD): A surface-launched trenchless technology for the installation of pipes, conduits, and cables. HDD creates a pilot bore along the design pathway and reams the pilot bore in one or more passes to a diameter suitable for the product, which is pulled into the prepared bore in the final step of the process.
- L. INADVERTENT FLUID RELEASE (IFR): When the Drilling Fluid pressure exceeds the strength and confining pressure of the ground and Drilling Fluid leaves the Borehole and reaches the surface, waterway, or underground facilities. Also known as hydrofracture or frac-out.

Horizontal Directional Drilling

- M. **MAXIMUM ALLOWBLE DOWNHOLE PRESSURE:** Drilling Fluids injection pressure at which higher pressures will theoretically cause IFR to occur. Estimates of this pressure for a given location within the Borehole use subsurface geotechnical engineering properties, Drilling Fluid properties, HDD means and methods, and HDD alignment geometry.
- N. **PILOT BORE:** The initial, controlled drilled path used to establish the plan and profile of the HDD, guide Borehole enlargement to the required size, and define the eventual final alignment of the Carrier Pipe.
- O. **PITCH:** The deviation angle from a horizontal plane is measured as Pitch. When the drill is directed downward, the Pitch is negative. When it is directed toward the surface, the Pitch is positive. Also known as inclination.
- P. **PULLBACK:** The Carrier Pipe installation process where the Carrier Pipe is connected behind the Reamer using a Swivel and pulling head and the Carrier Pipe is pulled into place.
- Q. **REAMING:** The enlargement of the initial Pilot Bore in one or more passes to accommodate the desired Carrier Pipe diameter.
- R. **SWAB PASS:** A proof pass with a barrel or compacting style Reamer of equal to or greater diameter than the Carrier Pipe used to check the Borehole is properly conditioned and has been prepared to an appropriate final diameter. The Swab Pass does not cut the Borehole to a larger diameter from the Borehole diameter established during the final Reaming pass.
- S. **SWIVEL:** A device that allows the pullhead and Carrier Pipe to be isolated from drill pipe rotation yet transfers tensile forces from the drill pipe to the pullhead.
- T. **TRACKING SYSTEM:** Equipment and procedures that allow for the positioning of the downhole assembly to be tracked during Pilot Bore drilling. The Borepath is monitored during the Pilot Bore by taking periodic readings of the measured distance, inclination, and azimuth of a sonde located within the downhole assembly. Generally categorized as a walkover or non-walkover system. Readings can be compared to the Drawings to determine the accuracy of the drilled Borepath.

1.6 GENERAL

- A. The Contractor shall be responsible for the HDD design verification, construction, and performance of the HDD installation of the Casing and Carrier Pipe for this project.
- B. This is a performance specification. Minimum design and construction requirements are presented herein and in the Drawings. It is the Contractor's responsibility to review and confirm the design to fulfill the specified design requirements specified by the COA necessary for completion of the work.
- C. A geotechnical investigation was completed for the project as indicated in Section 1.4B.

1.7 REQUIREMENTS

- A. Obtain permits by submitting applications and notify impacted Governing Agency(s), for this work prior to beginning construction activities as dictated by the specific application. Provide copies of executed permits to the Owner. Be responsible for full compliance with all permit conditions. Failure to comply with permit conditions can result in the Project Engineer/Owner shutting down the construction within the Governing Agency(s) right-of-way until compliance is established and confirmed. Compliance with permit conditions shall be established and verified at no additional cost to the Owner.
- B. Perform HDD in accordance with all Governing Agency(s) applicable permit requirements and industry standards. In the case of differing Governing Agency(s) specifications or requirements, the more stringent requirements shall apply as determined by the Owner.
- C. Provide a Tracking System that is capable of tracking the Pilot Bore progress within the specified tolerances herein.
- D. Provide adequate communication between entry and exit locations if work is being performed at both ends of the alignment.
- E. Notify Colorado 811 a minimum of three complete working days or as required by conflicting utility owners prior to any excavation or drilling and obtain utility clearance for all construction work. This utility clearance shall remain active and be updated for the duration of the project.
- F. Be responsible for containing, collecting and cleanup of all Drilling Fluid released by remediation tasks which may be required by the Project Engineer or permit agencies. Such work shall be at no additional cost to the Owner.
- G. Conduct operations so as not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.8 QUALITY ASSURANCE

- A. Prior to beginning any HDD work, establish and mark field survey of the proposed drill path including starting and ending point locations and intermediate marks at a maximum spacing of the length of one drill rod using the City of Arvada's Professional Land Surveyor registered in the State of Colorado.

1.9 QUALIFICATIONS

- A. Contractor shall meet the minimum qualification requirements as identified in the City of Arvada Request For Qualifications Bid. Additionally, the Contractor shall submit names and experience resumes for key field personnel. Key staff shall demonstrate on their resumes that they meet the following qualifications:
 - 1. HDD Project Manager: Minimum three years' experience as a Project Manager and have a minimum of three similar HDD project experience. Similar projects are defined as:

- a. At least five (5) HDD installations of at least 2-inch nominal diameter HDPE with a minimum length of 250 feet each and that have passed within the last five (5) years.
 - b. One of these previous projects shall have been a crossing of CDOT ROW through significant percentages of gravel and/or cobble (at least 30 percent) along a significant portion of the alignment.
2. HDD Superintendent: Minimum three years' experience as a superintendent and have a minimum of three similar HDD project experience.
- B. All personnel employed by the Contractor in the work shall be experienced and competent in their respective tasks and shall work only under the direct control of a suitably experienced Superintendent specified in this Section.

1.10 SUBMITTALS

- A. Submit the following submittals with sufficient detail to allow the Project Engineer to determine whether the proposed means and methods, materials, and equipment meet the specified requirements. Project Engineer acceptance of Contractor submittals shall not relieve the Contractor of their responsibilities under this contract.
- B. Preconstruction: Submit to the Project Engineer the following a minimum of two weeks before the scheduled start of HDD related construction activity:
 1. Qualification Documentation, see Paragraph 1.9.
 2. Submit copies of all required permits for the HDD work.
 3. An accident prevention program, a site-specific health and safety plan, and an emergency response plan.
 4. The Contractor shall review and confirm in writing the design for the proposed HDD installation prior to construction.
 - a. If proposed Borehole geometry differ from those indicated in the HDD design, differences shall be submitted in writing a minimum of 2 weeks prior to the start of construction for the Project Engineer approval.
 - b. If the Contractor wishes to substantially deviate, as determined by the Project Engineer, from the COA-supplied HDD design geometry then the Contractor is responsible for having a new HDD profile and alignment drawing. The revised design shall be submitted and approved by the Owner and Project Engineer prior to construction. The Project Engineer may perform these tasks for the Contractor upon agreement from the Owner and at the Contractors expense.
 5. Working Drawings including the following: work, storage, staging, and Carrier Pipe assembly areas; access; traffic control; layout of excavation and ancillary equipment for the Casing and Carrier Pipe installation; and pollution prevention measures.
 6. Schedule. A critical path schedule of HDD-related activities and activities for project components interfacing with the HDD installation. At a minimum, the schedule shall include site set up, Pilot Bore installation, ream pass(es), Casing pipe, Carrier Pipe Pullback, and Carrier Pipe testing.
 7. Equipment. Supply full details and manufacturer's technical specifications for the HDD system to be utilized including the following, at minimum: drill rig, pit pump, Tracking

System components, downhole tooling to include reamer numbers and sizes, and drill pipe loading equipment. All equipment shall meet the requirements of Paragraph 2.1.

- a. Tracking System submittal shall include the accuracy of the guidance system at the design drill depths and a description of how the Pilot Bore will be tracked during the installation. Include an example as-built plan and profile using the same Tracking System as proposed for this Work.
8. Materials. Supply manufacturer data sheets and identify the type and size for required materials to complete the project including:
- a. Casing Pipe (see Section 2.2). Include manufacturer's certificate certifying the Casing Pipe meets or exceeds specified requirements.
 - b. Carrier Pipe (see Section 2.2). Include manufacturer's certificate certifying the Carrier Pipe meets or exceeds specified requirements.
 - c. Tracer Wire (see Section 2.2)
9. Drilling Fluids:
- a. Include the proposed Drilling Fluid mix design based on anticipated subsurface conditions, including percentages of bentonite and additives. Include manufacturers information and purpose of any additives used in the mix design. The Drilling Fluid shall be designed to maintain and stabilize the Borehole during all phases of HDD installation.
 - b. Submit management procedures employed throughout the installation, including:
 - 1) Drilling Fluid Management Plan. Plan shall describe means and methods for containment, collecting and disposal of Drilling Fluid during the project, and equipment and materials that will be included in the Drilling Fluid Spill Kit.
 - 2) Drilling Fluid disposal plan listing the equipment to be used and the location that is willing and able to accept Drilling Fluid waste from the project.
10. Fuel and Hydraulic Fluid Containment and Contingency Spill Plan is required. Include means and methods for managing, containing, and cleanup of fuel and oil spills should they occur at the site. Contractor shall dispose of all fuel, oil, or other leakage from equipment including diapers, absorbent material, and other related cleanup and spill control materials. A Fuel and Oil Spill Kit shall be on site and available for use during all drilling operations.
11. Contingency plans for the following scenarios are required and shall include, measures that will be taken to minimize probability of the below scenarios, observations that may indicate the presence of the scenario occurring, and possible actions that may be taken in the event the scenario occurs:
- a. Inadvertent Fluid Return (IFR). The plan shall specifically address methods and procedures to minimize the possibility of an IFR and contain a potential IFR through Geotechnical Bore LB-03 conducted roughly 15-feet south of the alignment as shown on the Contract Drawings. The plan shall also address how drilling fluids will be contained in the event of an IFR in Wadsworth Boulevard.
 - b. Loss of Drilling Fluid circulation.
 - c. Obstruction encountered during Pilot Bore drilling or Reaming.
 - d. Broken drill pipe.

- e. Broken Casing or Carrier Pipe during Casing or Carrier Pipe positioning or Pullback
 - f. Pull back pipe stoppage during pipe pull back of Casing or Carrier Pipe due to Borehole collapse or other obstruction.
 - g. Utility strike or damage to an existing utility.
 - h. Line or grade outside specified tolerances.
 - i. Unforeseen subsurface conditions.
- C. Construction: Submit the following to the Project Engineer during construction, within 24 hours of the day they describe:
- 1. A preliminary Pilot Bore as-built shall be submitted and accepted prior to proceeding with Reaming.
 - 2. Drill Logs (minutes per drill pipe, torque (ft-lbs), thrust (lbs), depth or inclination and measured distance, azimuth and measured distance or distance left/right, Pitch, drilling fluid pressure (psi), as a minimum. Drill Logs shall be digital and recorded by the drill rig or Tracking System as appropriate.
 - 3. Drilling Fluid logs: Include sand content, density, and viscosity measurements, as well as quantities of additives, bentonite, and water used when mixing Drilling Fluid.
- D. Post construction Submittals:
- 1. As-built plan and profile information for the Borepath based on electronic guidance system data. At a minimum, a survey data point shall be obtained for the As-Built drill path at a maximum spacing equivalent to one drill pipe.
 - 2. Identify and describe unexpected variations to subsurface conditions or discovery of uncharted utilities.
 - 3. Show depth and location of any abandoned drill paths.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. The Subcontractor shall transport, handle, and store Casing and Carrier Pipes and fittings as recommended by the manufacturer.
- B. Product pipe and fittings that are damaged before or during installation shall be repaired or replaced, as recommended by the manufacturer or required by the Project Engineer. The costs of such repair or replacement shall be borne by the Contractor and be accomplished prior to proceeding with the project.
- C. The Contractor shall deliver, store and handle other materials as required to prevent damage. Materials that are damaged or lost shall be repaired or replaced by the Contractor at no additional expense to the Project Engineer or Owner.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Protect piping system pieces from entry of foreign materials and water by temporary covers, completing sections of work, and isolating parts of completed system.

- F. Accept products on site in manufacturer's original containers or configuration. Inspect for damage.
- G. Store field joint materials per manufacturer's recommendations.

1.12 ENVIRONMENTAL REQUIREMENTS

- A. The Contractor shall comply with all other Federal, State, and local environmental requirements including, but not limited to, storm water runoff, construction dewatering, disposal of drilling fluid, and hazardous waste management and disposal.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. Provide the equipment necessary for excavation of the Borepath and HDD installation of the waterline and to complete all work associated with this section.
 - 1. The drill rig shall have a minimum capability of 10,000 lbs. of thrust/pullback.
- B. Drilling fluid spill kit shall be adequate to contain, collect, and dispose of drilling fluid that is either spilled on site or surfaced to the ground or waterbody through an IFR. A drilling fluid spill kit shall be located at each end of the Borepath during all HDD operations.
- C. Be responsible for type of drill rig, drill pipe, drill and Reaming tools, Drilling Fluid management, and other pertinent equipment required for complete installation of the proposed Casing and Carrier Pipe. Be responsible for mobilizing on-site with a full range of drill stems and Reaming heads to allow for the anticipated subsurface conditions, based on the boring logs. Drill pipes shall be of proper size and diameter to allow for full thrust and torque capabilities of the drilling machines.
- D. Provide a Tracking System that is capable of tracking the Pilot Bore progress within the specified tolerances. The Tracking System shall be capable of providing horizontal and vertical steering data along the entire drill path for this crossing as shown in the Drawings.
 - 1. Tolerances for the HDD plan and profile are provided in PART 3.
 - 2. The tracking system must be a non-walkover type, such as wire line tracking system.

2.2 MATERIALS

- A. Pipe:
 - 1. Casing and Carrier Pipes shall be as shown on the Drawings and shall be specifically capable of installation by HDD method. Increase the thickness the Casing and Carrier Pipe or grade of pipe material at the Contractors discretion and sole expense. The Carrier Pipe shall be in accordance with the pipe manufacturer's specifications and guidelines for HDD. Adhere to pipe manufacturer's installation guidelines for: 1) handling, 2) positioning into

the Borehole, 3) end preparations, mating procedures, and installation, and 4) special applications.

a. Casing Pipe allowed:

- 1) 4-inch and 6-inch nominal diameter HDPE with a minimum DR 11
- 2) Casing Pipe shall include two tracer wires attached opposite each other during Pullback with tape or other means to keep the tracer wires in place.

b. Carrier Pipe allowed:

- 1) 2-inch and 3-inch nominal diameter HDPE with a minimum DR 11
- 2) Carrier Pipe shall be suitable for use as a pressure conduit.

2. Drilling Fluids:

- a. Drilling Fluid design and Drilling Fluid maintenance to design parameters shall be the responsibility of the Contractor. The Drilling Fluid shall be non-toxic and consist of bentonite slurry and additives compatible with the Drilling Fluid approved by the Project Engineer. It shall be the Contractor's responsibility and cost to obtain and pre-treat make-up water as required.
- b. A water source for Drilling Fluids will be provided by the Owner. The Contractor shall be responsible for transporting the water from the source to the project site.
- c. Drilling Fluids shall be non-hazardous and suitable for landfill or similar disposal.
- d. Remove all Drilling Fluids from the site and dispose of all Drilling Fluids as required by Governing Agency(s) and local codes.

3. Fill materials shall be in accordance with Specification Section 31 23 10 – Excavation and Backfill.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Do not begin work until:

1. Required preconstruction submittals listed in Section 1.10 have been accepted by the Project Engineer and Owner.
2. Verify connection to existing piping system size, location, and invert elevations are in accordance with the Drawings.
3. All required permits are in place and the Governing Agency(s) have been satisfactorily notified of the schedule and work.

B. Identify required lines, levels, contours, and datum locations.

C. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

- D. Perform grading and site modifications necessary to control Drilling Fluids and prevent drainage of fluids or contaminated material away from the site. A minimum 1-foot-tall berm shall be constructed, or straw wattles shall be used around the drill rig and convey Drilling Fluids nearest the drill rig.
- E. Perform Borehole excavation operations in a manner that will minimize loss of ground and minimize settlement of the ground surface, structures, and utilities above and adjacent to the alignment.
- F. Drilling Fluid may be used during Pilot Bore, Reaming, and Pullback. Drilling Fluid may be present within the Borehole to the extent possible throughout the HDD operation.
- G. Prior to the Pilot Bore and each Reaming Pass, sufficient Drilling Fluid shall be mixed such that Drilling Fluid pump rates are sufficient to flush cuttings from the hole for the planned excavation rate without requiring a pause in excavation to allow for additional Drilling Fluid to be mixed. In the event sufficient Drilling Fluid is not prepared, in the opinion of the Project Engineer or the COA, the COA or Project Engineer reserves the right to stop HDD construction and request the HDD Contractor to mix additional Drilling Fluid prior to continuing.
- H. Excavate approach trenches in accordance with approved Working Drawings and as site conditions require for the HDD installation and open cut pipe connection. Minimize excavation to the extent reasonable.
- I. Maintain clean working conditions at all times at the job site. All excavated soil, and any other material not required for construction shall be removed from the excavation area in a timely manner.
- J. Safety fencing shall be installed around the perimeter of any pits during nonworking hours.
- K. The Borehole shall be reamed to a sufficient size at least 1.5 times larger in diameter than the Casing Pipe specified in the Contract Documents.
- L. Contractor shall assume liability for loss or damage to downhole equipment.
- M. Install and operate HDD equipment and support utilities as necessary for the proposed construction and the safety of workers in accordance with project requirements and all Federal, State, and local laws, regulations, and codes.
- N. Casing and Carrier Pipe shall be laid out and assembled in such a manner as to not obstruct or impact traffic or third parties within the easement limits presented on the Drawings.

3.2 HORIZONTAL DIRECTIONAL DRILLING

- A. Perform HDD in a manner required to install Casing and Carrier Pipe as indicated on the Drawings. Furnish all manpower and equipment required to perform the Casing and Carrier Pipe installation. The operation shall include all excavation, Pilot Bore, Reaming, conditioning, and Pullback operations, at a minimum. The Contractor shall:
 - 1. Be responsible for mixing the required Drilling Fluids to suit the proposed drilling application and the subsurface materials to be encountered. Drilling Fluids shall be utilized

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- and mixed in full accordance with the Drilling Fluid manufacturer's printed instructions. Subsurface material information has been provided in the Geotechnical Investigation Report for the project.
2. Be responsible for collecting and disposal of excess Drilling Fluids and cuttings. Materials shall be collected, transported and disposed of at an approved site or facility.
- B. Drilling shall be conducted with controlled Drilling Fluid and advancement rates to minimize Borehole annular pressures and prevent from excavating at a rate not able to be maintained by the mud pump.
- C. Continuously monitor drilling fluid pumping rate and pressure during HDD operations to ensure adequate removal of soil cuttings and stabilization of bore.
- D. At minimum, monitor sand content, density, and viscosity of the Drilling Fluid no less than once every two hours during HDD operations.
- E. Pilot Bore
1. The Pilot Bore shall progress from the HDD entry location at the eastern end of the HDD alignment to the HDD exit location on the western end of the HDD alignment for both bores.
 2. Guide and monitor the Pilot Bore using the accepted Tracking System.
 3. Drill the Pilot Bore along the vertical and horizontal alignment as indicated on the Drawings, within the tolerances specified herein.
 4. Establish and mark field survey of the installed drill path, including starting and ending point locations and intermediate stakes at a maximum spacing of one drill pipe.
 5. If the Pilot Bore is sufficiently off line and grade such that the Casing Pipe will not meet the tolerances specified herein, a new Pilot Bore meeting the line and grade tolerances specified herein shall be drilled at the sole expense of the Contractor.
 6. Maintain the minimum offset between the drill holes and the existing utilities as shown on the Drawings.
- F. Reaming
1. After completing the Pilot Bore, the hole may be enlarged using a reamer as determined by the Contractor. Be responsible for conditioning the Borehole as necessary prior to the installation of the Casing Pipe. Conditioning may include utilizing tooling that provides compactive force on Borehole walls.
 2. The final conditioned Borehole diameter shall be in concert with HDD Good Practices Guidelines.
- G. Pullback
1. Do not proceed with Pullback without an accepted submittal of the Pilot Bore as-built profile and alignment.
 2. Pullback operations shall be carried out as soon as possible following any Swab Pass of the Borehole. The Swab Pass, if used, shall be completed a maximum of 4 hours prior to Pullback. During Pullback, the Contractor shall continue Pullback operations without interruption regardless of the day of week or hour of the day.

3. A Pullback head shall be attached to the Casing Pipe to allow fastening to the Swivel. The head shall be closed to prevent Drilling Fluid from entering the Carrier Pipe during Pullback and be fixed to the Carrier Pipe in accordance with pipe Manufacturer's recommendations.
4. Do not damage the Casing or Carrier Pipes during installation.
5. Do not rotate the Casing or Carrier Pipes during installation.
6. Do not exceed the pipe manufacturer's recommended maximum pullback forces.
7. Do not bend the Casing or Carrier Pipe at a bend radius tighter than the manufacturer's recommendations.
8. Install continuous tracer wire without splices. Tape or insulate trace wire to prevent corrosion and maintain integrity of pipe detection.
9. At completion of Pullback, Carrier and Casing Pipe shall extend a minimum of 5 feet past connection locations or as recommended by the manufacturer, whichever is greater.

3.3 QUALITY CONTROL

- A. All existing utilities within the project area shall be marked and/or potholed by the Contractor prior to initiating HDD operations, including connecting pit excavations.
 1. Where the drill path is designed to cross within 10 feet of an existing utility, the utility shall be potholed and monitored throughout HDD construction through the open pothole.
- B. Perform all work in the presence of the Project Engineer, unless the Owner or Project Engineer has granted prior approval in writing to perform such work in their absence.
- C. Perform all work in accordance with all current applicable regulations and codes of Federal, State, and local agencies. In the event of conflict, comply with the most restrictive requirements.
- D. Drilling Fluid monitoring shall be at the Contractor's expense and discretion.
 1. Stop drilling, search for an IFR, and notify the Project Engineer if a Drilling Fluid circulation volume or Drilling Fluid circulation pressure loss of 25 percent or greater is observed during HDD operations.
- E. Intermediate Drilling Fluid management locations, or relief wells, are not allowed and all Drilling Fluids shall be maintained. The Contractor shall account for managing Drilling Fluids in accepting the provided HDD design and in design of Drilling Fluids.

3.4 TOLERANCES

- A. The Casing and Carrier Pipes shall not be installed shallower than the minimum cover specified on the Contract Drawings at any point in the alignments.
- B. The entry and exit locations of the installed Casing and Carrier Pipes shall be within 2 feet radially of the locations shown on the Drawings.
- C. The Contractor shall be responsible for connecting the HDD installed pipeline to the open cut installed pipeline on either end of the HDD installation regardless of whether the HDD installed pipeline is within or outside of tolerances specified herein. Costs for any necessary connection

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appurtenances, or change or modification to these appurtenances to facilitate pipeline connection, shall be the sole expense of the Contractor.

- D. If the Casing and Carrier Pipes is off line and/or grade by more than the specified tolerances, make adjustments, repairs and changes, or replacement as necessary to achieve the specified tolerances as approved by the Project Engineer and at no cost to Owner.
- E. If the Casing and Carrier Pipes is sufficiently far off line and/or grade to require redesign of structures or connections, acquisition of easements, or backfilling and re-excavation, be responsible for necessary additional work at no additional cost to the Owner. If the Casing and Carrier Pipes are off line and/or grade by an amount that requires, in the opinion of the Project Engineer, re-design of any structure, be responsible for all redesign costs.

3.5 SAFETY REQUIREMENTS

- A. Methods of construction shall be such as to ensure the safety of the work, project participants, the public, third parties, and adjacent properties, whether public or private. All work shall conform to the requirements of all Federal, State, and local laws and regulations. Traffic control and minimum separation distances from travel lanes shall conform to the requirements of all Federal, State, and local laws and regulations. The Contractor is solely responsible for maintaining safe working conditions at the site at all times.
- B. Designate a Safety Officer. The Safety Officer shall administer an accident prevention program and shall prepare a code of safe practices and an emergency plan. Hold safety meetings daily prior to initiating work and provide safety instruction for new employees.
- C. Fire Prevention and Control: All construction shall be performed in accordance with the applicable fire prevention and control requirements of all Federal, State, and local agencies.

3.6 CLEANUP AND RESTORATION:

- A. Remove all equipment, unused materials, Drilling Fluids, and debris from the site at the end of the job. Restoration shall follow construction as the work progresses and shall be completed as soon as possible. Restore and repair any damage resulting from surface settlement caused by the work. Any property or improvements damaged or destroyed, shall be restored to a condition equal to or better than existing prior to construction at no additional cost to the Owner and as approved by the Project Engineer and Governing Agency(s). Restoration shall be completed immediately if a third party or the Owner is inconvenienced by the damage, and in no case later than thirty (30) days after the damage is discovered. This provision for restoration shall include all property which was affected by the construction operations.
- B. Dispose of all Drilling Fluids, cuttings, and Mud Circulation Pit spoil after completion of the project at a legal off-site disposal area and provide all permits necessary for such disposal. All fees and costs related to the collection, transport and disposal of fluids and cuttings and any related permit costs shall be the Contractor's responsibility. During transport, all fluids shall be contained in steel tanks or other suitable vessels. Pavement surfaces where Drilling Fluids have been spilled shall be sprayed off with water to achieve pre-construction condition.

3.7 DISINFECTION AND FLUSHING, PRESSURE AND LEAKAGE TESTING, BACKFILL

- A. Disinfection, flushing, pressure and leakage testing shall be conducted in accordance with City of Arvada Standards.

3.8 CONSTRUCTION RECORDS

- A. Maintain Daily Shift Reports for all components and phases of work. The reports shall be signed by the site superintendent or shift foreman, submitted to the Project Engineer within 24 hours of completed daily work, and shall contain the following:
 - 1. Subcontractors onsite with their personnel and equipment, and the work performed. The reports shall be broken down into work time and down/standby time for each Subcontractor.
 - 2. Work crews and equipment onsite, and the work performed. The reports shall be broken down into work time and down/standby time for each crew and piece of equipment.
 - 3. Progress made for each construction stage.
 - 4. Problems or unusual conditions encountered, and actions taken to address these situations.
 - 5. Record of safety meetings conducted.
 - 6. List of visitors to construction site.
- B. Maintain records of all instrumentation and monitoring of the Borehole excavation including but not limited to the following:
 - 1. The station of the excavation and advance distance with respect to drill pipe count and date and time.
 - 2. The position of the drill path in relation to the design line and grade as measured during the Pilot Bore installation.
 - 3. The date, starting time, and finish time.
 - 4. Drill and Drilling Fluid logs (Section 1.10).
 - 5. Any unusual conditions, breakdowns, and delays.
- C. Keep and maintain at the construction site a complete set of field drawings for the recording of as-built conditions. It shall be marked or noted thereon all field information, properly dated, recording up-to-date as-built conditions. As-built drawings shall be submitted and accepted by the Project Engineer prior to recommending final payment. Any survey completed before, during, or after construction shall be at the determination of the Contractor and shall be at no additional cost to the COA.
- D. Submit construction records digitally to the COA and Project Engineer.

END OF SECTION 330523

SECTION 330531.16 - POLYVINYL CHLORIDE PRESSURE PIPE FOR WATER SERVICE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Polyvinyl chloride (PVC) water pipe and fittings, complete as shown on Drawings and as specified.
 - 1. Pipe or Piping: Refers to all pipe, fittings, material and appurtenances required to construct PVC water pipe complete, in place.
 - 2. Equipment and materials specified are intended to be standard types used in transporting potable water.
- B. Related Requirements:
 - 1. Section 330509.33, "Thrust Restraint for Utility Piping."
 - 2. Section 330513, "Manholes and Structures."
- C. Coordinate Work of this Section with City of Arvada Standards.

1.3 PREINSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing Work of this Section.

1.4 ACTION SUBMITTALS

- A. Product Data: Name of pipe and fitting manufacturers, materials list furnished by each manufacturer and catalog information for each product.
- B. Shop Drawings:
 - 1. Piping layouts and schedules including dimensioning, fittings, types and locations of valves and appurtenances, and joint details.
 - 2. Methods and location of supports, anchorage, gasket material, grade of material and all other pertinent technical information.
 - 3. Indicate restrained joint locations.

1.5 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificate: Submit certified test reports that products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Document actual locations of installed pipe.

1.7 QUALITY ASSURANCE

- A. Perform Work according to City of Arvada and CDPHE Standards. In cases of conflict, City of Arvada standards take precedence.
- B. PVC water pipe shall be from a single manufacturer.
- C. PVC pipe installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory provided by Owner.
 - 1. Manufacturer's cooperation is required in these inspections.
 - 2. cost of plant inspection of pipe approved for this Contract, plus cost of inspection of a reasonable amount of disapproved pipe, will be borne by Owner.
- D. Inspections of pipe may also be made by Project Engineer or other representatives of Owner after delivery.
 - 1. Pipe is subject to rejection at any time due to failure to meet any of requirements specified, even though sample pipes may have been accepted as satisfactory at place of manufacture.
 - 2. Marked for identification, rejected pipe and removed from job at once.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 - 1. Bundled or package items to provide adequate protection of ends during transportation to site. Pipe damaged in shipment will be replaced as directed by Project Engineer.
 - 2. Where applicable, deliver materials in manufacturer's packaging including application instructions.

- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
 - 1. Any gouges or scratches that extend 10 percent or more into pipe wall shall be cause for rejection of that pipe.
 - 2. undamaged portion may cut off and used.
 - 3. Clearly mark rejected materials as rejected. Segregate and remove from site.
- C. Storage: Per manufacturer's instructions, referenced standards and as specified
 - 1. Adequately support stored pipe from below, at 3 feet maximum intervals to prevent deformation. Pipe stored in stacks no higher than that given in the following table or manufacturer's instructions whichever is more restrictive:
 - a. Pipe Diameter 8 inches or Less: Maximum Number of Rows Stacked: 5
 - b. Pipe Diameter 12 to 24: Maximum Number of Rows Stacked: 4
 - c. Pipe Diameter 24 to 30: Maximum Number of Rows Stacked: 3
 - d. Pipe Diameter 33 to 48: Maximum Number of Rows Stacked: 2
 - 2. Do not store plastic manholes, pipe, and fittings in direct sunlight.
 - 3. Store in a manner keeping materials at ambient outdoor temperatures.
 - 4. No pipe or fitting is to be exposed to sunlight for more than 30 days.
 - 5. Provide temporary shading as required to meet this requirement.
 - 6. Simple covering of pipe and fittings which allows temperature buildup or direct or indirect sunlight will not be permitted.
- D. Protection:
 - 1. Pipe and fittings showing cracks, or which have received a blow that may have caused an incident fracture, even though no such fracture can be seen, is to be marked as rejected and removed at once from work.
 - 2. Thoroughly clean pipe and fittings before installation. Keep interior clean until testing
 - 3. Handle per manufacturer's written rigging instructions.
 - a. Use special devices and methods as required to achieve results specified. Do not use uncushioned devices in handling.
 - 4. Store gaskets for mechanical and push-on joints in cool and dry location, out of direct sunlight, and not in contact with petroleum products.
 - 5. Provide additional protection according to manufacturer instructions.

1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field locations and sizes of connections to existing piping and equipment prior to submitting pipe lay drawings.
 - 2. Document field measurements on Shop Drawings.

1.11 WARRANTY

- A. Furnish two-year manufacturer's warranty for PVC pipe and fittings.

PART 2 - PRODUCTS

2.1 SYSTEMS

- A. Contractor is responsible for compatibility between pipe materials, fittings and appurtenances.

2.2 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

- A. Polyvinyl Chloride (PVC) Pipe:

1. PVC Pressure Pipe: 4 through 60 inch per AWWA C909 requirements.
2. Piping 12 inch and Less: Class 200 with a Dimension Ratio of 21.
3. Piping Materials: PVC compounds Class 12454 as defined in ASTM D1784.
 - a. Mark pipe lengths with manufacturer's name or trademark, size, material code, pressure class, AWWA designation number and seal of test agency that verified pipe material for potable-water service.

- B. Polyvinyl Chloride (PVC) Fitting:

1. Bell and Spigot Push-on Joints.
 - a. Bell: Consists of integral wall section with solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly.
 - b. Installation of elastomeric gasketed joints and joint performance: Per ASTM F477, ASTM D3139. Joint lubricants as recommended by manufacturer and meet all requirements of NSF/ANSI Standard 61 (NSF 61).
2. Fittings and Accessories for Waterlines and Sewers: Bell and/or spigot configurations compatible with pipe.
3. Fittings for Water Mains: Cast or ductile iron per AWWA C110 or C153 for mechanical joints. Furnish Adaptors, fittings, and transition gaskets necessary to connect cast or ductile iron fittings to PVC.
4. PVC Fittings: Per AWWA C900. Pressure rating same as or higher than pipeline. If color is based on local requirements, change as needed.
5. Water Lines: Blue in color.
6. Install restraining glands. Restraining glands for PVC pipe shall conform to AWWA C111 and be Megalug by EBAA Iron Sales Inc., or equal.

2.3 ACCESSORIES

- A. Provide Trace wire for placement above direct buried utility in accordance with City of Arvada Standards.

2.4 SOURCE QUALITY CONTROL

- A. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
- B. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that excavation base is ready to receive Work.
- B. Verify that excavations, dimensions, and elevations are as indicated on Drawings.
- C. Do not deviate centerline of pipe from a straight line drawn between centers of openings at ends of pipe by more than 1/6 inch per foot of length.

3.2 PREPARATION

- A. Pipe and Fittings: Thoroughly cleaned before installation and kept clean until they are used in Work.
 - 1. When laid, must conform to lines and grades required.

3.3 INSTALLATION

- A. As soon as excavation is complete to normal grade of bottom of trench:
 - 1. Place bedding, compact and grade to provide firm, uniform, and continuous support for pipe.
 - 2. Excavate bell holes so only barrel of pipe bears upon bedding.
 - 3. Lay pipe accurately to lines and grades indicated on Drawings.
 - 4. Blocking under pipe is not permitted.
- B. Bedding Placement:
 - 1. Place Bedding evenly on each side of pipe to mid-diameter.
 - a. Use hand tools to force bedding under haunches of pipe and into bell holes to give firm continuous support for pipe.
 - 2. Place bedding to 12 inches above top of pipe.
 - 3. Place initial 36 inch of backfill above bedding in 12 inches layers and carefully compacted.
 - 4. Compaction: Generally done evenly on each side of pipe.
 - a. Compaction Equipment: Do not operate directly over pipe until sufficient backfill has been placed ensuring such compaction equipment will not damage pipe.

- b. Obtain pipe manufacturer's approval of equipment used in compacting initial 36 inch of backfill prior to use.
- C. Piping:
 - 1. Install PVC pipe and fittings per requirements of manufacturer, ASTM D2321 and AWWA C605 or as otherwise specified.
 - 2. Sound and clean before installation.
 - 3. When installation is not in progress, including lunchtime, open ends of pipe must be closed by watertight plug or other approved means.
 - 4. Preserve proper alignment during installation.
 - 5. Joint Deflection: Not to exceed manufacturer recommendations.
 - 6. Fittings: Provide in addition to those shown on Drawings, if required, in crossing utilities that may be encountered upon opening trench.
- D. Defective Pipe Discovered After Installation: Remove and replace with sound pipe in a satisfactory manner.
- E. When Cutting Pipe: By machine, leaving a smooth cut at right angles to pipe axis.
 - 1. Cut Ends of Pipe Used with Bell: Bevel to conform to manufactured spigot end and a reference mark made at same distance from pipe end as measured from a factory marked end from same manufacturer.
 - 2. Project Engineer may examine each bell and spigot end to determine whether any preformed joint has been damaged prior to installation.
 - a. Reject pipe having defective joint surfaces. Marked as defective and immediately remove from job site.
- F. Pipe lengths must have assembly mark aligned with pipe previously laid and held securely until enough backfill has been placed to hold pipe in place. Joints must not be subjected to any applied longitudinal or lateral stresses other than bedding compaction as specified.
- G. Before Joint are Made: Inspect pipe to assure a close joint with next adjoining pipe has been maintained and that inverts are matched and conform to required grade. Do not drive pipe down to grade by striking it.
- H. Take precautions to prevent flotation of pipe in trench.
- I. Moveable Trench Bracing: Trench boxes, moveable sheeting, shoring or plates to support sides of trench.
 - 1. Prevent movement of pipe, and disturbance of pipe bedding and backfill, when placing and moving boxes or supporting bracing.
 - 2. Do not allow Trench boxes, moveable sheeting, shoring or plates to extend below top of pipe. If trench boxes, moveable sheeting, shoring or plates are installed below top of pipe, they must be moved slowly taking care not to disturb pipe, bedding or backfill. As trench boxes, moveable sheeting, shoring or plates are moved, Place pipe bedding filling voids created and then recompact backfill to provide uniform side support for pipe.

- J. Concrete Thrust Blocks: Installed at fittings and locations as directed by Project Engineer.
1. Minimum bearing area shall be as shown on Drawings.
 2. Place blocks against undisturbed material and must not cover joints, bolts or nuts, or interfere with removal of any joint.
 3. Wooden side forms may be provided for thrust blocks.
- K. Jointing:
1. Restrained Joints: Install where shown on Drawings.
 2. Jointing PVC Pipe (Push-on type):
 - a. Installed in strict accordance with manufacturer's instructions.
 - b. Lay pipe with bell ends looking ahead.
 - c. Be sure joint surfaces clean.
 - d. Insert a rubber gasket in groove of bell end of pipe.
 - e. Lubricate with approved lubricant per manufacturer's recommendations.
 - f. Insert plain end of pipe to be installed into bell of pipe to which it is to be joined, and when in alignment pushed home with a come-along or by other means.
 - g. Check that reference mark on spigot end is flush with end of bell.
 3. Jointing Mechanical Joint Fittings:
 - a. Mechanical Joints at Valves, Fittings and Where Designated: Jointed per AWWA C111 and manufacturer detailed instructions.
 - b. PVC Sewer Pipe and Fittings: Jointed per recommendations of latest ASTM standards and manufacturer detailed instructions.
 - c. Install Suitable PVC to cast iron adaptors prior to installing fittings.
 - d. Cut PVC beveled spigot flush prior to insertion in mechanical joint pipe.
 - e. Field Assembled Joints: Thoroughly clean joint surfaces and rubber gaskets with soapy water before tightening bolts to specified torques.
 - 1) Under no circumstances are extension wrenches or pipe over handle of ordinary ratchet wrench to be used to secure greater leverage.
- L. Pipe Identification: Install pipe identification per City of Arvada Standards.

END OF SECTION 330531.16

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SECTION 330531.19 - FUSIBLE POLYVINYL CHLORIDE (fPVC) PRESSURE PIPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Furnish all labor, materials, equipment and incidentals required and install and test fusible polyvinyl chloride (fPVC) force main pipes and fittings, complete with all necessary jointing facilities and materials, specials, adapters and other appurtenances as shown on the Drawings and as specified herein for HDD crossings.

1.3 SUBMITTALS

- A. Submit to the Project Engineer, within 30 days of the Effective Date of the Agreement, the name of the pipe and fitting manufacturers and a list of materials to be furnished by each manufacturer. Also, include information on local representative for each manufacturer, if product is sold through a distributor.
- B. Shop Drawings including piping layouts and schedules shall include dimensioning, fittings, types and locations of valves and appurtenances, joint details, methods and location of supports, anchorage, gasket material, grade of material and all other pertinent technical information for all items to be furnished.
- C. Prior to each shipment of pipe, certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM and AWWA Standards specified herein shall be submitted.
- D. Submit a plan to the Project Engineer that would discuss steps/procedures to ensure that the original pipe internal diameter will be the same after the pipe installation including post grouting of the annulus between the pipe and the borehole.
- E. Submit a plan to the Project Engineer that would discuss a testing method to measure the pipe internal diameter upon completion of the installation of the pipe including removing the water used for ballasting the pipe during pullback.

1.4 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. ASTM D638 - Standard Test Method for Tensile Properties of Plastics
2. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
3. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
4. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
5. ASTM D2444 - Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
6. ASTM D2584 - Standard Test Method for Ignition Loss of Cured Reinforced Resins
7. ASTM F1057 - Standard Practice for Estimating the Quality of Extruded Poly (Vinyl Chloride) (PVC) Pipe by the Heat Reversion Technique

B. American Water Works Association (AWWA):

1. AWWA C110/C153 - Standard for Ductile-Iron and Gray-Iron Fittings
2. AWWA C111 - Standard for Rubber-Gasket Joints for Ductile-Iron Pipe and Fittings
3. AWWA C605 - Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
4. AWWA C900 - Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14-in Through 36-in.

C. National Sanitation Foundation (NSF):

1. Standard No. 14 - Plastic Piping Components and Related Materials.

D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.5 QUALITY ASSURANCE

- A. All fPVC water pipe and fittings shall be from a single manufacturer. The supplier shall be responsible for the provisions of all test requirements specified in NSF Standards No. 14, 60 and 61 as applicable. In addition, all fPVC pipe to be installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory provided by the Owner. The Contractor shall require the manufacturer's cooperation in these inspections. The cost of plant inspection of all pipe approved for this Contract, plus the cost of inspection of a reasonable amount of disapproved pipe, will be borne by the Owner.
- B. Inspections of the pipe may also be made by the Project Engineer or other representatives of the Owner after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the requirements specified herein, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once.

C. Fusion Technician Requirements:

1. Fusion Technician shall be provided by the pipe supplier and be fully qualified by the pipe supplier to install fusible polyvinyl chloride pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project. Fusion Technician shall have three (3) years of experience in order to provide their services on the project.

1.6 SYSTEM DESCRIPTION

- A. Contractor shall be responsible for compatibility between pipe materials, fittings, and appurtenances.

1.7 DELIVERY, STORAGE AND HANDLING

- A. All items shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the Project Engineer.
- B. Care shall be taken in loading, transporting, and unloading items to prevent damage to the items, particularly in colder temperatures.
- C. All items shall be examined before installation and no piece shall be installed which is found to be defective. Handling and installation of pipe and fittings shall be in accordance with the manufacturer's instructions, referenced standards and as specified herein.
- D. Any pipe or fitting showing a crack, or which have received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the Work.
- E. While stored, pipe shall be adequately supported from below at not more than 3-ft intervals to prevent deformation. The pipe shall be stored in stacks no higher than 3 pipes.
- F. Pipe and fittings shall be stored in a manner which will keep them at ambient outdoor temperatures and out of the sunlight or delivered to the site so that no pipe is exposed to sunlight for more than 60 days. Temporary shading as required to meet this requirement shall be provided. Simple covering of the pipe and fittings which allows temperature build-up or direct or indirect sunlight will not be permitted.
- G. If any defective item is discovered after it has been installed, it shall be removed and replaced with an exact replacement item in a satisfactory manner by the Contractor, at the Contractor's own expense. All pipe and fittings shall be thoroughly cleaned before installation and the interior shall be kept clean until testing.
- H. In handling the items, use special devices and methods as required to achieve the results specified herein. No uncushioned devices shall be used in handling the item.

PART 2 - PRODUCTS

2.1 FUSIBLE POLYVINYL CHLORIDE (fPVC) PIPE AND FITTINGS

- A. fPVC pressure pipe shall conform to the requirements of AWWA C900. The pipe shall be made from PVC compounds Class 12454 as defined in ASTM D1784. Each pipe length shall be marked with the manufacturer's name or trademark, nominal pipe size, material code, Dimension Ratio, pressure class, AWWA reference and seal of test agency that verified pipe material for sewer service and service for carrying brine discharges. All pipes 12-inch and smaller shall be Fusible C-900 DR21, 200 psi maximum working pressure. All pipes larger than 12-inch shall be Fusible C-900 DR25, 165 psi maximum working pressure.
- B. Fusible PVC pipe shall be extruded with plain ends. The ends shall be square to the pipe, with no bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.
- C. All fittings for force mains shall be cast or ductile iron conforming to AWWA C110/C153 for mechanical joints. All adaptors, fittings, and transition gaskets necessary to connect cast or ductile iron fittings to PVC shall be furnished. Joint restraint shall be EBAA Iron, Inc., Series 2000PV, Uni Flange, Romac Industries or approved equal.
- D. Fusible PVC pipe shall be furnished by Underground Solutions, Inc.

2.2 ACCESSORIES

- A. Provide tracer wire to be installed alongside fusible PVC via slip lining. Tracer wire shall be 7 x 7 stranded copper clad steel, extreme strength with 4,700 lb break load, with minimum 50-mil HDPE insulation thickness, or equal.

PART 3 - EXECUTION

3.1 HOST PIPE PREPARATION

- A. The host pipe shall be cleaned in accordance with all applicable standards and guidelines. Unless otherwise specified, all interior pipe surfaces shall be cleaned per AWWA M28. The number of cleaning passes will depend on the method used and what is needed to create a uniform interior host pipe surface that is free of all loose material and sharp edges. Any potentially deleterious areas of the host pipe should be removed or secured in place, prior to the insertion of fusible polyvinyl chloride (PVC) pipe.
- B. Hazardous materials shall be removed and disposed of per all applicable requirements and regulations.

3.2 VIDEO INSPECTION

- A. The host pipe shall be inspected by video camera after or during the cleaning process in accordance with these specifications.
- B. Video camera inspection after host pipe cleaning shall indicate condition of host pipe and the suitability of host pipe for fusible polyvinyl chloride (PVC) pipe insertion.
- C. Obstructions such as corporation taps, valves, and valve bodies, and collapsed piping shall be remedied prior to pipe insertion. Spot repairs shall be made in accordance with the project contract drawings and these specifications.

3.3 INSTALLATION OF FUSIBLE PVC PIPE AND FITTINGS

- A. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional cost to the Owner. All pipe and fittings shall be thoroughly cleaned before installation, shall be kept clean until they are used in the Work and when laid, shall conform to the lines and grades required. fPVC pipe and fittings shall be installed in accordance with requirements of the manufacturer, or as otherwise provided herein.
- B. All pipe shall be sound and clean before installation. When installation is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plug or other approved means. Good alignment shall be preserved during installation. The bend radius of the pipe shall not exceed that recommended by manufacturer or as shown on the Drawings. Fittings, in addition to those shown on the Drawings, shall be provided, if required, in crossing utilities which may be encountered.
- C. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe.
- D. Make thermal butt fusion using only procedures that are recommended by the pipe manufacturer and in accordance with the manufacturer's and pipe supplier's written procedures for the fusion process.
- E. Install tracer wire alongside fPVC pipe to allow for future location of existing pipe.

3.4 JOINTING MECHANICAL JOINT FITTINGS

- A. Mechanical joints at valves, fittings and where designated shall be in accordance with the AWWA C111 and the instructions of the manufacturer. Suitable fPVC to ductile iron adaptors shall be installed prior to installing fittings. fPVC beveled spigot shall be cut flush prior to insertion in mechanical joint pipe. To assemble the joints in the field, thoroughly clean the joint surfaces and rubber gasket with soapy water before tightening the bolts.
- B. Bolts shall be tight to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage.

3.5 FUSION JOINTS

- A. Unless otherwise specified, fusible polyvinylchloride pipe lengths shall be assembled in the field with butt-fused joints. The Contractor shall follow the pipe supplier's written instructions for this procedure. Joint strength shall be equal to the pipe as demonstrated by testing requirements. All fusion joints shall be completed as described in this Specification.

3.6 FUSION PROCESS

A. General

1. Fusible polyvinylchloride pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this Specification and pipe supplier's recommendations.
2. Fusible polyvinylchloride pipe will be fused by qualified fusion technicians provided by the pipe supplier, as documented by the pipe supplier. Training records for qualified fusion technicians shall be available to Owner or Project Engineer upon request.
3. Each joint fusion shall be recorded and logged by an electronic monitoring device (data logger) affixed to the fusion machine. Joint data shall be submitted as part of the As-Recorded information, in accordance with this Specification.
4. The fusible polyvinylchloride pipe will be installed in a manner so as not to exceed the recommended bending radius.
5. Where fusible polyvinylchloride pipe is installed by pulling in tension, the recommended Safe Pulling Force, according to the pipe supplier, shall not be exceeded.
6. Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following properties, including the following elements:
 - a. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches within the pipe circle being fused. Plates shall be clean and free of any contamination. Heater controls shall properly function, and cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's recommendations.
 - b. CARRIAGE – Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.
 - c. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.
 - d. DATALOGGER - The current version of the pipe supplier's recommended and compatible software shall be used. Protective case shall be utilized for the handheld wireless portion of the unit. Datalogger operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.

7. Other equipment specifically required for the fusion process shall include the following:

- a. Pipe rollers shall be used for support of pipe to either side of the machine.
 - b. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement and /or windy weather.
 - c. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.
 - d. Facing blades specifically designed for cutting fusible polyvinylchloride pipe.
- B. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion of thermoplastic pipe. The software shall register and/or record the parameters required by the manufacturer and these Specifications. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

3.7 TESTING

- A. After the casing pipe installation, the casing pipe shall be tested for integrity of pipe internal diameter. Refer to Section 331300 Disinfecting of Water Utility Distribution for testing requirements.

3.8 GROUT FILLING ANNULAR SPACE

- A. Once installation is complete, contractor shall grout annular space as described by the approved grouting plan submittal per Paragraph 1.3.D.

END OF SECTION 330531.19

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SECTION 331213 - WATER SERVICE CONNECTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe and fittings for 2-inch water service connections to buildings.
 - 2. Curb stop assemblies.
 - 3. Underground pipe markers.
 - 4. Water Service Saddletaps.

1.3 ACTION SUBMITTALS

- A. Section 013300 "Submittal Procedures" for requirements for submittals.
- B. Product Data: Submit data on pipe materials, pipe fittings, corporation stop assemblies, curb stop assemblies, meters, meter setting equipment, service saddles, backflow preventer, and accessories.
- C. Shop Drawings: Indicate details showing vault and accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- B. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- C. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.5 CLOSEOUT SUBMITTALS

- A. Section 017700 "Closeout Procedures" for requirements for submittals.
- B. Project Record Documents: Record actual locations of piping mains, curb stops, connections, thrust restraints, and invert elevations.

- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store products and materials off ground and under protective coverings and away from walls.
- C. Exercise care in handling precast concrete products to avoid chipping, cracking, and breakage.

PART 2 - PRODUCTS

2.1 WATER PIPING AND FITTINGS

- A. Copper Tubing:
 - 1. Comply with ASTM B88.
 - 2. Type K, annealed.
 - 3. Fittings: Conform to ASME B16.18, cast copper.
 - 4. Joints: Compression connection.

2.2 SERVICE SADDLE

- A. Description:
 - 1. Type: Two stainless bands with brass body.
 - 2. Designed to hold pressures in excess of pipe working pressure.
 - 3. Shall be compatible with approved corporation stops.
- B. Manufacturers:
 - 1. AY McDonald, Model 3855
 - 2. Mueller, Model BR2S
 - 3. Ford, Model 202BS
 - 4. Romac, Model 202BS
 - 5. James Jones, Model J-969
 - 6. Power Seal, Model 3409

2.3 CURB STOP ASSEMBLIES

A. Manufacturers:

1. Mueller
2. Ford
3. AY McDonald
4. Cambridge
5. James Jones Co.

B. Curb Stops:

1. Body: Brass or red brass alloy.
2. Comply with AWWA C800 and ASTM B62.
3. Valve Type: Compression ball type.
4. Sealing: Positive pressure.
5. Working pressure: 300 psig maximum.

C. Curb Boxes and Covers:

1. Tyler 6500 Series Screw Type or 6860 Series Box in Asphalt.
2. Furnish per City of Arvada Standards

2.4 UNDERGROUND PIPE MARKERS

A. Install utility identification per City of Arvada Standards.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017300 "Execution" for requirements for installation examination.
- B. Verify that building service connections and municipal utility water main sizes, locations, and inverts are as indicated on Drawings.

3.2 PREPARATION

- A. Section 017300 "Execution" for requirements for installation preparation.
- B. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
- C. Remove scale and dirt from inside and outside of piping before assembly.
- D. Prepare pipe connections to equipment with flanges or unions.

3.3 INSTALLATION

A. Bedding:

1. Placement:
 - a. Place bedding material at trench bottom.
 - b. Level fill materials in one continuous layer not exceeding 6 inches compacted depth.
 - c. Compact to 95 percent maximum density.
2. Backfill around sides and to top of pipe with cover fill, tamp in place, and compact to 95 percent maximum density.

B. Pipe and Fittings:

1. Maintain separation of water main from sewer according to CDPHE code.

C. Curb Stop Assemblies:

1. Set curb stops on compacted soil.
2. Boxes:
 - a. Center and plumb curb boxes over curb stops.
 - b. Set box cover flush with finished grade.

D. Disinfection of Water Piping System:

1. Disinfect installed piping per City of Arvada Standards.

3.4 FIELD QUALITY CONTROL

- A. Section 017300 "Execution" for requirements for testing, adjusting, and balancing.
- B. Pressure test water distribution system according to AWWA C600.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

END OF SECTION 331213

APPENDIX A

GEOTECHNICAL INVESTIGATION REPORT

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GEOTECHNICAL INVESTIGATION REPORT

2021 WATER MAIN IMPROVEMENTS PROJECT

ARVADA, COLORADO

February 2023





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Denver, Colorado 80227
303.625.9502
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February 22, 2022
Project No. 21210

CDM Smith
555 17th Street, Suite 500
Denver, CO 80202

Attention: Ms. Shilpa Shivakumar, PE
Project Manager

Regarding: Geotechnical Engineering Investigation
2021 Water Main Improvements Project
Arvada, Colorado

Ms. Shivakumar,

Submitted herewith is the Geotechnical Engineering Investigation report for the 2021 Water Main Improvements Project. This study was conducted in general accordance with the Task Order with CDM Smith dated April 10, 2022. This report contains the subsurface data and geotechnical recommendations to aid design and construction of earth-related phases of this project.

If you have any questions regarding the contents of this report, please contact the undersigned.

Sincerely,
Lithos Engineering

A handwritten signature in black ink, appearing to read "Alex Warren".

Alex Warren, EI, GIT
Staff Engineer

A handwritten signature in black ink, appearing to read "James Carroll".

James Carroll, PE
Project Manager

A handwritten signature in blue ink, appearing to read "Benny Siljenberg".

Benny Siljenberg PE
Vice President



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B	Geotechnical Laboratory Testing Results

1 INTRODUCTION & PROJECT BACKGROUND

The City of Arvada (City) 2021 Water Main Improvements Project (Project) includes a series of water main replacements, relocations, installations, and interconnections at project sites located throughout the City. CDM Smith retained Lithos Engineering (Lithos) to provide geotechnical engineering and trenchless design services for the Project sites (Figure 1). The proposed improvements include:

1. A new 12-inch PVC interconnect in West 72nd Avenue under the Farmer's Highline Canal (Site E).
2. New service line connections to within the HomeDepot parking lot, Costco Wholesale on Wadsworth Boulevard. This site also includes : two 8-inch PVC lines, one 3-inch HDPE to copper line, and a 2-inch irrigation service line (Site G).
3. A new 12-inch PVC water main replacement in Jellison Street from Croke and Farmer's Highline Canal to West 74th Place (Jellison).
4. A 24-inch steel water main replacement in West 74th and Carr Street (74th).
5. A new installation 8 or 10-inch water main that will run along the south side of West 72nd Avenue (72nd).

The purpose of this report is to provide the results of the geotechnical investigation and geotechnical recommendations for design and construction of various project elements.

2 GEOLOGIC SETTING & GEOHAZARDS

2.1 Regional Geology

Geologic mapping performed by Bryant, B., McGrew, L.W., and Wobus, R.A. (1981) indicates the Project sites are underlain by Holocene-aged Post-Piney Creek and Piney Creek alluvium, Pleistocene-aged loess, Louviers alluvium, and Verdos alluvium. The Post-Piney Creek and Piney Creek alluvium is described as brown to gray to yellow clay, silt, and sand with coarse pebbly to cobbly gravel up to 30 feet thick. The loess deposits are described as brown, yellow, gray, or red slightly clayey, sandy silt or silty sand up to five feet thick. The loess generally contains small pebbles and can be calcareous. Louviers alluvium is described as brown, gray, yellow, or red clayey silt and sand and coarse-cobbly clayey sand and gravel up to 118 feet thick. The Verdos alluvium is described as red, brown, yellow, or gray clayey, silty sand and boulder gravel with a variable amount of calcareous cement and a thickness up to 69 feet. Bedrock in the area is mapped as Pleistocene to Upper Cretaceous-aged Denver and Arapahoe Formations. The Denver Formation is described as yellowish-brown to grayish-olive claystone, siltstone, and sandstone up to 951 feet thick. The Arapahoe Formation is described as yellowish-gray to yellowish-brown, coarse- to fine-grained quartz-mica-feldspar sandstone, siltstone, and claystone with thickness as much as 502 feet.

3 GEOTECHNICAL INVESTIGATION

Lithos conducted the subsurface investigation at the Project sites between May 19, 2022 and January 26th, 2023. The geotechnical investigation included geotechnical drilling and a geotechnical laboratory testing program. Lithos completed sixteen geotechnical borings to investigate the general subsurface conditions at the different Project sites. Boring location maps for each site are shown in Figures 2 through 9 at the end of this report.

Geotechnical borings were advanced to depths between 8.9 feet below the existing ground surface (bgs) and 31.5 feet bgs. Lithos subcontracted Vine Laboratories to drill the borings utilizing a CME 55/300 track-mounted drilling rig and CME 55 and CME 75 truck-mounted drilling rigs. Drilling and sampling procedures were conducted in general accordance with ASTM D3550 – *Standard Practice for Thick Wall, Ring-Lined, Split Barrel, Drive Sampling of Soils*, and ASTM D1587 – *Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes*. Continuous-flight, hollow-stem and solid-stem augers were used to advance borings below the existing ground surface through soil and into bedrock. During advance of the augers, split spoon and Modified California samples (1.4-inch inner diameter, 2.0-inch inner diameter) were obtained at 2.5- and 5-foot intervals. The number of blows by a 140-pound hammer falling 30-inches required for 12 inches of sampler penetration (recorded in 6-inch increments) are presented on the boring logs. Boring logs are included in Appendix A.

3.1 Geotechnical Laboratory Testing

A geotechnical laboratory testing program was developed by Lithos and conducted by Martinez Associates on representative samples collected during the subsurface investigation. A laboratory summary table is provided in Appendix B. Laboratory tests conducted in general accordance with associated ASTM standards are presented in the table below.

Geotechnical Laboratory Testing	
Test	Standard
Grain Size Distribution	ASTM D422/ASTM C136
#200 Sieve Wash	ASTM D1140
Unconfined Compressive Strength	ASTM D2166
Swell / Consolidation	ASTM D4546
Atterberg Limits	ASTM D4318
Moisture Content & Dry Density	ASTM D2216 & D2937

If field characterized soil or bedrock descriptions differed from results indicated by laboratory classification testing, the boring logs presented in Appendix A were amended to reflect laboratory testing results.

3.2 Corrosion Potential Testing

Bulk samples were collected from multiple borings at the Jellison and 74th project sites. Samples were delivered to QualCorr for testing, analysis, and corrosion recommendations. Results of the corrosion laboratory testing will be presented by QualCorr in a separate report.

4 SUBSURFACE CONDITIONS

Subsurface conditions were assessed based on the findings of the geotechnical investigation described in the previous section. Soil and rock descriptions noted on the boring logs and below are in general accordance with ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)* and D2488 – *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*.

4.1 Subsurface Materials

Primary materials encountered during the subsurface investigation include fill, fine alluvium, coarse alluvium, and claystone and sandstone bedrock of the Denver and Arapahoe Formations. Boring logs and a supplementary boring log key explaining boring log details are provided in Appendix A.

4.1.1 Fill

Fill was encountered in all borings at Site G and 72nd at the ground surface and extended to depths from 5 to 8 feet bgs. Encountered fill was described as the following in accordance with the United Soil Classification System (USCS):

- LEAN CLAY (CL)
- LEAN CLAY with sand (CL)
- LEAN CLAY with sand and gravel (CL)
- Sandy LEAN CLAY (CL)
- Sandy LEAN CLAY with gravel (CL)

Fill was primarily comprised of clay with varying amounts of sand and gravel with blow counts from 6 to 19 blows per foot (bpf) indicating a consistency of medium stiff to very stiff.

Two unconfined compressive strength (UCS) tests were conducted on fill samples with results of 1,946 and 3,240 pounds per square foot (psf).

Two swell-consolidation tests were performed on fill samples from 72nd. Both samples exhibited a swell of 0.3 percent under an inundation pressure of 500 psf and a swell pressure of 850 and 1,500 psf, respectively, indicating a low swell potential (as defined by the Colorado Association of Geotechnical Engineers (1996)).

4.1.2 Fine Alluvium

Fine alluvium was encountered in all borings at Site E, G, Jellison, 74th, and 72nd, generally at the ground surface or underlying fill and coarse alluvium, extending to depths from 5 to 31.5 feet bgs. Encountered fine alluvium was described as the following in accordance with the United Soil Classification System (USCS):

- LEAN CLAY (CL)
- LEAN CLAY with sand (CL)
- Sandy LEAN CLAY (CL)
- FAT CLAY with sand (CH)

Fine alluvium was primarily comprised of clay with varying amounts of sand. Blow counts ranged from 4 to 19 bpf indicating a consistency of soft to very stiff.

One unconfined compressive strength UCS test was conducted on the fine alluvium with a result of 1,125 psf.

4.1.3 Coarse Alluvium

Coarse alluvium was encountered in all borings at Site G and Jellison, generally at the ground surface or underlying fill and extended to depths from 10 to 25 feet bgs. Encountered coarse alluvium was described as the following in accordance with the United Soil Classification System (USCS):

- Clayey SAND (SC)
- Poorly-graded SAND with gravel (SP)
- Poorly-graded SAND with gravel and clay (SP-SC)
- Well-graded SAND with gravel and clay (SW-SC)
- Poorly-graded GRAVEL with sand and clay (GP-GC)

Coarse alluvium was primarily comprised of sand and gravel with varying amounts of clay. Blow counts ranged from 7 to 63 bpf indicating a loose to very dense relative density of.

4.1.4 Denver Formation Bedrock

Claystone bedrock of the Denver Formation was encountered in borings at Site G, with depths ranging from 18 to greater than 25 feet bgs to end of exploration. The bedrock was slightly weathered to fresh with blow counts of 41 bpf to 50 blows per 2 inches of sampler penetration (50/2”).

Two UCS tests were conducted on the bedrock with results ranging from 2,991 to 10,237 psf.

4.1.5 Arapahoe Formation Bedrock

Claystone and sandstone bedrock of the Arapahoe Formation was encountered in borings at Site E, Jellison, and 74th, with depths ranging from 5 and 30 feet bgs to end of exploration. Claystone bedrock was slightly to highly weathered with blow counts of 15 to 31 bpf. Sandstone bedrock was slightly to highly weathered with blow counts of 37 to 50/4”.

One UCS test was conducted on the claystone bedrock with a result of 5,348 psf. Two UCS tests were conducted on the sandstone bedrock with results ranging from 2,765 to 9,503 psf.

Two swell-consolidation tests were performed on the claystone bedrock. One sample from Site E exhibited a swell of 1.8 percent under an inundation pressure of 500 psf and a swell pressure of 1,240 psf, indicating a low swell potential (as defined by the Colorado Association of Geotechnical Engineers (1996)). One sample from 74th exhibited consolidation of 0.8 percent under inundation pressures of 500 psf. This consolidation sample is discounted in our analysis due to laboratory procedures on a disturbed sample.

4.2 Groundwater

Groundwater was encountered in eight borings during the subsurface investigation from 8.9 to 21.3 feet bgs. Groundwater was not encountered in boring LE-2 at Site E, LE 5 and 6 at Site G, and in any boring at 72nd. Fluctuations in the groundwater level may occur due to variations in rainfall, temperature, site development, and other factors not evident at the time that these measurements were made. The table below presents initial groundwater levels during drilling.

Groundwater Readings	
Boring	Groundwater Level (feet below existing ground surface)
LE-1 Site E	20
LE-2 Site E	Did Not Encounter
LE-1 Site G	10
LE-3 Site G	8.9
LE-5 Site G	Did Not Encounter
LE-6 Site G	Did Not Encounter
LE-7 Site G	9.4
LE-1 Jellison	17.9
LE-2 Jellison	16.7
LE-1 74th	21.3
LE-3 74 th	5.1
LE-72 nd -B1	Did Not Encounter
LE-72 nd -B2	Did Not Encounter
LE-72 nd -B3	Did Not Encounter
LE-72 nd -B4	Did Not Encounter
LE-72 nd -B5	Did Not Encounter

5 PIPELINE RECOMMENDATIONS

The following sections are included primarily for the engineer performing design. If additional geotechnical design and pipeline recommendations are necessary, Lithos should be contacted to provide the required information.

Corrosion Pipe installation trenches are anticipated to be backfilled with properly compacted granular pipe bedding material. Depending on the specific pipe type selected, the corrosion potential of soils and water surrounding trench backfill should be assessed. The designer should account for the corrosive soil conditions when selecting pipe materials based on the corrosion laboratory results presented by QualCorr in a separate report, presented in Appendix A.

5.1 Pavement Recommendations

Onsite pavement for access roads and parking areas should consist of 6-inch (full depth) asphalt without base course, 4-inches asphalt over 6 inches of Class 6 base course; or 5.5 inches of Portland Cement concrete without base course as per the City of Arvada Engineering Code of Standards and Specifications Section 700: Roadway and Parking Lot Design, Traffic Control Devices and Street Lighting. The subgrade should be proof rolled to verify stability and if the proof roll reveals soft or loose soils, the subgrade should be stabilized. Stabilization can be accomplished through the use of geotextile stabilization or by utilizing rockfill material over the base of the excavation.

5.2 Differential Movement

Pipelines excavated through various soils and bedrock will be susceptible to differential movements up to 1 inch. Pipe penetrations into structures should be designed to tolerate a total of 1 inch of upward or downward relative movement. Existing and proposed structures are expected to function as relatively rigid structures, therefore, flexible joints and/or connections between lines and structures are recommended. Allowance for differential movement should be expected and planned for where pipelines penetrate structures. We recommend CLSM backfill be used in pipe trenches within 10 feet of structures, in lieu of traditional pipe bedding and pipe trench backfill to mitigate the migration of groundwater which could lead to soil movement.

5.3 Thrust Restraint

Buried, pressurized pipes experience thrust forces at various pipe configurations including tees, reducers, dead ends, valves, bends, and wyes. In order to balance internal transient pressures, thrust blocks or restrained joints are recommended for pipe restraint. For thrust block design, the contractor is directed to follow the City of Arvada Standard detail 400-18. A minimum of 1 foot of cover over thrust blocks is recommended and thrust blocks should be oriented such that the passive pressure influence zones do not overlap for adjacent blocks and do not impact other subsurface utilities. If restrained joints are selected, various coefficients of friction for potential pipe materials against anticipated trench backfill material are presented below.

Coefficient of Friction for Buried Pipe	
Pipe Type	Coefficient of Friction
Steel	0.30
Ductile Iron	0.30
Plastic	0.25

5.4 Modulus of Soil Reaction (E')

The modulus of soil reaction (E') is an empirically derived coefficient which is related to the stiffness of the native soils and the nature and degree of compaction of the pipe bedding and backfill material. Various design guidelines specific to pipe material provide recommended values for E'. For full embedment of pipe in compacted granular pipe bedding, where the trench is excavated in soils that are loose/medium stiff or better (stiffer or denser, typically with blow counts greater than 4 blows per foot), and where the trench width measured at the pipe elevation (Bd) is at least 2 times the pipe diameter (D), an E' value as shown in the table below should be used.

Modulus of Soil Reaction (E')	
Pipe Type	E' (psi)
Steel	1,000
PVC	2,000
Ductile Iron	700
HDPE	1,000

5.5 Seepage Control

Free-draining pipe bedding creates a conduit for the migration of groundwater along the backfilled pipeline trench. The migration of groundwater can alter local hydrogeologic regimes. To reduce groundwater migration in the pipeline trench, Lithos recommends low permeability trench plugs be constructed from impervious material and should be keyed into the in-situ soils or bedrock along the trench bottom and sidewalls, extending at least 6 inches to 12 inches above the top of the bedding elevation. Trench plugs should be installed at a spacing not to exceed 500 feet and on either side of structures. Material requirements for trench plugs are provided in Section 6.2.2.

6 CONSTRUCTION CONSIDERATIONS

The following sections are intended for the Engineer producing specifications and the contractor constructing the proposed project. Construction considerations include temporary excavations, site grading and earthwork, bedrock or oversized material excavation, and construction dewatering.

6.1 Temporary Excavations

General site safety including temporary excavations are the sole responsibility of the contractor performing construction. Lithos is providing temporary excavation information strictly as an informational benefit to the project team, specifically the general contractor. An Occupational Safety and Health Administration (OSHA) defined competent person should be identified by the contractor to be in charge of temporary excavations. In general, the contractor's competent person should have experience or training in determining soil types, benching and shoring, and have the ability to detect potential temporary slope stability and protective system issues.

OSHA defines an excavation as a man-made cut, trench, or depression formed by the removal of earth. A trench is a specific type of narrow excavation with a geometry including a greater depth than width and a width of 15 feet or less. Trenches 5 feet deep or greater should be sloped, retained with shoring, or shielded appropriately. Shielding most commonly includes trench boxes. In general, shoring can include inclined, horizontal, or vertical systems depending on the excavation geometry and availability of retention alternatives. Sloping and benching should be in accordance with OSHA recommendations. Benching should include a maximum 4-foot vertical face for each bench and the overall excavation geometry less than or equal to the OSHA defined slope.

A registered professional engineer should approve the contractor's approach for trenches greater than or equal to 20 feet in depth. In addition, shoring for trench excavations should be designed by a professional engineer or be based on tabulated data prepared or approved by a registered professional engineer in accordance with OSHA 1926.652(b) and (c).

Lithos has evaluated observed soil conditions likely to be penetrated by the proposed construction. Based on the OSHA determined soil Types, the following table presents maximum recommended temporary excavation slopes to be utilized during construction.

OSHA Temporary Excavation Slopes		
Backfill Material Type	OSHA Classification	Maximum Recommended Slope (H:V) ^{1,2}
Coarse Grained Alluvial Deposits	Type C	1½:1
Fine Grained Alluvial Deposits	Type B	1:1
Bedrock	Type A	0.75:1

¹ H:V is an abbreviation for Horizontal:Vertical

² Valid for trench excavations less than 20 feet in depth

During construction, heavy equipment or excavated material stockpiles should be kept away from excavation edges to the extent possible. It is recommended that heavy equipment or excavated material stockpiles be kept at least 10 feet from the edges of excavations. Underground utilities should be fully understood and documented prior to initiating excavations. Finally, the contractor's competent person should inspect trenches and excavations routinely for signs of instability including sliding, toppling, subsidence and bulging, heaving or squeezing, boiling, and/or other visual concerns.

6.1.1 Shored Temporary Excavations

The contractor may elect to use a temporary shoring system to limit excavation extents, particularly if other site infrastructure may be impacted. For excavations greater than 20 feet deep, the contractor will be required to submit a design prepared by a professional engineer registered in the state of Colorado to demonstrate that the shoring system maintains both local and global slope stability for the duration of the open excavation.

Typically trench boxes are used to support lateral loads during excavation and construction in soils that have sufficient standup time to excavate the trench, install the trench box, complete installation and remove the trench box without full contact of the soils. Tight shoring typically involves full contact of the soils with the shoring system. Typical tight shoring systems include sheet pile walls, soldier pile and lagging walls, secant pile walls, soil nail walls and slide rail systems.

6.2 Site Grading and Earthwork

Appropriate site preparation, material placement and compaction, and backfill selection can reduce the risk of post-construction settlement and potential issues related to lateral earth pressures. General site grading and earthwork considerations are presented in the following sections.

6.2.1 Site Preparation

Areas supporting backfill and pipe bedding should be properly prepared. Once the rough grade has been established in excavated areas, and prior to placement of backfill, the exposed subgrade should be carefully inspected via proof rolling, probing, and testing, as determined necessary by the geotechnical engineer. Frozen, wet, soft, or loose soil, as well as any other undesirable material should be removed. Once suitable soil conditions are achieved, the subgrade should be scarified and compacted prior to fill placement. The suitable exposed soil materials should be scarified and moistened or dried, as necessary, to a minimum depth of 8 inches below the proposed construction. Scarified material should be compacted

to the minimum specifications defined in the following sections. If within bedrock, the subgrade does not need to be scarified and recompact.

6.2.2 Structure and Trench Backfill Material

Backfill is anticipated within pipeline trenches. Material recommendations are provided below:

1. Earthen material consisting of non-organic sands, gravels, silts, and clays or mixture thereof with a maximum size of 3 inches is recommended for backfill above the pipe bedding zone. Backfill materials are based on City of Arvada Engineering Code of Standards and Specifications Section 300: Soils and Earthwork.
2. CDOT “Fine Aggregate” meeting the gradation presented in CDOT Section 703.01 is recommended as backfill for the pipe bedding zone. The pipe bedding zone considered includes a minimum of 6 inches of separation between the subsoil and the pipe. Pipe bedding materials and placement recommendations are based City of Arvada Engineering Code of Standards and Specifications Section 300: Soils and Earthwork.
3. Controlled Low Strength Material (CLSM) or imported, low permeability, non-expansive clay material is recommended for use as trench plugs. If imported clay material is used, it shall have a minimum fines content of 60 percent and a minimum plasticity index of 15.
4. Imported CDOT Class 1 backfill meeting the general gradation of “Class 1 Structure Backfill Material” as specified in CDOT Section 703.08, CLSM “flowable fill” is recommended for backfill of structures.

Pipeline trenches may be backfilled with native soil if in accordance with the recommendations above. Claystone or processed claystone should not be used as backfill. The contractor may need to provide separation and/or processing of the onsite excavated soils for reuse purposes. If another material is considered for any of the presented applications, Lithos should be contacted to review submitted particle size distribution and plasticity testing results.

6.2.3 Fill Placement and Compaction

Lift thickness for pipe bedding should not exceed 6 inches. Minimum recommended compaction specifications are outlined in the following table.

Soil Compaction Recommendations		
Backfill Material Type ^{3,4}	Moisture and Compaction Specifications	
	Moisture Content ¹	Dry Density ²
Select Fill	-1% to +3%	≥ 95%
Imported Structural Backfill	-2% to +2%	≥ 95%

¹ Moisture content relative to the optimum moisture content as determined by ASTM D698

² Dry density relative to the maximum dry density as determined by ASTM D698

³ Pipe bedding should be compacted to a minimum relative density of 65% in accordance with ASTM D4263 and D4254.

⁴ The Geotechnical Engineer shall determine whether backfill material exhibits a suitable Standard Proctor compaction curve and can be tested in accordance with ASTM D698. If the material does not exhibit a Standard Proctor compaction curve such as CDOT Fine Aggregate, we recommend material is compacted to a minimum relative density of 65% (ASTM D4253 and ASTM D4254).

Project specifications require the minimum testing frequency of placed fill. Lithos recommends testing each lift of placed material to determine if compaction specifications are achieved. Adequate moisture control and small lift thicknesses will substantially aid in achieving the desired compaction and shall be carefully controlled throughout fill placement. If fill materials visibly exceed moisture specifications, Lithos recommends reworking the materials until the desired moisture is obtained. Lithos can also be consulted to aid in the further defining testing specifications for placed fill materials.

Mechanical compaction is required for all materials placed as backfill during construction. Compaction of cohesive materials is best accomplished with equipment such as a jumping jack or padfoot roller. Non-cohesive soils are best compacted with a vibratory plate or vibratory smooth-drum roller. Compaction utilizing any flooding type technique should not be allowed. Care should be taken when compacting fill adjacent to structures. Generally, we recommend operating only light-weight compaction equipment such as jumping jacks and vibratory plates immediately adjacent to structures.

6.3 Bedrock or Oversized Material Excavation

Based on the subsurface investigation, bedrock at Site E and 74th was classified as claystone and sandstone and bedrock excavation is anticipated during proposed construction activities. Therefore, the use of heavy-duty excavation equipment is anticipated to be sufficient to excavate bedrock layers. It is likely excavations may be performed using a bucket with the correct teeth.

6.4 Construction Dewatering

Groundwater was encountered during the subsurface investigation. Temporary construction dewatering should be anticipated for the proposed construction at locations where excavations extend below groundwater. Generally, sump pumps to control minor groundwater seepage should be anticipated for the majority of the excavations. Trench drains, deep wells and well points may also be needed. Construction dewatering must adhere to the Colorado Department of Public Health and Environment (CDPHE) regulations and discharge permit requirements. Lithos is available to assist with dewatering

design if required. Dewatering should be carefully evaluated and accounted for in the construction estimate to avoid construction cost and time increases.

7 CONSTRUCTION OBSERVATION AND QUALITY ASSURANCE

Site observations during construction specifically to address the geotechnical and trenchless components of the Project by Lithos are recommended including, trenchless construction, trench and bedrock excavations, placement of pipe bedding, and backfill placement and compaction. Quality assurance of compaction and backfill materials are necessary to increase long-term performance of the proposed waterline. Lithos recommends that a qualified testing agency is retained during construction to monitor backfill materials and compaction. Lithos should be notified if unanticipated subsurface conditions are encountered during construction in order to re-evaluate and potentially change the design and/or construction recommendations presented in this report.

8 LIMITATIONS

This study was conducted in accordance with generally accepted geotechnical engineering and engineering geologic practices and principals; no warranty, express or implied is made. The subsurface conditions described in this report were based on data obtained from widely spaced exploratory borings, geotechnical laboratory testing, information provided by the client, engineering judgement, and our experience with similar subsurface conditions and projects. The boring logs presented in this report only depict the subsurface conditions at the actual boring locations. Subsurface conditions are typically variable, both laterally and vertically, and the nature and extent of the subsurface variations across the site may not become evident until construction. The boundaries between different soil types and bedrock presented in this report are approximate and, in some cases, may be more abrupt or gradational than described herein. Groundwater levels may vary with time, adjacent surface water levels, precipitation, and changes to the hydrogeological conditions at or surrounding the project site.

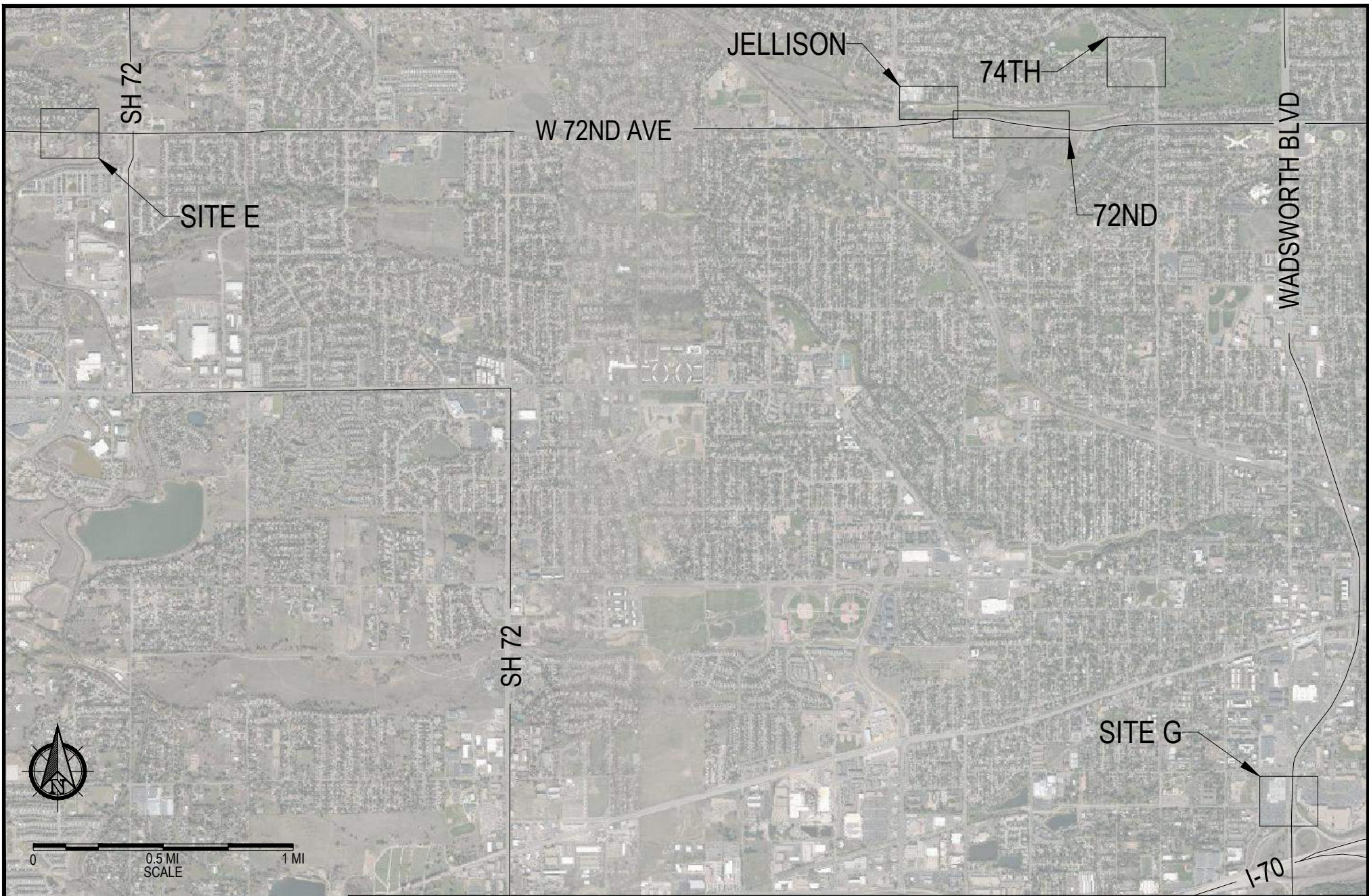
This report has been prepared exclusively for our client for design purposes for the subject project. Lithos Engineering is not responsible for technical interpretations by others of the data presented in this report or use of this report by others for the subject project or other projects. If differing site conditions are encountered during further evaluation of the subsurface conditions by others or during construction, Lithos Engineering should be notified immediately to determine if any changes to our recommendations presented in this report are warranted.

The recommendations presented in this report are only intended for the proposed design and construction as understood by Lithos Engineering at the time of issuing this report. If the proposed design and construction changes, Lithos Engineering should be notified immediately and given the opportunity to review the proposed changes and if necessary, modify our recommendations presented herein.

An environmental assessment was not included in Lithos Engineering scope of work for this project. Any statements regarding the absence or presence of hazardous and/or toxic substances presented herein are only intended for informational purposes. If the client is concerned about the environmental conditions at the site, Lithos Engineering recommends the client and/or owner retain a qualified environmental firm to conduct an environmental site assessment.

REFERENCES

- ASTM Standards, ASTM International, West Conshohocken, PA (2012).
- Bryant, Bruce, McGrew, L.W., and Wobus, R.A. (1981) *Geologic Map of the Denver 1° x 2° Quadrangle, North-Central Colorado*, USGS National Geologic Map Database.
- City of Arvada 2022 Engineering Code of Standards and Specifications Section 300: Soils and Earthwork
- City of Arvada 2022 Engineering Code of Standards and Specifications Section 700: Roadway and Parking Lot Design, Traffic Control Devices and Street Lighting
- Colorado Association of Geotechnical Engineers (1996), Guideline for Slab Performance Risk Evaluation and Residential Basement Floor System Recommendations.



LEGEND:

- MAJOR ROADWAYS
- PROJECT LOCATIONS

LITHOS
ENGINEERING
2750 S. WADSWORTH BLVD. SUITE D-200
DENVER, COLORADO 80227
303.625.9502

PROJECT
TITLE

2021 WATER MAIN
IMPROVEMENTS PROJECT

DRAWING
TITLE

SITE VICINITY MAP

OWNER

CITY OF ARVADA

CLIENT

**CDM
Smith**

PROJECT NO.:

21210

DRAWN BY:

AW

LOCATION:

ARVADA, CO

DESIGNED BY:

JC

DATE:

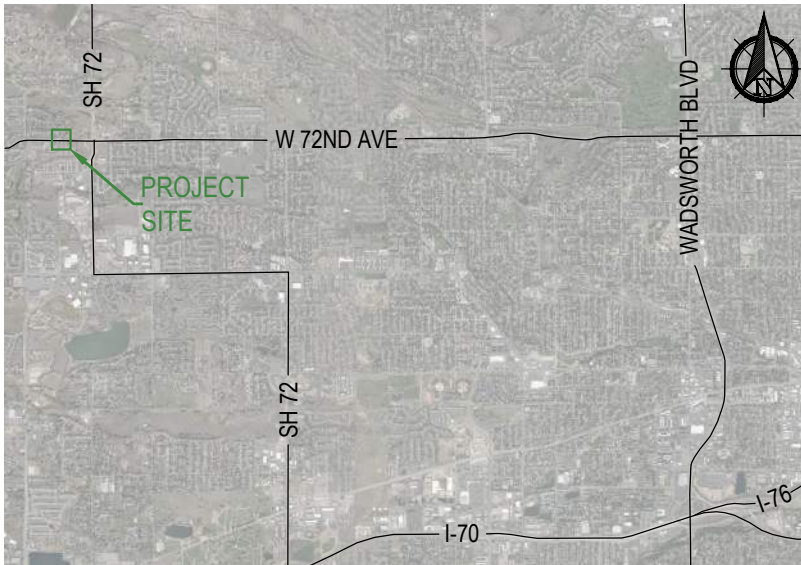
11/15/22

CHECKED BY:

RD

FIGURE NUMBER

1



LEGEND:

● BORING LOCATION

NOTE:

- SEE CONTRACT DRAWINGS FOR OFFICIAL ALIGNMENT. BORING LOCATIONS FROM GEOTECHNICAL INVESTIGATION REPORT.

— · — SITE VICINITY MAP



— · — SITE INVESTIGATION MAP

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303.625.9502

PROJECT
TITLE

DRAWING
TITLE

2021 WATER MAIN
IMPROVEMENTS PROJECT

BORING LOCATION MAP
SITE E

OWNER
CITY OF
ARVADA

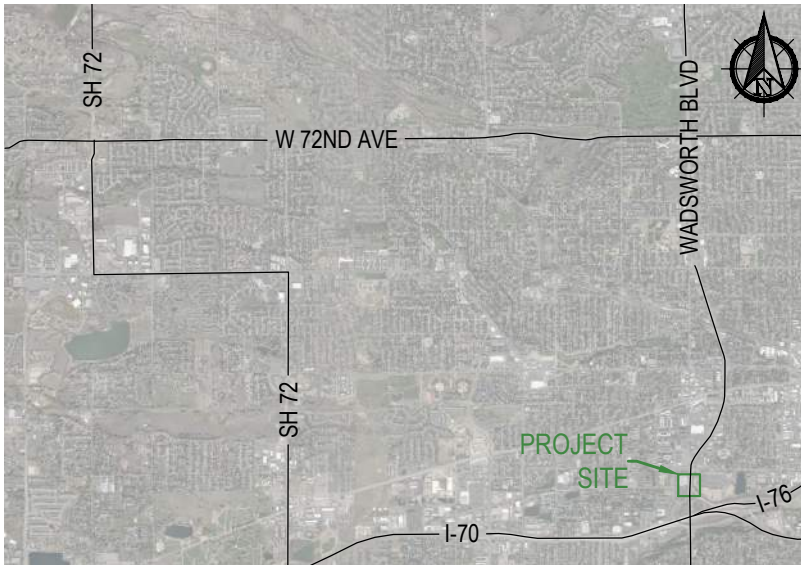
CLIENT
**CDM
Smith**

PROJECT NO.: 21210
LOCATION: ARVADA, CO
DATE: 11/15/22

DRAWN BY: AW
DESIGNED BY: JC
CHECKED BY: RD

FIGURE NUMBER

2



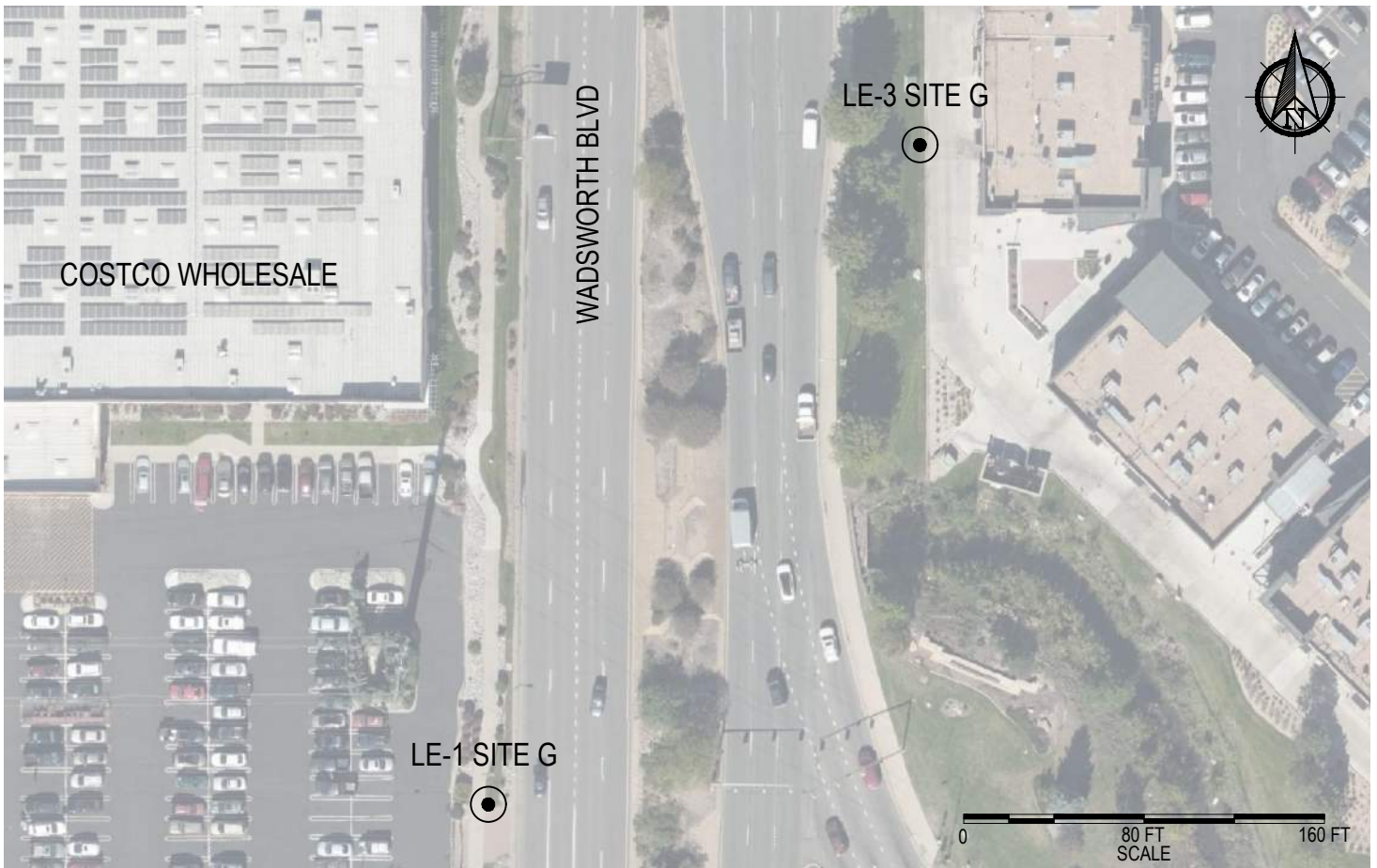

SITE VICINITY MAP

LEGEND:


BORING LOCATION

NOTE:

1. SEE CONTRACT DRAWINGS FOR OFFICIAL ALIGNMENT. BORING LOCATIONS FROM GEOTECHNICAL INVESTIGATION REPORT.




SITE INVESTIGATION MAP

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ENGINEERING

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DENVER, COLORADO 80227
303.625.9502

PROJECT TITLE

2021 WATER MAIN
IMPROVEMENTS PROJECT

DRAWING TITLE

BORING LOCATION MAP
SITE G

OWNER

 CITY OF
ARVADA

CLIENT

 CDM
Smith

FIGURE NUMBER

3

PROJECT NO.: 21210

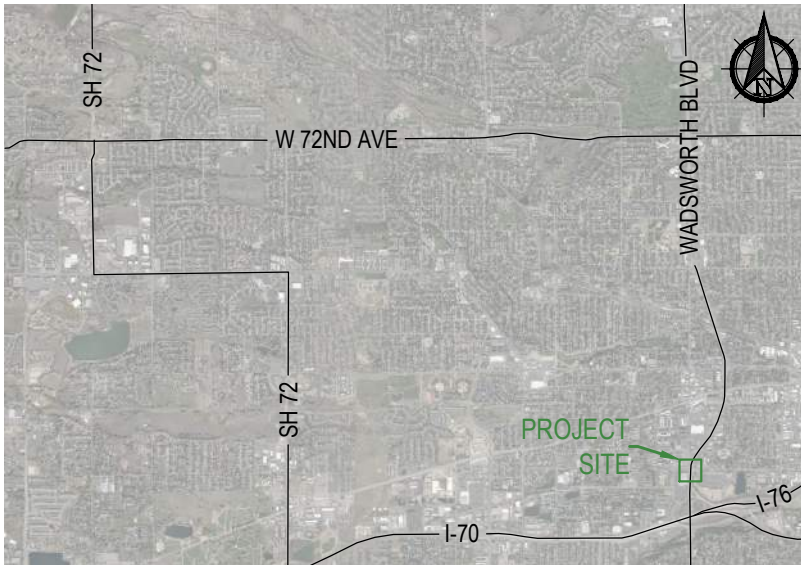
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LOCATION: ARVADA, CO

DESIGNED BY: JC

DATE: 11/15/22

CHECKED BY: RD



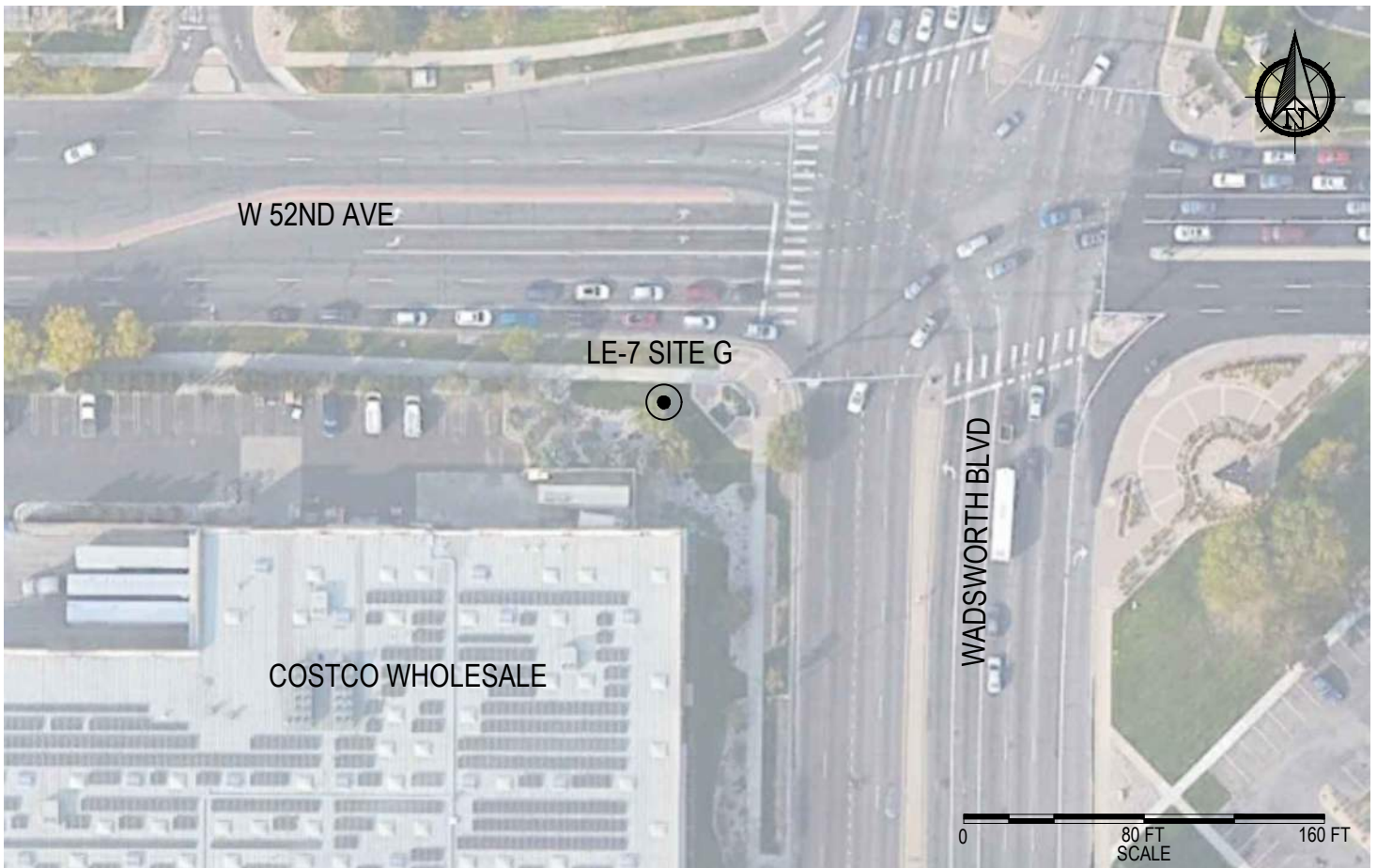

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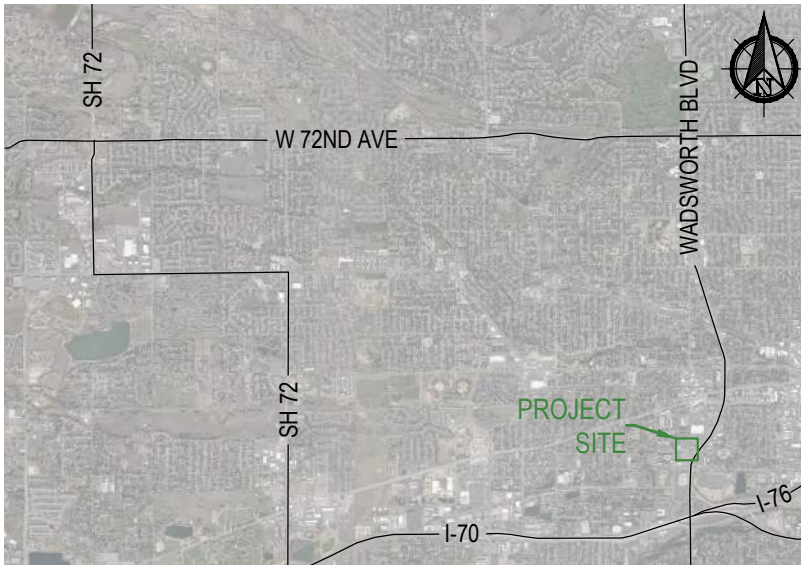

BORING LOCATION

NOTE:

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SITE INVESTIGATION MAP




SITE VICINITY MAP

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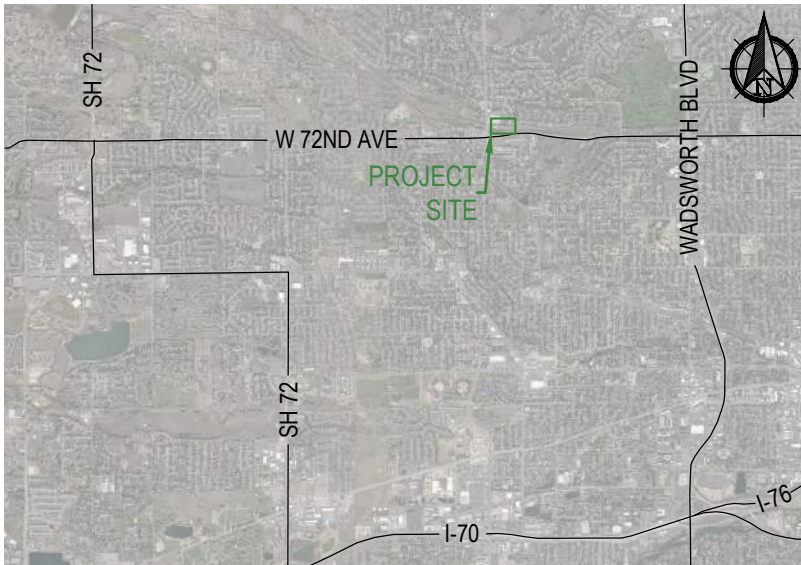

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SITE INVESTIGATION MAP



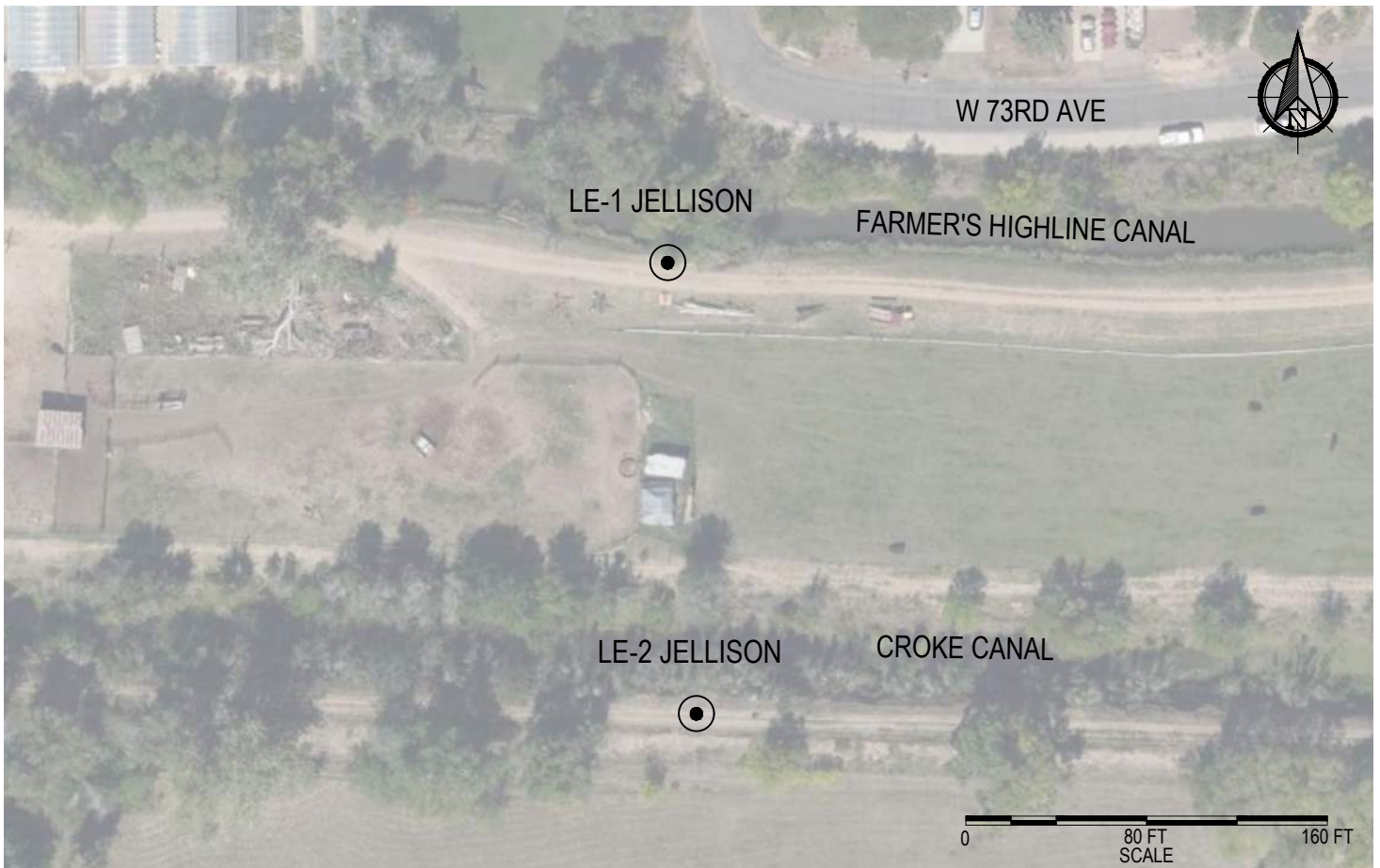
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● BORING LOCATION

NOTE:

- SEE CONTRACT DRAWINGS FOR OFFICIAL ALIGNMENT. BORING LOCATIONS FROM GEOTECHNICAL INVESTIGATION REPORT.

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- SITE VICINITY MAP



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- SITE INVESTIGATION MAP

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PROJECT
TITLE

2021 WATER MAIN
IMPROVEMENTS PROJECT

DRAWING
TITLE

BORING LOCATION MAP
JELLISON

OWNER

CITY OF
ARVADA

CLIENT

CDM
Smith

PROJECT NO.:

21210

DRAWN BY:

AW

LOCATION:

ARVADA, CO

DESIGNED BY:

JC

DATE:

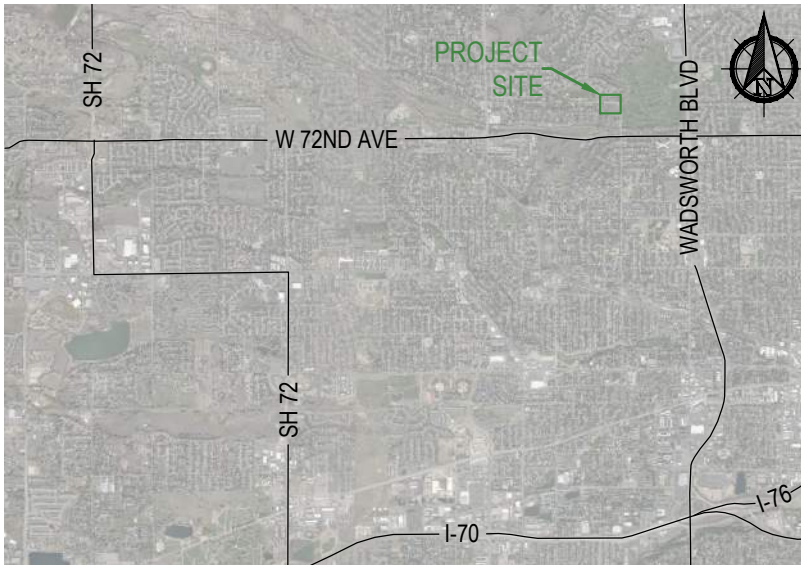
11/15/22

CHECKED BY:

RD

FIGURE NUMBER

6



LEGEND:

● BORING LOCATION

NOTE:

- SEE CONTRACT DRAWINGS FOR OFFICIAL ALIGNMENT. BORING LOCATIONS FROM GEOTECHNICAL INVESTIGATION REPORT.

-
- SITE VICINITY MAP



-
- SITE INVESTIGATION MAP

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DENVER, COLORADO 80227
303.625.9502

PROJECT
TITLE

DRAWING
TITLE

2021 WATER MAIN
IMPROVEMENTS PROJECT

BORING LOCATION MAP
74TH

OWNER
CITY OF
ARVADA

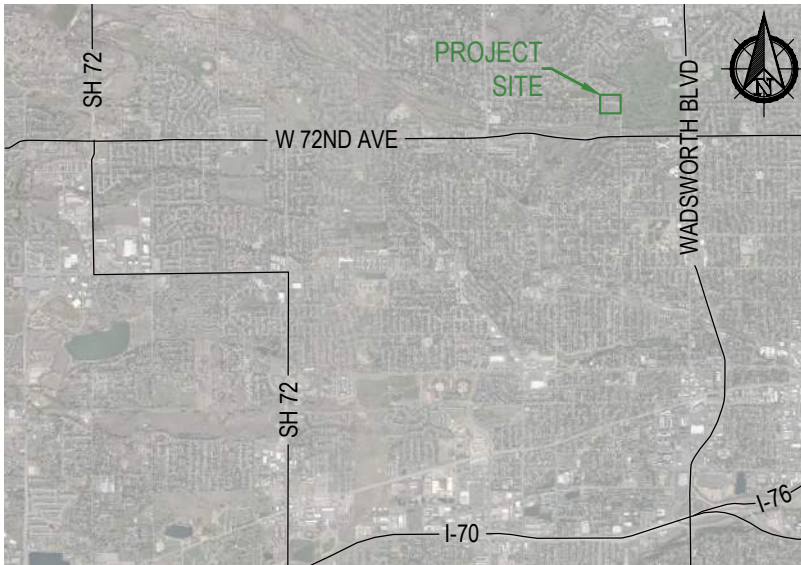
CLIENT
**CDM
Smith**

PROJECT NO.: 21210
LOCATION: ARVADA, CO
DATE: 11/15/22

DRAWN BY: AW
DESIGNED BY: JC
CHECKED BY: RD

FIGURE NUMBER

7



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● BORING LOCATION

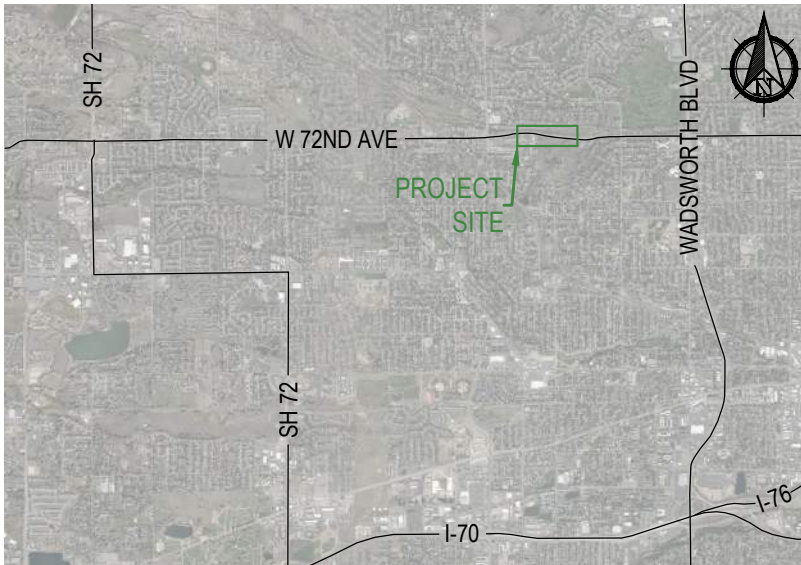
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SITE VICINITY MAP



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SITE INVESTIGATION MAP



LEGEND:

● BORING LOCATION

NOTE:

1. SEE CONTRACT DRAWINGS FOR OFFICIAL ALIGNMENT. BORING LOCATIONS FROM GEOTECHNICAL INVESTIGATION REPORT.

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SITE VICINITY MAP



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SITE INVESTIGATION MAP



APPENDIX A

Geotechnical Drilling Keys and Boring Logs

BORING LOG KEY

STANDARD GEOTECHNICAL DRILLING

Soil Classifications:

Clear Square Sieve Openings				U.S. Standard Series Sieve Sizes			
12"	3"	3/4"	4	10	40	200	
Boulders	Cobbles	Gravel		Sand			Silts and Clays
		Coarse	Fine	Coarse	Medium	Fine	
300mm	75mm	19mm	4.75mm	2.0mm	0.42mm	0.075mm	

Gradation Estimates by Field Observation	
Description	Quantity (%)
Trace	<5
Few	5 to 10
Little	15 to 25
Some	30 to 45
Mostly	> 50

Relative Density or Consistency of Non-cohesive and Cohesive Soils			
Non-cohesive Soils		Cohesive Soils	
Classification	Blows per 12 in	Classification	Blows per 12 in
Very Loose	0 to 4	Very Soft	0 to 2
Loose	5 to 10	Soft	3 to 4
Medium Dense	11-30	Medium Stiff	5 to 8
		Stiff	9 to 15
Dense	31 to 50	Very Stiff	16 to 30
Very Dense	>50	Hard	>30

Color: Sample colors are in general accordance with basic brown, red, yellow, and gray combinations

Description of Moisture	
Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil below the groundwater table

Description of Odor	
Description	Criteria
No Organic Odor	Organic odor is not present
Trace Organic Odor	Mild organic odor; mixture of soil and organics
Strong Organic Odor	Prominent organic odor; sample is primarily organic

Plasticity	
Description	Criteria
Nonplastic	A $\frac{1}{8}$ " diameter thread cannot be rolled
Low	A $\frac{1}{8}$ " in diameter thread can be rolled with difficulty; a lump cannot be formed at a moisture lower than the plastic limit
Medium	A $\frac{1}{8}$ " in diameter thread can be rolled easily; a crumbly lump can be formed at a moisture lower than the plastic limit
High	A $\frac{1}{8}$ " in diameter thread can be rolled very easily; a lump can be formed at a moisture lower than the plastic limit

Cementation	
Description	Criteria
Weak	Crumbles with light finger pressure
Moderate	Crumbles with considerable finger pressure
Strong	Will not crumble with finger pressure

Rock Descriptions:

Weathering	
Description	Criteria
Fresh	No visible sign of rock material weathering; perhaps slight discoloration on major discontinuity surfaces.
Slightly Weathered	Discoloration of rock material on discontinuity surfaces.
Moderately Weathered	Less than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly Weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.

Texture	
Description	Criteria
Very Fine Grained	Grains not individually visible to the unaided eye
Fine Grained	Grains barely visible to the unaided eye, up to $\frac{1}{16}$ " diameter
Medium Grained	Grain diameter between $\frac{1}{16}$ " and $\frac{3}{16}$ "
Coarse Grained	Grains diameter between $\frac{3}{16}$ " and $\frac{1}{4}$ "
Very Coarse Grained	Grains larger than $\frac{1}{4}$ " in diameter

Field Hardness	
Description	Criteria
Very Hard	Cannot be scratched with a knife or sharp pick.
Hard	Can be scratched with a knife or pick only with difficulty
Medium	Can be gouged $\frac{1}{16}$ " deep by firm pressure on knife or pick point
Soft	Can be grooved or gouged readily with knife or pick point
Very Soft	Can be carved with knife and scratched readily by fingernail

Geologic Interpretation:

A **Geologic Interpretation** of encountered soil and bedrock units is provided for each specific **Visual Material Description**. Examples of geologic interpretations for soil that may be presented include: FILL, ALLUVIUM, AEOLIAN, AND GLACIAL TILL, AND RESIDUUM. Rock geologic interpretations are referenced based on a combination of field classifications and applicable geologic maps.

Sample Graphics and Descriptions:

-  California Barrel Sampler: Barrel sampler loaded with sample liners and driven to collect a relatively representative and intact specimen of soil or weak rock.
-  Split-Spoon Sampler: Split-barrel sampler driven in accordance with ASTM D1586 used to provide visual material descriptions and collect a disturbed specimen.
-  Shelby Tube Sampler: Thin wall tube hydraulically pushed into the subsurface to collect a representative and intact specimen of soil.
-  Bulk Sample: Bulk or bagged sample taken from auger cuttings.

 Continuous Sampler: A 5-foot long sampler barrel that is driven to collect a continuous 5-foot run of cohesive and non-cohesive soil.

Groundwater Monitoring Well Graphics:

 Riser Pipe with Auger Cuttings
 Auger Cuttings

 Well Screen with Silica Sand
 Stick-Up Well

 Riser Pipe with Silica Sand
 Flush Mounted Cap

 Riser Pipe with Bentonite Chips

 First Groundwater Reading

 Second Groundwater Reading

 Third Groundwater Reading

Boring Graphics:

Below are the primary boring log graphics. Any classification combinations will result in a combination of graphics.

 Fill

 Lean Clay

 Silt

 Fat Clay

 Elastic Silt

 Well Graded Gravel

 Poorly Graded Gravel

 Well Graded Sand

 Poorly Graded Sand

 Sandstone

 Claystone

 Siltstone

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ENGINEERING

Sampler Diameter(s): 1.4", 2.0"

BORING: LE-2 Site E Project Name: Arvada Waterline Project Number: 21210 Client's Name: CDM Smith Owner's Name: City of Arvada Drilling Subcontractor: Lithos Representative: A Warren Date(s) of Drilling: 5/19/22						Drilling and Sampling Methods Drill Make and Model: CME 55/300 Track Drilling Method: Hollow Stem Auger Bit Type: Cutting Head Casing Description: N/A Hammer Weight (lbs)/Fall (in): 140lbs/30in Sampler Type(s): Split Spoon, Mod Cal Sampler Diameter(s): 1.4", 2.0"						LITHOSENGINEERING Boring Location: 39.8270726, -105.1693343 Boring Elevation: 5579' Notes: Location and elevation from Google Earth									
Sampling Data						Visual Material Description						Laboratory Testing Results									
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)	Geologic Graphic	Soil: -GEOLOGIC INTERPRETATION- USCS Classification (group symbol), particle sizes, density or consistency, color, moisture, odor, other descriptions			Rock: -GEOLOGIC INTERPRETATION- Bedrock Classification, hardness, weather, color, texture, joint size, other descriptions			Groundwater Depth / Monitoring Well Configuration	In-Situ States		INDEX DATA				Strength & Compressibility	
							Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)		Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)			
0							FINE ALLUVIUM Lean clay with sand cuttings														
5574			6	6			5.0 ft.-														
6			4	12			ARAPAHOE FORMATION Claystone, soft, slightly weathered, olive, mostly clay, some fine to medium sand, little fine and coarse gravel up to 1" in matrix, iron oxidation, calcareous As above except pale olive, trace gravel up to 1" in matrix														
5568			7	4			As above except slightly to highly weathered, trace fine sand			15.6 107.9					46	19					
12			5	14			Claystone, soft, slightly weathered, olive, little fine sand interbedded, iron oxidation, black organics														
5562			17	6			As above except slightly to highly weathered, pale olive to olive, trace sand, no black organics														
18			19	6			Sandstone, soft, slightly to highly weathered, pale olive to olive, mostly fine sand, some clay, iron oxidation			14.0 113.8							9,503				
5556			20	10			As above														
24			50/6	8			As above except slightly weathered, pale olive														
5550			50/4	6			As above except few interbedded lignite														
30							END OF EXPLORATION			30.5 ft.-											
5544																					
36																					
General Notes: 1) Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2) The maximum particle size identified in the material description is dependent on sampler dimensions. 3) Additional information is provided on the Boring Log Key. 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.												Groundwater Data: Date: 5/19/22 Elapsed Time: 0hr Depth to Groundwater: DNE									

BORING: LE-1 Site G

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: _____
 Lithos Representative: A Warren
 Date(s) of Drilling: 6/20/22

Drilling and Sampling Methods

Drill Make and Model: CME 55 Track
 Drilling Method: SSA/HSA
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140lbs/30in
 Sampler Type(s): Split Spoon, Mod Cal
 Sampler Diameter(s): 1.4", 2.0"



Boring Location: 39.7890415, -105.0816948
 Boring Elevation: 5310'
 Notes: Location and elevation from Google Earth

Sampling Data						Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results																
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)			Geologic Graphic	In-Situ States			INDEX DATA				Strength & Compressibility								
									Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)					
0	5310																							
6	5304	5	9	8																				
12	5298	20	15	14																				
18	5292	25	24	10																				
18	5292	45	35	18																				
18	5292	8	24	8																				

General Notes:

- 1) Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- 2) The maximum particle size identified in the material description is dependent on sampler dimensions.
- 3) Additional information is provided on the Boring Log Key.
- 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		
Date:	Elapsed Time:	Depth to Groundwater:
6/20/22	0hr	10-feet

BORING: LE-3 Site G

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: _____
 Lithos Representative: A Warren
 Date(s) of Drilling: 5/26/22

Drilling and Sampling Methods

Drill Make and Model: CME 75
 Drilling Method: SSA/HSA
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140lbs/30in
 Sampler Type(s): Split Spoon, Mod Cal
 Sampler Diameter(s): 1.4", 2.0"



Boring Location: 39.789839, -105.081014
 Boring Elevation: 5309'
 Notes: Location and elevation from Google Earth

Sampling Data						Geologic Graphic	Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)				In-Situ States			INDEX DATA				Strength & Compressibility																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
									Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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General Notes:

- Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- The maximum particle size identified in the material description is dependent on sampler dimensions.
- Additional information is provided on the Boring Log Key.
- Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		
Date:	Elapsed Time:	Depth to Groundwater:
5/26/22	0hr	8.9 feet

Groundwater Data:		
Date:	Elapsed Time:	Depth to Groundwater:

BORING: LE-Site G-B6 Project Name: <u>Arvada Waterlines</u> Project Number: <u>21210</u> Client's Name: <u>CDM Smith</u> Owner's Name: <u>City of Arvada</u> Drilling Subcontractor: <u>Vine Laboratories, LLC</u> Lithos Representative: <u>Adam M</u> Date(s) of Drilling: <u>01/26/2023</u>						Drilling and Sampling Methods Drill Make and Model: <u>CME 55 Truck Mounted</u> Drilling Method: <u>Solid Stem Auger</u> Bit Type: <u>Auger Cutting Head</u> Casing Description: <u>N/A</u> Hammer Weight (lbs)/Fall (in): <u>140 lbs. / 30 in.</u> Sampler Type(s): <u>Split Spoon, Mod Cal</u> Sampler Diameter(s): <u>1.4", 2.0"</u>						LITHOS ENGINEERING Boring Location: <u>39.7930, -105.0814</u> Boring Elevation: <u>5314</u> Notes: <u>Location from Google Earth, Elevation from USGS 3D Elevation Program</u>							
Sampling Data						Visual Material Description						Laboratory Testing Results							
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)	Geologic Graphic	Soil:		Rock:		Groundwater Depth / Monitoring Well Configuration	In-Situ States		INDEX DATA				Strength & Compressibility	
							-GEOLOGIC INTERPRETATION-		-GEOLOGIC INTERPRETATION-			Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)
0							COARSE ALLUVIUM												
5	5310		9 9 13	18			Poorly graded SAND with clay and gravel (SP-SC), medium dense, greenish black to dark brown, dry												
10	5305		22 25	12			As above except dense, dark brown to olive brown												
15	5300		22 24 26	18			Poorly graded SAND (SP) with gravel, very dense, olive, dry												
16.5							END OF EXPLORATION												
20	5295																		
25	5290																		
30	5285																		

General Notes:

1) Soil classificaitons are in general accordance with ASTM D2487

2) The maximum particle size identified in the material description is dependent on sampler dimensions.

3) Additional information is provided on the Boring Log Key.

4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:

Date:

Elapsed Time:

Depth to Groundwater:

BORING: LE-Site G-B7 Project Name: Arvada Waterlines Project Number: 21210 Client's Name: CDM Smith Owner's Name: City of Arvada Drilling Subcontractor: Vine Laboratories, LLC Lithos Representative: Adam M Date(s) of Drilling: 01/26/2023					Drilling and Sampling Methods Drill Make and Model: CME 55 Truck Mounted Drilling Method: Solid Stem Auger Bit Type: Auger Cutting Head Casing Description: N/A Hammer Weight (lbs)/Fall (in): 140 lbs. / 30 in. Sampler Type(s): Split Spoon, Mod Cal Sampler Diameter(s): 1.4", 2.0"					LITHOSENGINEERING Boring Location: 39.7910, -105.0818 Boring Elevation: 5310 Notes: Location from Google Earth, Elevation from USGS 3D Elevation Program						
Sampling Data					Visual Material Description					Laboratory Testing Results						
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)	Geologic Graphic	Soil:		Groundwater Depth / Monitoring Well Configuration	In-Situ States		INDEX DATA			Strength & Compressibility	
							-GEOLOGIC INTERPRETATION-			Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)
USCS Classification (group symbol), particle sizes, density or consistency, color, moisture, odor, other descriptions																
Rock:		Bedrock Classification, hardness, weather, color, texture, joint size, other descriptions														
-GEOLOGIC INTERPRETATION-																
COARSE ALLUVIUM																
Poorly graded SAND with clay and gravel (SP-SC), loose, dark brown, dry																
Well graded SAND (SW) with gravel and trace clay, medium dense, olive to dark brown, dry																
As above except very dense, wet. Bottom 3" is angular quartz gravel 1/4" to 1/2" diameter. Max gravel size is 2" diameter																
Poorly graded GRAVEL (GP) with sand, dense, olive gray, wet																
Poorly graded SAND (SP) with gravel, very desne, pale olive, wet, gravel up to 2" diameter																
END OF EXPLORATION																
General Notes:					Groundwater Data:											
1) Soil classifaitions are in general accordance with ASTM D2487					Date: 01/26											
2) The maximum particle size identified in the material description is dependent on sampler dimensions.					Elapsed Time: 0 hr											
3) Additional information is provided on the Boring Log Key.					Depth to Groundwater: 9.4'											
4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.																

BORING: LE-1 Jellison

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: _____
 Lithos Representative: A Warren
 Date(s) of Drilling: 5/27/22

Drilling and Sampling Methods

Drill Make and Model: CME 55
 Drilling Method: Hollow Stem Auger
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140lbs/30in
 Sampler Type(s): Split Spoon, Mod Cal
 Sampler Diameter(s): 1.4", 2.0"



Boring Location: 39.828381, -105.107281

Boring Elevation: 5560'

Notes: Location and elevation from Google Earth

Sampling Data						Geologic Graphic	Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)				In-Situ States			INDEX DATA				Strength & Compressibility																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
									Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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General Notes:

- 1) Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- 2) The maximum particle size identified in the material description is dependent on sampler dimensions.
- 3) Additional information is provided on the Boring Log Key.
- 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		
Date:	Elapsed Time:	Depth to Groundwater:
5/27/22	0hr	17.9 feet

BORING: LE-2 Jellison

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: _____
 Lithos Representative: A Warren
 Date(s) of Drilling: 5/27/22

Drilling and Sampling Methods

Drill Make and Model: CME 55
 Drilling Method: Solid Stem Auger
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140lbs/30in
 Sampler Type(s): Split Spoon, Mod Cal
 Sampler Diameter(s): 1.4", 2.0"



Boring Location: 39.827839, -105.107244
 Boring Elevation: 5548'
 Notes: Location and elevation from Google Earth

Sampling Data						Visual Material Description		Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results												
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)				Geologic Graphic	In-Situ States			INDEX DATA				Strength & Compressibility				
										Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)	
0							COARSE ALLUVIUM														
5544																					
6			6 6 6	5			Clayey SAND (SC), mostly fine sand, some clay, medium dense, olive, dry, calcareous, plant material														
			4 4 5	12			As above except brown, small roots, black organics										46.7				
5538			4 5 8	4			FINE ALLUVIUM														
12			4 5 5	14			LEAN CLAY with sand (CL), mostly clay, little fine sand, stiff, olive to olive yellow, slightly moist, calcareous														
			3 4	10			As above except olive														
5532			3 4	10			As above except medium stiff														
18			2 2 2	18			As above except soft, iron oxidation, medium plasticity														
			2 2 3	18			As above except medium stiff, wet, no iron oxidation														
5526																					
24			2 3 2	15			Sandy LEAN CLAY (CL), mostly clay, some fine sand, medium stiff, olive, wet										59.4	32	11		
5520																					
30			5 7 10	18			As above except very stiff														
5514							END OF EXPLORATION														
36																					

General Notes:

- Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- The maximum particle size identified in the material description is dependent on sampler dimensions.
- Additional information is provided on the Boring Log Key.
- Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		Date:		Elapsed Time:		Depth to Groundwater:	
		5/27/22		0hr		20 feet	
		5/27/22		30min		16.7 feet	

BORING: LE-1 74th

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: _____
 Lithos Representative: A Warren
 Date(s) of Drilling: 5/27/22

Drilling and Sampling Methods

Drill Make and Model: CME 55
 Drilling Method: Hollow Stem Auger
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140lbs/30in
 Sampler Type(s): Split Spoon, Mod Cal
 Sampler Diameter(s): 1.4", 2.0"



Boring Location: 39.8310913, -105.0922403
 Boring Elevation: 5559'
 Notes: Location and elevation from Google Earth

Sampling Data						Geologic Graphic	Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results															
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)				In-Situ States			INDEX DATA					Strength & Compressibility							
									Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)					
0							FINE ALLUVIUM																	
5.556																								
6			5 4 3	6			LEAN CLAY with sand (CL), mostly clay, little fine sand, medium stiff, olive to yellowish brown, slightly moist, roots, calcareous																	
			3 2 2	15			As above except soft, olive, medium plasticity, moist											37	17					
5.550			3 4 6	18			As above except stiff, yellowish brown, black organics, calcareous																	
12			3 6 7	16			As above																	
5.544			10 13	10			ARAPAHOE FORMATION Claystone, very soft, slightly to highly weathered, olive, iron oxidation, calcareous																	
			10 30	8			Claystone, soft, slightly weathered, olive to light gray, few fine sand, iron oxidation, calcareous, black organics																	
18			13 24	8			Sandstone, very soft, slightly weathered, yellowish brown to olive, mostly fine to medium sand, some clay, mica, iron oxidation, black organics																	
5.538			50/9	6			As above																	
24			50/10	8			As above																	
5.532																								
30																								
5.526																								
36																								

General Notes:

- 1) Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- 2) The maximum particle size identified in the material description is dependent on sampler dimensions.
- 3) Additional information is provided on the Boring Log Key.
- 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		
Date:	Elapsed Time:	Depth to Groundwater:
5/27/22	30min	21.3 feet

LITHOS
ENGINEERING

Boring Location: 39.8307, -105.0910
Boring Elevation: 5536
Notes: Location from Google Earth, Elevation
from USGS 3D Elevation Program

Sampling Data						
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)	Geologic Graphic
Visual Material Description						
Soil: -GEOLOGIC INTERPRETATION- USCS Classification (group symbol), particle sizes, density or consistency, color, moisture, odor, other descriptions Rock: -GEOLOGIC INTERPRETATION- Bedrock Classification, hardness, weather, color, texture, joint size, other descriptions						
Groundwater Depth / Monitoring Well Configuration						
			In-Situ States	INDEX DATA		Strength & Compressibility
			Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)
						Sand Content (%)
						Fines Content (%)
						Liquid Limit (%)
						Plasticity Index (%)
						UCS (psf)
						Swell Pressure (psf)
						Swell Percent (%)
0						
5	5535					
5.1 ft.	5530	Lean CLAY (CL) with trace sand, stiff, olive gray to reddish brown, moist	3 4 6	18		
10	5525	As above except stiff, pale olive with brown mottling, wet	6 8	12		
15	5520	Sandy lean CLAY (CL), stiff, pale olive, wet	5 5 7	18		
END OF EXPLORATION						
20	5515					
25	5510					
30	5505					

- 1) Soil classifications are in general accordance with ASTM D2487
- 2) The maximum particle size identified in the material description is dependent on sampler dimensions.
- 3) Additional information is provided on the Boring Log Key.
- 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

	Groundwater Data:	
Date:	Elapsed Time:	Depth to Groundwater:
01/26	0 hr	5.1'

BORING: LE-72nd-B1

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: Drilling Engineers
 Lithos Representative: J. Halverson
 Date(s) of Drilling: 09/28/22

Drilling and Sampling Methods

Drill Make and Model: CME-75
 Drilling Method: Solid Stem Auger (SSA)
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140/30
 Sampler Type(s): Modified California
 Sampler Diameter(s): 2.0-inches



Boring Location: 39.8274652, -105.1045791
 Boring Elevation: 5,541.0-feet
 Notes: _____

Sampling Data						Geologic Graphic	Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results														
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)				In-Situ States			INDEX DATA				Strength & Compressibility							
									Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)				
0							PAVEMENT SECTION Asphalt: 9.0-inches Base: 3.0-inches																
2.5	5540		3 8	7			FILL Sandy LEAN CLAY with gravel (CL), some fine to coarse sand, little fine to coarse gravel, stiff, olive brown, moist, maximum particle size 1.0-inches. As above.																
5	5537.5		5 4	11			Sandy LEAN CLAY (CL), some fine to coarse sand, trace fine gravel, stiff, dark blueish gray to olive brown, moist, maximum particle size 0.5-inches.	22.1	100.3				50.9	41	24	1,946	850	0.3					
7.5	5535		4 6	12																			
10	5532.5		6 7	6			FINE ALLUVIUM LEAN CLAY with sand (CL), little fine to medium sand, stiff, pale olive, moist, calcite.																
12.5	5530		5 6	9			Sandy LEAN CLAY (CL), some fine to coarse sand, stiff, pale olive, moist, calcite.																
15	5527.5						END OF EXPLORATION																

General Notes:

- 1) Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- 2) The maximum particle size identified in the material description is dependent on sampler dimensions.
- 3) Additional information is provided on the Boring Log Key.
- 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		Date:		Elapsed Time:		Depth to Groundwater:	
		09/28/22		0-days		DNE	

BORING: LE-72nd-B2

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: Drilling Engineers
 Lithos Representative: J. Halverson
 Date(s) of Drilling: 09/28/22

Drilling and Sampling Methods

Drill Make and Model: CME-75
 Drilling Method: Solid Stem Auger (SSA)
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140/30
 Sampler Type(s): Modified California
 Sampler Diameter(s): 2.0-inches



Boring Location: 39.8274323, -105.1030383
 Boring Elevation: 5,542.0-feet
 Notes: _____

Sampling Data						Geologic Graphic	Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)				In-Situ States			INDEX DATA				Strength & Compressibility																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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General Notes:

- 1) Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- 2) The maximum particle size identified in the material description is dependent on sampler dimensions.
- 3) Additional information is provided on the Boring Log Key.
- 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		Depth to Groundwater:
Date:	Elapsed Time:	
09/28/22	0-days	DNE

BORING: LE-72nd-B3

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: Drilling Engineers
 Lithos Representative: J. Halverson
 Date(s) of Drilling: 09/28/22

Drilling and Sampling Methods

Drill Make and Model: CME-75
 Drilling Method: Solid Stem Auger (SSA)
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140/30
 Sampler Type(s): Modified California
 Sampler Diameter(s): 2.0-inches



Boring Location: 39.8273026, -105.1013263
 Boring Elevation: 5,540.0-feet
 Notes: _____

Sampling Data						Geologic Graphic	Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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LITHOS
ENGINEERING

Boring Location: 39.8271771, -105.0999774
Boring Elevation: 5,544.0-feet
Notes:

General Notes: 1) Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2) The maximum particle size identified in the material description is dependent on sampler dimensions. 3) Additional information is provided on the Boring Log Key. 4) Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.	Groundwater Data: Date: Elapsed Time: Depth to Groundwater:		
	09/28/22	0-days	DNE

BORING: LE-72nd-B5

Project Name: Arvada Waterline
 Project Number: 21210
 Client's Name: CDM Smith
 Owner's Name: City of Arvada
 Drilling Subcontractor: Drilling Engineers
 Lithos Representative: J. Halverson
 Date(s) of Drilling: 09/28/22

Drilling and Sampling Methods

Drill Make and Model: CME-75
 Drilling Method: Solid Stem Auger (SSA)
 Bit Type: Cutting Head
 Casing Description: N/A
 Hammer Weight (lbs)/Fall (in): 140/30
 Sampler Type(s): Modified California
 Sampler Diameter(s): 2.0-inches



Boring Location: 39.8270434, -105.0981481
 Boring Elevation: 5,544.0-feet
 Notes: _____

Sampling Data						Geologic Graphic	Visual Material Description	Groundwater Depth / Monitoring Well Configuration	Laboratory Testing Results															
Depth (ft)	Elevation (ft)	Sample Identification	Blow Count/6 in	Recovery (in) / RQD (%)	Drilling Rate (min./ft.)				In-Situ States			INDEX DATA				Strength & Compressibility								
									Moisture Content (%)	Dry Unit Weight (pcf)	Water Soluble Sulfates (%)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	UCS (psf)	Swell Pressure (psf)	Swell Percent (%)					
0							PAVEMENT SECTION Asphalt: 7.0-inches Base: 4.0-inches																	
2.5	5542.5		3 6	9			FILL LEAN CLAY with sand (CL), little fine to coarse sand, stiff, mottled yellowish brown to olive to gray, moist, chunks of claystone. As above.																	
5	5540		5 10	12			As above.			23.4	98.3			71.4	44	25	3,240	1,500	0.3					
7.5	5537.5		7 12	8			FINE ALLUVIUM LEAN CLAY (CL), few fine sand, very stiff, dark brown, moist, calcite, trace roots.																	
10	5535		7 11	9			LEAN CLAY with sand (CL), little fine to coarse sand, very stiff, yellowish brown, moist, calcite.																	
12.5	5532.5						END OF EXPLORATION																	
15	5530																							

General Notes:

- Soil classifications are in general accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- The maximum particle size identified in the material description is dependent on sampler dimensions.
- Additional information is provided on the Boring Log Key.
- Groundwater measurements for monitoring wells present water levels at the time of drilling, highest level, and lowest level. Refer to the respective report for a complete history of groundwater values.

Groundwater Data:		
Date:	Elapsed Time:	Depth to Groundwater:
09/28/22	0-days	DNE



APPENDIX B

Geotechnical Laboratory Testing Results

2021 WATER MAIN IMPROVEMENTS PROJECT - 21210
GEOTECHNICAL LABORATORY TESTING RESULTS

Boring	Depth (feet bgs)	Moisture (%)	Dry Unit Weight (pcf)	Gradation			Atterberg			Swell Pressure (psf) ²	Swell (+)/ Consolidation (-) (%)	Unconfined Compressive Strength (psf)	USCS Classification ¹
				% Gravel	% Sand	% Fines	LL	PL	PI				
LE-1 Site E	10	13.3	113.5									5,348	Claystone
LE-1 Site E	17.5	11.3	116.2										Sandstone
LE-1 Site E	20					38.1							Sandstone
LE-2 Site E	5									1,240	1.8		Claystone
LE-2 Site E	10	15.6	107.9				46	27	19				Claystone
LE-2 Site E	17.5	14.0	113.8									9,503	Sandstone
LE-1 Site G	5	16.7	105.4			30.7	28	19	9				SC
LE-1 Site G	15			32.9	55.1	12.0							SW-SC
LE-1 Site G	25	15.9	117.5									10,237	Claystone
LE-3 Site G	7.5	7.0											SP
LE-3 Site G	12.5			49.0	43.5	7.5							GP-GC
LE-3 Site G	20						40	23	17				Claystone
LE-3 Site G	30	14.3	114.2									2,991	Claystone
LE-1 Jellison	7.5	18.5				42.7							SC
LE-1 Jellison	15					53.4							CL
LE-1 Jellison	20	22.3	101.6				30	16	14			1,125	CL
LE-2 Jellison	7.5					46.7							SC
LE-2 Jellison	15	18.3	100.8										CL
LE-2 Jellison	25					59.4	32	21	11				CL
LE-1 74th	7.5						37	20	17				CL
LE-1 74th	15	15.5	107.1							NA	-0.8		Claystone
LE-1 74th	25	17.8	103.9			44.2						2,765	Sandstone
LE-72nd-B1	5	22.1	100.3			50.9	41	17	24	850	0.3	1,946	CL
LE-72nd-B5	5	23.4	98.3			71.4	44	19	25	1,500	0.3	3,240	CL

¹Where fines content and Atterberg Limits testing was not conducted, USCS Classifications were determined per ASTM D2488. USCS column is provided for soil. Bedrock descriptions provided for information only.

²Swell pressure as measured under an inundation pressure of 500 psf

APPENDIX B

SWMP 2021 WATER MAIN IMPROVEMENTS

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STORMWATER MANAGEMENT PLAN

2021 Water Main Improvements Project

Date of Preparation: April 7, 2023

Arvada Site Disturbance Permit: (SITE ##-####)
CDPS Number: (COR #####)

Property Owner:

Bethany Yaffe byaffe@arvada.org
720-898-7774

Property Operator:

Sam Lewis slewis@arvada.org
720-898-7796

SWMP Preparer:

Ryan Tordella tordellart@cdmsmith.com
303-383-2307

STORMWATER MANAGEMENT PLAN

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APPENDICES

Appendix A – CDPS Construction Permit (One page document)
Appendix B – Erosion and Sediment Control Plans, BMP Details and Landscape Plan
Appendix C – Soils Report
Appendix D – National Flood Hazard Layer - FIRMette
Appendix E – Inspection Forms

1.0 INTRODUCTION

This SWMP identifies possible pollutant sources at this construction site that may contribute pollutants to stormwater, and identifies control measures that, when implemented in accordance with good engineering, hydrologic, and pollution control practices, will reduce or eliminate any possible water quality impacts. A copy of this SWMP will be available onsite or will be easily accessible via an electronic format. This SWMP will be revised, as necessary, when site conditions change.

This SWMP was prepared in accordance with good engineering, hydrologic and pollution control practices. Changes or additions may be required to address changes in conditions at the project. If such changes are made, this SWMP will be updated accordingly. This SWMP will be implemented as written and updated from commencement of construction activity until final stabilization is achieved. This SWMP was developed to meet the Colorado Discharge Permit System (CDPS) General Permit for Stormwater Discharges Associated with Construction Activity (Permit No. COR-400000, effective April 1, 2019) authorizing stormwater discharges from construction activities that result in a total land disturbance of one acre or greater or if a project is less than an acre but part of a larger common plan of development. This SWMP was also developed to meet the City of Arvada's requirements. The City regulates stormwater through its Site Development Permit (SDP). A copy of the CDPS Construction Permit for this project is included in **Appendix A**.

2.0 PROJECT SITE LOCATION AND DESCRIPTION

This project includes 5 separate locations within the City of Arvada (Locations C, D, E, F, G)
Location C – Carr St @ 74th Avenue – 0.27 Acres Disturbed
Location D – Jellison St between 74th Ave and 72nd Ave – 0.13 Acres Disturbed
Location E – 72nd Ave just west of Indiana St – 0.08 Acres Disturbed
Location F – 72nd Ave between Kipling St and Carr St – 0.49 Acres Disturbed
Location G – Wadsworth Blvd at 52nd Ave – 0.15 Acres Disturbed

The project sites for each location are all very similar. Each area includes a replacement of existing or new water main underneath existing pavement. There are 3 ditch crossings included with this project that will include open cutting across each ditch during the dry season. For this project, the limits of construction and limits of disturbance are the same. The areas adjacent to the construction work include roadway and parking lots. The adjacent land for a short part of Segment D is farmland.

- Total Area of Construction Limits: [1.12 acres]
- Total Area of Disturbance Limits: [1.12 acres]

There are no planned grading or landscaping activities associated with this project. All disturbed asphalt and landscaping will be replaced to its original status.

Erosion and Sediment Control Plans are included in **Appendix B**.

3.0 SITE CONTACT INFORMATION

Owner:

Name: Bethany Yaffe
Title: Civil Engineer
Address: 8101 Ralston Rd Arvada, CO 800002
Phone: 720-898-7774
Email: byaffe@arvada.org

Operator

Name: Sam Lewis
Title: Water System Utility Supervisor
Address: 720-898-7796
Phone: 8101 Ralston Rd Arvada, CO 800002
Email: slewis@arvada.org

Project Manager/Site Supervisor:

Name:
Title:
Address:
Phone:
Email:

Qualified Stormwater Manager:

Name:
Title:
Address:
Phone:
Email:

Control Measure Contractor:

Name:
Title:
Address:
Phone:
Email:

Other:

Name:
Title:
Address:
Phone:
Email:

4.0 PROPOSED SEQUENCE FOR MAJOR CONSTRUCTION ACTIVITIES

Each of the 5 locations will follow the same phases described below:

Stage 1 – Mobilization including: initializing the stabilized staging area, any/all vehicle tracking pads, curb socks and inlet protection

Stage 2 – During construction – All BMPs will be maintained in an operable and effective condition, which includes removing sediment that has deposited on a weekly basis. Street sweeping of any roads near disturbed areas shall occur on a weekly basis as well. All BMPs from phase 1 will be left in place and maintained during phase 2.

Stage 3 – Demobilization – Final stabilization, which shall occur almost immediately after paving operations have completed. After final paving, all curb socks, VTCs, stabilized staging areas, and inlet protection shall be removed from the site. After all BMPs have been removed, one final street sweeping operation shall occur.

Project Phase	Estimate Date	Controls to be implemented during each phase*
Pre-Disturbance/Site Preparation		• Curb socks, inlet protection, vehicle tracking pads
Construction		• All installed BMPs to be maintained
Final Stabilization		• After final paving is complete, BMPs to be removed.

5.0 EXISTING SOIL DATA

Fill was encountered at the ground surface and extended to depths from 5 ft to 8ft below grade. Fill was described as the following: Sandy Lean Clay (CL)

Fine alluvium was encountered generally at the ground surface or underlying coarse alluvium and extended to depths 5 to 31.5 ft below grade and was described as: Lean Clay, Sandy Lean Clay

Coarse Alluvium was encountered generally at the ground surface or underlying fill and extended to depths from 10 to 21 ft below grade and was described as: Clayey sand, poorly-graded sand with gravel, poorly graded sand with gravel and clay, well-graded sand with gravel and clay, poorly graded gravel with sand and clay.

SEGMENT	SOIL TYPE
C	FINE ALLUVIUM
	CLAYSTONE AND SANDSTONE BEDROCK OF THE ARAPAHOE FORMATION
D	FINE ALLUVIUM
	COARSE ALLUVIUM
	CLAYSTONE AND SANDSTONE BEDROCK OF THE ARAPAHOE FORMATION
E	FINE ALLUVIUM
	CLAYSTONE AND SANDSTONE BEDROCK OF THE ARAPAHOE FORMATION
F	
G	FILL
	COARSE ALLUVIUM
	CLAYSTONE BEDROCK OF THE DENVER FORMATION

A copy of the soils report is included in **Appendix C**.

6.0 EXISTING VEGETATION

The majority of the project limits are under asphalt. However, the project does include open cutting across 3 ditches as well as some work in an open farm field. The replacement seed mix for all of these locations will be CDOT for regions outside roadway or the following:

Western Wheatgrass	Arriba	30%
	Barton	(4.8)
	Rosana	
Switchgrass	Grenville	20%
	Nebraska 20	(0.9)
	Blackwell	
	Pathfinder	
Sideoats Grama	Vaughn or Butte	15%
		(1.35)
Big Bluestem	Kaw	15%
		(1.65)
Blue Grama	Lovington	10%
	Hachita	(0.3)
Buffalograss	Texoka or	10%
	Sharps' Improved	(0.3)

		100%
		(9.3 lbs PLS/acre)

7.0 RECEIVING WATERS

7.1 Immediate and Ultimate Receiving Waters

Location C: This segment crosses the Croke Canal within a small segment and immediately outfalls into the City's MS4 along Carr St prior to entering the ponds within the Indian Tree Golf Course. This ultimately discharges into Little Dry Creek, which is tributary to Clear Creek.

Location D: A portion of this segment crosses the Farmers Highline Canal and then flows south along Jellison St. prior to immediately entering the City of Arvada MS4 on the NE corner of 73rd Ave. & Jellison St. This then outfalls ultimately into the Farmers Highline Canal, a private irrigation canal. The other portion of this segment immediately enters the City of Arvada's MS4 along the north side of 74th Ave. flowing to the west. This ultimately outfalls into Raston Creek, which is tributary to Clear Creek.

Location E: This segment adjacent to 72nd Ave. sheet flows to the east along the south side of 72nd Ave. It then becomes a concentrated flow prior to entering the City of Arvada's MS4 on the SW corner of 72nd Ave. & Indiana St. This then outfalls ultimately into Ralston Creek, which is tributary to Clear Creek.

Location F: This segment adjacent to 72nd Ave. flows along the south side of 72nd Ave. to the east where it immediately enters the City of Arvada's MS4 on the south side of 72nd Ave. These flows pass through a series of ponds throughout Majestic View Park and ultimately outfall into Ralston Creek, which is tributary to Clear Creek.

Location G: This segment immediately outfalls into the City of Arvada's MS4 on the west side of Wadsworth Blvd (multiple locations). This then ultimately outfalls directly to Clear Creek.

This construction project is within the City of Arvada, which has a Phase II Municipal Separate Storm Sewer System (MS4) Permit from the State of Colorado.

Are their anticipated wetland impacts (Circle)? Yes ☒ No
Stream impacts (Circle)? Yes ☒ No

Each of the project locations is outside the 100 year flood zone.

A copy of the flood insurance rate map (FIRM) for this site (FIRMette) is included in Appendix E.

7.2 Stream Crossings

This project includes open cutting across the following ditches during dry season:

Segment C – Croke Canal Crossing

Segment D - Farmers highline Canal Crossing, Croke Canal Crossing

7.3 Impaired Waters

Is the stream listed as impaired (on 303 (d) list)? If so, list the parameter of impairment and if any special treatment is required?

Clear Creek is on the 303(d) list As-T; 303(d) : E.ColiS; 303(d) : Mn-D; 303(d) : OrgSed; 303(d) : Temp

This project should not negatively impact the pollutants listed above.

If yes impaired, does the stream have a TMDL and if so, list the impairment and any special treatment required? N/A

8.0 POTENTIAL POLLUTANT SOURCES

Potential Source of Pollution	Potential Exists for this Project?	Description of Activities & Control Measures Used
Disturbed and stored soils - Stockpiled soils (e.g. topsoil, embankments, wetland, spoils, etc.) - Disturbed soils (exposed areas, staging areas, parking, etc.)v	Yes	Potential during all phases of construction activities, including but not limited to excavating, grading, cutting, filling, landscaping, etc. Potential pollutants include disturbed eroded sediment entering state waterways, inlets and sewers, and off right of way. <u>Control Measures-</u> Sediment control and stockpile containment may include usage of silt fence, rock socks, sediment control logs, and inlet protection as outlined in the SWMP narratives. Erosion control may include mulch/mulch tackifier application, seeding/ mulching, and vegetative protection.

Potential Source of Pollution	Potential Exists for this Project?	Description of Activities & Control Measures Used
		Administrative BMPs include site management and limiting number and location of stockpiles. Phased construction to reduce the amount of open area at any given time.
Vehicle tracking of sediments	Yes	Potential during all construction activities. Control Measures - Sediment control including vehicle tracking pads, street sweeping, and inlet protection. Minimize the number of entry and exit points, add orange perimeter fence to define construction entries/exits and establish perimeter control, and require equipment to be cleaned prior to arrival on site.
Management of contaminated soils	No	No known contaminated soils are expected to be encountered during this project. If contaminated soils/water are encountered, all activity shall be stopped until the situation can be assessed. The owner will be contacted.
Loading and unloading operations	Yes	Potential during delivery and staging of materials, equipment, soil, debris, etc. <u>Control Measures</u> - Loading and unloading operations shall occur within the disturbance limits of the project using designated vehicle tracking pads. Administrative controls include site management to minimize the number of areas at which loading/unloading occurs. Education as to where access points are on the project to prevent vehicle tracking.
Outdoor storage activities (erodible building materials, fertilizers, chemicals, etc.)	Yes	Potential during all phases of construction activities including delivery, staging/storage and use of various materials. <u>Control Measures</u> – Containment of the storage or staging areas using temporary berms or plastic/metal containment structures. Use of secondary containment device for storage of chemicals and petroleum products. Chemicals shall not be used, stored or stockpiled within 50 feet of state waters.

Potential Source of Pollution	Potential Exists for this Project?	Description of Activities & Control Measures Used
		Administrative controls including site management to ensure limited amount of materials are stored on site and are placed in proper designated areas.
Vehicle and equipment maintenance and fueling	Yes	Fueling of equipment or vehicles and equipment or vehicle repair activities may occur during all phases of construction activity. <u>Control Measures</u> – Limit areas where fueling occurs (no less than 50 feet from any state water, inlet, flow line). Ensure spill response kit is accessible where fueling is taking place. Use of plastic sheeting, drip pans, dirt berms and other measures to contain fluids. Immediate clean-up and disposal of spoils as detailed in the Spill Prevention, Control and Countermeasure Plan (Section 13). Secondary containment will be provided for containers 55 gallons or greater. Administrative controls include site management to limit equipment and vehicle maintenance that occurs on site.
Significant dust or particulate generating processes (e.g., saw cutting material, including dust)	Yes	Potential during clearing and grubbing, cut/fill activities, saw cutting/sanding work and final stabilization. <u>Control Measures</u> – Water truck on site for use as needed to minimize dust production. Use of pickup broom or vacuum during or immediately following saw cutting projects.
Routine maintenance activities including fertilizers, pesticides, herbicides, detergents, fuels, solvents, oils, etc.	Yes	Very few routine maintenance activities will occur on site. See Vehicle and Equipment maintenance for activities associated with those items. <u>Control Measures</u> – See Vehicle and Equipment Maintenance
On-site waste management practices (waste piles, liquid wastes, dumpsters)	Yes	All activities including clear and grubbing, demolition activities, et. <u>Control Measures</u> – Trash receptacles will be placed on site and garbage disposed of when full. Public trash will be routinely picked up around the site (daily) and disposed of in proper containers. Waste

Potential Source of Pollution	Potential Exists for this Project?	Description of Activities & Control Measures Used
		piles shall be placed a minimum of 50 feet from state waters, contained by earthen berms, silt fence, erosion logs, and landforms. Waste piles shall be placed in areas where stormwater runoff would not result in contamination of state waters. Liquid wastes will be contained and removed from site and properly disposed of by the subcontractors/contractor generating wastes in accordance with the Spill Prevention, Control and Countermeasure Plan (Section 13).
Concrete truck/equipment washing, including washing of the concrete truck chute and associated fixtures and equipment	Yes	Activities associated with this pollution source are concrete pours. <u>Control Measures</u> – Dedicated concrete washout areas that are clearly marked and maintained.
Dedicated asphalt, concrete batch plants and masonry mixing stations	No	Not applicable for this site. If these activities are added, then the SWMP will be amended.
Non-industrial waste sources such as worker trash and portable toilets	Yes	Potential throughout construction. <u>Control Measures</u> – See onsite waste management. Cleanup of trash will occur daily. A dumpster will be placed on site, at our office trailer. This will be emptied on a weekly basis, and more often, if waste amounts warrant extra pick-ups. Portable toilets will be located a minimum of 50 feet from state waters. They shall be adequately staked and cleaned on a weekly basis. They will be inspected daily for spills. Administrative controls will include site management practices to ensure workers are placing trash in the appropriate dumpsters. Monitoring to ensure trash dumpsters are removed from the site when full. Monitoring to ensure portable toilets are cleaned as needed, and repaired or removed if found to be leaking.
Other areas or procedures where spills can occur	Yes	Not applicable for this site. If these activities are added, then the SWMP will be amended.

9.0 NON-STORMWATER DISCHARGES

Potential Non-Stormwater Discharges	Potential Exists for this Project?	Description of Activities & Control Measures Used
Discharges from uncontaminated springs that do not originate from an area of land disturbance	No	Not applicable for this site. If these activities are added, then the SWMP will be amended.
Discharges to the ground of concrete washout water associated with the washing of concrete tools and concrete mixer chutes. Discharges of concrete washout water must not leave the site as surface runoff or reach receiving waters	Yes	A concrete wash-out area will be utilized to capture wastewater and waste products resulting from the cleaning of concrete and masonry equipment.
Discharges of landscape irrigation return flow	No	Not applicable for this site. If these activities are added, then the SWMP will be amended.
Discharges from emergency fire-fighting activities	Yes	To the extent allowed by the circumstances at the scene and without compromising the health and safety of personnel or the public, emergency firefighting activities should be performed in a manner that avoids or minimizes discharges to the MS4. <u>BMPs</u> – If possible, avoid directing firefighting flows directly on erodible surfaces if runoff will enter Receiving Waters or MS4 facilities. If possible, apply fire-fighting flows so that runoff will flow over vegetated areas.
Dewatering activities meeting a low-risk discharge guidance	Yes	Groundwater is not anticipated to be encountered based on the Geotechnical Investigation. If dewatering is needed, and not able to be discharged per the CDPS

Potential Non-Stormwater Discharges	Potential Exists for this Project?	Description of Activities & Control Measures Used
		low risk guidelines, a supplemental dewatering permit for dewatering through CDPS will be obtained. Any surface water dewatering covered under the CDPS guidelines needed for the project will be clearly identified on the site maps after installation.
Discharges covered under other CDPS discharge permits? 1. When a flowing watercourse must be crossed regularly during construction and a temporary stream crossing is needed, approval may be required by the U.S. Army Corps of Engineers. Under State requirements, documentation must be available showing that analysis was conducted to determine whether or not a permit was required. 2. Anytime a discharge is pumped from a construction site due to groundwater, or groundwater comingled with stormwater, and discharged to a waterway or inlet, a Construction Dewatering Discharge Permit must be obtained from the State of Colorado. 3. Other permits may include, but are not limited to, sand and gravel permits for batch plants, hydrostatic testing discharge permits, floodplain permits and others.	Yes	Groundwater Permit required for site

10.0EFFLUENT LIMITATIONS

10.1 Control Measure Details

This section includes the narrative description of appropriate control measures that will be implemented before, during, and after construction activities. Both structural and non-structural control measures will be described.

Control Measure Name	Description	Phase
Concrete Washout Area	Designating and properly managing a specific area of the construction site as a concrete washout area. Designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. <u>Surface discharges of concrete washout water from construction sites are prohibited.</u>	All phases
Construction Fencing	Restricts site access to designated entrances and exits, delineates construction site boundaries, and keeps construction out of sensitive areas such as natural areas to be preserved as open space, wetlands and riparian areas.	All phases
Construction Phasing	Attention to construction phasing, scheduling, and sequencing of land disturbing activities. Erosion and sediment controls needs adjustment as the project progresses and should be documented in the SWMP.	All phases
Erosion Control Blanket	Temporary or permanently installed manufactured products designed to control erosion and enhance vegetation establishment and survivability, particularly on slopes and in channels.	Final stabilization
Good House-keeping	Prevents pollution associated with solid, liquid and hazardous construction-related materials and wastes.	All phases
Inlet Protection	Permeable barriers installed around an inlet to filter runoff and remove sediment prior to entering a storm drain inlet. Inlet protection can be constructed from rock socks, sediment control logs, silt fence, block and rock socks, or other materials.	All phases
Outlet Protection	Helps reduce erosion immediately downstream of a pipe, culvert, slope drain, rundown or other conveyance with concentrated, high-velocity flows. Typical outlet protection consists of riprap or rock aprons at the conveyance outlet.	All phases
Rock Socks	Used either as a perimeter control or as part of inlet protection. Traps sediment from stormwater runoff that flows onto roadways as a result of construction activities. Constructed of gravel that has been wrapped by wire mesh or a geotextile to form an elongated cylindrical filter.	All phases
Sediment Control Log	A linear roll made of natural materials such as straw, coconut fiber, or other fibrous material trenched into the ground and held with a wooden stake. They are used as	All phases construction

Control Measure Name	Description	Phase
	a sediment barrier to intercept sheet flow runoff from disturbed areas.	
Seeding and Mulching	Seeding is used to stabilize disturbed areas that will be inactive for an extended period or at final grade that will not be otherwise stabilized. Effective seeding includes preparation of a seedbed, selection of an appropriate seed mixture, proper planting techniques, and protection of the seeded area with mulch, geotextiles, or other appropriate measures. Mulching consists of evenly applying straw, hay, shredded wood mulch, rock, bark or compost to disturbed soils and securing the mulch by crimping, tackifiers, netting or other measures. Reduces erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff.	Final stabilization
Silt Fencing	Geotextile fabric installed using stakes on down-gradient side and trenched into soil. Provides sediment control by reducing runoff velocity. Used as perimeter control and back of curb control	All phases
Stabilized Staging Area	A clearly designated area where construction equipment and vehicles, stockpiles, waste bins, and other construction-related materials are stored. The contractor office trailer may also be located in this area.	All phases
Stockpile Management	Minimizes erosion and sediment transport from soil stockpiles. Should be used when soils or other erodible materials are stored at the construction site. Special attention should be given to stockpiles in close proximity to natural or manmade storm systems.	All phases
Street Sweeping	Uses mechanical pavement cleaning practices to reduce sediment, litter and other debris washed into storm sewers by runoff. Reduces pollutant loading to receiving waters and in some cases reduces clogging of storm sewers and prolong the life of infiltration oriented BMPs and reduce clogging of outlet structures in detention BMPs.	All phases; as needed
Tree Protection	Used to maintain a stable surface cover as part of construction phasing, or provide protection in areas designated to remain in natural conditions under post-development conditions. Includes installation of a construction fence around the area requiring protection. Where upgradient areas are disturbed, it may also be necessary to install perimeter controls to minimize sediment loading to sensitive areas.	All phases
Vehicle Tracking Control	Provides stabilized construction site access where vehicles exit the site onto paved public roads. Helps remove sediment (mud or dirt) from vehicles, reducing tracking onto the paved surface. Constructed from angular rock or other proprietary materials.	All phases

10.2 Other Effluent Limitations

Additional controls measures:

- Soil Compaction – Soil compaction must be minimized for areas where infiltration control measures will occur or where final stabilization will be achieved through vegetative cover.
- Topsoil Preservation – Unless infeasible, topsoil will be preserved for those areas of a site that will utilize vegetative final stabilization. [If infeasible, provide information on why it is infeasible). Consider adding the following with any bullets that apply. If this does not apply to the project, do not include. None of these are requirements and once added to the SWMP they should be followed in the field. Topsoil preservation may include the following measures:
 - Limit construction disturbance area including those used for access by installing construction fence or other means to limit impacts to existing topsoil.
 - In areas of grading or excavation, strip and segregate topsoil separately from other excavated materials.
 - In areas with construction traffic where topsoil is likely to mix with subsoil, strip and stockpile topsoil.
- Minimize Disturbances – Disturbances will be minimized to the extent feasible especially on steep slopes.
- Temporary Stabilization – Temporary stabilization must be implemented for earth disturbing activities on any portion of the site where ground disturbing construction activity has permanently ceased, or temporarily ceased for more than 14 calendar days. Temporary stabilization methods may include, but are not limited to, surface roughening, tarps, soil tackifier, and hydroseed and although not specifically outlined in the permit may also include temporary hard surfaces. During the seasons when seeding does not produce vegetative cover, temporary stabilization will occur. The permittee may exceed the 14-day schedule when either the function of the specific area of the site requires it to remain disturbed, or, physical characteristics of the terrain and climate prevent stabilization. The SWMP must document the constraints necessitating the alternative schedule, provide the alternate stabilization schedule, and identify all locations where the alternative schedule is applicable on the site map.
- Construction activities will be limited to those areas within the limits of disturbance as shown on the plans. Construction activities in addition to normal construction procedures will include the on-site parking of vehicles or equipment, on-site staging, on-site batch plants, haul roads or work access and any other action which would disturb existing conditions. Off road staging areas or stockpiles must be pre-approved by the City of Arvada. Disturbances beyond these limits will be restored to original condition.

Other controls related to final stabilization, bulk storage, spill prevention, and protection of vegetation within 50 feet of receiving waters are covered in other sections of this SWMP.

11.0 MATERIALS HANDLING

This section includes the narrative description of all potential pollutants other than sediment that will be handled and disposed of in an appropriate manner that does not contaminate stormwater.

Material/Waste Product Name	Description and Intended Use and Associated Control Measure	Phase
Concrete Curing Compounds	Used for concrete work. Containers will be kept intact with no leakage and in an area with good housekeeping practices to avoid spills	During concrete pouring activities
Diesel	Used to fuel equipment. Containers will be kept intact with no leakage and in an area with good housekeeping practices to avoid spills	All phases when heavy equipment is in use
Diesel Engine Antifreeze Coolant	Used in equipment. Containers will be kept intact with no leakage and in an area with good housekeeping practices to avoid spills	All phases when heavy equipment is in use
Hydraulic Oil	Used in equipment. Containers will be kept intact with no leakage and in an area with good housekeeping practices to avoid spills	All phases when heavy equipment is in use
Motor Oil	Used in equipment. Containers will be kept intact with no leakage and in an area with good housekeeping practices to avoid spills	All phases when heavy equipment is in use
Unleaded Gasoline	Used to fuel equipment. Containers will be kept intact with no leakage and in an area with good housekeeping practices to avoid spills	All phases when heavy equipment is in use

12.0 CONTROL MEASURE MAINTENANCE

All erosion and sediment control practices and other protective measures identified in the SWMP will be maintained in effective operating condition. Control measures that are not adequately maintained in accordance with good engineering, hydrologic and pollution control practices, including removal of collected sediment outside the acceptable tolerances of the control measures are considered to be no longer operating effectively and must be addressed.

Assessment of control measures will be performed as part of the comprehensive inspection. Where site assessment results in the determination that new or replacement control measures are necessary, the control measures must be installed to ensure ongoing compliance with this SWMP. Where control measures have failed or are otherwise non-compliant, they must be addressed immediately or an alternative schedule with rationale will be supplied in the inspection corrective action log. See control measures details and specification for specific maintenance information

13.0 SPILL PREVENTION AND RESPONSE PLAN

13.1 Spill Prevention

All parties on site will take all measures necessary to prevent spills that could negatively impact stormwater quality. The following general spill prevention methods should be used on site:

- Ensuring personal safety for all personnel affected by the spill;
- Proper storage of all materials;
- Proper maintenance of all containers;
- Bulk storage, 55 gallons or greater, for petroleum products and other liquid chemicals must have secondary containment or equivalent;
- Train employees in spill prevention and cleanup;
- Designate responsible individuals to oversee and enforce control measures;
- Spills should be covered and protected from stormwater run-on during rainfall to the extent that it doesn't compromise cleanup activities;
- Do not bury or clean/wash spills with water without using a wet vacuum;
- Store and dispose of used clean up materials, contaminated materials, and recovered spill material properly;
- Do not allow water used for cleaning and decontamination to enter storm drains or waterways;
- Contain water overflow or minor water spillage and do not allow it to discharge into storm drains or waterways;
- Loading and unloading of chemicals should be observed by on site personnel at all times;
- Do not store chemicals within 50 feet of a storm drain or waterway; and
- All spills must be documented and properly cleaned up immediately.

13.2 Spill Prevention and Response Training

Prior to project startup, personnel and contractors will be trained in the following spill control procedures by the Erosion Control Specialist/Qualified Stormwater Manager.

- Chemicals planned to be used on site;
- Spill control;
- Containment, vessel, tank, and piping inspection and maintenance;

- Spill response, containment, and clean-up; and
- Company policies on reporting and responding to spills.

13.3 Environmental Sensitive Areas

There are no environmentally sensitive areas in the work area.

13.4 Spill Reporting and Cleanup Contacts

All responsible personnel and their corresponding contact information are presented in the table below.

Responsibility	Name and Title	Phone Number
Emergency Local Fire, Police, & Ambulance	N/A	911
EPA National Response Center	N/A	1-800-424-8802
CDPHE Spill Reporting Hotline	N/A	1-877-518-5608
Primary Contact for Spills		
Secondary Contact for Spills		
On-Site Spill Responder		
Arvada Stormwater Team	Jake Moyer/Stormwater Administrator	720-898-7812

13.5 Location of Spill Kits

The kit will contain an absorbent boom, absorbent rags, absorbent litter and an over-pack drum to storm the material. Spill kit materials should be replenished after use in the field. Spill kits should be inspected regularly to check if materials need to be replenished.

Type of Spill Kit	Location

13.6 Quantities of Chemical and Locations Stored On-Site

The following is a table of chemical quantities and where they are located on site. (Note: Also refer to the Potential Pollutants list and evaluation in Section 8 of this SWMP.)

Material	Quantity	Staging/Storage Location

13.7 Chemical Container Labeling

Any products/chemicals that are located or stored on site shall be properly labeled as to the contents of the material. The Safety Data Sheet (SDS) for all products/chemicals utilized on site can be found in a notebook at the project trailer.

13.8 Minor Spills (less than 5 gallons)

Notification and cleanup procedures to be implemented in the event of a spill for spills which do not enter state waters or are under reporting limits of the chemical of concern (e.g. diesel fuel, hydraulic fluid, motor oil, used hydraulic fluid and motor oil, tack oil).

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spills.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
 - Contain the spread of the spill.
 - Recover spilled materials.
 - Clean the contaminated area and properly dispose of contaminated materials.
- Keep within permitted area.
- It must not threaten any stormwater conveyance.

13.9 Major Spills (greater than 5 gallons)

Significant spill procedures for spills of any size that enter state waters or have the potential to do so and can be controlled by the first responder along with the aid of other trained personnel. Section 13.4 above contains spill notification contacts and phone numbers. This response may require all work to stop. Spills must be clean up immediately

- Contain spread of the spill.
- Notify the project foreman immediately.
- If the spill occurs on paved or impermeable surfaces, clean up using dry methods. Contain the spill by encircling with absorbent materials and do not let the spill spread. Make sure nearby storm drains and waterways are protected.
- If the spill occurs in a dirt area, immediately contain the spill by constructing an earthen berm. Dig up and properly disposed of contaminated soil.
- If the spill occurs during a rain event, cover the spill with tarps, visqueen or similar material to prevent contaminating runoff. Make sure nearby storm drains and waterways are protected.

13.10 Notification of Regulatory Agencies

For non-hazardous materials which may endanger health or the environment; spills or discharge of hazardous substance or oil, which may cause pollution of the waters of the state; the following measures shall be implemented:

- Contact the CDPHE Environmental Emergency Spill Reporting Line (1-877-518-5608) within 24 hours of the spill event. A written notification to the CDPHE-EMP is necessary within 5 days.
- Contact the Colorado State Patrol 24-hour hotline (1-303-239-4501) if the spill is on a state highway.
- Report spill to the Project Engineer.
- Call the Arvada Stormwater Team (720-898-7812) if spilled material spreads to an Arvada storm drain or a waterway.

For spills involving hazardous materials, the following measures shall be implemented:

- Contact the local emergency response team by dialing 911.
- Contact the CDPHE Environmental Emergency Spill Reporting Line (1-877-518-5608) within 24 hours of the spill event. A written notification to the CDPHE-EMP is necessary within 5 days.
- Contact the Colorado State Patrol 24-hour hotline (1-303-239-4501) if the spill is on a state highway.
- Call the Arvada Stormwater Team (720-898-7812) if spilled material spreads to an Arvada storm drain or a waterway.

14.0 FINAL STABILIZATION

14.1 Establishing Final Stabilization

Final stabilization is reached when all ground surface disturbing activities at the construction site are complete; and, for all areas of ground surface disturbing activities, a uniform vegetative cover with an individual plant density of at least 70 percent (uniform) of what would have been provided by native vegetation in a local, undisturbed area.

14.2 Final Stabilization Measures

- The SWMP shall clearly describe the practices used to achieve final stabilization of all disturbed areas at the site, and any planned practices to control pollutants in stormwater discharges that will occur after construction operations have been completed at the site.*
- Unless infeasible, topsoil shall be preserved for those areas of a site that will utilize vegetative final stabilization.*
- Final stabilization practices for obtaining a vegetative cover should include, as appropriate: seed mix selection and application methods; soil preparation and amendments; soil stabilization practices (e.g., crimped straw, hydro mulch or rolled erosion control products); and appropriate sediment control measures as needed until final stabilization is achieved; etc.*

All final stabilization methods shall be in accordance with Section 1000 of the City of Arvada's Engineering Standards and Specifications

14.2.1 Seeding Plan

The majority of the project limits are under asphalt. However, the project does include open cutting across 3 ditches as well as some work in an open farm field. The replacement seed mix for all of these locations will be CDOT for regions outside roadway or the following:

See next page for seed mix.

Western Wheatgrass	Arriba	30%
	Barton	(4.8)
	Rosana	
Switchgrass	Grenville	20%
	Nebraska 20	(0.9)
	Blackwell	
	Pathfinder	
Sideoats Grama	Vaughn or Butte	15%
		(1.35)
Big Bluestem	Kaw	15%
		(1.65)
Blue Grama	Lovington	10%
	Hachita	(0.3)
Buffalograss	Texoka or	10%
	Sharps' Improved	(0.3)

		100%
		(9.3 lbs PLS/acre)

14.2.2 Reseeding Operations /Corrective Stabilization

Areas where seed has not germinated after one season will be evaluated by the City. Areas that have not germinated will have seed, mulch and mulch tackifier (or blanket) reapplied in accordance with Section 1000 of the City's Engineering Standards and Specifications.

14.3 Long-Term/Permanent Stormwater Control Measures

The site will be returned to pre-construction vegetated conditions.

15.0 INSPECTIONS

During construction the site will be inspected by a Qualified Stormwater Manager at one of the following frequencies approved by the CDPHE:

- At least one inspection every 7 calendar days
- At least one inspection every 14 calendar days including post storm inspections within 24 hours of a storm that causes surface erosion.

The City of Arvada allows a 14-day and post storm inspection frequency.

Inspect the following areas for evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters:

- Construction site perimeter;
- All disturbed areas;
- Designated haul routes;

- Material and waste storage areas exposed to precipitation;
- Locations where stormwater has the potential to discharge offsite; and
- Locations where vehicles exit the site.

A reduced frequency inspection schedule may be followed with approval from the City of Arvada for the following site conditions:

- Inspections at completed sites that are awaiting final stabilization
- Winter conditions exclusion

A copy of a blank inspection form is included in **Appendix E**. Completed inspection forms must be kept on site or be easily accessible via an electronic format.

16.0 RECORDKEEPING

A copy of this SWMP and all inspection records must be retained for three years from the permit termination date.

APPENDIX A

CDPS Construction Permit

PENDING CONTRACTOR

APPENDIX B

EROSION AND SEDIMENT CONTROL PLANS, BMP DETAILS, AND LANDSCAPE PLANS

REFER TO DESIGN SHEETS

APPENDIX C
SOILS REPORT



United States
Department of
Agriculture

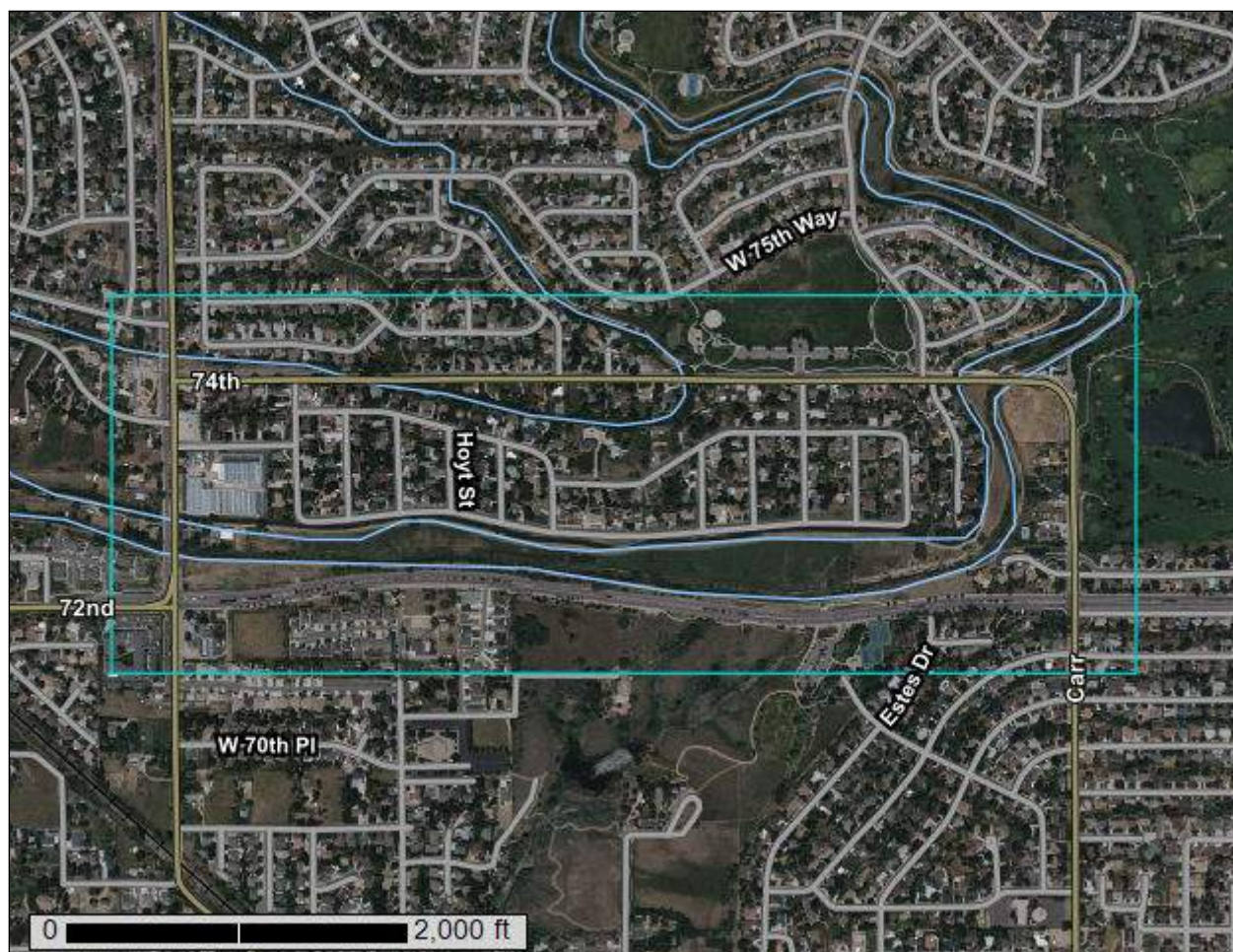
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

Segment C,D,F



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 17, Sep 7, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2020—Jul 2, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
42	Englewood clay loam, 2 to 5 percent slopes	6.4	2.1%
80	Leyden-Primen-Standley cobbly clay loams, 15 to 50 percent slopes	3.8	1.2%
94	Manzanola clay loam, 15 to 25 percent slopes	8.7	2.9%
96	Manzanola-Renohill-Stoneham complex, 9 to 15 percent slopes	12.9	4.2%
105	Nunn-Urban land complex, 0 to 2 percent slopes	138.7	45.6%
106	Nunn-Urban land complex, 2 to 5 percent slopes	77.0	25.3%
163	Ulm-Urban land complex, 5 to 9 percent slopes	56.8	18.7%
Totals for Area of Interest		304.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a

given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

42—Englewood clay loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: jpn
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Englewood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Englewood

Setting

Landform: Drainageways, alluvial fans
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Clayey, calcareous alluvium

Typical profile

H1 - 0 to 9 inches: clay loam
H2 - 9 to 39 inches: clay
H3 - 39 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Minor Components

Urban land

Percent of map unit: 3 percent
Hydric soil rating: No

Nunn

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Haverson, rarely flooded

Percent of map unit: 3 percent
Landform: Drainageways, flood plains
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R049XY036CO - Overflow
Hydric soil rating: No

Denver

Percent of map unit: 3 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Englewood, wet, rarely flooded

Percent of map unit: 3 percent
Landform: Drainageways, flood plains, alluvial fans
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R048BY265CO - Salt Meadow
Hydric soil rating: No

80—Leyden-Primen-Standley cobbly clay loams, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: jpq9
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Leyden and similar soils: 35 percent
Primen and similar soils: 30 percent

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Standley and similar soils: 20 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leyden

Setting

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear, convex

Parent material: Calcareous, gravelly, cobbly, stony, and clayey slope alluvium over residuum weathered from mudstone

Typical profile

H1 - 0 to 3 inches: cobbly clay loam

H2 - 3 to 35 inches: gravelly clay

H3 - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 15 to 50 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: R049XB208CO - Clayey Foothill

Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)

Hydric soil rating: No

Description of Primen

Setting

Landform: Hillslopes, ridges

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Cobbly, gravelly, clayey material over residuum weathered from sandstone

Typical profile

H1 - 0 to 9 inches: cobbly clay loam

H2 - 9 to 14 inches: cobbly clay

H3 - 14 to 18 inches: gravelly clay

H4 - 18 to 22 inches: weathered bedrock

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Description of Standley

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous, gravelly, cobbly, stony, and clayey alluvium and/or colluvium

Typical profile

H1 - 0 to 9 inches: cobbly clay loam
H2 - 9 to 22 inches: gravelly clay
H3 - 22 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C

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Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Minor Components

Denver

Percent of map unit: 3 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Kutch

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Midway

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R049XB212CO - Shaly Foothill
Hydric soil rating: No

Urban land

Percent of map unit: 3 percent
Hydric soil rating: No

Nunn

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

94—Manzanola clay loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: jpq5

Elevation: 5,200 to 6,500 feet

Mean annual precipitation: 13 to 17 inches

Frost-free period: 126 to 142 days

Farmland classification: Not prime farmland

Map Unit Composition

Manzanola and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manzanola

Setting

Landform: Hillslopes, ridges

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Calcareous, clayey alluvium

Typical profile

H1 - 0 to 5 inches: clay loam

H2 - 5 to 29 inches: clay

H3 - 29 to 60 inches: clay loam

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 2 percent

Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

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Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Minor Components

Midway

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R049XB212CO - Shaly Foothill
Hydric soil rating: No

Denver

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Englewood

Percent of map unit: 3 percent
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Ulm

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluvial, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Renohill

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Urban land

Percent of map unit: 1 percent

Hydric soil rating: No

96—Manzanola-Renohill-Stoneham complex, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: jpqv

Elevation: 5,200 to 6,500 feet

Mean annual precipitation: 13 to 17 inches

Frost-free period: 126 to 142 days

Farmland classification: Not prime farmland

Map Unit Composition

Manzanola and similar soils: 35 percent

Renohill and similar soils: 30 percent

Stoneham and similar soils: 20 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manzanola

Setting

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Parent material: Calcareous, clayey alluvium

Typical profile

H1 - 0 to 5 inches: clay loam

H2 - 5 to 29 inches: clay

H3 - 29 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 2 percent

Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Description of Renohill

Setting

Landform: Hillslopes, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Calcareous, clayey residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 16 inches: clay
H3 - 16 to 32 inches: clay loam
H4 - 32 to 36 inches: unweathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Description of Stoneham

Setting

Landform: Knobs, hillslopes, ridges
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous, loamy alluvium and/or eolian deposits

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Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 12 inches: clay loam
H3 - 12 to 60 inches: loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Minor Components

Primen

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Ulm

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Midway

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R049XB212CO - Shaly Foothill
Hydric soil rating: No

Nunn

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Leyden

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Urban land

Percent of map unit: 1 percent
Hydric soil rating: No

105—Nunn-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: jpkj
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Nunn and similar soils: 65 percent
Urban land: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunn

Setting

Landform: Terraces, fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey, calcareous alluvium

Custom Soil Resource Report

Typical profile

H1 - 0 to 6 inches: clay loam
H2 - 6 to 30 inches: clay
H3 - 30 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Denver

Percent of map unit: 5 percent
Landform: Alluvial fans, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Englewood

Percent of map unit: 5 percent
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Standley

Percent of map unit: 5 percent

Custom Soil Resource Report

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

106—Nunn-Urban land complex, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: jpkk
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Nunn and similar soils: 65 percent
Urban land: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunn

Setting

Landform: Fans, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey, calcareous alluvium

Typical profile

H1 - 0 to 6 inches: clay loam
H2 - 6 to 30 inches: clay
H3 - 30 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Denver

Percent of map unit: 5 percent
Landform: Alluvial fans, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Englewood

Percent of map unit: 5 percent
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Standley

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

163—Ulm-Urban land complex, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: jpm1

Custom Soil Resource Report

Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Ulm and similar soils: 65 percent
Urban land: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ulm

Setting

Landform: Terraces, hillslopes
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous, clayey alluvium derived from calcareous shale

Typical profile

H1 - 0 to 6 inches: clay loam
H2 - 6 to 21 inches: clay
H3 - 21 to 50 inches: clay
H4 - 50 to 60 inches: clay loam

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Other vegetative classification: CLAYEY FOOTHILL (048AY208CO)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Terraces, hillslopes
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: No

Minor Components

Renohill

Percent of map unit: 3 percent

Landform: Hillslopes, ridges

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Manzanola

Percent of map unit: 3 percent

Landform: Hillslopes, ridges

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Nunn

Percent of map unit: 3 percent

Landform: Hillslopes, terraces

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope, tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Denver

Percent of map unit: 3 percent

Landform: Hillslopes, terraces

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Side slope, tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Englewood

Percent of map unit: 3 percent

Landform: Drainageways

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

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United States
Department of
Agriculture

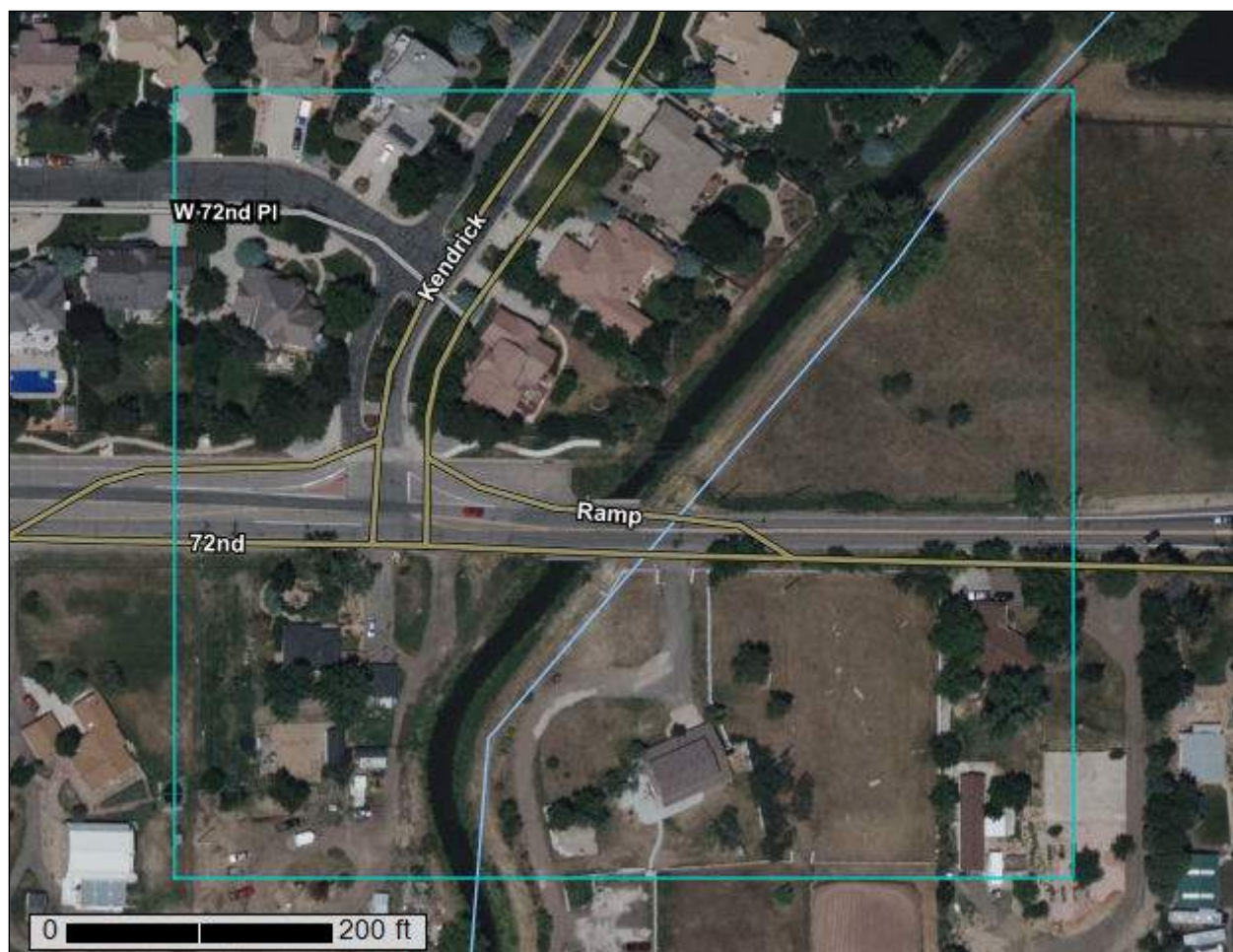
NRCS

Natural
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Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

Segment E



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 17, Sep 7, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2020—Jul 2, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102	Nunn clay loam, 0 to 2 percent slopes	9.3	100.0%
Totals for Area of Interest		9.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

102—Nunn clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tlps
Elevation: 5,300 to 5,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 100 to 130 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nunn and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunn

Setting

Landform: Terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: clay loam
Bt - 6 to 18 inches: clay
Btk - 18 to 30 inches: clay
Bk - 30 to 47 inches: clay loam
BCK - 47 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 0.5
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Minor Components

Englewood

Percent of map unit: 9 percent
Landform: Alluvial fans, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Standley

Percent of map unit: 6 percent
Landform: Terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

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United States
Department of
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NRCS

Natural
Resources
Conservation
Service

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Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

Segment G



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 17, Sep 7, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2020—Jul 2, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Alda loam, 0 to 2 percent slopes	7.0	9.5%
108	Nunn variant-Urban land complex, 0 to 3 percent slopes	66.4	90.5%
Totals for Area of Interest		73.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

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development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

1—Alda loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: jpk9
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alda and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alda

Setting

Landform: Flood plains, terraces, valley floors
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous, stratified alluvium over sandy and gravelly alluvium

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 38 inches: stratified loamy sand to loam
H3 - 38 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B
Ecological site: R049XA178WY - Wetland (Foothills And Mountains Southeast)
Other vegetative classification: WET MEADOW (48AY315CO)
Hydric soil rating: No

Minor Components

Niwot

Percent of map unit: 3 percent
Landform: Meandering channels
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: R049XA178WY - Wetland (Foothills And Mountains Southeast)
Hydric soil rating: No

Fluventic haplaquolls

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XA178WY - Wetland (Foothills And Mountains Southeast)
Hydric soil rating: Yes

Urban land

Percent of map unit: 3 percent
Hydric soil rating: No

Loveland

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048BY265CO - Salt Meadow
Hydric soil rating: Yes

Loveland variant

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY036CO - Overflow
Hydric soil rating: No

108—Nunn variant-Urban land complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: jpkm
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Nunn variant, rarely flooded, and similar soils: 65 percent

Urban land: 20 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunn Variant, Rarely Flooded

Setting

Landform: Alluvial fans, flood plains, terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous alluvium

Typical profile

H1 - 0 to 12 inches: clay loam

H2 - 12 to 43 inches: clay

H3 - 43 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 24 to 36 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: C

Ecological site: R048BY265CO - Salt Meadow

Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: No

Minor Components

Englewood

Percent of map unit: 5 percent

Landform: Drainageways

Down-slope shape: Linear

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Across-slope shape: Concave
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Nunn

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Loveland variant, rarely flooded

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY036CO - Overflow
Hydric soil rating: No

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United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX D

NATIONAL FLOOD HAZARD LAYER – FIRMette

DWL RQDD PRRG-EPUGDHU)BWWH



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(1) 6 5 7 7 5 4 3 2 1 5 5 5 5 5

6 5 5 2 5 5 5 5	L W K R W % D H J P R R G O H D W L R Q % - F Q H \$ 9 \$ L W K % R U F S W K - F Q H \$ 5 5 5 5 \$ H O D W R U J P R R G O
2 6 5 2 2 5 5	\$ Q Q D D & Q Q H J P R R G - E P U G \$ U H V R D Q Q D D F Q Q H I O R R G Z W K D H U D H G S W K O H W W K Q R Q H I R R W R U Z W K G U L Q D U H D / R O H W W K Q R Q H V D U H E O H F Q H; X W U H & Q Q L W L R Q / \$ Q Q D & Q Q H J P R R G - E P U G - F Q H; \$ U H D Z W K \$ G H G J P R R G \$ L N G H W R H M H G H R M H V - F Q H; \$ U H D Z W K J P R R G \$ L N G H W R H M H - F Q H'
2 6 5 5	\$ U H D R Q L E D J P R R G - E P U G - F Q H; (I H F W L Y H B V \$ U H D R Q G W H U E Q G J P R R G - E P U G - F Q H'
6 5 5 5 5 5	& Q Q Q D & O Y H U W R U S W R U R P Z U H M H L N H R U J P R R G O O
2 6 2 5 5	& U R W & F W L R Q / Z W K \$ Q Q D & Q Q H D A V H U & U I D H O H D W L R Q & D W D D T U D Q H F W % D H J P R R G O H D W L R Q L Q H % L E W R & W X G - X U L V G L F W L R Q % R Q Q D U & D W D D T U D Q H F W % D H O L Q H & U R L O H % D H O L Q H & U R U D S L F J D W X U H
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7 4 H S Q Q L V S D H G R Q W K H B S L V D Q D S S U R L B W H
S R Q V V O H F W H G B W K H X H J D Q G G R H / Q R W U H B H
D Q D W K R U L W D W L Y H S U R S U W O R F D W L R Q

7 4 L V B S F F B O L H V Z W K J V W D Q Q D U G / I R U W K H X H R
G L J W D D I O R R G B S / L I L W L V Q R W Y R L G D V G H F U L E G B O R Z
7 4 H E D F B S V R Q F F B O L H V Z W K J V E D H B S
D F X U D R W D Q Q D U G /
7 4 H I O R R G K Q Q U G L Q R U B M L R Q L V G U L Y H G L U H F W O I U R F W K
D W K R U L W D W L Y H J Z E V H U Y L F H V S U R L G H G B J 7 4 L V B S
Z V H S R U W H G R Q D V , \$ D Q G G R H / Q R W
U H O H W R Q Q H V R U D F Q Q Q W V B H X Q V W R W L V G D W H D Q G
W L F 7 4 H J D Q G H I F W L Y H L Q R U B M L R Q B R Q Q H R U
B F F F V S H U V G G B Q Z G D W D R Y H U W L F

7 4 L V B S L B H L V Y R L G L I W K H R Q R U R U H R W K H I R O R Z Q I B S
H O H R Q W V G R Q W D S S D U , E D H B S L B H U I O R R G J R H O D E O V
O H H Q G V A D H E D U B S F U H D W L R Q G D W H F F Q W A L G Q W L I L H V
) S S Q D Q H U D Q G) S H I F W L Y H G D W H D S L B H V I R U
X P S S G D Q G X Q R G U Q J G D U H V F D Q Q W B H X H G I R U
U H O D W R U S U S R M V

[illegible]



(b) (6) ~~PPS (11, 13) 531.827~~


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 -FQ\$ 9 \$
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		\$DQD &QFHJ)PFG-EPJG \$JHD/ R DQDQ RQGH-HIOFGZWKXDJHDH G-BVKOHVWKKQQRHFRW RU ZWKGDJLQ DHDV/R OHVWKKQQRHFDVDOHEOHQH;
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		\$JHDZWK\$GFG)PFG\$WGHWR HHH GHBMVH -RQH;
26\$62 28\$		\$JHDZWK)PFG\$WGHWRHHH -RQH'

Address	Disassembly	Comment
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25005	(IIFWLYH) 25005	
25010	\$JDR I Q, W, H, U, E, Q, G, D, R, G, GUG	#RQ;
25015	----- &QQO &OYUW RU &WRU &RU	
25020	HYLH RU D, R, G, GUG	












8URW 6FWLRQ/ ZWK \$QDD &QFH
 DMHU 6UIDFH QHDMWRQ
 &QDWD 7UDQFW
 %DMHQFQG QHDMWRQLQH %
 LEW R 6WG
 -XULVLFWLRQ/RQDU
 &QDWD 7UDQFW %DMQLQH
 3URLQH %DMQLQH
 -GURUDLFH DMXUH

26
 26

	☐	L.L.WOOD DWD\$YLOODEOH
	☐	R.L.WOOD DWD\$YLOODEOH
\$36	☒	8PS-G

74HS L QGLVSDHG RQWKHESLV DQDSSJFLBWH
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)SSDQDQEU,DG)SHIFWLYHGDWHDSLBHVRU
XDSHGDSXQFQUJHGDUH/RQQWRBHXHGRUR
UHDWRU,SUSRVH

DWLRQD DRRG-EPUGDHU)BWWH



HQS

Q)6\$7 7\$4(6\$)5\$5\$7

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	 LWK%RUFSWK -RQHS 9 \$ 9 \$
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	 HHHHNN RU)DRGZDO

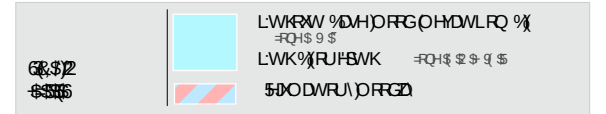
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	 \$J.L.WD DWD\$DLOEDH
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	JHDZ WK & H G PRC J WGHWR H H H H H RWH #QH;
	JHDZ WK PRC J WGHWR H H H #QH;

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		(IHFWLYHIV	
2025		\$JHJR QGHMUEQCG)PRG-EDUG	=FQH'

(S) --- 8000 80YUW RU 6VRURZU
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	☐	R1LWDDWD\$DLOEDH	
036	☒	QPS-G	

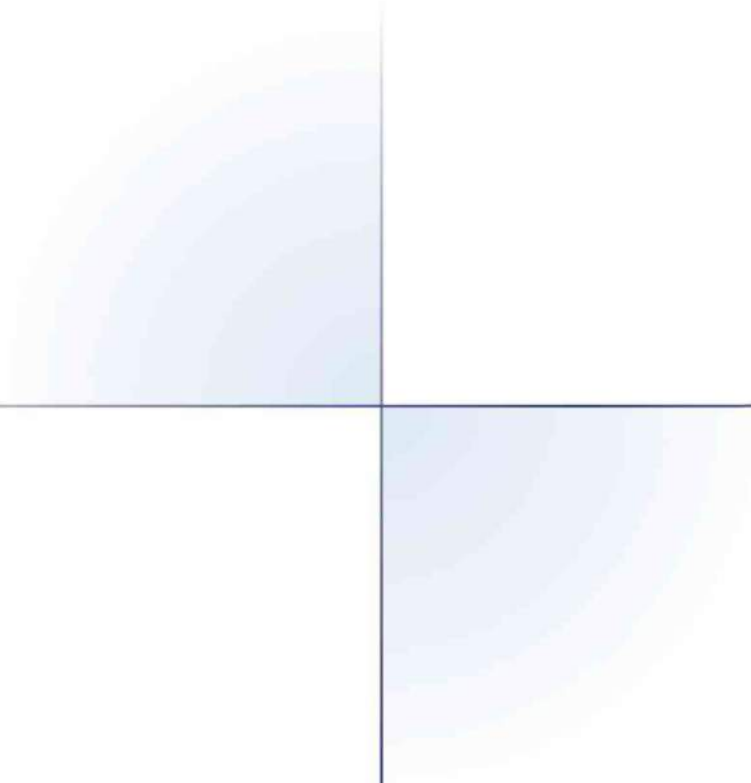
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APPENDIX E
INSPECTION FORMS
PENDING CONTRACTOR



APPENDIX C

FRICO Approval Letter and Contractor Requirements

The following documents were provided to us for review purposes:

1. Bid Set Drawing submittal 2021 WATER MAIN IMPROVEMENT PROJECT drawings by CDM Smith dated 10/3/23.
2. Geotechnical Investigation Report, 2021 Water main Improvement Project, February 2023 by Lithos Engineering.
3. Response letters from CDSmith dated February 24, 2023, and May 2, 2023.

GENERAL COMMENTS

1. FRICO expressly reserves the right to require projects to be constructed at a minimum in accordance with the guidelines set forth in the “Farmers Reservoir and Irrigation Company Design Review Manual” in order to protect the quality, integrity, operation, and efficiency of FRICO Property and Facilities.
2. A standard license agreement is required between FRICO and the developer (and any successor). A temporary construction easement and other agreements may also be required.

RECOMMENDATIONS

Based on our review of the drawings and associated design documents, ERC recommends that FRICO provide technical approval of the project with the following conditions:

1. Coordination with FRICO will be needed well in advance of excavating into the canal embankment deeming the canal inoperable. The allotted canal downtime will need to be agreed to with FRICO.
2. At least 72 hours before construction activities commence, schedule, and conduct a preconstruction meeting with all parties involved with the work including FRICO.
3. At least 48 hours prior to beginning construction, provide written notification to FRICO.
4. Provide a closed utility locate ticket to a FRICO representative at the pre-construction meeting.
5. As part of the agreement, FRICO will need to have assurance that an access route is maintained open for FRICO during and after construction.
6. Ponding/nuisance flows and wet conditions will likely persist throughout the project. Consequently, the contractor shall have a water management plan which includes controls required to ensure the work can be completed within the planned construction timeframe.
7. The contractor should be prepared to divert up to 20 cfs.
8. Keep a record of the dewatering effort that is required. This can be done by visually inspecting the discharge a few times a day, estimating the flow, and keeping a record of this information.
9. If trench boxes are to be used for installation of the pipe, there may be sloughing of adjacent materials causing a weakened zone between the trench and canal banks/bottom. The contractor should be aware that this may require additional work effort to remove/replace/repair any weakened zones to see that the new construction is securely keyed into the existing materials.
10. Provide submittals of proposed construction materials, including but not limited to, grout mixtures, concrete mix designs, soils, riprap, pipe, seed mixes and shop drawings to FRICO for approval prior to placement, allowing a minimum of two week for FRICO to review.

11. Provide submittal of pipe installation and backfill plan to FRICO for approval prior to installation, allowing a minimum of two weeks for FRICO to review.
12. FRICO will need to confirm the final canal elevations to insure correct grades for effective hydraulic functioning. The elevation shown on the plans for the canal bottom may need to be adjusted slightly based on field conditions.
13. Inform FRICO 48-hours in advance to allow for inspection of the following items:
 - a. Removal and abandonment of the existing overhead pipe.
 - b. Excavation for installation of the pipe.
 - c. Final prepared subbase for placement of the pipe.
 - d. Installation of the casing pipe.
 - e. Pipe/trench backfill.
 - f. Forming for the concrete cutoff walls.
 - g. Concrete placement.
 - h. Channel soil lining.
14. Provide results for concrete strength and backfill compaction with 24 hours of testing.
15. Re-establish FRICO's access roads including placing a gravel wearing course as needed.
16. Provide redlined As-Built Drawings at completion of the project and provide coordinates of the pipe alignment in NAD83 State Plane or lat/long format.

The recommendation of technical approval by ERC of this project does not constitute notice to proceed. An approved construction schedule and written notice to proceed from FRICO's General Manager are required prior to commencing construction activities.

Thank you for the opportunity to complete this service on behalf of FRICO. Please feel free to call ERC if you have any questions regarding the review of this project.

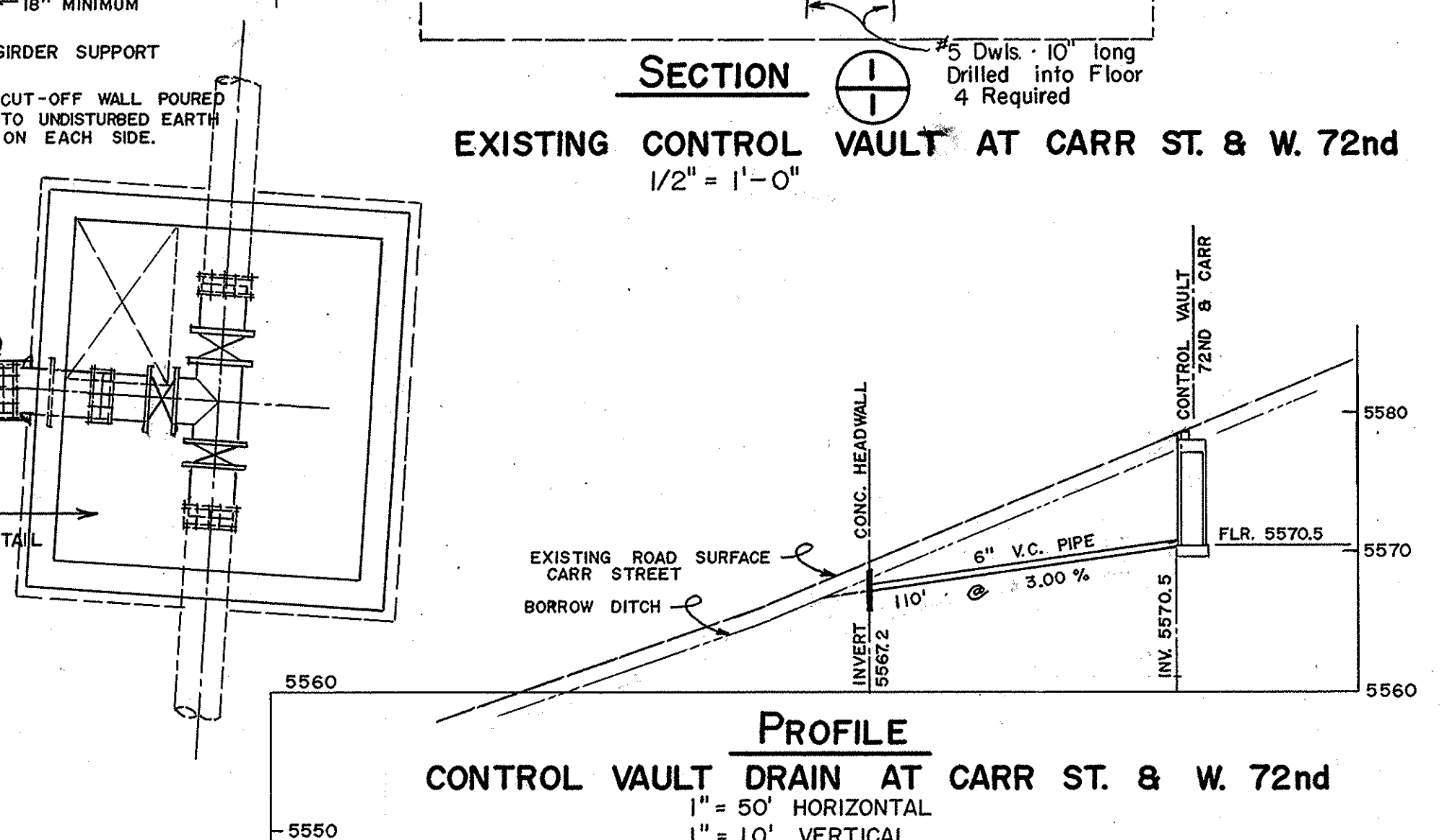
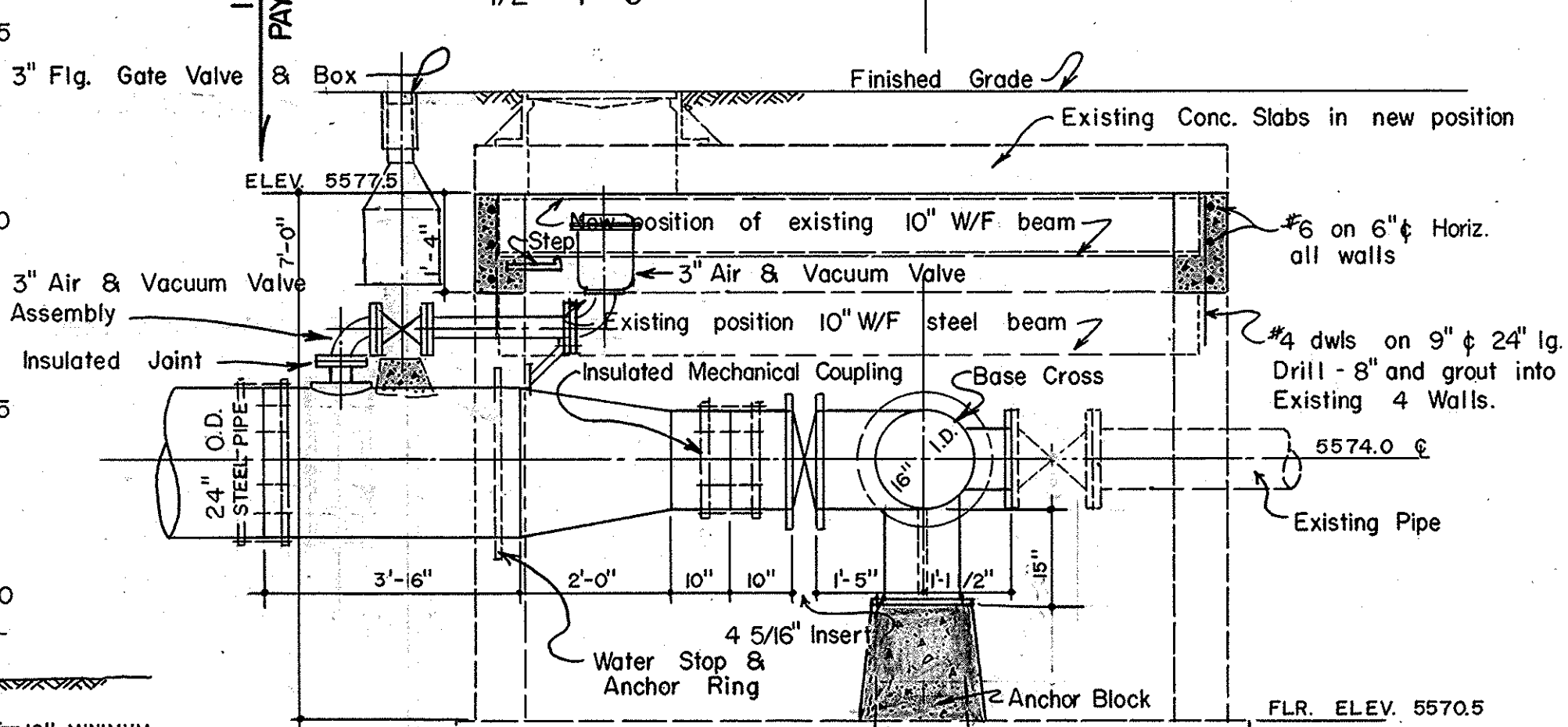
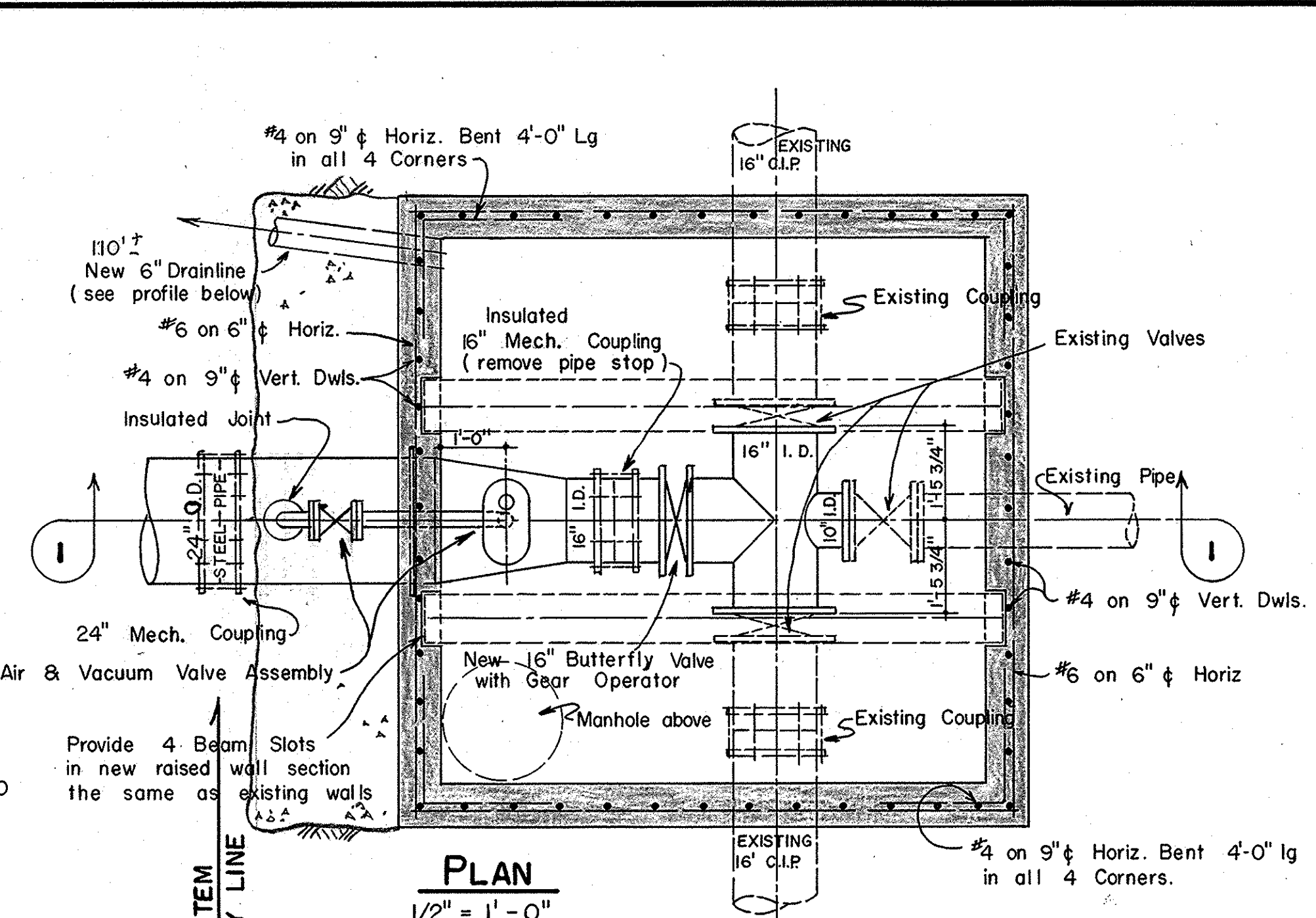
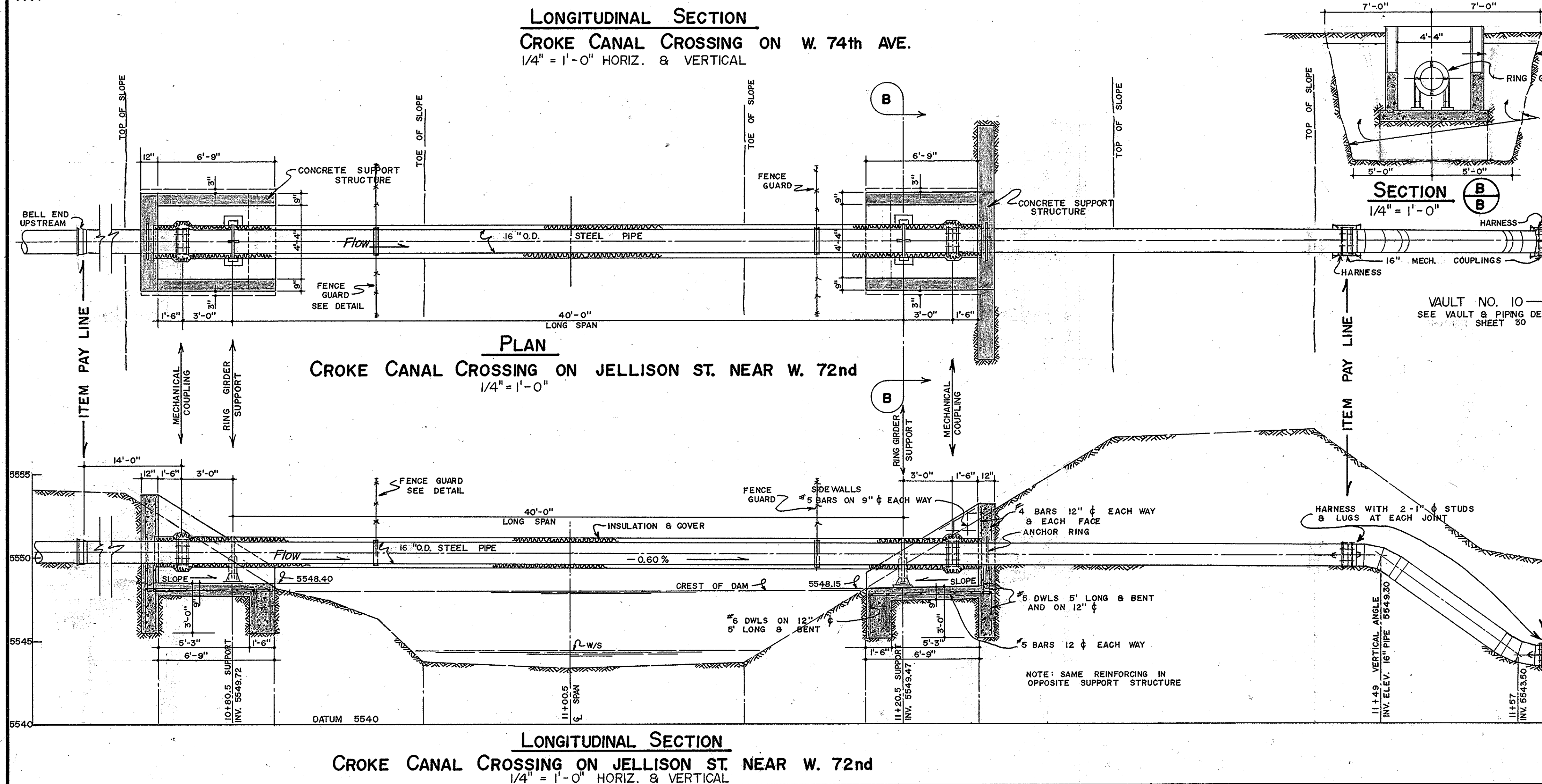
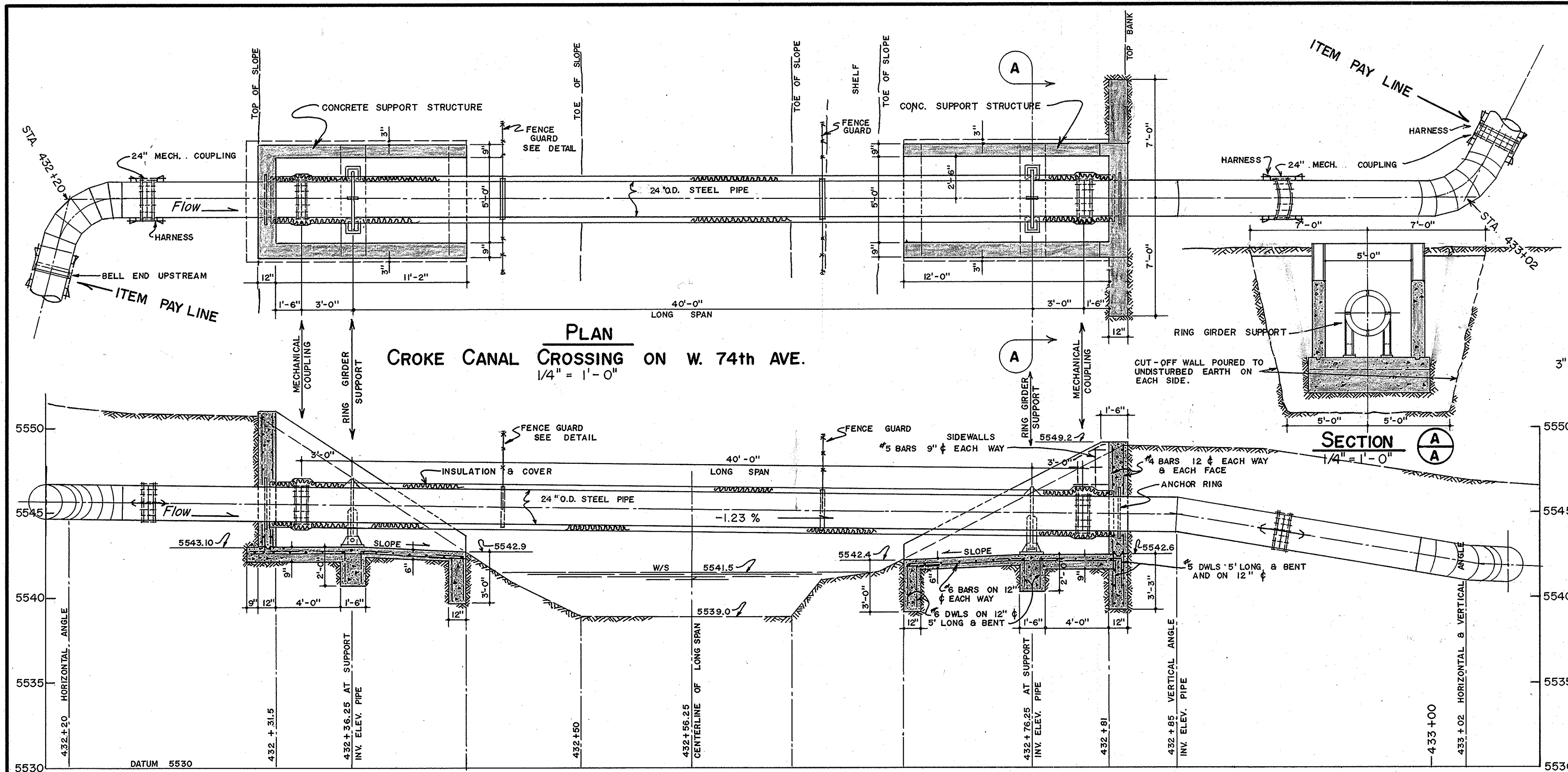
Sincerely,

ECOLOGICAL RESOURCE CONSULTANTS

A handwritten signature in black ink, appearing to read 'Lisa Shea'.

Lisa Shea, PE
Project Manager
303-679-4820 Ext. 110
lisa@erccolorado.net

cc: Jeff DeLisio (FRICO)



8/24/66	AS BUILT	WGP
DATE	REVISIONS	BY
DESIGN	HEL	SUBMITTED BY
DRAWN	WGP	ENGINEER
CHECKED	DC	APPROVED BY
CITY OF ARVADA, COLORADO		
PROJECT NO. 64-W-2		
NORTH ARVADA WATER TRANSMISSION LINE		
CROKE CANAL LONG-SPAN CROSSINGS & DETAILS		
COWAN & LOOMIS, CONSULTING ENGINEERS		DATE JULY 1965
P.O. BOX 83, ARVADA, COLORADO		SHEET 31 OF 31

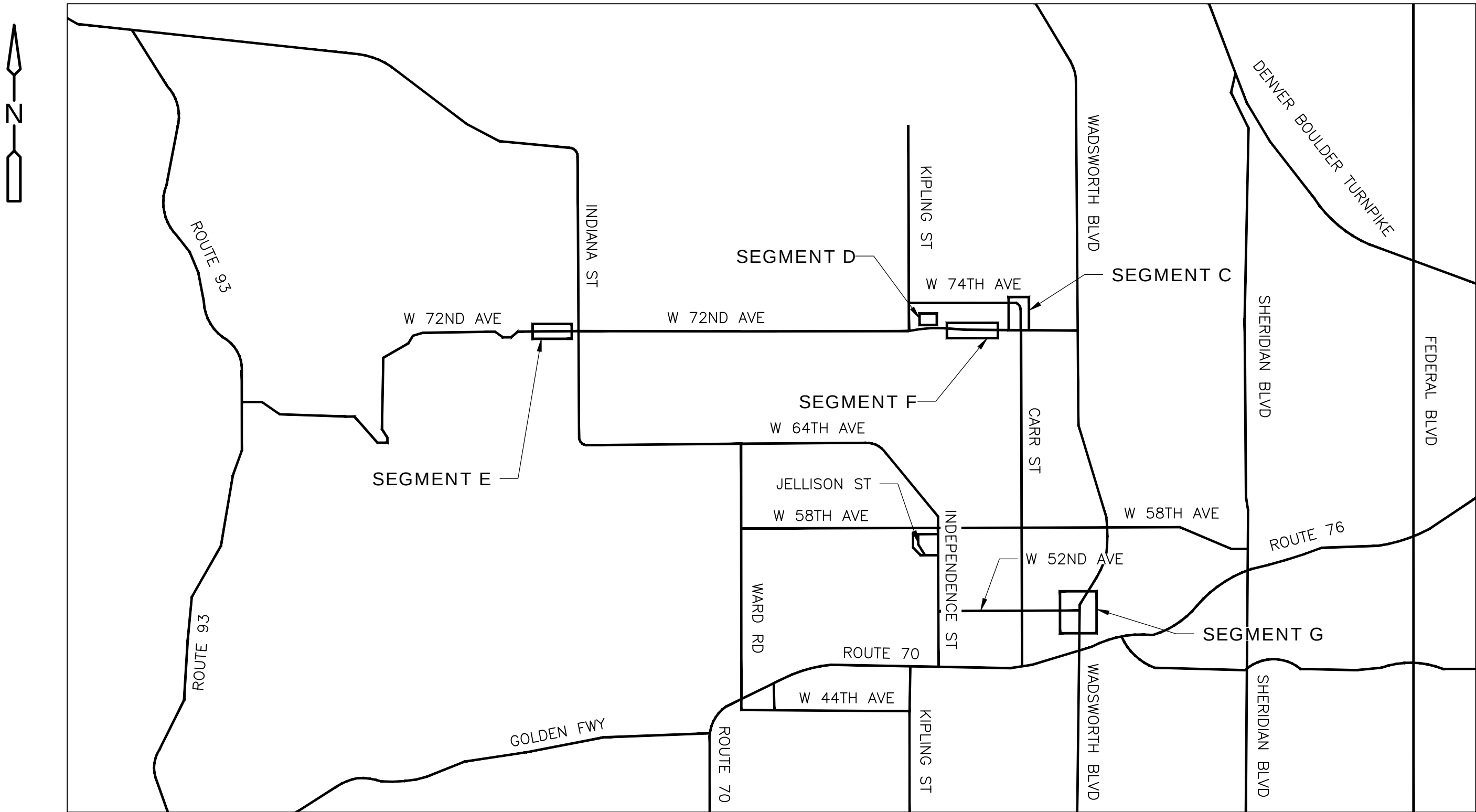
CITY OF ARVADA, COLORADO

2021 WATER MAIN IMPROVEMENTS PROJECT

CITY OF ARVADA **CSB 23-PW-091**

LIST OF DRAWINGS

SHEET	TITLE
GENERAL	
GN-0	COVER
GN-1	GENERAL NOTES I
GN-2	GENERAL NOTES II
GN-3	ABBREVIATIONS AND SYMBOLS
CIVIL	
SEGMENT C	
C-1	W. 74TH AVE. PLAN AND PROFILE
C-2	W. 74TH AVE. AND CARR STREET PLAN AND PROFILE
C-3	CARR ST. PLAN AND PROFILE
SEGMENT D	
D-1	JELLISON ST. VAULT DEMOLITION AND MODIFICATION PLAN
SEGMENT E	
E-1	FARMERS HIGHLINE CANAL CROSSING PLAN AND PROFILE
SEGMENT F	
F-1	W. 72ND AVE. PLAN AND PROFILE I
F-2	W. 72ND AVE. PLAN AND PROFILE II
F-3	W. 72ND AVE. PLAN AND PROFILE III
F-4	W. 72ND AVE. PLAN AND PROFILE IV
F-5	W. 72ND AVE. PLAN
SEGMENT G	
G-1	W. 52ND AVE. AND WADSWORTH BLVD. KEY PLAN
G-2	HOME DEPOT SHOPPING CENTER PLAN AND PROFILE
G-3	W. 52ND AVE. AND WADSWORTH BLVD. PLAN AND PROFILE
G-4A	WADSWORTH BLVD. IRRIGATION LINE PLAN AND PROFILE
G-4B	COSTCO SERVICE LINE PLAN AND PROFILE
G-5	COSTCO AC PIPE REMOVAL
CIVIL DETAILS	
CD-1	CITY OF ARVADA STANDARD DETAILS I
CD-2	CITY OF ARVADA STANDARD DETAILS II
CD-3	CITY OF ARVADA STANDARD DETAILS III
CD-4	CITY OF ARVADA STANDARD DETAILS IV
CD-5	CITY OF ARVADA STANDARD DETAILS V
CD-6	STANDARD DETAILS VI
CD-7	STANDARD DETAILS VII
CD-8	STANDARD DETAILS VIII
CD-9	STANDARD DETAILS IX
EROSION CONTROL PLANS	
EC-1	W. 74TH AVE. EROSION CONTROL PLAN
EC-2	CARR ST. EROSION CONTROL PLAN
EC-3	JELLISON ST. VAULT DEMOLITION AND MODIFICATION EROSION CONTROL PLAN
EC-4	FARMERS HIGHLINE CANAL CROSSING EROSION CONTROL PLAN
EC-5	W. 72ND AVE. EROSION CONTROL PLAN I
EC-6	W. 72ND AVE. EROSION CONTROL PLAN II
EC-7	HOME DEPOT SHOPPING CENTER EROSION CONTROL PLAN
EC-8	W. 52ND AVE. AND WADSWORTH BLVD. EROSION CONTROL PLAN
EC-9	COSTCO SERVICE LINE EROSION CONTROL PLAN
EC-10	COSTCO AC PIPE REPLACEMENT EROSION CONTROL PLAN
EC-11	EROSION CONTROL STANDARD DETAILS I
EC-12	EROSION CONTROL STANDARD DETAILS II
EC-13	EROSION CONTROL STANDARD DETAILS III
CATHODIC PROTECTION	
CP-1	CATHODIC PROTECTION TEST STATION DETAILS
CP-2	CATHODIC PROTECTION DETAILS



FRICO APPROVAL BLOCK

The signature of the General Manager of FRICO is for the purposes of acknowledging acceptance of the design of the Permitted Structures only. The signature shall not in any way change the rights and obligations of either party with respect to the (TITLE OF EASEMENT OR LICENSE AGREEMENT) to which these designs are attached. FRICO is expressly relying upon the design standards and performance standards set forth in these drawings as presented by CITY OF ARVADA, and CITY OF ARVADA shall be solely responsible for, as constructed, the Permitted Structures shall perform as specified herein.

General Manager, the Farmers Reservoir and Irrigation Company

**CDM
Smith**

DENVER, COLORADO

Water Environment Transportation Energy Facilities

APPROVED:

James Wolfshagen, PE 10/26/23 21-WA-02
City Engineer Date Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



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REUSE OF DOCUMENTS: THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.

GENERAL NOTES:

1. WITHIN CONSTRUCTION TRENCH, ALL EXPOSED UNDERMINED UTILITIES MUST BE PROTECTED AND SUPPORTED.
2. UTILITIES 30" AND LARGER THAT WILL BE UNDERMINED MUST HAVE A SITE-SPECIFIC SUPPORT PLAN THAT IS COORDINATED WITH THE CONSTRUCTION MEANS AND METHODS DESIGNED AND SUBMITTED BY A COLORADO PROFESSIONAL ENGINEER.
3. LOCATION OF ALL EXISTING UTILITIES (PRIVATE OR PUBLIC) SHALL BE IDENTIFIED OR VERIFIED BY CONTRACTOR PRIOR TO MOBILIZATION, CONSTRUCTION, OR ORDERING OF MATERIALS. FOR INFORMATION CONTACT: DENVER INTER-UTILITY GROUP, 1-800-922-1987 OR LOCAL AGENCY, PRIVATE ENTITY, OR OTHER ASSOCIATED ENTITIES WITHIN THE LIMITS OF CONSTRUCTION. THE CONTRACTOR SHALL BEAR THE FULL COST OF REMOVAL, REPLACEMENT, AND DELAY RELATED TO UNVERIFIED EXISTING CONDITIONS. CONFLICTS OR DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
4. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO COMPLETE THE WORK SHOWN ON THE PLANS OR DESCRIBED IN THE SPECIFICATIONS IN A SATISFACTORY MANNER. UNLESS OTHERWISE PROVIDED, THE CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, AND INCIDENTALS TO COMPLETE THE WORK.
5. EXISTING SEWERS, WATER MAINS, GAS MAINS, TELEPHONE CONDUITS, ELECTRIC CABLES, AND OTHER UNDERGROUND UTILITIES AND STRUCTURES ARE SHOWN ON THE DRAWINGS ONLY TO THE EXTENT SUCH INFORMATION HAS BEEN MADE AVAILABLE TO OR DISCOVERED BY THE ENGINEER. UTILITIES HAVE BEEN DESCRIBED AS TO QUALITY LEVELS DEFINED IN ASCE 38. IT IS EXPECTED THAT THERE MAY BE DISCREPANCIES AND OMISSIONS IN THE LOCATION AND QUANTITIES OF BURIED UTILITIES AND STRUCTURES SHOWN. THIS INFORMATION IS REPRESENTATIVE OF THE BEST INFORMATION OBTAINED DURING DESIGN, BUT ALL RESPONSIBILITY FOR THE ACCURATE COMPLETENESS THEREOF IS EXPRESSLY DISCLAIMED. THE CONTRACTORS WILL CONDUCT INVESTIGATION AS THEY THINK NECESSARY TO VERIFY ITS CORRECTNESS AND COMPLETENESS. THE CONTRACTOR SHALL FIELD LOCATE AND PROTECT, AHEAD OF EXCAVATION, ALL UNDERGROUND UTILITIES, AND STRUCTURES SO THAT THEY WILL NOT BE ACCIDENTALLY CUT OR DAMAGED BY CONSTRUCTION OPERATION.
6. CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING ANY EXISTING SURFACE FEATURES AND IMPROVEMENTS ENCOUNTERED DURING EXCAVATION OR DISTURBED BY CONSTRUCTION ACTIVITIES (FENCING, UTILITIES, ASPHALT OR GRAVEL PAVEMENT, RIP-RAP, ETC.) TO THEIR ORIGINAL CONDITION (OR BETTER) AND COORDINATING THIS ACTIVITY WITH THE APPROPRIATE PARTIES. THIS SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER AND SHALL APPLY TO ALL EXISTING IMPROVEMENTS WHETHER SHOWN ON THE PLANS OR NOT. ALL REPLACEMENT FENCING SHALL BE NEW MATERIAL.
7. THE LOCATION OF TEST HOLES INDICATED ON THE DRAWINGS IS APPROXIMATE. CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR ACTUAL TEST HOLE LOCATIONS AND THE FINDINGS OF THE GEOTECHNICAL INVESTIGATIONS.
8. CONTRACTOR SHALL PROTECT ALL EXISTING TREES AND SHRUBS INCLUDING ROOTS UNLESS OTHERWISE NOTED. ALL TRIMMING SHALL BE APPROVED BY OWNER PRIOR TO IMPLEMENTATION.
9. STRUCTURES SUCH AS CURBS AND GUTTERS, CONCRETE AND ASPHALT DRIVES AND WALKWAYS, PAVING BRICKS, FENCING, RETAINING WALLS, ETC. CROSSED BY THE PIPELINE(S) MAY NOT BE INDICATED ON THE PLANS. CONTRACTOR SHALL RESTORE ANY EXISTING STRUCTURES THAT ARE DISTURBED, DAMAGED, OR REMOVED BY CONSTRUCTION. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID AND INCLUDE ALL COSTS FOR THIS WORK IN THE BID.
10. CONTRACTOR SHALL REMOVE AND REPLACE ALL EXISTING FENCING DISTURBED BY CONSTRUCTION ACTIVITIES ALONG THE ENTIRE PIPELINE ROUTE, WHETHER OR NOT IT IS IDENTIFIED ON THE DRAWINGS. CONTRACTOR SHALL INVENTORY THE VARIOUS QUANTITIES OF FENCING ALONG THE ALIGNMENT AND INCLUDE COSTS IN THE BID TO COMPLETELY REMOVE AND REPLACE THE FENCING AS REQUIRED TO CONSTRUCT THE PIPELINES. REPLACEMENT FENCING SHALL MATCH ORIGINAL FENCING IN MATERIAL HEIGHT AND ALIGNMENT AND SHALL BE CONSTRUCTED OF ENTIRELY NEW MATERIALS UNLESS OTHERWISE APPROVED IN ADVANCE BY THE OWNERS.
11. ALL ROADS AND STREETS WITH OPEN CUT EXCAVATION SHALL HAVE A MINIMUM OF ONE LANE OPEN AT ALL TIMES FOR EMERGENCY ACCESS. CONTRACTOR SHALL PROVIDE TWO-WAY TRAFFIC CONTROL AT ALL OPEN CUT ROAD WORK. CONTRACTOR SHALL OPEN CUT EXISTING TRAVEL AND ASPHALT SURFACED ROADS WHERE INDICATED ON THE DRAWINGS. THICKNESS AND TYPE OF REPLACEMENT ASPHALT, BASE COURSE, AND AGGREGATE ROAD BASE SHALL BE AS SPECIFIED AND SHALL, AT A MINIMUM, MATCH EXISTING SURFACING.
12. THE CONTRACTOR SHALL COORDINATE DRIVEWAY ACCESS TO ALL ADJOINING PROPERTIES ACCESSIBLE TO THE PUBLIC AND EMERGENCY VEHICLES. ACCESS SHALL ALSO BE MAINTAINED FOR MAIL SERVICE, TRASH REMOVAL, SCHOOL BUSES AND SNOW REMOVAL. DESIGN FOR MAINTAINING ACCESS WILL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE CONTROLLING AGENCY FOR REVIEW AND APPROVAL.
13. DURING NON-WORKING HOURS, UP TO 10 FEET OF OPEN PIPE TRENCH WILL BE ALLOWED. CONTRACTOR SHALL PROVIDE PLATING TO COVER ALL UN-BACKFILLED TRENCHES DURING NON-WORKING HOURS. CONTRACTOR SHALL ALSO PROVIDE TEMPORARY FENCING AROUND ALL EQUIPMENT AND UN-BACKFILLED TRENCH AREAS DURING NON-WORKING HOURS.
14. CONTRACTOR SHALL COMPLY WITH TRENCH PLATE REQUIREMENTS OF THE GOVERNING JURISDICTION IF TRENCH PLATE REQUIREMENTS ARE NOT SPECIFIED. THE CONTRACTOR SHALL APPLY SKID RESISTANT COATING ON THE TRENCH PLATES AND COLD MIX ASPHALT CONCRETE AT THE EDGES. THE TRENCH PLATES SHALL BE NOTCHED INTO THE ASPHALT CONCRETE OR TRAVELED SURFACE TO PREVENT SLIPPAGE AND ROCKING UNDER TRAFFIC.
15. THE CONTRACTOR SHALL BACKFILL UTILITY TRENCHES EACH EVENING AND SHALL LAY NO MORE THAN ONE SECTION OF WATER MAIN, BEFORE RETURNING TO BACKFILL, COMPACT THE SUBGRADE, AND INSTALL THE BASE WHERE APPLICABLE. UPON COMPLETION OF THE WORK, THE LINES SHALL BE CLEANED, WITH ALL DEBRIS REMOVED AT DOWNSTREAM MANHOLE. THE CONTRACTOR SHALL ASSIST THE ENGINEER BY PROVIDING INSPECTION ASSISTANCE AS REQUIRED. THE CONTRACTOR SHALL MAKE NOTE OF ANY CORRECTIONS REQUIRED AND SHALL PERFORM ALL REMEDIAL ACTIONS PRIOR TO FINAL ACCEPTANCE BY THE CITY. THE ASPHALT SHALL BE PLACED AFTER THE PIPE WORK AND TESTING ARE COMPLETED AND ACCEPTED BY THE CITY.
16. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
17. HORIZONTAL STATIONING ALONG THE PIPELINE ALIGNMENT IS FOR LEVEL LINE MEASUREMENT AND FOR PAYMENT OF THE PIPELINES. CONTRACTOR SHALL PROVIDE THE ACTUAL PIPE LENGTH TO BE DETERMINED BY THE SLOPE OR CURVE ON WHICH THE PIPE IS INSTALLED.
18. PIPING SHALL BE LAID TO THE LINES AND GRADES SHOWN ON THE DRAWINGS.

19. CITY OF ARVADA ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS SECTIONS ARE REFERENCED ON THE DRAWINGS BUT NOT INCLUDED ON THE BID DRAWINGS. CONTRACTOR SHALL ABIDE BY AND REVIEW THE CITY'S STANDARDS AND DETAILS PRIOR TO BIDDING. CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH CONFORMING TO THE CITY STANDARDS IN THEIR BID. IN THE INSTANCE OF A CONFLICT BETWEEN THE DESIGN DOCUMENTS AND CITY STANDARDS, THE CITY STANDARDS SHALL TAKE PRECEDENCE.
20. CONTRACTOR IS REQUIRED TO APPLY FOR AND OBTAIN A CONSTRUCTION DEWATERING PERMIT FROM CDPHE. THE DEWATERING PLAN MUST BE SUBMITTED TO THE CITY OF ARVADA FOR REVIEW.
21. THE CONTRACTOR SHALL OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER DISCHARGE PERMIT AND A CONSTRUCTION DEWATERING PERMIT FROM COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE). CDPHE MAY TAKE UP TO 60 DAYS TO RESPOND TO A PERMIT REQUEST.
22. ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH THE STATE OF COLORADO PERMITTING PROCESS FOR "STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES". FOR INFORMATION, CONTACT CDPHE, WATER QUALITY CONTROL DIVISION WCQD-PE0B2, ATTN: PERMITS AND ENFORCEMENT, PHONE (303) 692-3596.
23. ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH THE STATE OF COLORADO PERMITTING PROCESS FOR "FUGITIVE DUST EMISSIONS ASSOCIATED WITH CONSTRUCTION ACTIVITIES". CDPHE, AIR POLLUTION CONTROL DIVISION, APCD-SSB 1, ATT: LAND DEVELOPMENT PERMITTING SECTION, PHONE (303)692-3150.
24. AT LEAST 10 WORKING DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION ACTIVITIES, THE TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE CITY. THE PLAN SHALL BE PREPARED BY A CERTIFIED TRAFFIC CONTROL SUPERVISOR. NO WORK SHALL BEGIN UNTIL ALL TRAFFIC CONTROL DEVICES HAVE BEEN PLACED IN ACCORDANCE WITH THE APPROVED PLAN. THE CONTRACTOR SHALL CONTINUOUSLY MAINTAIN THE TRAFFIC CONTROL DEVICES FOR THE ENTIRE DURATION OF THE PROJECT.
25. THE CONTRACTOR SHALL APPLY AND PAY FOR A RIGHT-OF-WAY PERMIT AS REQUIRED.
26. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS AND UTILITY OWNERS IN WRITING 72 HOURS PRIOR TO ANY CONSTRUCTION OR SHUT-OFF IN SERVICE. THE NOTICES MUST HAVE CONTRACTOR'S PHONE NUMBER AND NAME OF THE CONTACT PERSON, AND EMERGENCY PHONE NUMBER FOR AFTERHOURS CALLS, TO INCLUDE CITY DAYTIME AND EMERGENCY CONTACT INFORMATION.
27. ALL TRENCHES SHALL BE ADEQUATELY SUPPORTED, AND THE SAFETY OF THE WORKERS PROVIDED FOR AS REQUIRED BY THE MOST RECENT OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (OSHA) "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION".
28. THE CONTRACTOR SHALL BE REQUIRED TO FIELD VERIFY THE SUBSURFACE CONDITIONS OF THE SOIL ALONG THE ROUTE OR WORK AND SHALL PROVIDE DEWATERING EQUIPMENT NECESSARY TO PERFORM WORK ACCORDING TO THE CONSTRUCTION DOCUMENTS.
29. WASTE MATERIALS SHALL BE DISPOSED OF BY CONTRACTORS AT NO ADDITIONAL EXPENSE TO THE CITY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN A DISPOSAL SITE FOR THE UNUSED MATERIAL, DEMOLITION MATERIAL, AND HAZARDOUS WASTE MATERIAL.
30. NO BEDDING MATERIAL SHALL BE PLACED ABOVE THE SPRINGLINE OF THE PIPE UNTIL A CITY REPRESENTATIVE HAS AUTHORIZED BACKFILLING. IT SHALL BE THE DUTY OF THE CONTRACTOR TO NOTIFY THE CITY 48 HOURS IN ADVANCE OF PROPOSED BACKFILL OPERATIONS SO A CITY REPRESENTATIVE MAY INSPECT PIPE AND THE BEDDING PRIOR TO BACKFILLING.
31. ALL MATERIALS, WORKMANSHIP, CONSTRUCTION DETAILS, AND TESTING SHALL CONFORM TO THE CITY OF ARVADA ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS.
32. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL SURVEY MONUMENTS AND CORNER MARKERS. SURVEY MONUMENTS AND PROPERTY CORNER MARKERS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REESTABLISHED BY A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF COLORADO.
33. DIMENSIONS TO STRUCTURE, REFERENCED PIPING, PAVING, AND OTHER IMPROVEMENTS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND CONDITIONS 14 DAYS IN ADVANCE OF THE CONSTRUCTION PROGRESS. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER.
34. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING ROADS, BUILDINGS, OR OTHER STRUCTURES RESULTING FROM CONTRACTOR'S CONSTRUCTION ACTIVITIES. REPAIRS SHALL BE MADE TO THE SATISFACTION OF THE OWNER AND ENGINEER AT NO COST TO THE OWNER.
35. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING STAGING AREAS, SANITARY FACILITIES AND VEHICLE PARKING. AREAS SHALL BE APPROVED BY THE OWNER.
36. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, COUNTY, AND LOCAL LAWS AND ORDINANCES RELATING TO THE SAFETY AND CHARACTER OF WORK, EQUIPMENT, AND PERSONNEL. THIS INCLUDES, BUT IS NOT LIMITED TO SHEETING, SHORING, BRACING, VENTILATION, CONFORMANCE WITH TRAFFIC CONTROL AND MAINTENANCE OF BARRICADES AND WARNING DEVICES.
37. CONTRACTOR SHALL KEEP COMPLETE AND ACCURATE RECORD DRAWINGS OF THE WORK, UTILITY POTHOLE DATA, AND EXISTING CONDITIONS THAT CHANGED OR ARE DIFFERENT THAN SHOWN ON THE PLANS. UPON COMPLETION OF THE WORK, THE CONTRACTOR'S RECORD DRAWINGS SHALL BE SUBMITTED TO THE CITY AND ENGINEER FOR REVIEW AND COMMENT.
38. ABANDONMENT OF WATER MAINS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 332.0 OF ARVADA'S ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS.
39. CONTRACTOR SHALL USE EXCAVATION METHODS THAT PREVENT UNDERMINING OF EXISTING STRUCTURES AND PROVIDE EXCAVATION THAT ALLOWS FOR SLOPE STABILITY.
40. CONTRACTOR SHALL SUBMIT CONSTRUCTION PLANS, INCLUDING BUT NOT LIMITED TO SHORING, MITIGATION, AND DEWATERING, TO AGENCIES HAVING JURISDICTION OVER IRRIGATION CANALS.

WATER MAIN NOTES:

1. WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ARVADA ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS. IN THE INSTANCE OF A CONFLICT BETWEEN THE DESIGN DOCUMENTS AND CITY STANDARDS, THE ORDER OF PRECEDENCE SHALL BE AS FOLLOWS: CONTRACT SPECIFICATIONS, CONTRACT DRAWINGS, CITY OF ARVADA STANDARDS, SPECIAL CONDITIONS.
2. ALL WATERLINES ARE TO BE HYDROSTATICALLY TESTED BY THE CONTRACTOR IN ACCORDANCE WITH THE CITY OF ARVADA STANDARDS, SECTION 421.13-14.
3. WHERE SPECIFIED, PIPE SHALL BE C909 PVC PRESSURE CLASS 235 AND COMPLY WITH AWWA STANDARDS.
4. ALL WATER VALVES SHALL OPEN COUNTERCLOCKWISE. ALL WATER VALVES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA C500 AND SHALL BE OF THE RESILIENT SEAT TYPE.
5. ALL FLANGES BELOW GRADE SHALL BE INSULATED.
6. SANITARY PRECAUTIONS MUST BE TAKEN DURING WATERLINE CONSTRUCTION, AS CALLED FOR BY AWWA STANDARDS. PRECAUTIONS INCLUDE KEEPING PIPE CLEAN AND CAPPING OR OTHERWISE EFFECTIVELY COVERING OPEN PIPE ENDS TO EXCLUDE INSECTS, ANIMALS OR OTHER SOURCES OF CONTAMINATION FROM UNFINISHED PIPELINES AT TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.
7. ALL NEWLY INSTALLED PIPES, COATINGS AND RELATED PRODUCTS MUST CONFORM TO AMERICAN NATIONAL STANDARDS INSTITUTE/NATIONAL SANITATION FOUNDATION (ANSI/NSF) STANDARDS AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI.
8. WATER & SANITARY SEWER THAT ARE PARALLEL MUST BE INSTALLED IN SEPARATE TRENCHES WITH NO LESS THAN 10' (TEN FEET) MIN. HORIZONTAL CLEARANCE BETWEEN OUTSIDE EDGE OF PIPE, UNLESS OTHERWISE SHOWN.
9. COMPLETED WATERLINES MUST BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C651, "DISINFECTING WATER MAINS."
10. IF VERTICAL CLEARANCE AT SANITARY UTILITY CROSSINGS IS BETWEEN SIX (6) INCHES TO TWO (2) FEET, ONE (1) 20 FOOT JOINT OF C900 PVC, 150 PSI WATERLINE SHALL BE CENTERED AT SANITARY CROSSING.
11. ALL STUB OUTS AND THEIR FITTINGS FOR FUTURE WATER MAIN AND LATERAL EXTENSIONS SHALL BE MECHANICALLY RESTRAINED WITH MEGALUG, UNI-FLANGE, OR APPROVED EQUAL RESTRAINT DEVICES.
12. CONTRACTOR SHALL NOT OPERATE EXISTING CITY OF ARVADA VALVES. CITY OF ARVADA TO PERFORM ALL EXISTING VALVE OPERATION.
13. INSTALLATION OF CATHODIC PROTECTION (CP) IS REQUIRED ON ALL BURIED METALLIC PIPELINES. REFERENCE CP DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

STORM WATER POLLUTION PREVENTION NOTES:

1. REFER TO THE STORMWATER MANAGEMENT PLAN (SWMP) IN THE SPECIFICATIONS FOR STORMWATER CONTROLS AND REQUIREMENTS.
2. AS STATED IN THE 2022 ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS FROM THE CITY OF ARVADA: EROSION CONTROL MEASURES SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN CONFORMANCE WITH THE MHFD MANUAL (VOLUME 3). CONTRACTOR SHALL SUBMIT EROSION CONTROL PLAN TO ENGINEER THAT MATCHES CONTRACTORS MEANS AND METHODS. CONTRACTOR SHALL IMPLEMENT THE SWPPP AND SEDIMENT CONTROL BMPS BEFORE, DURING AND AFTER CONSTRUCTION ACTIVITIES UNTIL THE CITY OF ARVADA PROVIDES NOTICE TO TERMINATE USE OF CONTROLS.

SURVEY DATA:

	Location				
	C	D	E	F	G
Horizontal Datum	City of Arvada Control	CITY OF ARVADA COORDINATE SYSTEM (ASSUMED)	City of Arvada Control	CITY OF ARVADA COORDINATE SYSTEM (ASSUMED)	City of Arvada
Vertical Datum	City of Arvada	CITY OF ARVADA VERTICAL BENCHMARK 913 ELEVATION = 5539.60	NAVD88	CITY OF ARVADA VERTICAL BENCHMARK 913 ELEVATION = 5539.60	City of Arvada Control
	POINT NO. 1	POINT NO. 1	POINT NO. 3	POINT NO. 1	POINT NO. 100
Site Benchmark	N-726530.51	N-726530.85	N-1726694.94	N-726530.61	N-714275.77
	E-2113117.81	E-2113117.38	E-3093612.81	E-2113117.73	E-2118163.34
	ELEVATION = 5551.51	ELEVATION = 5551.47	ELEVATION = 5584.91	ELEVATION = 5551.94	ELEVATION = 5309.67

PROJECT CONTACTS:

1. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY FORTY-EIGHT (48) IN ADVANCE OF ANY EXCAVATION INVOLVING ITS UTILITIES SO THAT A COMPANY REPRESENTATIVE CAN BE PRESENT. THE LOCATION OF THE UTILITIES SHOWN IN PLANS ARE APPROXIMATE ONLY THE EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION.
2. FARMERS' HIGHLINE CANAL AND RESERVOIR COMPANY -- 303-451-7604
3. FARMERS RESERVOIR AND IRRIGATION COMPANY:

Scott Edgar, General Manager
Farmers Reservoir and Irrigation Company (FRICO)
80 South 27th Avenue
Brighton CO 80601
(303) 659-7373

CONSTRUCTION SEQUENCING:

1. SEGMENT F MUST BE CONSTRUCTED BEFORE SEGMENTS C AND D.
2. SEGMENT D MODIFICATIONS TO FOLLOW SEGMENT F.
3. SEGMENT C TO FOLLOW MODIFICATIONS OF SEGMENT D AND OCCUR DURING THE FRICO LOW FLOW PERIOD. ESTIMATED LOW FLOW PERIOD IS SEPTEMBER 1ST THROUGH OCTOBER 31ST. CONTRACTOR TO COORDINATE WITH CITY OF ARVADA AND FRICO FOR POTENTIAL SUMMER LOW FLOW PERIOD.
4. SEGMENT E SHALL OCCUR DURING THE FHL LOW FLOW PERIOD. ESTIMATED LOW FLOW PERIOD IS NOVEMBER 15TH THROUGH MARCH 10TH. REFER TO NOTE 7 ON SHEET E-1.
5. SEGMENT G MAY BE CONSTRUCTED AT ANY POINT DURING THE PROJECT IN ACCORDANCE WITH NOTES 6 AND 7 BELOW.
6. THE LOCATIONS WITHIN THE G-SEGMENT MUST BE CONSTRUCTED FROM NORTH TO SOUTH. ONCE CONSTRUCTED, THE COSTCO SERVICE LINE FED FROM EAST WADSWORTH SHALL REMAIN IN SERVICE FOR A MINIMUM 2 WEEKS PRIOR TO COMMENCEMENT OF WORK SHOWN ON SHEET G-5.
7. IF POSSIBLE, PERFORM THE WORK AT SEGMENT G-2 BETWEEN LABOR DAY AND MEMORIAL DAY TO AVOID PEAK SHOPPING SEASON.
8. SURFACE RESTORATION NEED NOT BE COMPLETE TO ADVANCE FROM ONE SEGMENT TO THE NEXT. HOWEVER, WATERMAIN MUST BE TESTED AND FULLY OPERATIONAL.
9. REFER TO THE CONSTRUCTION SEQUENCING DIAGRAM BELOW FOR SUMMARY OF WORK RESTRICTION PERIODS FOR EACH SEGMENT.

Segment	Sequence/Restriction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Segment F	Before C												
Segment D	After F, before C												
Segment C1* (STA 6+45 to STA 13+70)	After F												
Segment C2 (STA 0+00 to STA 6+45)	After F, Restriction on Canal work	X	X	X	X	X	X	X	X			X	X
Segment E	Restriction on Canal Work			X	X	X	X	X	X	X	X		
Segment G2	Before G3			X	X	X	X					X	X
Segment G3	After G2											X	X
Segment G4-A&B	After G3											X	X
Segment G5	Must be completed last for Segment G											X	X
1) If completed before C2, and there is a break in construction activity, this segment should temporarily connect to the existing system													
☒ Work restriction. Contractor shall not perform any work at this location.													

ASPHALT NOTES:

1. ROADWAY RESTORATION SHALL MATCH STANDARDS AND REQUIREMENTS FOR OWNER OF ROAD (CDOT, CITY, ETC) OR IF ON PRIVATE PROPERTY, SHALL BE REPLACED IN KIND.
2. FOR CITY OF ARVADA OWNED ROADWAYS, ASPHALT RESTORATION THICKNESS SHALL MATCH EXISTING OR BE 6", WHICHEVER IS GREATEST, PER CITY OF ARVADA STANDARDS, DETAIL 900-3.

CITY OF ARVADA

2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

GENERAL NOTES I

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



APPROVED:

Ryan W. Bentley, PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.

PROJECT NO. 263334-271511
FILE NAME: G001NFNT.DWG

SHEET NO.

GN-1

XREFs: [CDMS_2234] Images: []
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FARMERS RESERVOIR AND IRRIGATION COMPANY NOTES:

- DEFINITIONS
 - FACILITY OWNER – CITY OF ARVADA
 - PROPERTY OWNER – FRICO
 - CONTRACTOR – (TO BE DETERMINED)
 - ENGINEER – CDM SMITH
- ALL IRRIGATION AND CANAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FARMERS RESERVOIR AND IRRIGATION COMPANY DESIGN REVIEW MANUAL, LATEST EDITION. EXCEPT AS SPECIFICALLY MODIFIED BY THESE PROJECT DRAWINGS.
- CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD FRICO HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT. EXCEPTING FOR LIABILITY ARISING FROM THE GROSS NEGLIGENCE OF FRICO.
- FRICO AND ITS AGENTS OR CONSULTANTS DO NOT WARRANT OR GUARANTEE THE ADEQUACY OF DESIGNS REVIEWED AND APPROVED BY FRICO. FRICO'S REVIEW OF PROJECT REPORTS, PLANS, AND SPECIFICATIONS IS FOR THE SOLE BENEFIT OF FRICO TO DETERMINE IF PROJECT DETAILS CONFORM TO FRICO DESIGN GUIDELINES, WHICH ARE NECESSARY TO REASONABLY ASSURE THAT PROJECTS DO NOT ADVERSELY AFFECT THE FACILITIES OR OPERATIONS OF FRICO.
- CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH FRICO REPRESENTATIVE AND LOCAL GOVERNING MUNICIPALITY OR COUNTY GOVERNMENT AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION. THOSE IN ATTENDANCE SHALL INCLUDE OWNERS REPRESENTATIVE, ENGINEER, CONTRACTOR, AND OTHER AFFECTED AGENCIES. CONSTRUCTION PLANS WILL BE DISTRIBUTED AT THE PRE-CONSTRUCTION MEETING.
- TECHNICAL APPROVAL BY FRICO OF THE DESIGN OF THE IMPROVEMENTS SPECIFIED HEREIN SHALL NOT CONSTITUTE AUTHORIZATION TO BEGIN WORK. AN EASEMENT OR LICENSE AGREEMENT APPROVED TEMPORARY ACCESS AND CONSTRUCTION PERMIT (INCLUDING SCHEDULE THAT INCLUDES THE DAY, MONTH, AND YEAR WHEN WORK IS ALLOWED), AND WRITTEN NOTICE TO PROCEED FROM FRICO'S GENERAL MANAGER ARE ALSO REQUIRED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. FOLLOWING THE APPROVAL OF THE DESIGN PLANS AND EASEMENT OR LICENSE AGREEMENT, AND PRIOR TO THE PRE-CONSTRUCTION MEETING, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT A CONSTRUCTION SCHEDULE TO FRICO FOR REVIEW AND APPROVAL. FRICO'S APPROVAL OF THE CONSTRUCTION SCHEDULE IS IN FRICO'S SOLE DISCRETION. AND FRICO MAY REFUSE TO APPROVE A SCHEDULE IF IT MAY IMPACT THE CANAL'S OPERATIONS OR FRICO'S ABILITY TO MAINTAIN OR ACCESS ITS FACILITIES.
- CONTRACTOR SHALL RESTRICT CONSTRUCTION ACTIVITY TO AREAS DEFINED AS PERMANENT AND/OR TEMPORARY CONSTRUCTION EASEMENTS. UNLESS OTHERWISE AUTHORIZED BY FRICO AND PROPERTY OWNER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS ACCESS FOR FRICO PERSONNEL AND EQUIPMENT ALONG THE LENGTH OF THE EXISTING CANAL THROUGHOUT THE COURSE OF THE PROJECT
- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY FRICO. FRICO RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DO NOT CONFORM TO STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO FRICO FOR ENGINEERING REVIEW AND APPROVAL PRIOR TO INSTALLATION OF MATERIALS OR FACILITIES FOR WHICH SHOP DRAWINGS ARE CREATED.
- CONTRACTOR SHALL VERIFY ACCURACY BETWEEN WORK SET FORTH ON THESE PLANS AND WORK REQUIRED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND FRICO REPRESENTATIVE PRIOR TO START OF CONSTRUCTION.
- IT IS THE ENGINEER'S RESPONSIBILITY TO RESOLVE CONSTRUCTION PROBLEMS WITH FRICO DUE TO CHANGED CONDITIONS ENCOUNTERED BY CONTRACTOR DURING THE PROGRESS OF ANY PORTION OF THE PROPOSED WORK. IF, IN THE SOLE OPINION OF FRICO, PROPOSED ALTERATIONS TO THE APPROVED CONSTRUCTION PLANS INVOLVES SIGNIFICANT CHANGES TO THE CHARACTER OF THE WORK. OR TO THE FUTURE CONTIGUOUS PUBLIC OR PRIVATE IMPROVEMENTS. ENGINEER SHALL BE RESPONSIBLE FOR SUBMITTING REVISED PLANS TO FRICO FOR REVIEW AND APPROVAL, PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE WORK.
- GROUNDWATER ENCOUNTED DURING CONSTRUCTION SHALL NOT BE RELEASED TO FRICO'S CANAL OR OTHER FACILITIES WITHOUT WRITTEN APPROVAL FROM THE FRICO GENERAL MANAGER. NUISANCE FLOWS IN THE DITCH MAY BE BYPASSED WITH APPROVAL.
- ALL CONCRETE STRUCTURES USED FOR THE PROJECT SHALL CONFORM TO ACI 350. CONCRETE MIXTURES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AND A MAXIMUM WATER TO CEMENT RATIO OF 0.42. ALL CONCRETE JOINTS SHALL HAVE A CONTINUOUS WATERSTOP TO PROVIDE A WATERTIGHT SEAL. THE CONTRACTOR SHALL SUPPLY FRICO WITH SHOP DRAWINGS AND SPECIFICATIONS FOR ALL PRE-FABRICATED CONCRETE STRUCTURES TO INSURE CONFORMANCE TO ACI 350. WHERE THE EXISTING SIDES OR BOTTOM OF THE CANAL ARE DISTURBED AND ARE TO BE REPLACED. THE TOP TWO FEET OF BACKFILL MATERIAL SHALL BE CLAY CONTAINING AT LEAST 40 PERCENT BY DRY WEIGHT PASSING THE #200 SIEVE (FINES) AND A PLASTICITY INDEX OF 15 OR GREATER. AS AN ALTERNATIVE, THE EXISTING MATERIAL CAN BE MIXED WITH TWO PERCENT POWDERED DRY BENTONITE (BY DRY WEIGHT) PROVIDED THE EXISTING SOILS CONTAIN AT LEAST 25 PERCENT FINES. THE MATERIALS UPON COMPACTION SHALL HAVE A PERMEABILITY LESS THAN OR EQUAL TO 1×10^{-6} CM/SEC AS DETERMINED BY ASTM D 5084.
- THE CHANNEL CLAY LINING SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR (ASTM D698) OR 90% OF THE MODIFIED PROCTOR (ASTM D1557) AND WITHIN -2% TO +2% OF THE OPTIMUM MOISTURE CONTENT. FILL SHALL BE PLACED IN THIN LIFTS WITH MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES. PLACEMENT ON DITCH SLOPES MAY REQUIRE OVERBUILDING AND CUTTING BACK TO OBTAIN THE REQUIRED COMPACTION.
- ALL PROPOSED MATERIAL TYPES TO BE USED AS BEDDING. CLAY LINING AND BACKFILL SHALL BE SUBMITTED TO FRICO FOR APPROVAL PRIOR TO PLACEMENT.
- MATERIALS GRAIN SIZE ANALYSIS (ASTM D422). ATTERBERG LIMITS (ASTM D4318), AND MOISTURE-DENSITY RELATIONSHIP TESTS (ASTM D1557) SHALL BE COMPLETED. AS A MINIMUM, ON EACH SOIL TYPE OR AT A RATE OF ONE TEST EVERY 300 CY OF MATERIAL PLACED, WHICHEVER IS GREATER.
- COMPACTION OF BEDDING, CLAY LINING AND ALL TYPES OF BACKFILL SHALL BE TESTED AT A RATE OF AT LEAST ONE TEST PER 1,000 SQUARE FEET OF FILL MATERIAL PER LIFT OR ONCE A DAY WHEN BACKFILL IS BEING COMPACTED, WHICH EVER IS MORE FREQUENT. THIS FREQUENCY MAY BE ALTERED BY THE ENGINEER OR FRICO REPRESENTATIVE DEPENDING ON THE PROJECT. THE METHODS BY WHICH THE CONTRACTOR IS USING TO OBTAIN COMPACTION, OR IF CIRCUMSTANCES WARRANT ADDITIONAL TESTING, THE TESTING SHALL BE AT VARIOUS DEPTHS AND LOCATIONS. THE ENGINEER OR AN OWNERS REPRESENTATIVE RESERVES THE RIGHT TO REQUEST ADDITIONAL TESTS AND DETERMINE THE LOCATION OF TESTING. THE TESTING MAY BE COMPLETED EITHER BY SAND CONE DENSITY TEST (ASTM D1656) OR BY THE NUCLEAR GAUGE (ASTM D6938) METHODS. TEST RESULTS SHALL BE SUBMITTED TO FRICO'S REPRESENTATIVE WITHIN 24 HOURS OF THE TEST OR ON THE NEXT WORKING DAY.

- ON STEEP SIDE SLOPES, FILL MATERIALS, WHETHER CLAY LINING OR SUBGRADE SOILS, MAY BE REQUIRED TO BE PLACED IN HORIZONTAL LIFTS ALONG THE SLOPE TO ACHIEVE THE REQUIRED COMPACTION. THIS METHOD WILL CREATE AN OVERBUILT SECTION THAT WILL BE CUT BACK TO FORM THE DESIGN SLOPE.
- CONTRACTOR SHALL MAINTAIN SILT FENCE AND OTHER EROSION AND SEDIMENT CONTROL BMPS ON A DAILY BASIS AND SHALL PREVENT DEBRIS FROM ENTERING INTO THE CANAL. THE CONTRACTOR WILL BE RESPONSIBLE FOR DAILY CLEANING OF DEBRIS THAT ENTERS THE CANAL, IF BMPS FAIL.
- UNLESS ANOTHER SPECIFIC MAINTENANCE AGREEMENT IS IN PLACE. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FUNCTIONING OF FACILITY IMPROVEMENTS FOR A MINIMUM OF TWO YEARS FROM THE DATE OF SUBSTANTIAL COMPLETION / CONSTRUCTION ACCEPTANCE OF THE IMPROVEMENTS BY FRICO. ANY FAILURE DURING THIS PERIOD OF GUARANTEE SHALL BE REMEDIED BY CONTRACTOR TO THE SATISFACTION OF FRICO AT CONTRACTORS EXPENSE.
- AS-BUILT DOCUMENTS ARE TO BE SUPPLIED TO FRICO PRIOR TO SUBSTANTIAL COMPLETION / CONSTRUCTION ACCEPTANCE OF THE IMPROVEMENTS RECORD DOCUMENTS SHALL BE SUBMITTED ELECTRONICALLY IN BOTH PDF AND AUTOCAD FORMAT PRIOR TO FRICO ACCEPTANCE AS-BUILT DRAWINGS SHALL BE SIGNED AND STAMPED BY A REGISTERED PROFESSIONAL ENGINEER.
- INSTALL MARKER POSTS AT FRICO'S ROW LIMITS ON BOTH SIDE OF THE CANAL TO DESIGNATE THE LOCATION OF ANY UNDERGROUND UTILITIES.
- NO WEEKEND WORK ALLOWED WITHIN FRICO'S ROW WITHOUT PRIOR AUTHORIZATION.
- IF TRENCH BOXES ARE USED FOR OPEN CUT PIPE INSTALLATION, A MINITGATION PLAN FOR HANDLING POTENTIAL LOOSE MATERIALS AT THE INTERFACE OF UNDISTRUBED EARTH SHALL BE SUBMITTED TO FRICO FOR REVIEW.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

GENERAL NOTES II

APPROVED: Amey Wadhvani, PE 10/26/23 21-WA-02
City Engineer Date Job Number
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PROJECT NO. 263334-271511
FILE NAME: G002NFNT.DWG
SHEET NO.
GN-2

XREFs: [CDMS_2234] Images: []
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pw\\cdm-smith-0202-pw.bentley.com:pw_ext\263334\271511\04 Design Services NM_90%01 General\10 CAD\G003NFNT.dwg
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ABBREVIATIONS AND LEGEND:

ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
ARV – AIR RELEASE VALVE

BC – BOTTOM OF CURVE
BL – BASE LINE
B.M. – BENCH MARK
BOC – BACK OF CURB

CATV – CABLE TELEVISION
C.B. – CATCH BASIN
CDPHE – COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
CDWA – CHURCH DITCH WATER AUTHORITY
C.I. – CAST IRON
C&G – CURB & GUTTER
CL – CENTER LINE
CLF – CHAIN LINK FENCE
CPP – CORRUGATED PLASTIC PIPE
CONC. – CONCRETE
CONST. – CONSTRUCTION
CULV. – CULVERT

D.B.I. – DITCH BOTTOM INVERT
DB – DIRECT BURY
DEG – DEGREE
DI – DUCTILE IRON
D.W – DRIVEWAY

ECC – ECCENTRIC
ELECT – ELECTRIC
ELEV – ELEVATION
E.O.P. – EDGE OF PAVEMENT
EXP. JT. – EXPANSION JOINT

FH – FIRE HYDRANT
FHL – FARMERS HIGH LINE
FLG – FLANGED
FM – FORCEMAIN
FO – FIBER OPTIC LINE
FRICO – FARMERS RESERVOIR AND IRRIGATION COMPANY

GLV – GALVANIZED
GPM – GALLONS PER MINUTE
GV – GATE VALVE

HDPE – HIGH DENSITY POLYETHYLENE PIPE
HFAC – HARNESS FLANGE ADAPTOR COUPLING

ID – IDENTIFICATION
IEEE – INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
INV – INVERT

LR – LONG RADIUS

MES – MITERED END SECTION
MG – MILLION GALLON
MGD – MILLIONS OF GALLONS PER DAY
MH – MANHOLE
MIN – MINIMUM
MISC – MISCELLANEOUS
MJ – MECHANICAL JOINT

NAVD – NORTH AMERICAN VERTICAL DATUM
N.C. – NORMALLY CLOSED
NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
N.T.S – NOT TO SCALE

OH – OVERHEAD
OIT – OPERATOR INTERFACE TERMINAL
O&M – OPERATIONS AND MAINTENANCE
O.T. – OVERHEAD TELEPHONE

PVC – POLY VINYL CHLORIDE
PSI – POUNDS PER SQUARE INCH
PTFE – POLYTETRAFLUOROETHYLENE
PW – POTABLE WATER

R – RADIUS
R.C.P. – REINFORCED CONCRETE PIPE
RED – REDUCER
REF – REFERENCE
RJ – RESTRAINED JOINT
R/W – RIGHT OF WAY
RW – REUSE WATER

SAN – SANITARY SEWER
SB – SOIL BORING
SD – STORM DRAIN
SST – STAINLESS STEEL
SS – SANITARY SEWER
STL – STEEL
S/W – SIDEWALK
STA – STATION
SU – STANDARD UNITS

TC – TOP OF CURVE
TELE – TELEPHONE
TOB – TOP OF BANK
TOP – TOP OF PIPE
TOS – TOE OF SLOPE/TOP OF SLAB
TYP – TYPICAL

UG – UNDERGROUND
UGE – UNDERGROUND ELECTRIC
UGT – UNDERGROUND TELEPHONE
UNK – UNKNOWN
UPS – UNINTERRUPTED POWER SUPPLY
USC & GS – UNITED STATES COASTAL & GEODETIC SURVEY

VERT – VERTICAL
VPI – VERTICAL POINT INFLECTION

W – WATER
WM – WATER METER
WPP – WOOD POWER POLE
WTP – WOOD TELEPHONE POLE

GENERAL LEGEND

EXISTING

RIGHT OF WAY LINE

PROPERTY LINE

LIMITS OF CONSTRUCTION

FENCE (HEIGHT & MAT'L. INDICATED)

DITCH OR SWALE

DRAIN PIPE

CATCH BASIN

STORM DRAIN GRATE

STORM DRAIN (SIZE & MAT'L. INDICATED)

STORM DRAIN

CULVERT W/ENDWALLS (SIZE & MAT'L. INDICATED)

WATER MAIN

WATERMAIN SIZE, TYPE INDICATED

SANITARY SEWER SIZE, TYPE INDICATED

LINE VALVE

FIRE HYDRANT

VALVE (TYPE INDICATED)

END CAP

PLUG (AT END OF LINE)

REDUCER

SPOT ELEVATION

MANHOLE – TYPE (IF INDICATED)
E – ELECTRIC S – SANITARY
D – STORM T – TELEPHONE

CLEAN OUT

SILT FABRIC BARRIER

PROPOSED

L.O.C.

6' CHAIN LINK

D D

D D

24" SD RCP

SD

SD 18" CMP

W W W

8" W PVC

W W W

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UTILITY SYMBOLS

ELECTRIC POLE OR S.B.T. POLE (WOOD)  OR  (WITH LIGHT)

WOOD POWER POLE  WPP

ELECTRIC POLE OR S.B.T. POLE (CONC.)  OR  (WITH LIGHT)

CONCRETE POWER POLE  CPP

GUY WIRE 

OVERHEAD ELECTRIC  ELECT-OH

UNDERGROUND ELECTRIC  ELECT-B

OVERHEAD TELEPHONE  TELE-OH

UNDERGROUND TELEPHONE  TELE-B

GAS MAIN (SIZE AND MAT'L INDICATED)  12" STL GAS

GAS MAIN (SIZE INDICATED)  12" GAS

CABLE TELEVISION  CATV

FIBER OPTIC LINE (SIZE AND MAT'L INDICATED)  12" STL FO

FIBER OPTIC LINE  FO

UNDERGROUND CABLE (TYPE UNDETERMINED)  ELECT/CATV/FO

WATER METER  M

WATER METER WITH TOUCHREAD  WM(TR)

TELEPHONE BOX  T

CATV BOX  CATV

GAS VALVE 

SOIL BORING (NUMBER INDICATED)  B-1

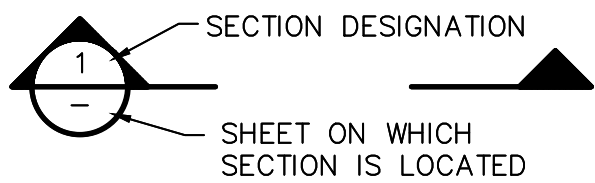
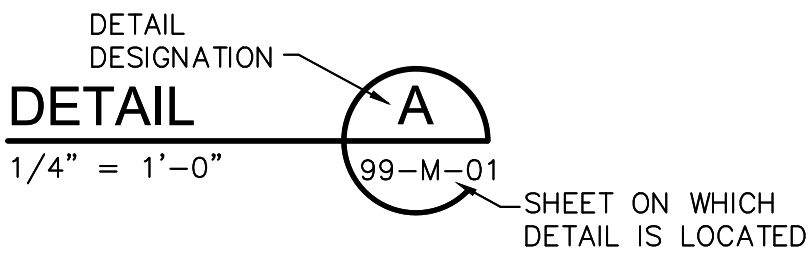
SOFT DIG (NUMBER INDICATED)  PH1

MONITORING WELL (NUMBER INDICATED)  MW

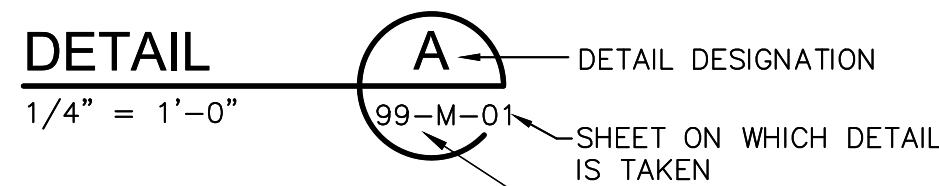
TREE 

SIGN – TYPE INDICATED 

DETAIL AND SECTION IDENTIFICATION

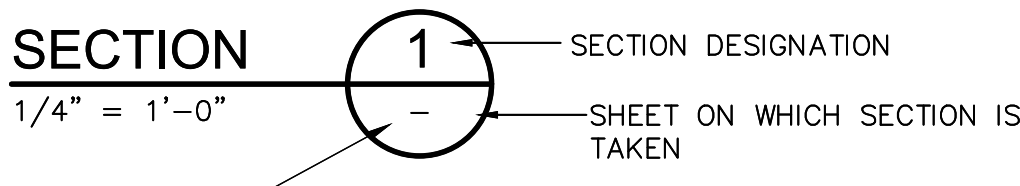


DETAIL REFERENCE



DETAIL SHOWN

SECTION REFERENCE



SECTION SHOWN

UTILITY INVESTIGATION RESULTS

LEVEL A – POTHOLE COMPLETED AND UTILITY LOCATED BY KINETIC INDUSTRIES

 GAS_A

LEVEL D – NO UNDERGROUND INVESTIGATION PERFORMED. RECORD DRAWINGS AND BEST AVAILABLE INFORMATION WAS USED TO ESTIMATE UTILITY LOCATION



NOTES:
1. REFER TO SPECIFICATIONS FOR SUE REPORTS AND DIMENSIONS FROM GRADE TO TOP OF PIPE.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

ABBREVIATION AND SYMBOLS

APPROVED:  10/26/23 21-WA-02
City Engineer Date Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.

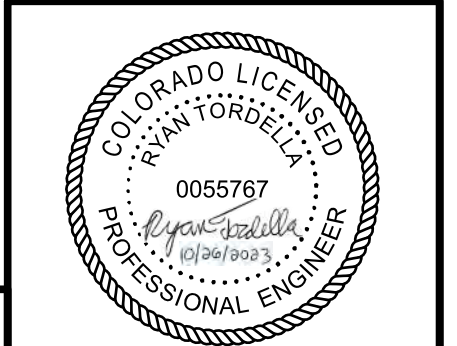


PROJECT NO. 263334-271511
FILE NAME: G003NFAB.DWG

SHEET NO.

GN-3

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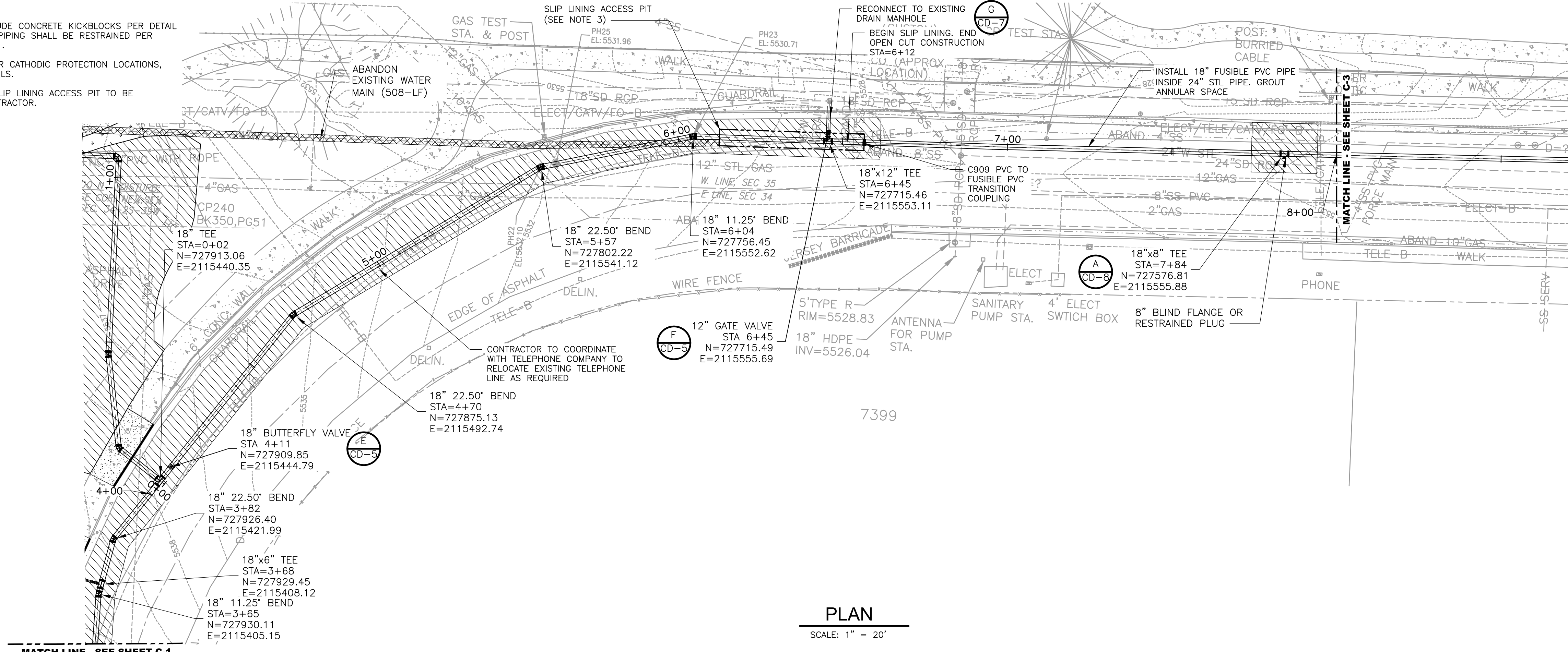
**CDM
Smith**
555 17th Street, Suite 500
Denver, CO 80202
Tel: (303) 383-2300

W. 74TH AVE.
PLAN AND PROFILE

PROJECT NO. 263334-271511
FILE NAME: C001PLPR.DWG
SHEET NO.
C-1

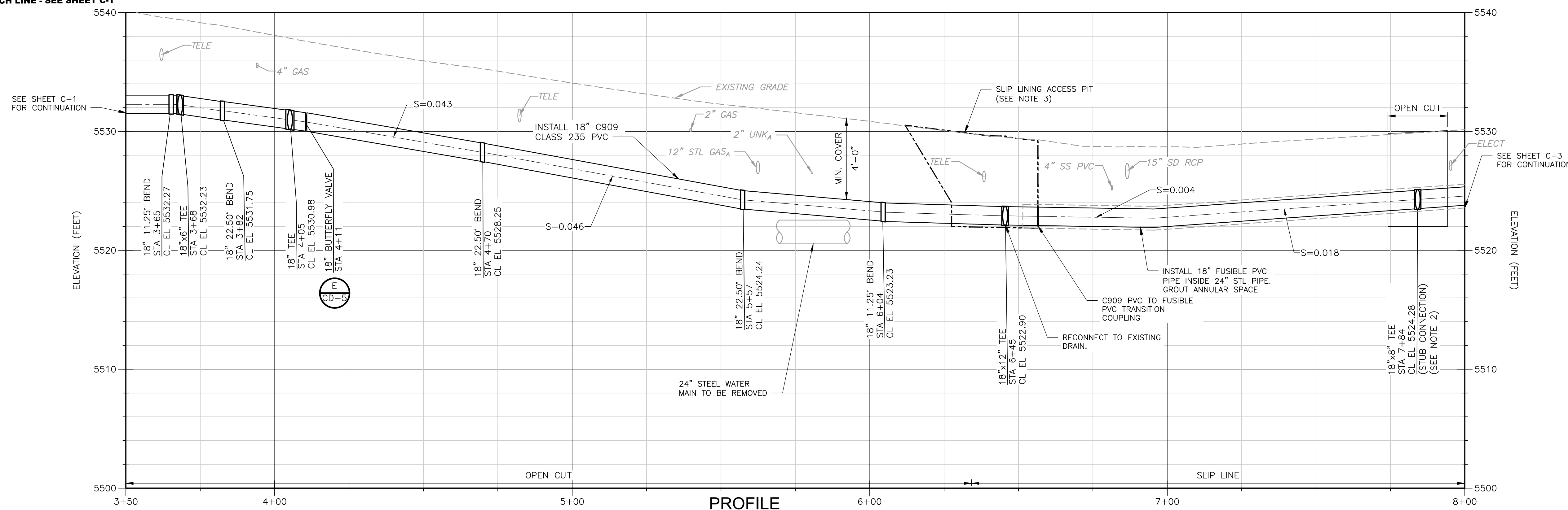
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- NOTES:
- ALL FITTINGS SHALL INCLUDE CONCRETE KICKBLOCKS PER DETAIL A ON SHEET CD-1. ALL PIPING SHALL BE RESTRAINED PER DETAIL C ON SHEET CD-1.
 - REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
 - SIZE AND LOCATION OF SLIP LINING ACCESS PIT TO BE DETERMINED BY THE CONTRACTOR.



PLAN

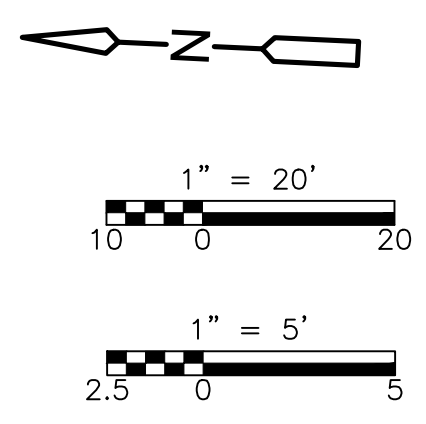
SCALE: 1" = 20'



PROFILE

HORIZONTAL: 1" = 20'
VERTICAL: 1" = 5'

- LEGEND :
- ASPHALT REPLACEMENT
 - LANDSCAPING / SEEDING
 - CLAY
 - SIDEWALK REPLACEMENT



DESIGNED BY:	R. TORDELLA
DRAWN BY:	R. PAWAR
SHEET CHK'D BY:	C. CERRETA
CROSS CHK'D BY:	T. CHARLES
APPROVED BY:	R. TORDELLA
DATE:	OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

W. 74TH AVE. AND CARR ST.
PLAN AND PROFILE

APPROVED: *[Signature]* 10/26/23 21-WA-02
City Engineer Date Job Number
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PROJECT NO. 263334-271511
FILE NAME: C002PLPR.DWG
SHEET NO. C-2

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MATCH LINE - SEE SHEET C-2

- NOTES:
- ALL FITTINGS SHALL INCLUDE CONCRETE KICKBLOCKS PER DETAIL A ON SHEET CD-1. ALL PIPING SHALL BE RESTRAINED PER DETAIL C ON SHEET CD-1.
 - CONTRACTOR SHALL MAINTAIN WATER SERVICE (INCLUDING SERVICE PRESSURE AT 43 PSI) AT 7319 AND 7339 CARR ST DURING CONSTRUCTION. TEMPORARY WATER SERVICE PIPING SHALL BE DISINFECTED PER SPECIFICATION SECTION 331300 AND CITY OF ARVADA STANDARDS AND PROTECTED WHEN ACTIVE.

SERVICE WATER PRESSURES AT 7319 AND 7339 SHALL NOT HAVE A MINIMUM PRESSURE OF LESS THAN 43 PSI DURING PEAK HOUR DEMAND PER CITY OF ARVADA STANDARDS.
 - REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
 - REMOVE TEMPORARY BLOWOFF ONCE WATER MAIN IS IN SERVICE
 - SIZE AND LOCATION OF SLIP LINING ACCESS PIT TO BE DETERMINED BY THE CONTRACTOR.
 - AT CONNECTION TO EXISTING WATER MAIN, CONTRACTOR TO VERIFY EXISTING PIPELINE RESTRAINT MEETS RESTRAINT REQUIREMENTS FOR BUTTERFLY VALVE AS A DEAD END PER DETAILS A, B, AND C ON SHEET CD-1.

LEGEND :

- ASPHALT REPLACEMENT
LANDSCAPING / SEEDING
CLAY
SIDEWALK REPLACEMENT

PLAN

SCALE: 1" = 20'

PROFILE

HORIZONTAL: 1" = 20'
VERTICAL: 1" = 5'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

CARR ST.
PLAN AND PROFILE

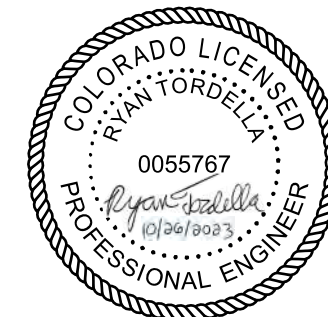
APPROVED:

City Engineer

10/26/23
Date

21-WA-02
Job Number

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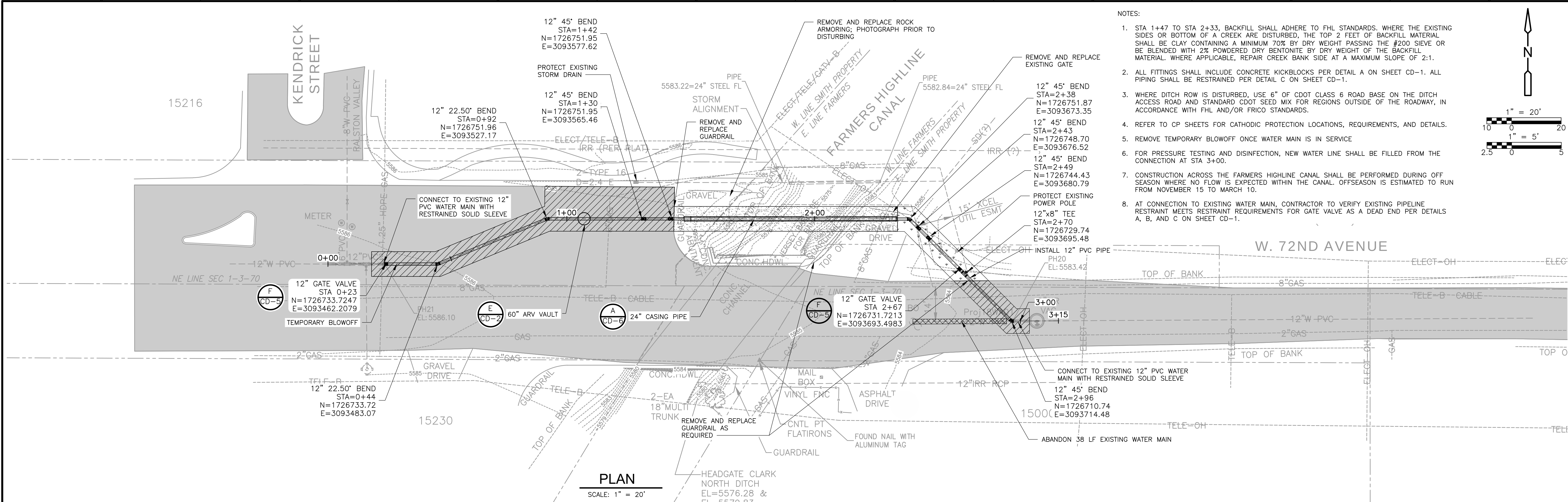
PROJECT NO. 263334-271511
FILE NAME: C003PLPR.DWG

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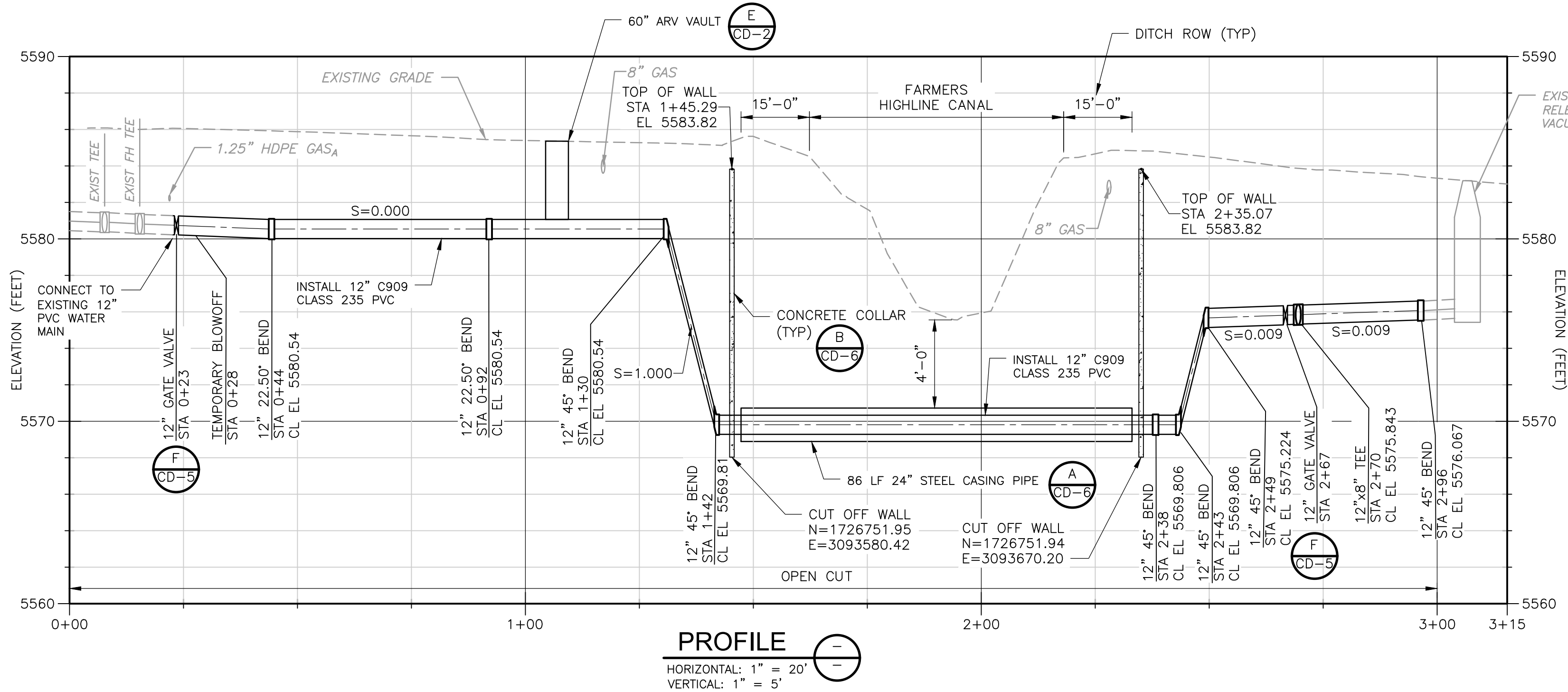
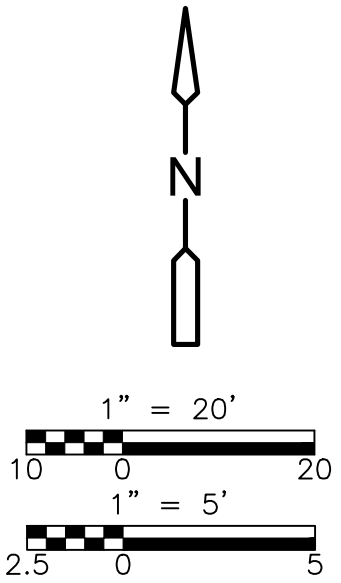
C-3

BID SET

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- NOTES:
- STA 1+47 TO STA 2+33, BACKFILL SHALL ADHERE TO FHL STANDARDS. WHERE THE EXISTING SIDES OR BOTTOM OF A CREEK ARE DISTURBED, THE TOP 2 FEET OF BACKFILL MATERIAL SHALL BE CLAY CONTAINING A MINIMUM 70% BY DRY WEIGHT PASSING THE #200 SIEVE OR BE BLENDED WITH 2% POWDERED DRY BENTONITE BY DRY WEIGHT OF THE BACKFILL MATERIAL. WHERE APPLICABLE, REPAIR CREEK BANK SIDE AT A MAXIMUM SLOPE OF 2:1.
 - ALL FITTINGS SHALL INCLUDE CONCRETE KICKBLOCKS PER DETAIL A ON SHEET CD-1. ALL PIPING SHALL BE RESTRAINED PER DETAIL C ON SHEET CD-1.
 - WHERE DITCH ROW IS DISTURBED, USE 6" OF CDOT CLASS 6 ROAD BASE ON THE DITCH ACCESS ROAD AND STANDARD CDOT SEED MIX FOR REGIONS OUTSIDE OF THE ROADWAY, IN ACCORDANCE WITH FHL AND/OR FRICO STANDARDS.
 - REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
 - REMOVE TEMPORARY BLOWOFF ONCE WATER MAIN IS IN SERVICE
 - FOR PRESSURE TESTING AND DISINFECTION, NEW WATER LINE SHALL BE FILLED FROM THE CONNECTION AT STA 3+00.
 - CONSTRUCTION ACROSS THE FARMERS HIGHLINE CANAL SHALL BE PERFORMED DURING OFF SEASON WHERE NO FLOW IS EXPECTED WITHIN THE CANAL. OFFSEASON IS ESTIMATED TO RUN FROM NOVEMBER 15 TO MARCH 10.
 - AT CONNECTION TO EXISTING WATER MAIN, CONTRACTOR TO VERIFY EXISTING PIPELINE RESTRAINT MEETS RESTRAINT REQUIREMENTS FOR GATE VALVE AS A DEAD END PER DETAILS A, B, AND C ON SHEET CD-1.



- LEGEND :
- ASPHALT REPLACEMENT
 - LANDSCAPING / SEEDING
 - CLAY
 - EXISTING ASPHALT

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

W 72ND AVE AND KENDRICK STREET
FARMERS HIGHLINE CANAL CROSSING
PLAN AND PROFILE

APPROVED: [Signature]
City Engineer
10/26/23 Date
21-WA-02 Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: E001PLPR.DWG
SHEET NO.
E-1

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ALIGNMENT CURVE DATA					
CURVE #	RADIUS	LENGTH	TANGENT	DELTA	CHORD LENGTH
C2	4006.00	201.62	100.83	2°53'01"	201.59



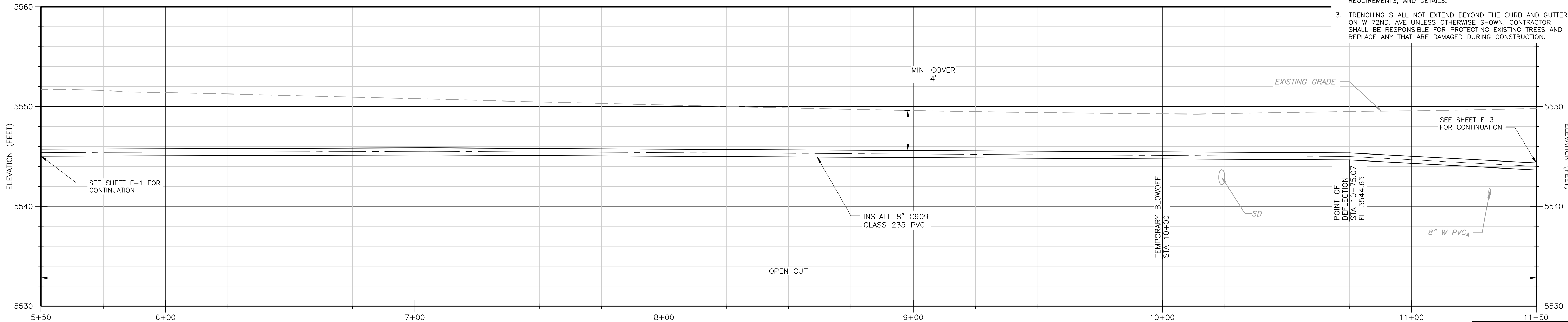
LEGEND :
ASPHALT REPLACEMENT

PLAN

SCALE: 1" = 20'

NOTES:

- ALL FITTINGS SHALL INCLUDE CONCRETE KICKBLOCKS PER DETAIL A ON SHEET CD-1. ALL PIPING SHALL BE RESTRAINED PER DETAIL C ON SHEET CD-1.
- REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
- TRENCHING SHALL NOT EXTEND BEYOND THE CURB AND GUTTER ON W 72ND. AVE UNLESS OTHERWISE SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING TREES AND REPLACE ANY THAT ARE DAMAGED DURING CONSTRUCTION.



PROFILE

HORIZONTAL: 1" = 20'
VERTICAL: 1" = 5'

					DESIGNED BY: R. TORDELLA
					DRAWN BY: R. PAWAR
					SHEET CHK'D BY: C. CERRETA
					CROSS CHK'D BY: T. CHARLES
					APPROVED BY: R. TORDELLA
REV. NO.	DATE	DRWN	CHKD	REMARKS	DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

W. 72ND AVE.
PLAN AND PROFILE II

APPROVED:

City Engineer Date 10/26/23 Job Number 21-WA-02

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.

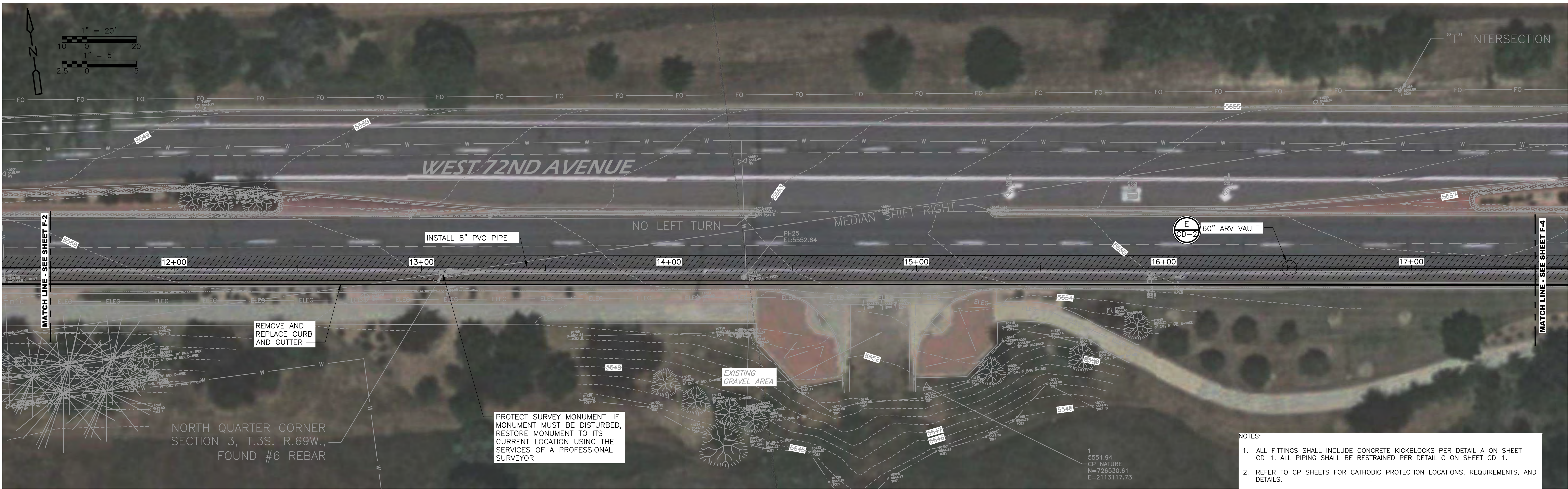


PROJECT NO. 263334-271511
FILE NAME: F002PLPR.DWG

SHEET NO.

F-2

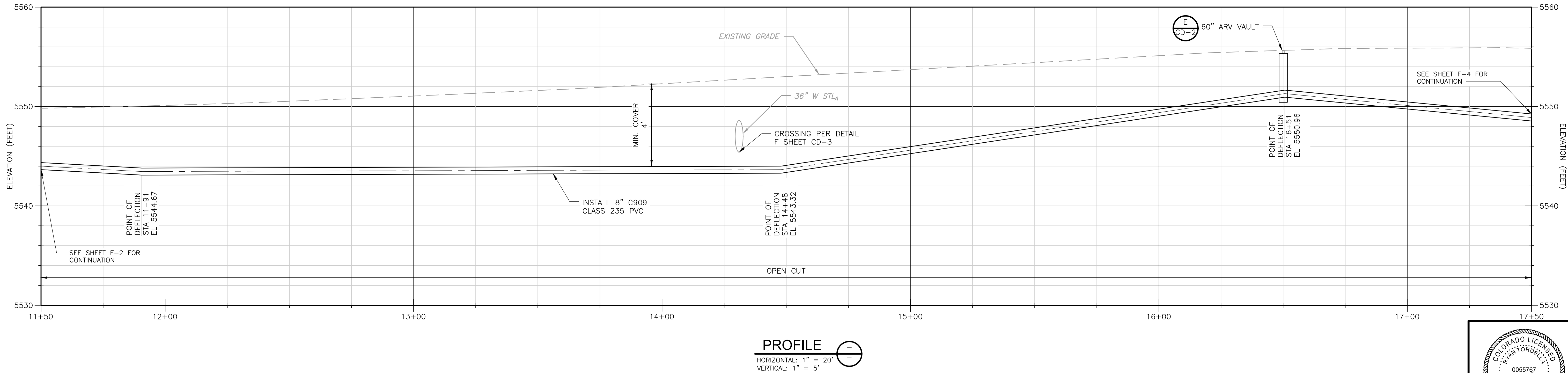
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LEGEND :
ASPHALT REPLACEMENT

PLAN
SCALE: 1" = 20'

- NOTES:
1. ALL FITTINGS SHALL INCLUDE CONCRETE KICKBLOCKS PER DETAIL A ON SHEET CD-1. ALL PIPING SHALL BE RESTRAINED PER DETAIL C ON SHEET CD-1.
 2. REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
 3. TRENCHING SHALL NOT EXTEND BEYOND THE CURB AND GUTTER ON W 72ND. AVE UNLESS OTHERWISE SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING TREES AND REPLACE ANY THAT ARE DAMAGED DURING CONSTRUCTION.



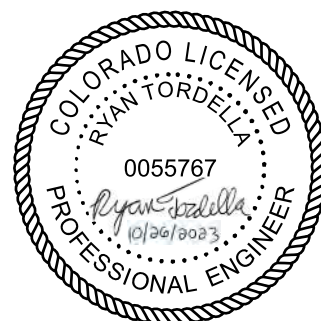
					DESIGNED BY: R. TORDELLA
					DRAWN BY: R. PAWAR
					SHEET CHK'D BY: C. CERRETA
					CROSS CHK'D BY: T. CHARLES
					APPROVED BY: R. TORDELLA
REV. NO.	DATE	DRWN	CHKD	REMARKS	DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

W. 72ND AVE.
PLAN AND PROFILE III

APPROVED:
City Engineer
10/26/23
Date
21-WA-02
Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



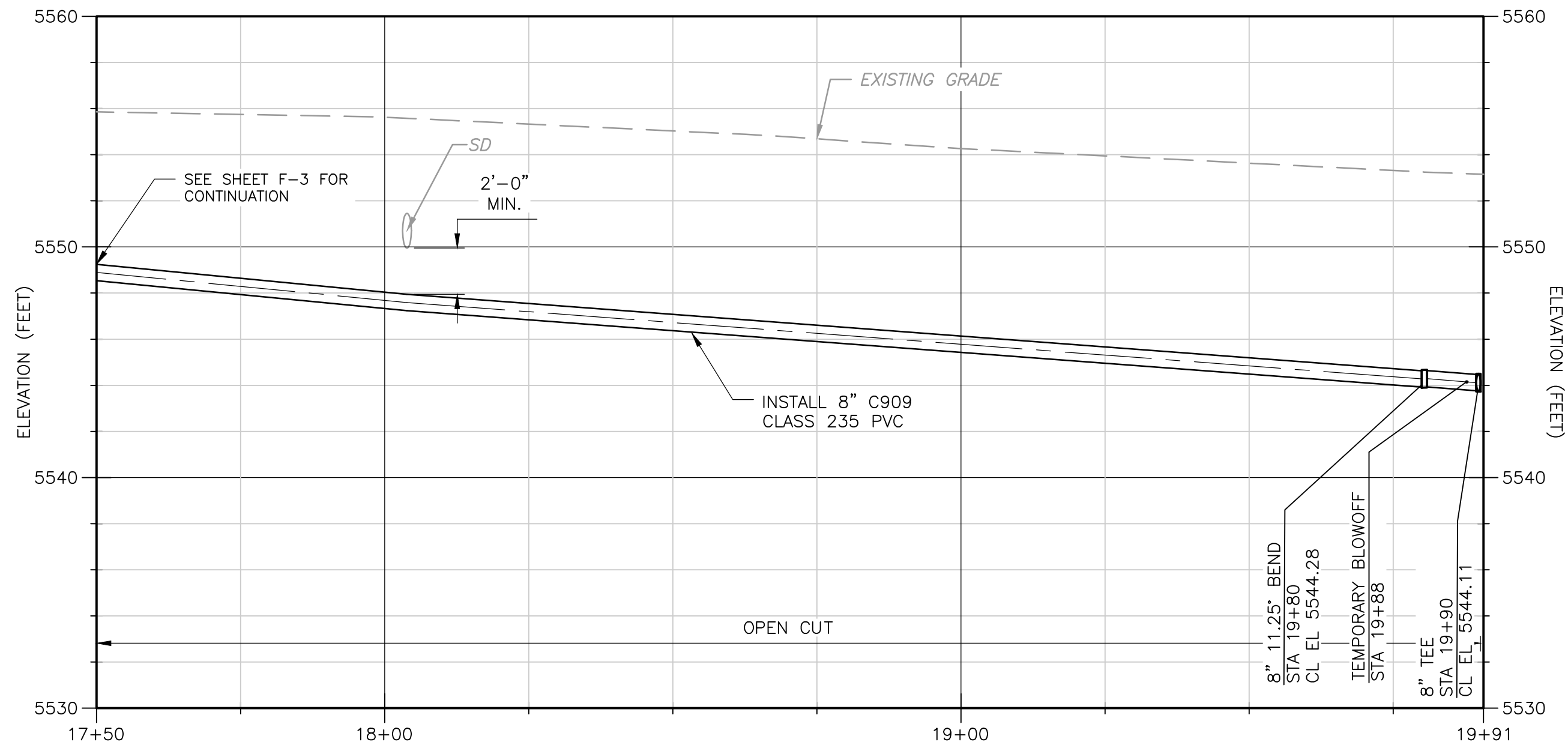
PROJECT NO. 263334-271511
FILE NAME: F003PLPR.DWG
SHEET NO.
F-3

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PLAN

SCALE: 1" = 20'



PROFILE

HORIZONTAL: 1" = 20'
VERTICAL: 1" = 5'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

W. 72ND AVE.
PLAN AND PROFILE IV

APPROVED:

Amey Wadhvani, PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: F004PLPR.DWG

SHEET NO.

F-4

XREF: (CDMS 2204, CEPO0555) Images (SHEET F-5, SHEET F-5_1)
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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



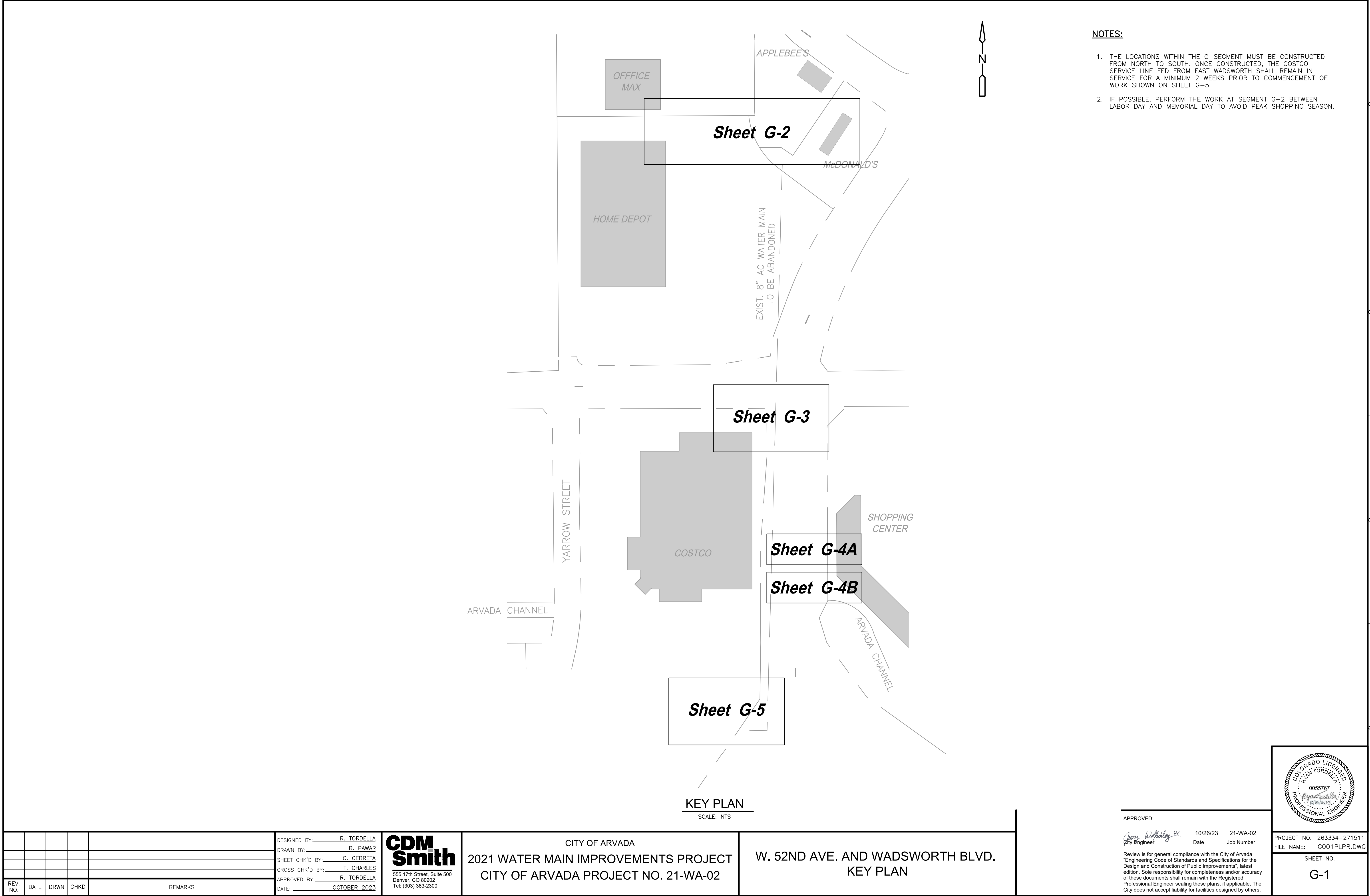
CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

W. 72ND AVE.
PLAN

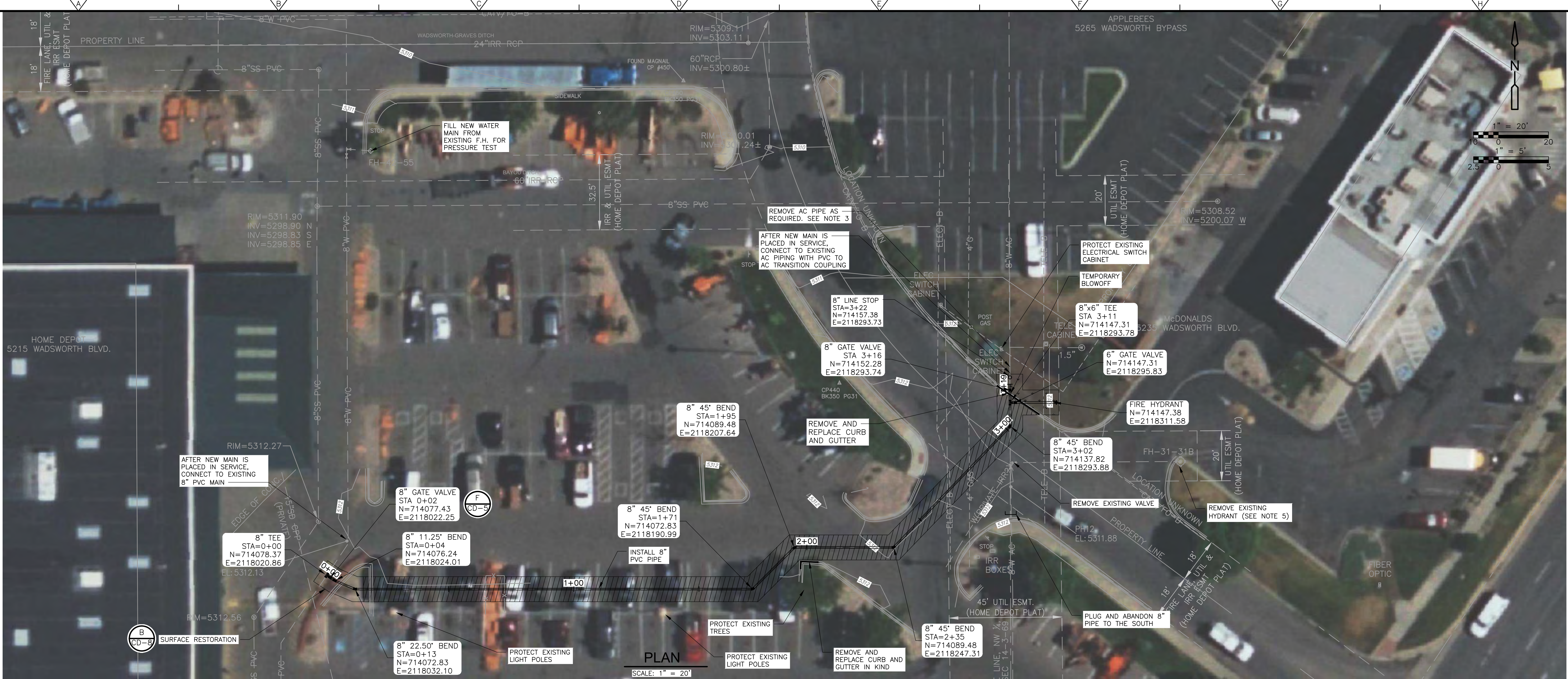
APPROVED: *Amey W. Winkley, PE* 10/26/23 21-WA-02
City Engineer Date Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.

PROJECT NO. 263334-271511
FILE NAME: FO01PLPR.DWG
SHEET NO.
F-5

XREFs: [CDMS 2204, CEP004SS, CEP006SS, CEP007SS] Images: []
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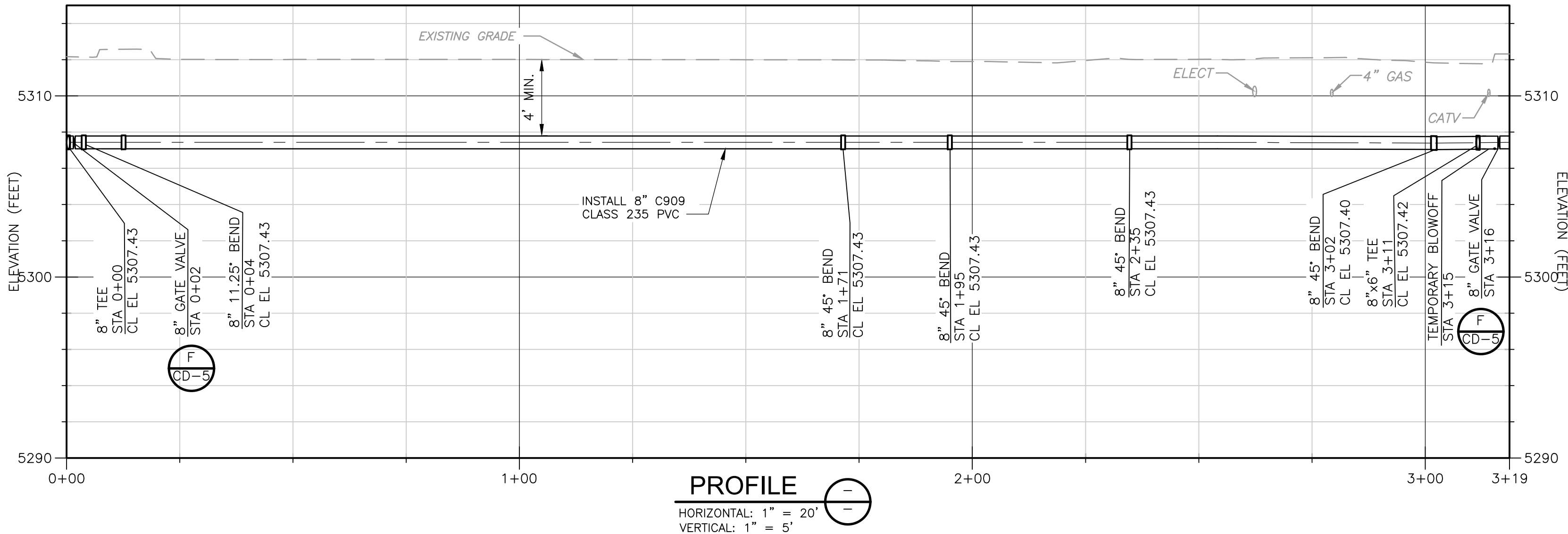


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NOTES:

- CONTRACTOR TO INSTALL 8" LINE STOP IN ORDER TO PERFORM THE WORK BETWEEN STA 3+00 AND 3+20. THIS LINE STOP IS REQUIRED FOR KEEPING THE MCDONALDS SERVICE LINE ACTIVE DURING CONSTRUCTION. SHOULD THE LINE STOP INSTALLATION FAIL, CONTRACTOR SHALL HAVE PARTS ON SITE TO REPAIR THE PIPE AND INSTALL THE REQUIRED ISOLATION. DURING CONSTRUCTION, CONTRACTOR TO COORDINATE LINE STOP INSTALLATION WITH CITY OF ARVADA AND MCDONALDS TO ENSURE THERE ARE NO (OR MINIMAL) SERVICE INTERRUPTIONS.
- ALL FITTINGS SHALL INCLUDE CONCRETE KICKBLOCKS PER DETAIL A ON SHEET CD-1. ALL PIPING SHALL BE RESTRAINED PER DETAIL C ON SHEET CD-1.
- CONTRACTOR SHALL ENSURE ALL OSHA REQUIREMENTS ARE MET WHEN CONNECTING TO/REMOVING EXISTING AC PIPE. DISPOSAL OF SECTIONS OF AC PIPE MUST BE IN A CDPHE APPROVED HAZARDOUS WASTE SITE.
- REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
- AT CONNECTION TO EXISTING WATER MAIN, CONTRACTOR TO VERIFY EXISTING PIPELINE RESTRAINT MEETS RESTRAINT REQUIREMENTS FOR GATE VALVE AS A DEAD END PER DETAILS A, B, AND C ON SHEET CD-1.
- CONTRACTOR SHALL NOTIFY THE CITY 3 WORKING DAYS BEFORE HYDRANT DEMOLITION AND COORDINATE REMOVAL WITH THE WATER UTILITY. CONTRACTOR SHALL SCHEDULE TIME FOR CITY STAFF TO CLOSE THE HYDRANT'S GATE VALVE. EXCAVATE AND DEMOLISH THE EXISTING FIRE HYDRANT, STANDPIPE, THRUST BLOCK AND HYDRANT BRANCH TO THE POINT OF CAPPING. CAP THE EXISTING PIPE 6-INCHES DOWNSTREAM OF THE CLOSED ISOLATION VALVE ON THE HORIZONTAL HYDRANT BRANCH. USE A MECHANICALLY JOINTED PLUG TO CAP THE HYDRANT. VERIFY THERE ARE NO LEAKS AT THE ISOLATION VALVE AND CAP BEFORE RESTORING THE SITE. RESTORE AND RESOD DISTURBED SURFACE IN ACCORDANCE WITH CITY OF ARVADA STANDARDS. CONTRACTOR SHALL SALVAGE HYDRANT AND NOTIFY OWNER FOR PICKUP.



LEGEND :

- ASPHALT REPLACEMENT
- LANDSCAPING / SEEDING

DESIGNED BY:	R. TORDELLA
DRAWN BY:	R. PAWAR
SHEET CHK'D BY:	C. CERRETA
CROSS CHK'D BY:	T. CHARLES
APPROVED BY:	R. TORDELLA
DATE:	OCTOBER 2023

REV. NO.	DATE	DRWN	CHKD	REMARKS



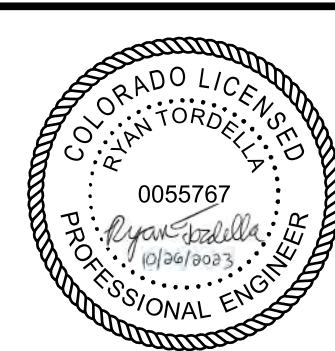
CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

HOME DEPOT SHOPPING CENTER
PLAN AND PROFILE

APPROVED:

Amey Wolfshagen, PE 10/26/23 21-WA-02
City Engineer Date Job Number

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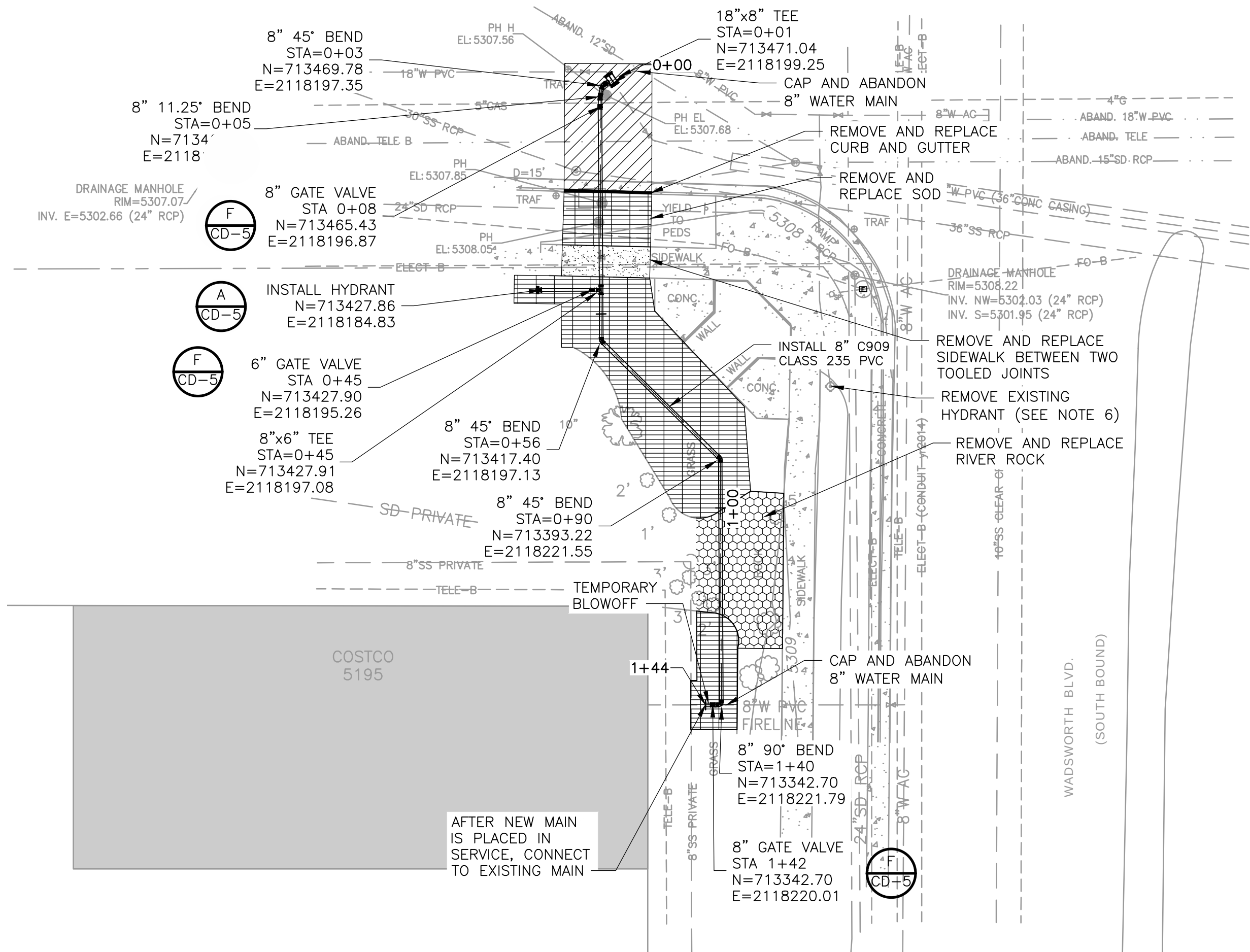


PROJECT NO. 263334-271511
FILE NAME: G002PLPR.DWG

SHEET NO.

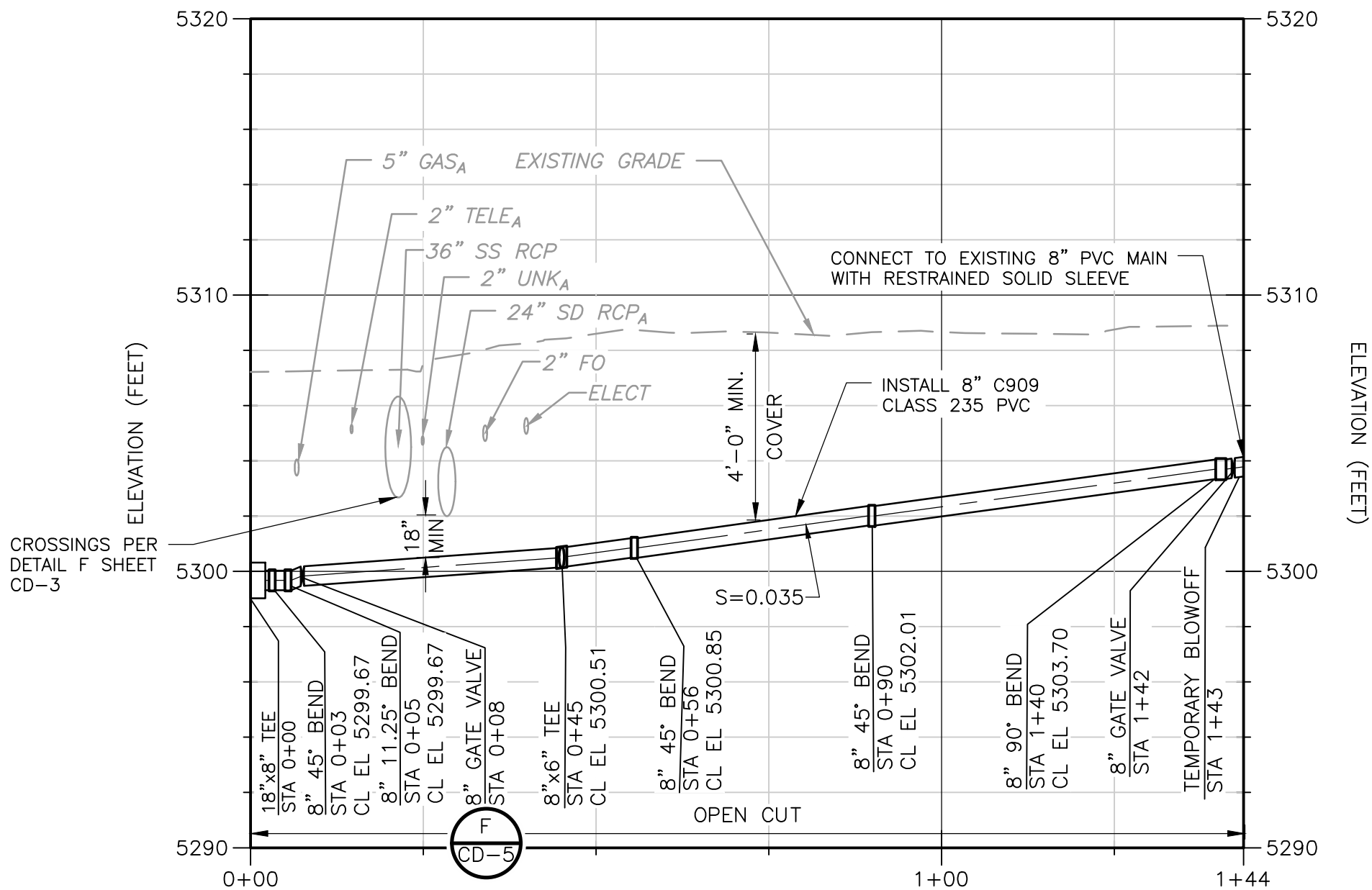
G-2

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PLAN

SCALE: 1" = 20'



PROFILE

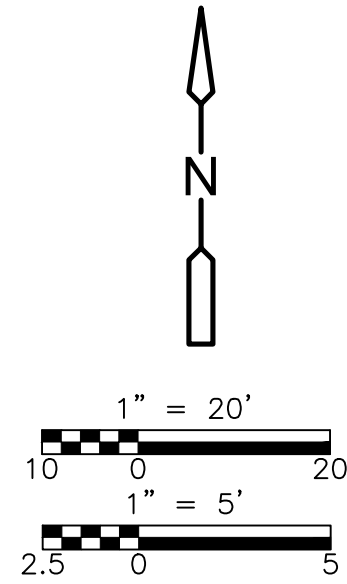
HORIZONTAL: 1" = 20'
VERTICAL: 1" = 5'

NOTES:

- ALL FITTINGS SHALL INCLUDE CONCRETE KICKBLOCKS PER DETAIL A ON SHEET CD-1. ALL PIPING SHALL BE RESTRAINED PER DETAIL C ON SHEET CD-1.
- REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
- FOR PRESSURE TESTING AND DISINFECTION, NEW WATER LINE SHALL BE FILLED FROM THE CONNECTION AT STA 0+00.
- REMOVE TEMPORARY BLOWOFFS ONCE WATER MAIN IS IN SERVICE.
- AT CONNECTION TO EXISTING WATER MAIN, CONTRACTOR TO VERIFY EXISTING PIPELINE RESTRAINT MEETS RESTRAINT REQUIREMENTS FOR GATE VALVE AS A DEAD END PER DETAILS A, B, AND C ON SHEET CD-1.
- CONTRACTOR SHALL NOTIFY THE CITY 3 WORKING DAYS BEFORE HYDRANT DEMOLITION AND COORDINATE REMOVAL WITH THE WATER UTILITY. CONTRACTOR SHALL SCHEDULE TIME FOR CITY STAFF TO CLOSE THE HYDRANT'S GATE VALVE. EXCAVATE AND DEMOLISH THE EXISTING FIRE HYDRANT, STANDPIPE, THRUST BLOCK AND HYDRANT BRANCH TO THE POINT OF CAPPING. CAP THE EXISTING PIPE 6-INCHES DOWNSTREAM OF THE CLOSED ISOLATION VALVE ON THE HORIZONTAL HYDRANT BRANCH. USE A MECHANICALLY JOINTED PLUG TO CAP THE HYDRANT. VERIFY THERE ARE NO LEAKS AT THE ISOLATION VALVE AND CAP BEFORE RESTORING THE SITE. RESTORE AND RESOD DISTURBED SURFACE IN ACCORDANCE WITH CITY OF ARVADA STANDARDS. CONTRACTOR SHALL SALVAGE HYDRANT AND NOTIFY OWNER FOR PICKUP.

LEGEND :

- ASPHALT REPLACEMENT
- LANDSCAPING / SEEDING
- REMOVE AND REPLACE RIVER ROCK
- REMOVE AND REPLACE SOD
- SIDEWALK REPLACEMENT



DESIGNED BY: R. TORDELLA	CDM Smith
DRAWN BY: R. PAWAR	555 17th Street, Suite 500
SHEET CHK'D BY: C. CERRETA	Denver, CO 80202
CROSS CHK'D BY: T. CHARLES	Tel: (303) 383-2300
APPROVED BY: R. TORDELLA	
DATE: OCTOBER 2023	



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

W. 52ND AVE. AND WADSWORTH BLVD.
PLAN AND PROFILE

APPROVED:

City Engineer Date Job Number

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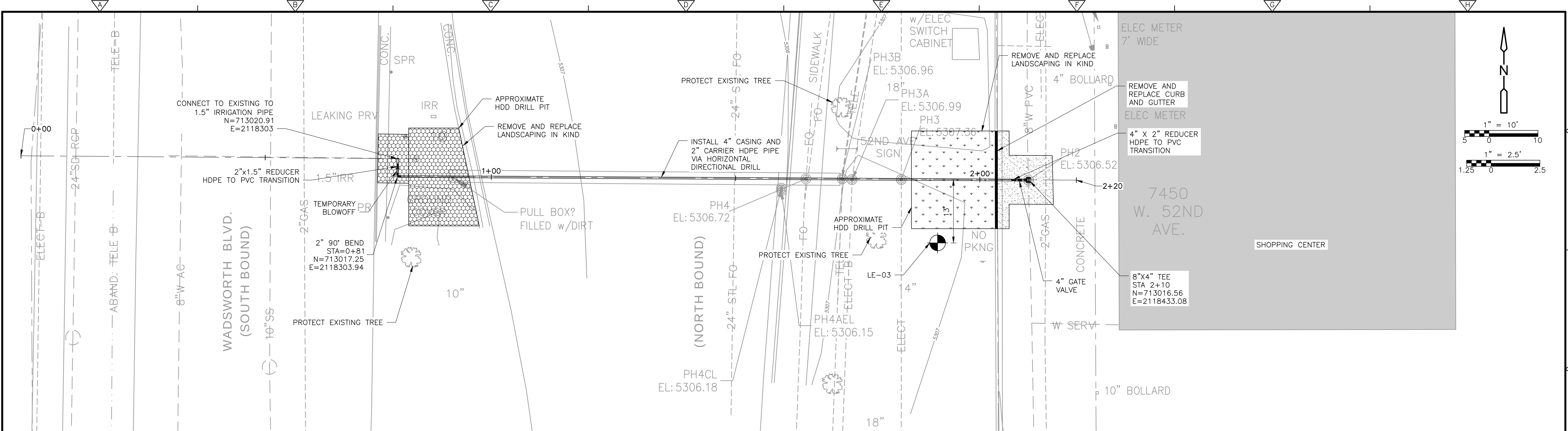


PROJECT NO. 265334-271511
FILE NAME: G003PLPR.DWG

SHEET NO.

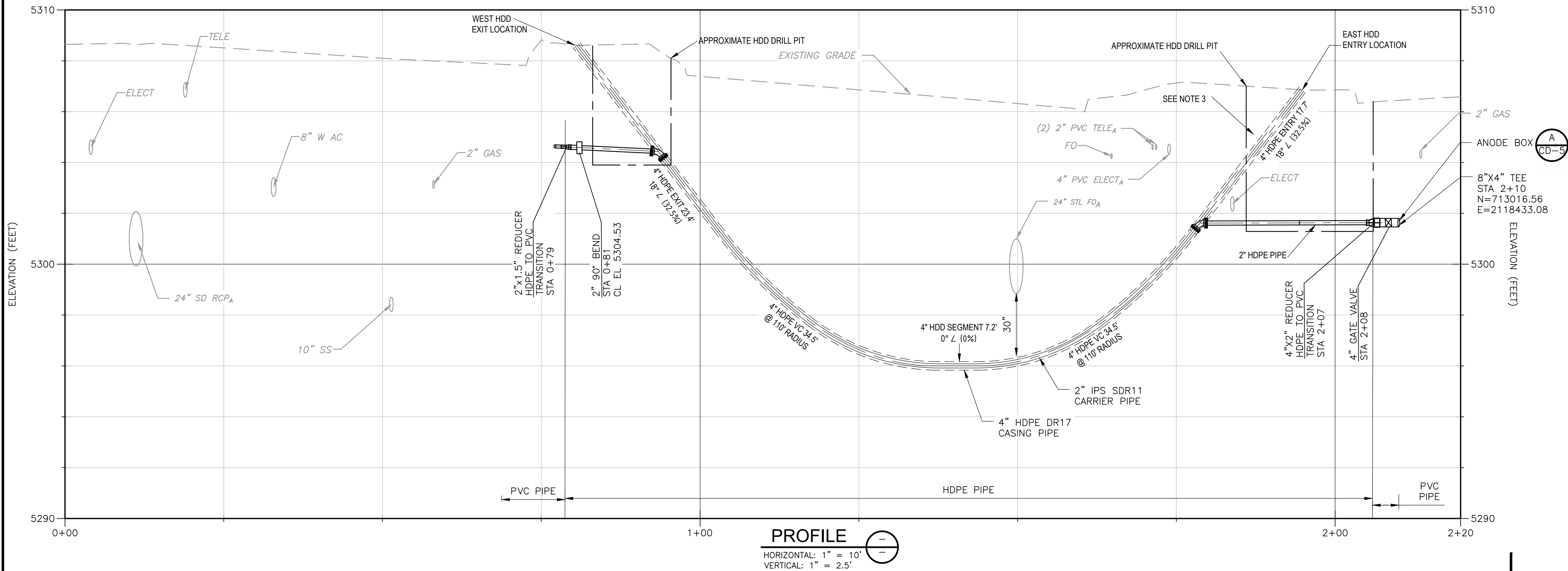
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PLAN

SCALE: 1" = 10'



PROFILE

HORIZONTAL: 1" = 10'
VERTICAL: 1" = 2.5'

NOTES:

- HDD PATH PROVIDED MAY BE MODIFIED AT THE DISCRETION OF THE CONTRACTORS PROVIDED:
 - CONTRACTOR MAINTAINS ENTRY AND EXIT POINT WITHIN 2 FEET OF WHERE SHOWN IN ALL DIRECTIONS
 - CONTRACTOR MAINTAINS CLEARANCES OF 2 FEET OF ALL UTILITIES
- HDD PIPE SHALL BE 2" IPS SDR11 PE4710 INSIDE 4" HDPE CARRIER PIPE
- CONTRACTOR TO SUPPORT OR COORDINATE RELOCATION OF UTILITIES EXPOSED DURING THE PIPELINE INSTALLATION.
- GEOTECHNICAL INFORMATION REGARDING THIS CROSSING IS LOCATED IN THE PROJECT GIR. GEOTECHNICAL BORING LE-03 SITE G IS THE CLOSEST BORING TO THIS CROSSING WITH AN OFFSET OF APPROX. 13'-FT. GROUND CONDITIONS ARE ANTICIPATED TO BE FILL MATERIAL CONSISTING OF LEAN CLAY FROM THE GROUND SURFACE TO 8'-FEET, COARSE ALLUVIUM TO 21'-FEET, WITH CLAYSTONE BEYOND 21'-FEET.
- REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
- FOR PRESSURE TESTING AND DISINFECTION, NEW WATER LINE SHALL BE FILLED FROM THE CONNECTION AT STA 2+20.
- REMOVE TEMPORARY BLOWOFFS ONCE WATER MAIN IS IN SERVICE.
- AT CONNECTION TO EXISTING WATER MAIN, CONTRACTOR TO VERIFY EXISTING PIPELINE RESTRAINT MEETS RESTRAINT REQUIREMENTS FOR GATE VALVE AS A DEAD END PER DETAILS A, B, AND C ON SHEET CD-1.
- CONTRACTOR SHALL OBTAIN REQUIRED CDOT PERMITS PRIOR TO COMMENCING WORK.
- PROTECT EXISTING MATURE TREES ON EAST SIDE OF WADSWORTH BLVD.

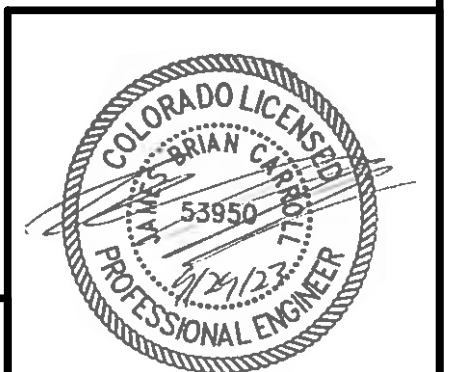
LEGEND :

- | | |
|--|-------------------------------|
| | LANDSCAPING / SEEDING |
| | REMOVE AND REPLACE RIVER ROCK |
| | SIDEWALK REPLACEMENT |

APPROVED:

Amey Wadhvani PE 10/26/23 21-WA-02
City Engineer Date Job Number

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PROJECT NO. 263334-271511
FILE NAME: G004PLPR.DWG

SHEET NO.
G-4A

REV. NO.	DATE	DRWN	CHKD	REMARKS

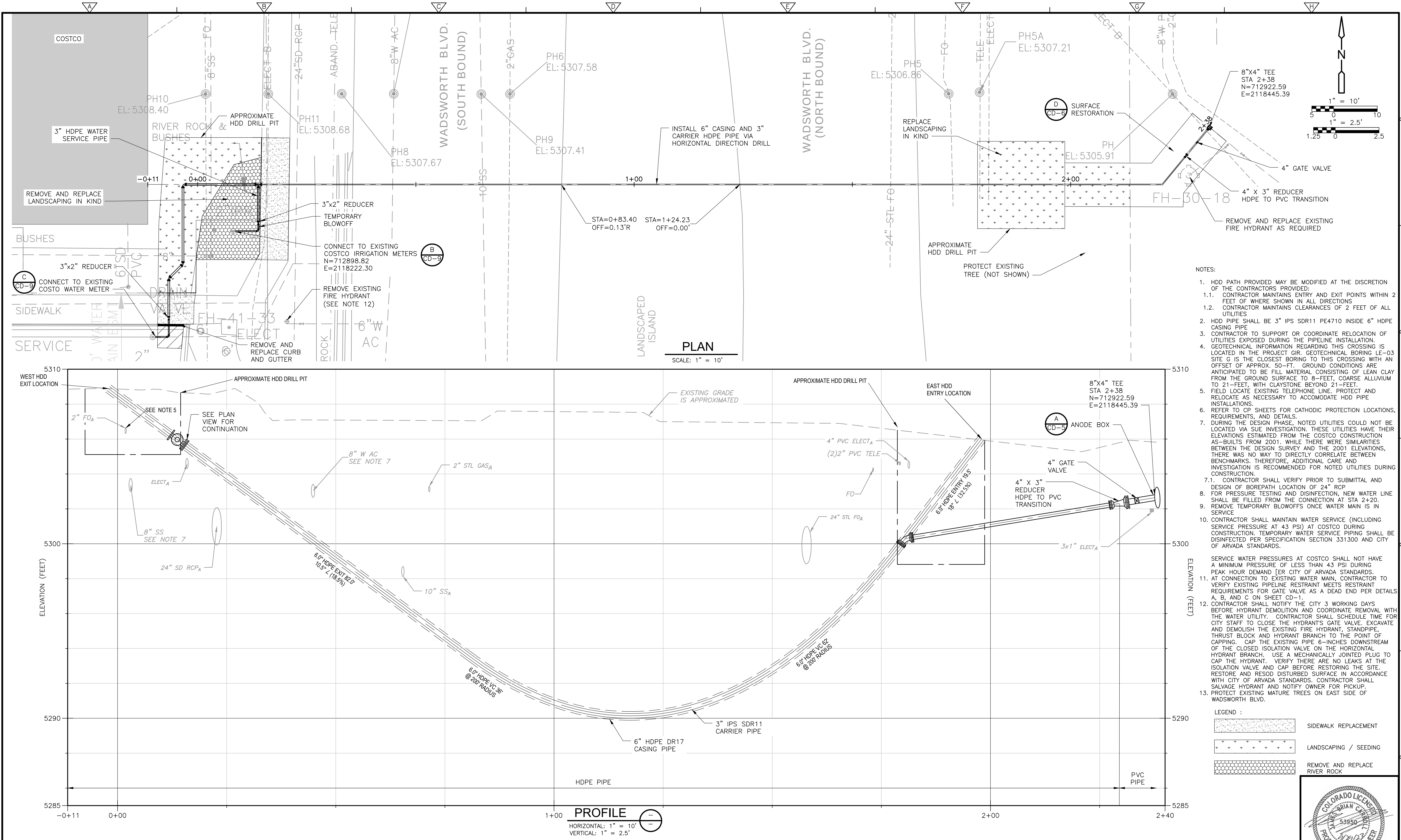
DESIGNED BY: J. CARROL
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: B. SILJENBERG
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

WADSWORTH BLVD. IRRIGATION LINE
PLAN AND PROFILE

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- NOTES:
- HDD PATH PROVIDED MAY BE MODIFIED AT THE DISCRETION OF THE CONTRACTORS PROVIDED.
 - CONTRACTOR MAINTAINS ENTRY AND EXIT POINTS WITHIN 2 FEET OF WHERE SHOWN IN ALL DIRECTIONS
 - CONTRACTOR MAINTAINS CLEARANCES OF 2 FEET OF ALL UTILITIES
 - HDD PIPE SHALL BE 3" IPS SDR11 PE4710 INSIDE 6" HDPE CASING PIPE
 - CONTRACTOR TO SUPPORT OR COORDINATE RELOCATION OF UTILITIES EXPOSED DURING THE PIPELINE INSTALLATION.
 - GEOTECHNICAL INFORMATION REGARDING THIS CROSSING IS LOCATED IN THE PROJECT GIR. GEOTECHNICAL BORING LE-03 SITE G IS THE CLOSEST BORING TO THIS CROSSING WITH AN OFFSET OF APPROX. 50-FT. GROUND CONDITIONS ARE ANTICIPATED TO BE FILL MATERIAL CONSISTING OF LEAN CLAY FROM THE GROUND SURFACE TO 8-FEET, COARSE ALLUVIUM TO 21-FEET, WITH CLAYSTONE BEYOND 21-FEET.
 - FIELD LOCATE EXISTING TELEPHONE LINE. PROTECT AND RELOCATE AS NECESSARY TO ACCOMMODATE HDD PIPE INSTALLATIONS.
 - REFER TO CP SHEETS FOR CATHODIC PROTECTION LOCATIONS, REQUIREMENTS, AND DETAILS.
 - DURING THE DESIGN PHASE, NOTED UTILITIES COULD NOT BE LOCATED VIA SUE INVESTIGATION. THESE UTILITIES HAVE THEIR ELEVATIONS ESTIMATED FROM THE COSTCO CONSTRUCTION AS-BUILTS FROM 2001. WHILE THERE WERE SIMILARITIES BETWEEN THE DESIGN SURVEY AND THE 2001 ELEVATIONS, THERE WAS NO WAY TO DIRECTLY CORRELATE BETWEEN BENCHMARKS. THEREFORE, ADDITIONAL CARE AND INVESTIGATION IS RECOMMENDED FOR NOTED UTILITIES DURING CONSTRUCTION.
 - CONTRACTOR SHALL VERIFY PRIOR TO SUBMITTAL AND DESIGN OF BOREPATH LOCATION OF 24" RCP FOR PRESSURE TESTING AND DISINFECTION. NEW WATER LINE SHALL BE FILLED FROM THE CONNECTION AT STA 2+20.
 - REMOVE TEMPORARY BLOWOFFS ONCE WATER MAIN IS IN SERVICE
 - CONTRACTOR SHALL MAINTAIN WATER SERVICE (INCLUDING SERVICE PRESSURE AT 43 PSI) AT COSTCO DURING CONSTRUCTION. TEMPORARY WATER SERVICE PIPING SHALL BE DISINFECTED PER SPECIFICATION SECTION 331300 AND CITY OF ARVADA STANDARDS.
 - SERVICE WATER PRESSURES AT COSTCO SHALL NOT HAVE A MINIMUM PRESSURE OF LESS THAN 43 PSI DURING PEAK HOUR DEMAND [ER CITY OF ARVADA STANDARDS.
 - AT CONNECTION TO EXISTING WATER MAIN, CONTRACTOR TO VERIFY EXISTING PIPELINE RESTRAINT MEETS RESTRAINT REQUIREMENTS FOR GATE VALVE AS A DEAD END PER DETAILS A, B, AND C ON SHEET CD-1.
 - CONTRACTOR SHALL NOTIFY THE CITY 3 WORKING DAYS BEFORE HYDRANT DEMOLITION AND COORDINATE REMOVAL WITH THE WATER UTILITY. CONTRACTOR SHALL SCHEDULE TIME FOR CITY STAFF TO CLOSE THE HYDRANT'S GATE VALVE. EXCAVATE AND DEMOLISH THE EXISTING FIRE HYDRANT, STANDPIPE, THRUST BLOCK AND HYDRANT BRANCH TO THE POINT OF CAPPING. CAP THE EXISTING PIPE 6-INCHES DOWNSTREAM OF THE CLOSED ISOLATION VALVE ON THE HORIZONTAL HYDRANT BRANCH. USE A MECHANICALLY JOINTED PLUG TO CAP THE HYDRANT. VERIFY THERE ARE NO LEAKS AT THE ISOLATION VALVE AND CAP BEFORE RESTORING THE SITE. RESTORE AND RESOD DISTURBED SURFACE IN ACCORDANCE WITH CITY OF ARVADA STANDARDS. CONTRACTOR SHALL SALVAGE HYDRANT AND NOTIFY OWNER FOR PICKUP.
 - PROTECT EXISTING MATURE TREES ON EAST SIDE OF WADSWORTH BLVD.

- LEGEND :
- SIDEWALK REPLACEMENT
 - LANDSCAPING / SEEDING
 - REMOVE AND REPLACE RIVER ROCK

DESIGNED BY:	J. CARROL
DRAWN BY:	R. PAWAR
SHEET CHK'D BY:	C. CERRETA
CROSS CHK'D BY:	T. CHARLES
APPROVED BY:	B. SILJENBERG
DATE:	OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

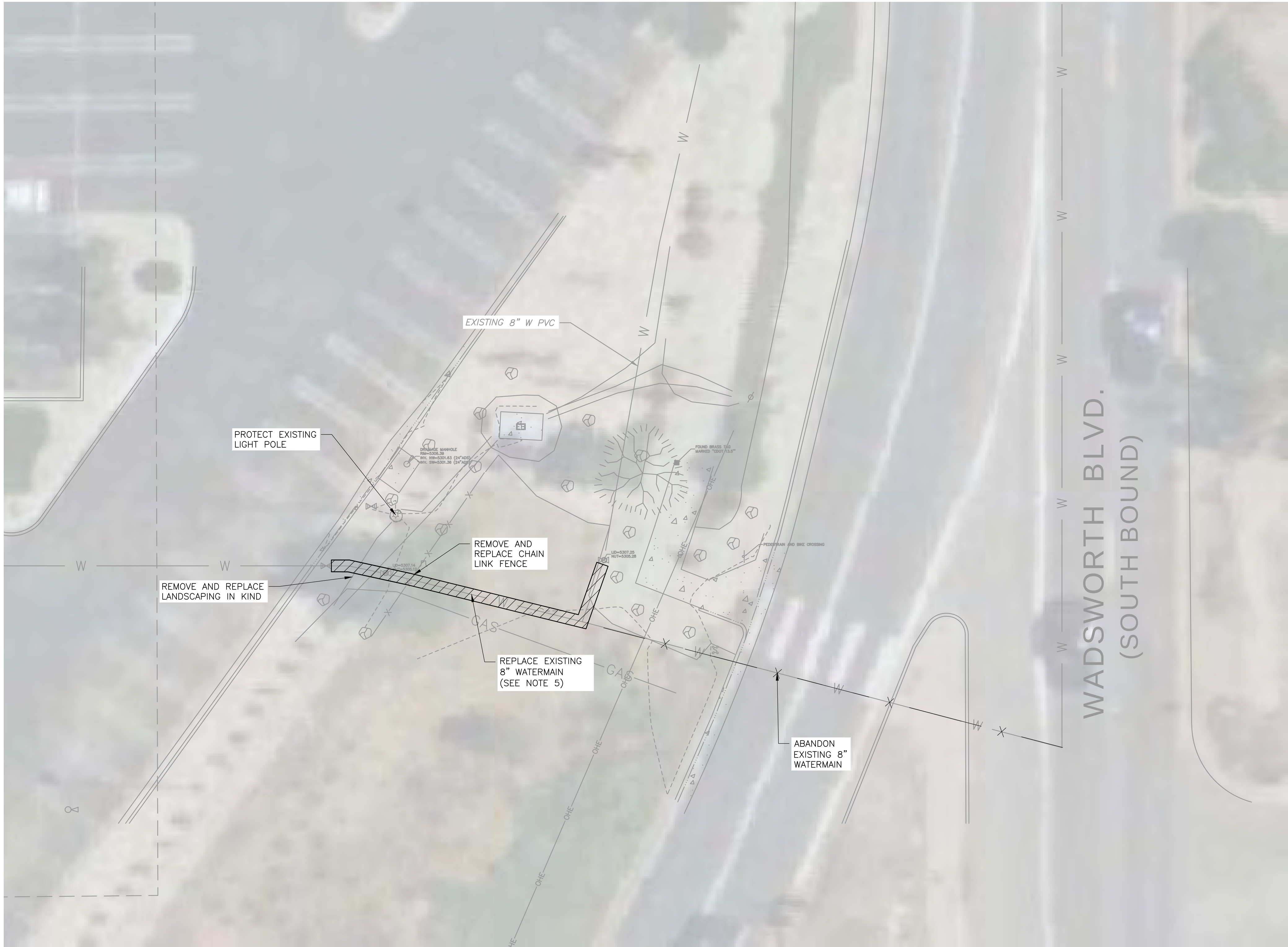
COSTCO SERVICE LINE
PLAN AND PROFILE

APPROVED:
10/26/23 21-WA-02
Date Job Number
10/26/23 21-WA-02
City Engineer
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PROJECT NO. 263334-271511
FILE NAME: G004PLPR.DWG
SHEET NO.
G-4B

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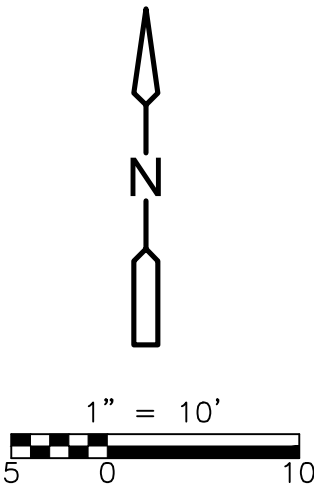


PLAN

SCALE: 1" = 10'

NOTES:

1. A MINIMUM OF ONE EXISTING VALVE SHALL REMAIN. ONCE EXCAVATED, REMOVE EXISTING VALVES LOCATED ON AC PIPE.
2. IF BOTH EXISTING VALVES ARE LOCATED ON AC PIPE, COORDINATE WITH CITY OF ARVADA TO DETERMINE WHICH VALVE WILL REMAIN.
3. CONTRACTOR SHALL REPAIR ALL DISTURBED AREAS TO PRECONSTRUCTION CONDITIONS.
4. AT CONNECTION TO EXISTING WATER MAIN, CONTRACTOR TO VERIFY EXISTING PIPELINE RESTRAINT MEETS RESTRAINT REQUIREMENTS FOR GATE VALVE AS A DEAD END PER DETAILS A, B, AND C ON SHEET CD-1.
5. REFER TO SPECIFICATION SECTION 013526 "GOVERNMENTAL SAFETY REQUIREMENTS" FOR DISPOSAL OF HARZARDOUS PIPE MATERIAL.



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

COSTCO AC PIPE REMOVAL PLAN

APPROVED:

Amey Wolfshy PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: G005PLPR.DWG

SHEET NO.

G-5



XREF: [CDMS_2234] Images: []
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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



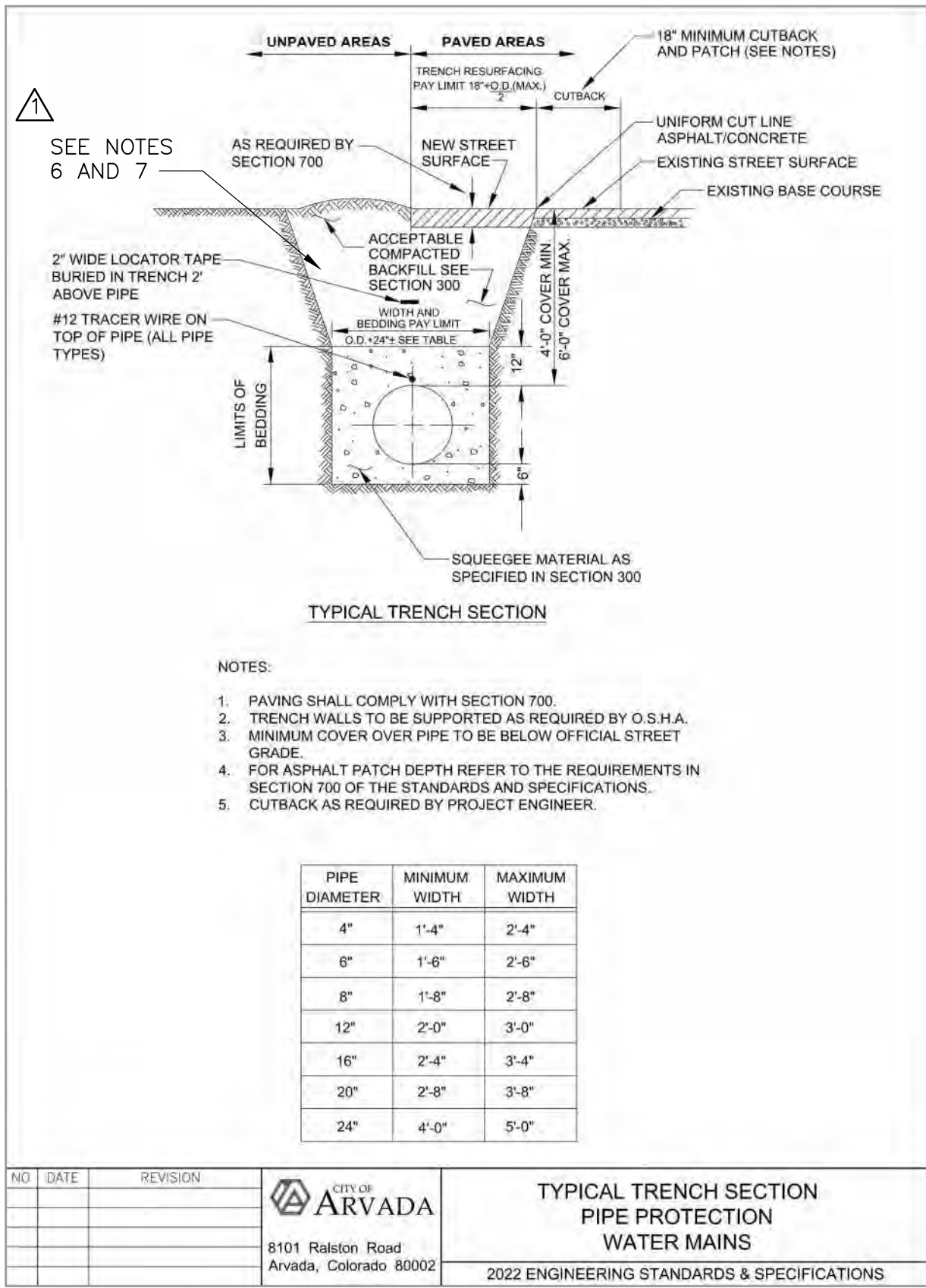
CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

CITY OF ARVADA
STANDARD DETAILS IV

APPROVED: Amy Wolfshagen, PE 10/26/23 21-WA-02
City Engineer Date Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: CD04STD.DWG
SHEET NO.
CD-4

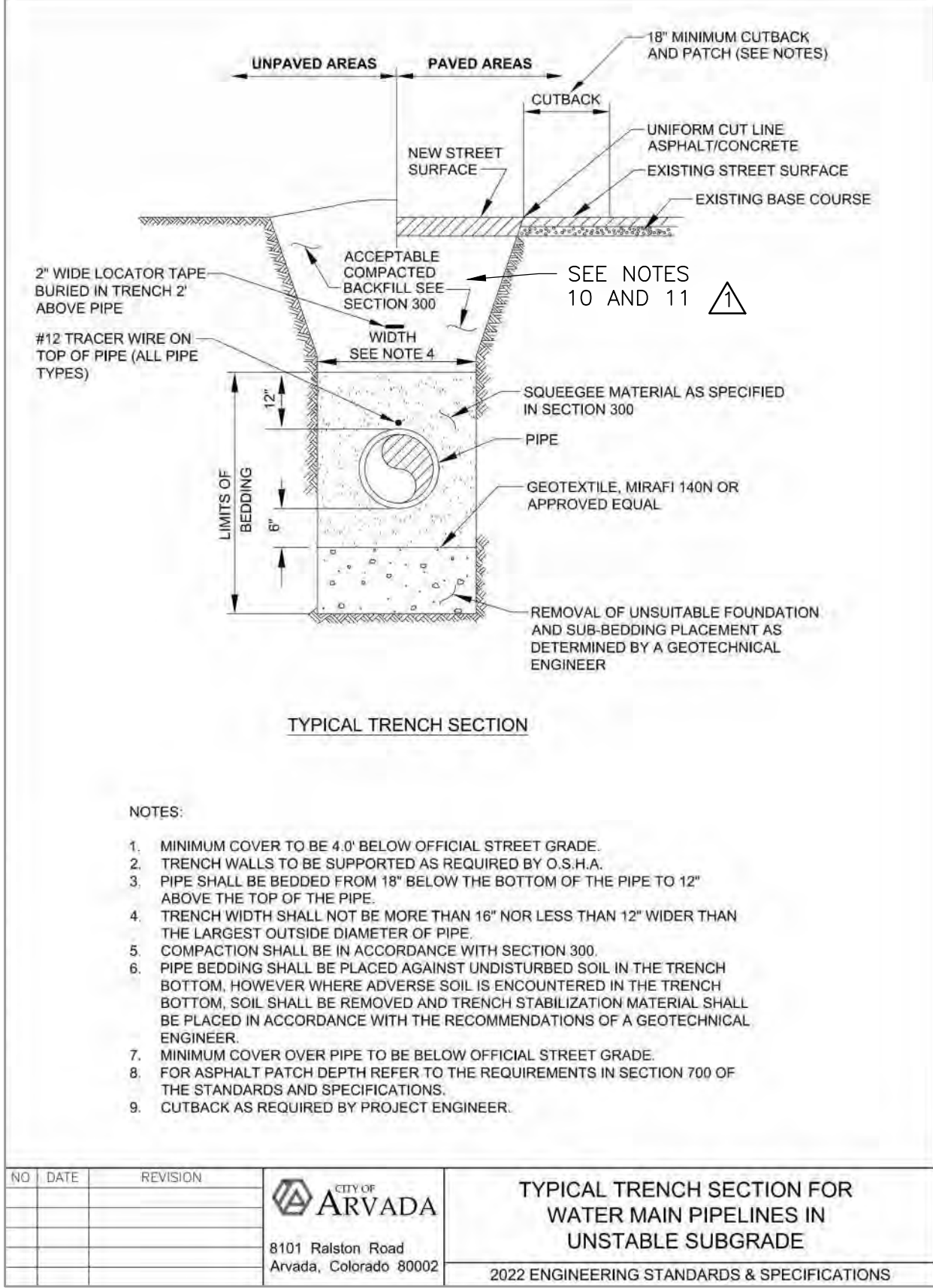


DETAIL

NTS

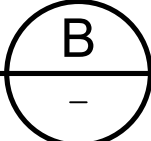


6. BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY FOR THE MATERIAL AND MOISTURE CONDITIONED TO 2% OF THE OPTIMUM MOISTURE CONTENT, AS DETERMINED BY TESTS MADE IN CONFORMANCE WITH ASTM D698.
7. WHERE THE EXISTING SIDES OR BOTTOM OF A DITCH ARE DISTURBED, THE TOP 2 FEET OF BACKFILL MATERIAL SHALL BE CLAY CONTAINING A MINIMUM 70% BY DRY WEIGHT PASSING THE #200 SIEVE OR BE BLENDED WITH 2% POWDERED DRY BENTONITE BY DRY WEIGHT OF THE BACKFILL MATERIAL, WHERE APPLICABLE, REPAIR DITCH BANK SIDE AT A MAXIMUM SLOPE OF 2:1.
8. WHERE DITCH ROW IS DISTURBED, USE 6" OF CDOT CLASS 6 ROAD BASE ON THE DITCH ACCESS ROAD AND STANDARD CDOT SEED MIX FOR REGIONS OUTSIDE OF THE ROADWAY, IN ACCORDANCE WITH FHL AND/OR FRICO STANDARDS.



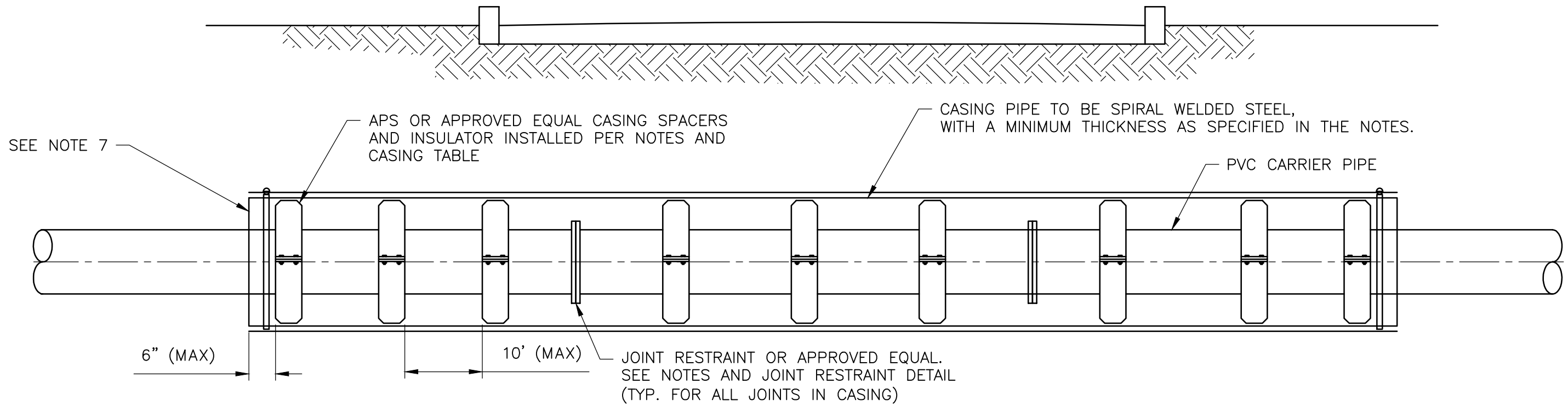
DETAIL

NTS



10. BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY FOR THE MATERIAL AND MOISTURE CONDITIONED TO 2% OF THE OPTIMUM MOISTURE CONTENT, AS DETERMINED BY TESTS MADE IN CONFORMANCE WITH ASTM D698.
11. WHERE THE EXISTING SIDES OR BOTTOM OF A DITCH ARE DISTURBED, THE TOP 2 FEET OF BACKFILL MATERIAL SHALL BE CLAY CONTAINING A MINIMUM 70% BY DRY WEIGHT PASSING THE #200 SIEVE OR BE BLENDED WITH 2% POWDERED DRY BENTONITE BY DRY WEIGHT OF THE BACKFILL MATERIAL, WHERE APPLICABLE, REPAIR DITCH BANK SIDE AT A MAXIMUM SLOPE OF 2:1.
12. WHERE DITCH ROW IS DISTURBED, USE 6" OF CDOT CLASS 6 ROAD BASE ON THE DITCH ACCESS ROAD AND STANDARD CDOT SEED MIX FOR REGIONS OUTSIDE OF THE ROADWAY, IN ACCORDANCE WITH FHL AND/OR FRICO STANDARDS.

XREFS: [CDMS_2234] Images: []
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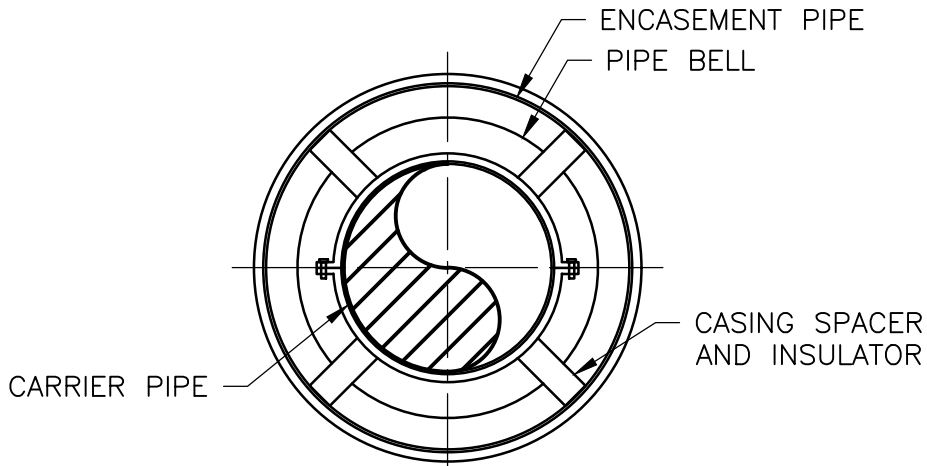


LONGITUDINAL SECTION

NOTES:

1. SPACERS FOR CARRIER PIPE SHALL BE PER CITY OF ARVADA APPROVED PRODUCTS LIST OR APPROVED EQUAL AND SHALL BE INSTALLED TO CENTER CARRIER PIPE WITHIN CASING AS WELL AS PREVENT THE CARRIER PIPE FROM RESTING ON THE BELLS WITHIN THE CASING.
2. CONTRACTOR TO TAKE INTO CONSIDERATION THE SIZE AND LIMITS OF PIPE RESTRAINTS WHEN ORDER AND INSTALLING CASING PIPE TO ALLOW FOR ADEQUATE CLEARANCE.
3. SPACERS TO BE PLACED A MIN OF 1' BACK FROM EACH JOINT THAT FALLS WITHIN CASING, A GREATER SET BACK MAY BE REQUIRED FOR LARGER PIPE. CASING SPACERS SHALL BE INSTALLED AT A MAXIMUM HORIZONTAL SEPARATION OF 10 FEET.
4. JOINT RESTRAINTS ARE REQUIRED ON ALL JOINTS IN PIPE CASING. ALTERNATIVE RESTRAINT DEVICES OR PIPE WITH BUILT-IN RESTRAINTS (I.E., CERTAINTED) MAY BE SUBMITTED TO DESIGN ENGINEER FOR APPROVAL.
5. CARRIER PIPE AND ENCASEMENT TO BE INSTALLED VIA OPEN CUT.
6. WHERE THE EXISTING SIDES OR BOTTOM OF A CREEK ARE DISTURBED, THE TOP 2 FEET OF BACKFILL MATERIAL SHALL BE CLAY CONTAINING A MINIMUM 70% BY DRY WEIGHT PASSING THE #200 SIEVE OR BE BLENDED WITH 2% POWDERED DRY BENTONITE BY DRY WEIGHT OF THE BACKFILL MATERIAL. WHERE APPLICABLE, REPAIR CREEK BANK SIDE AT A MAXIMUM SLOPE OF 2:1.
7. A ONE-EIGHTH INCH THICK SYNTHETIC RUBBER WRAP AROUND END SEALS WITH STAINLESS STEEL BANDS SHALL BE INSTALLED ON THE CASING PIPE AFTER CARRIER PIPE INSERTION. END SEALS SHALL BE WATERTIGHT, MODEL W WRAP AROUND END SEAL OF LINK SEAL AS MANUFACTURED BY GPT INDUSTRIES.
8. CATHODIC PROTECTION IS REQUIRED ON ALL CASING PIPE ACCORDING TO SECTION 400 OF THE CITY OF ARVADA ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS AND MAY BE REQUIRED ON THE CARRIER PIPE.
9. MAINTAIN AND TEST FOR ELECTRICAL ISOLATION OF CASING AND CARRIER PER SECTION 400 OF THE CITY OF ARVADA ENGINEERING CODE OF STANDARDS AND SPECIFICATIONS PRIOR TO BACKFILLING.

CARRIER PIPE NOMINAL DIAMETER (INCHES)	CASING PIPE		MINIMUM SPACER LENGTH (INCHES)
	MIN. O.D (INCHES)	MIN. WALL THICKNESS (INCHES)	
4	12	0.375	8
6	16	0.375	8
8	18	0.375	8
12	22	0.375	8
16	28	0.375	12
20	32	0.500	12
24	36	0.500	12

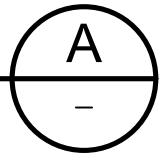


CROSS SECTION

OPEN CUT CREEK CROSSING PIPE CASING

DETAIL

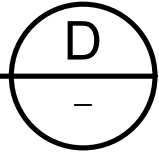
NTS



WADSWORTH HDD SURFACE RESTORATION

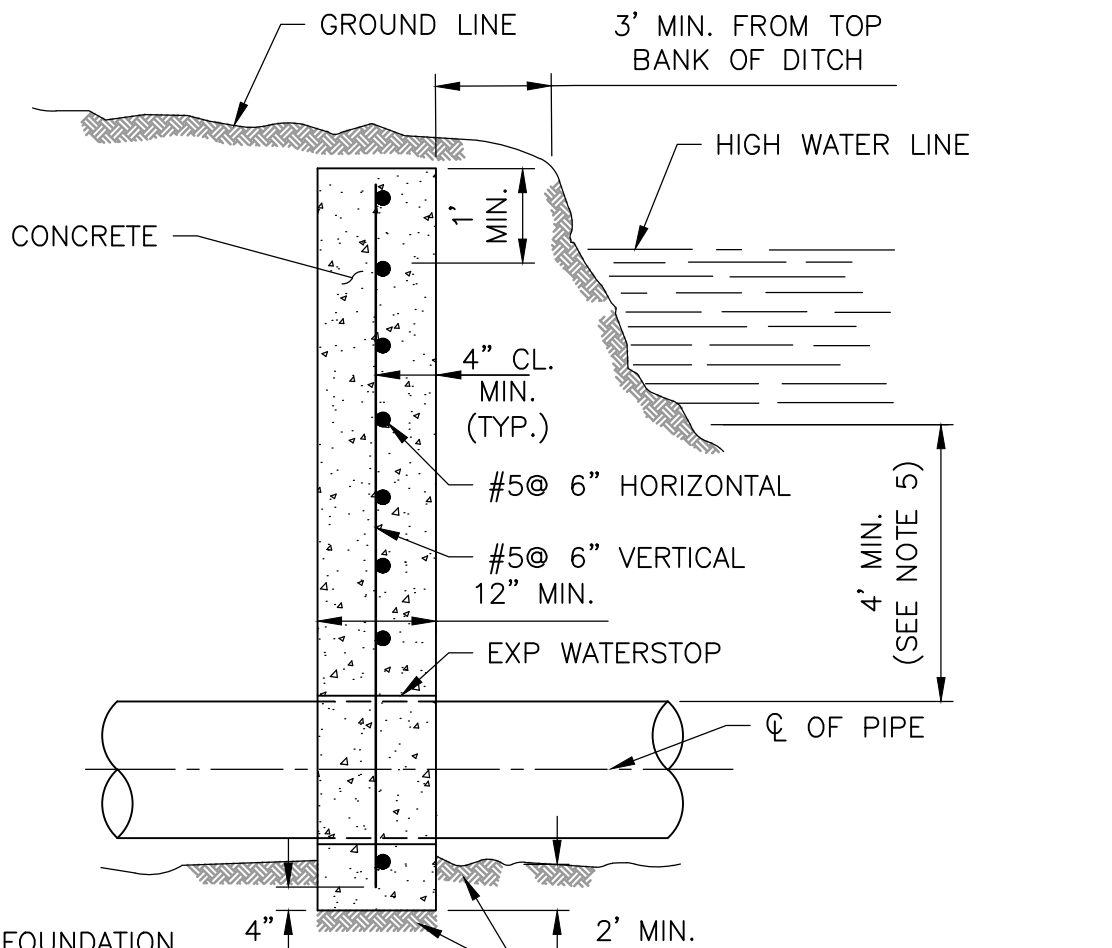
DETAIL

NTS



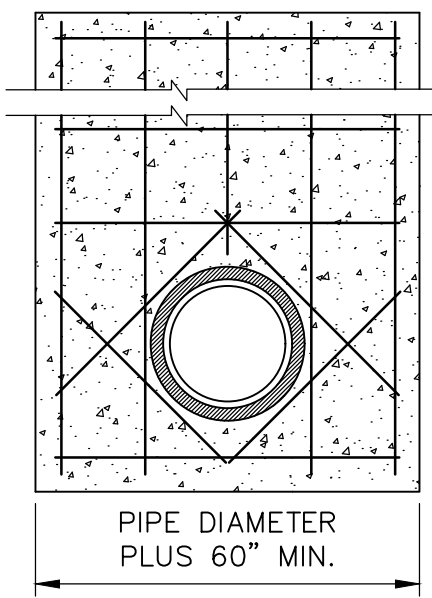
NOTES:

1. THE LOCATION RELATIVE TO THE CANAL, HEIGHT AND LENGTH OF THE CUT OFF WALL WILL BE DETERMINED BY THE ENGINEER AND/OR CANAL CO.
2. PIPES GREATER THAN 12" WITH A CROSSING THAT IS GREATER THAN 20' MUST BE IN A CASING PIPE, MAY BE C900 / C909. AS SHOWN ON THE DRAWINGS.
3. MAINTAIN 4" SEPARATION AND ELECTRICAL ISOLATION BETWEEN REBAR AND PIPING.
4. CONTRACTOR SHALL BACKFILL AROUND THE CUT OFF WALL EQUALLY TO PREVENT OVERTURNING OR MOVEMENT IN THE WALL. BACKFILL SHALL BE COMPACTED TO 90% (MIN.) OR MAXIMUM MODIFIED PROCTOR DENSITY.
5. PIPE INSTALLATIONS ACROSS CROKE CANAL SHALL MAINTAIN A MINIMUM DEPTH OF 5' BETWEEN CANAL INVERT AND TOP OF CASING PIPE. REFER TO SHEETS C-1.

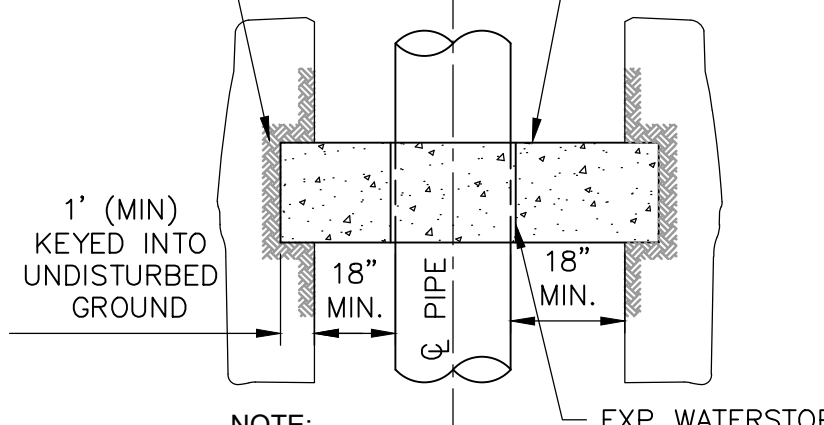


SIDE VIEW

ANY QUESTIONABLE FOUNDATION CONDITION SHOULD BE REFERRED TO THE PROJECT ENGINEER



FRONT VIEW



PLAN VIEW

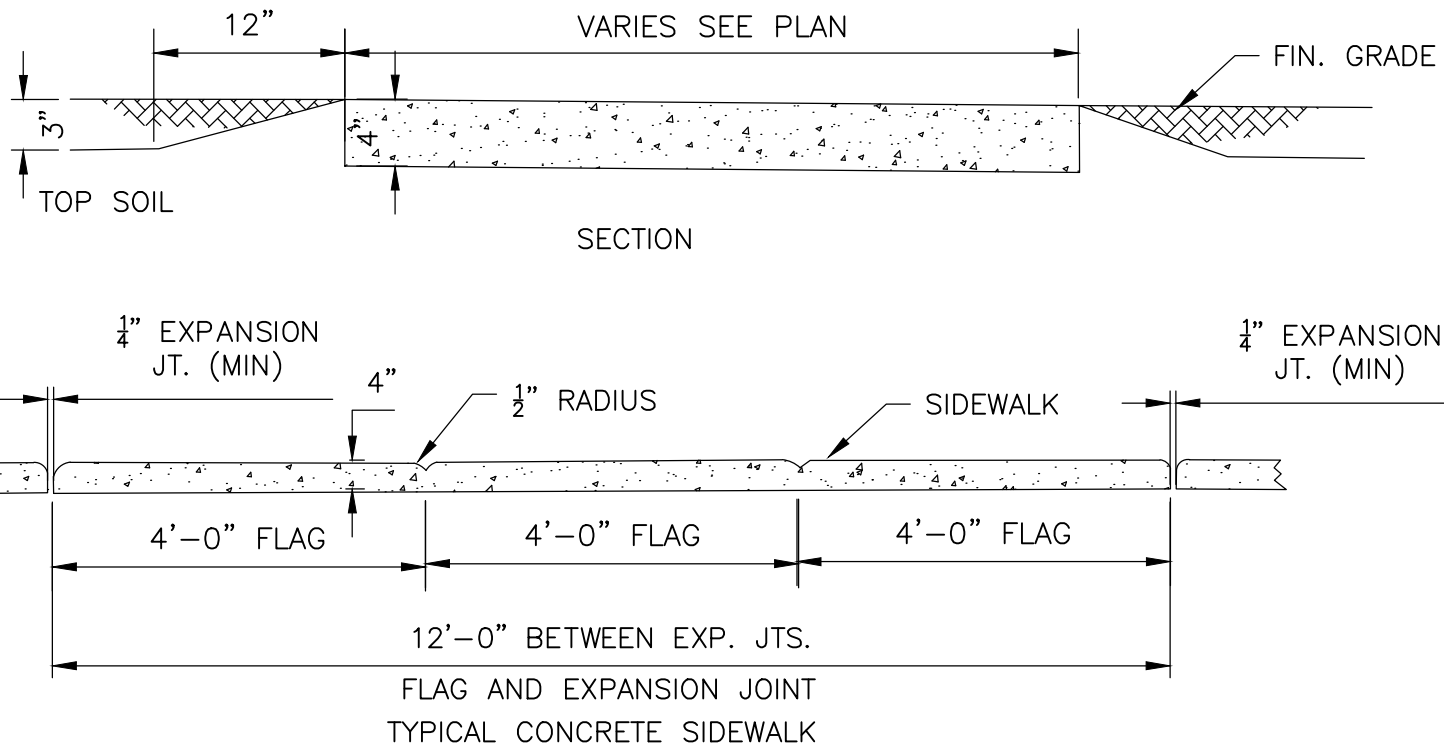
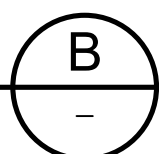
NOTE:

REINFORCEMENT NOT SHOWN FOR CLARITY.

TYPICAL CUT-OFF WALL FOR DITCH OR CANAL CROSSING

DETAIL

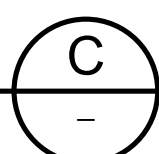
NTS



CONCRETE SIDEWALK

DETAIL

NTS



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: <u>R. TORDELLA</u>
DRAWN BY: <u>R. PAWAR</u>
SHEET CHK'D BY: <u>C. CERRETA</u>
CROSS CHK'D BY: <u>T. CHARLES</u>
APPROVED BY: <u>R. TORDELLA</u>
DATE: <u>OCTOBER 2023</u>



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

STANDARD DETAILS VI

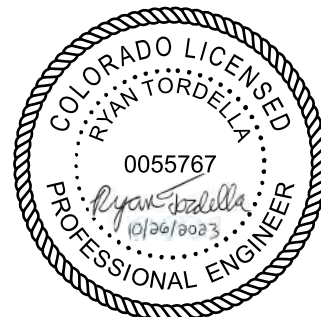
APPROVED:

Amey Wadhvani, PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

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PROJECT NO. 263334-271511
FILE NAME: CD06STD.T.DWG

SHEET NO.

CD-6

XREFs: [CDMS_2234] Images: [IMAGE-1, IMAGE-2, IMAGE-3, IMAGE-4]
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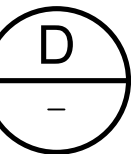


JELLISON ST. VAULT MODIFICATIONS

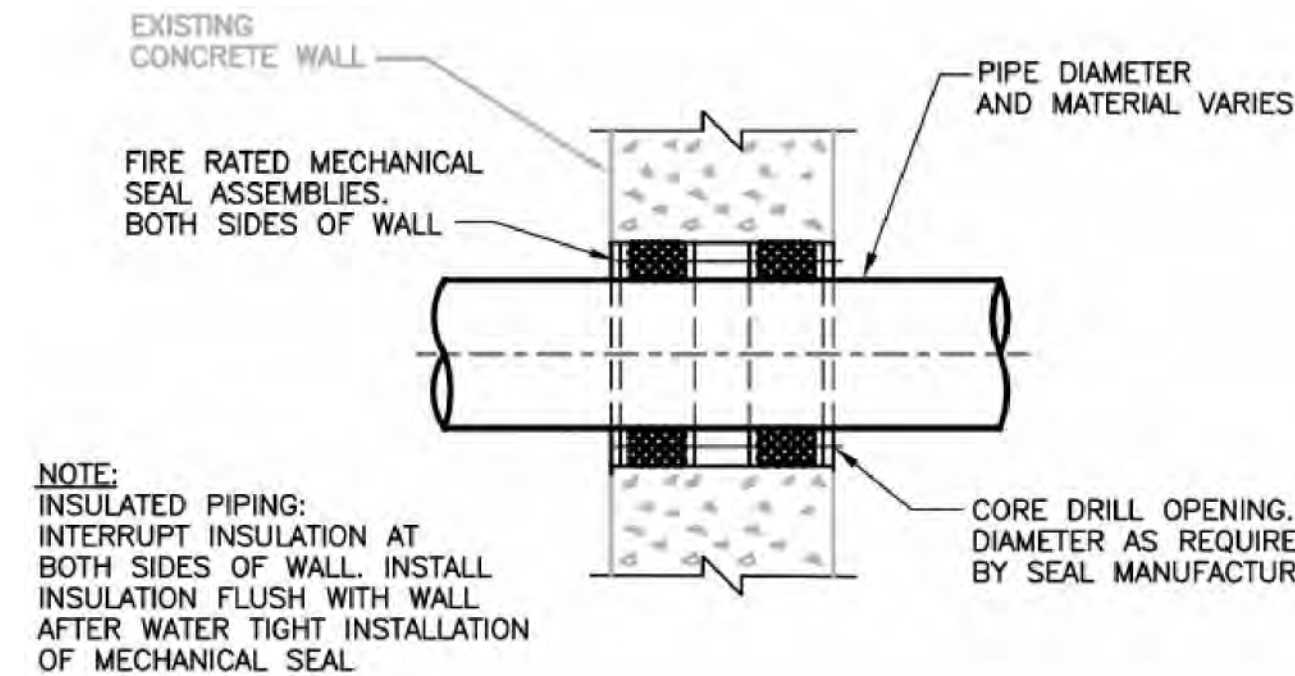
NOTES:

1. CONNECT TO EXISTING FLANGES ON UPSTREAM AND DOWNSTREAM SIDE OF VAULT WITH INSULATING FLANGES AS PER DETAIL C, CP-2.
2. INSTALL CP CONTINUITY BONDS ALONG NEW PIPE SPOOL TO CONNECT EXISTING UPSTREAM PIPE TO EXISTING DOWNSTREAM PIPE PER DETAIL A, CP-2. TAPE CP CONTINUITY BOND WIRES TO TOP OF NEW PIPE USING POLYETHYLENE TAPE SPACED EVERY 18 INCHES.

DETAIL

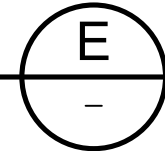


NTS



CORE DRILLED OPENING AND FIRE RATED MECHANICAL MODULAR WALL SEALS PENETRATION THROUGH EXISTING WALL

DETAIL



NTS

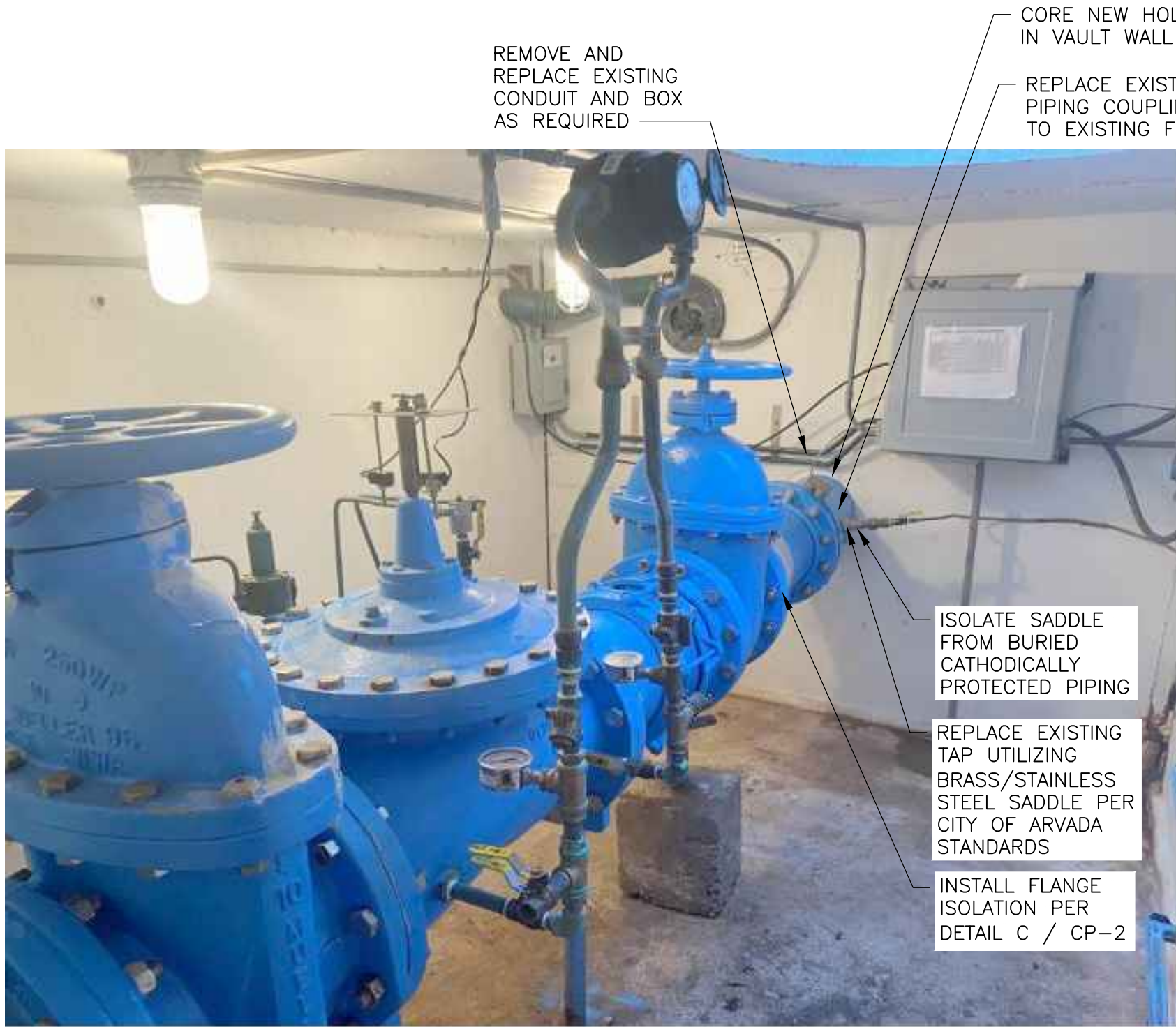
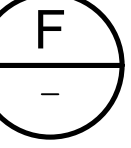


PHOTO INSIDE OF CARR ST. PRV VAULT (SHEET C-1)

DETAIL

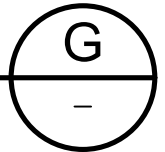


NTS



PHOTO INSIDE OF CARR ST. DRAIN VAULT (SHEET C-2)

DETAIL



NTS

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA	
DRAWN BY: R. PAWAR	
SHEET CHK'D BY: C. CERRETA	
CROSS CHK'D BY: T. CHARLES	
APPROVED BY: R. TORDELLA	
DATE: OCTOBER 2023	



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

STANDARD DETAILS VII

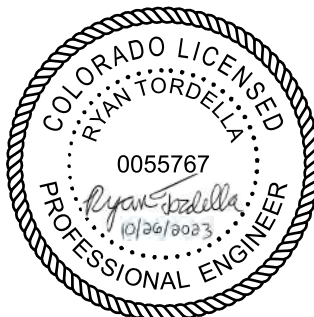
APPROVED:

Amey Wadhvani, PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

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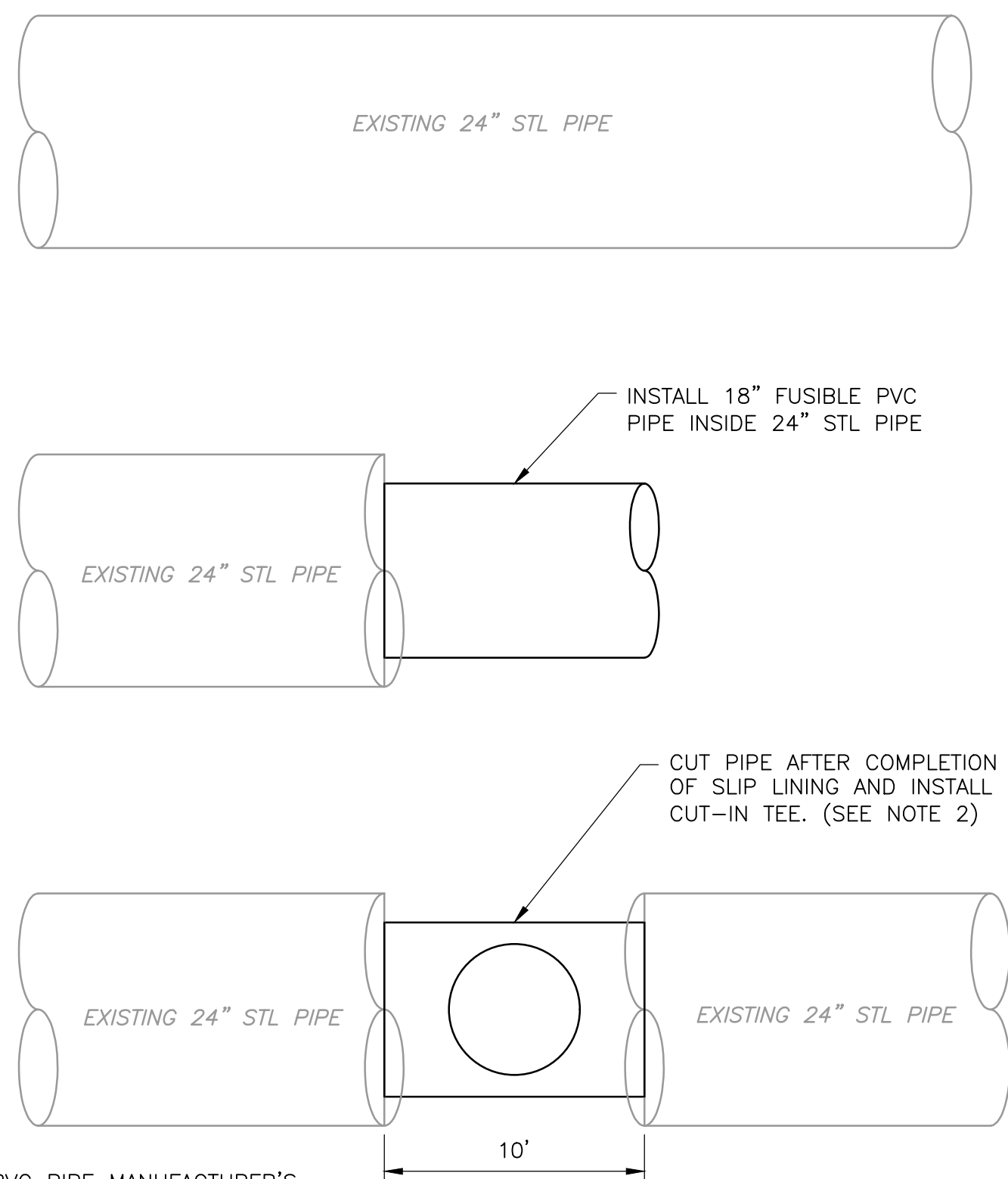


PROJECT NO. 263334-271511
FILE NAME: CD07STD.TD.DWG

SHEET NO.

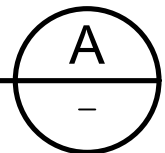
CD-7

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NOTES:

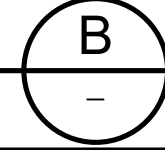
1. COORDINATE WITH FUSIBLE PVC PIPE MANUFACTURER'S REPRESENTATIVE FOR PROPER INSTALLATION.
2. INSTALL TAPPING SADDLE ON NEW FUSIBLE PVC PIPE IN LIEU OF NEW TEE WHERE SHOWN ON THE DRAWINGS.
3. DURING REMOVAL OF EXISTING STEEL PIPE, CONTRACTOR SHALL PROTECT FUSIBLE PVC.



HOME DEPOT SURFACE RESTORATION

DETAIL

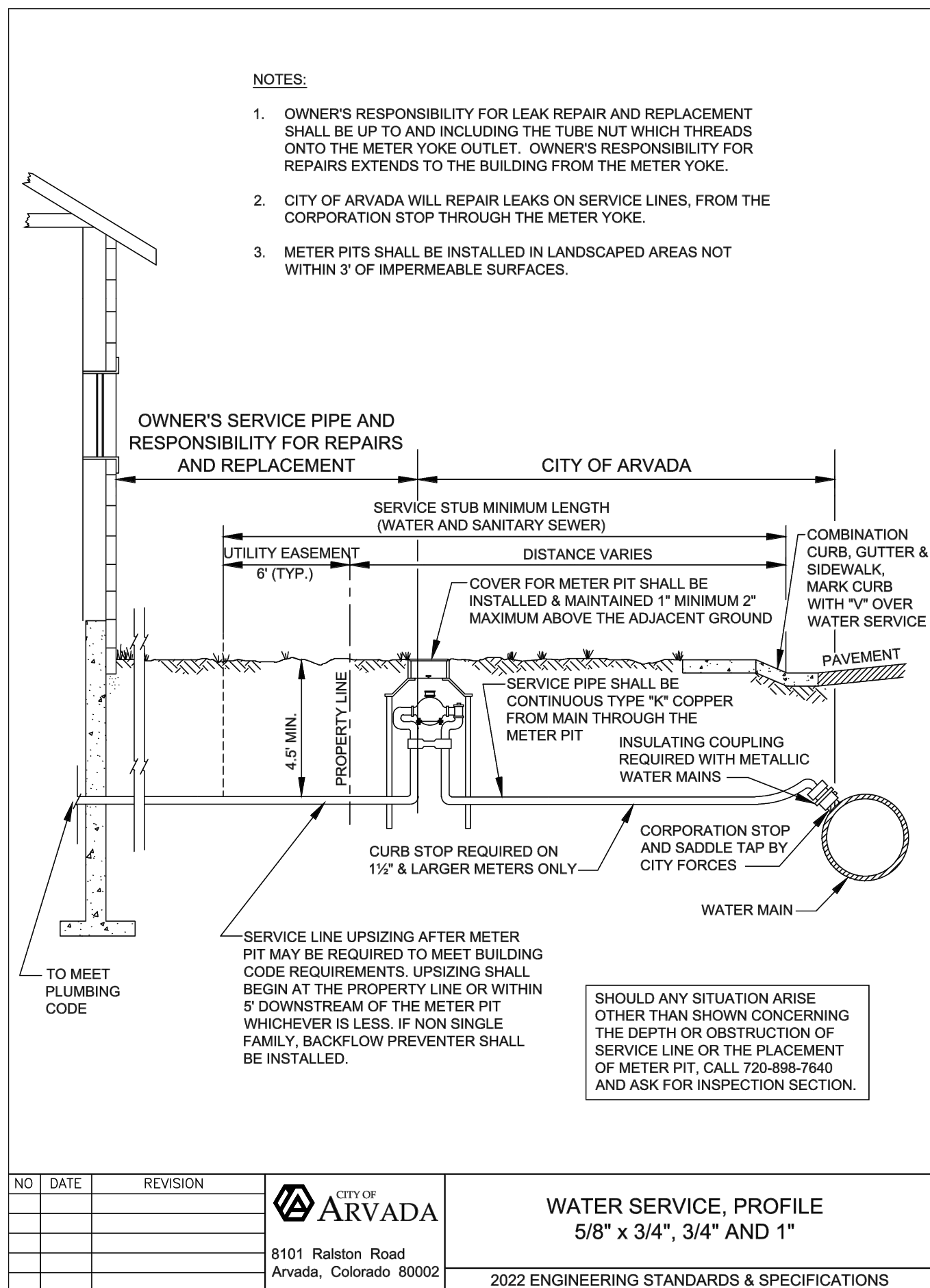
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**CDM
Smith**
555 17th Street, Suite 500
Denver, CO 80202
Tel: (303) 383-2300

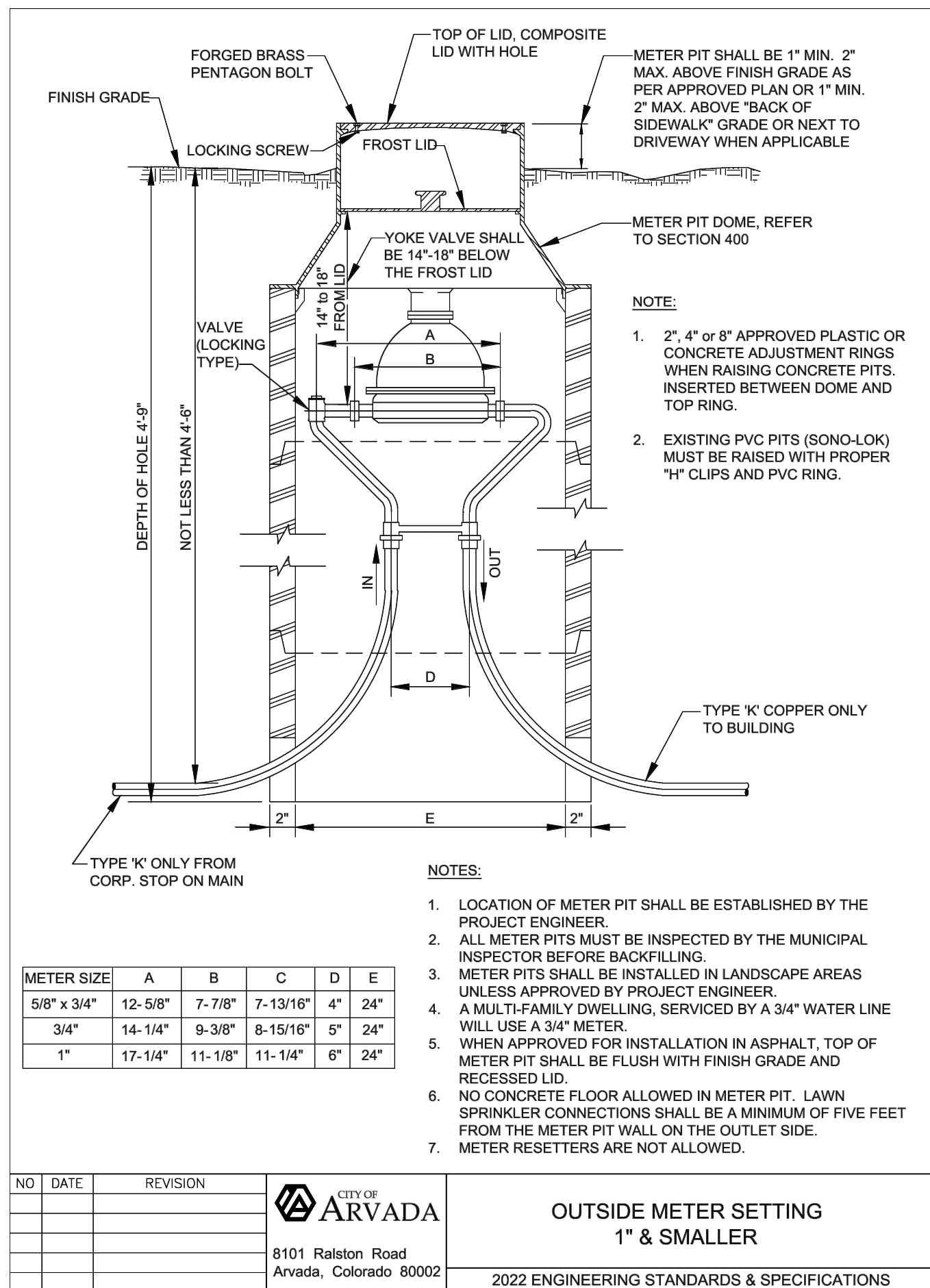
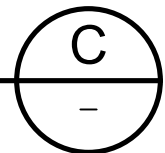
CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

STANDARD DETAILS VIII



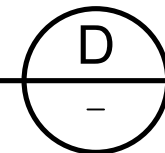
DETAIL

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DETAIL

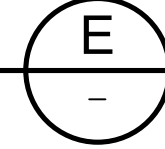
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HOLLAND CT. HYDRANT CONNECTION

DETAIL

NTS



APPROVED:

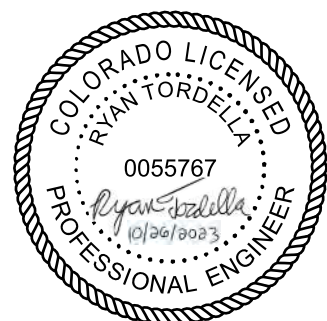
Jimmy Wolschlag PE.
City Engineer

10/26/23
Date

21-WA-02

Job Number

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PROJECT NO. 263334-271511
FILE NAME: CD08STDT.DWG

SHEET NO.

CD-8

BID SET

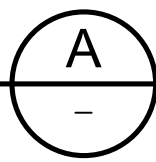
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CARR ST TREE PROTECTION AND UTILITY COORDINATION

DETAIL

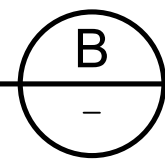
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COSTCO METER RECONNECTION

DETAIL

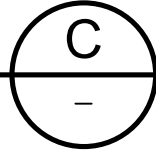
NTS



COSTCO METER RECONNECTION

DETAIL

NTS



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

STANDARD DETAILS IX

APPROVED:

Amy Wolfshy PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

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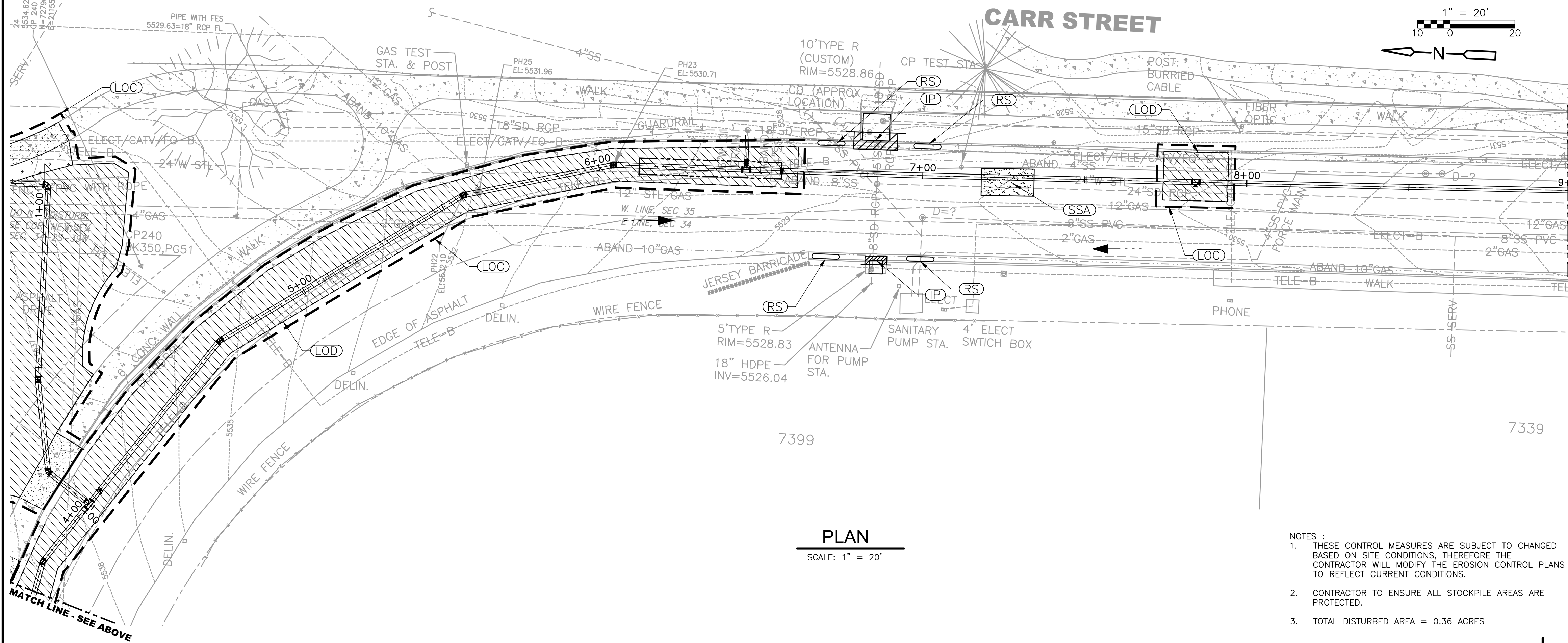
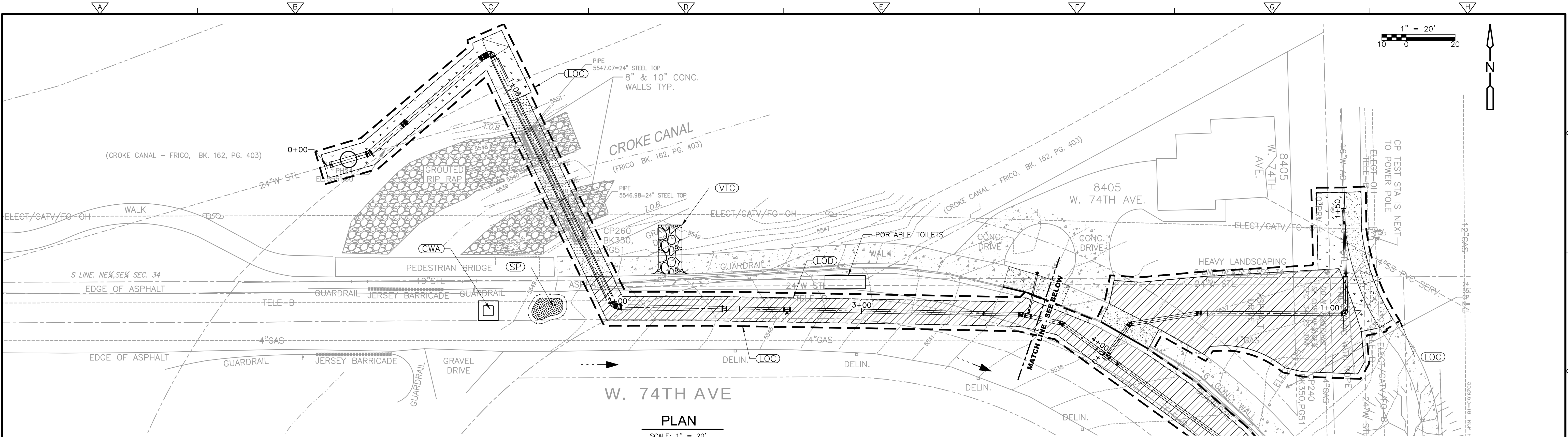


PROJECT NO. 263334-271511
FILE NAME: CD09STDT.DWG

SHEET NO.

CD-9

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BMP LEGEND	
	(CWA) CONCRETE WASHOUT AREA
	(RS) ROCK SOCK
	(IP) INLET PROTECTION
	(SF) SILT FENCE
	(SSA) STABILIZED STAGING AREA
	(VTC) VEHICLE TRACKING CONTROL
	(LOC) LIMITS OF CONSTRUCTION
	(LOD) LIMITS OF DEMOLITION
	FLOW ARROW
	(SP) STOCKPILE MANAGEMENT
	(SCL) SEDIMENT CONTROL LOG

LEGEND :	
	ASPHALT REPLACEMENT
	LANDSCAPING / SEEDING (REFER TO SWMP FOR SEED MIX AND APPLICATION)
	CLAY
	SIDEWALK REPLACEMENT

- NOTES :
- THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
 - CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
 - TOTAL DISTURBED AREA = 0.36 ACRES

DESIGNED BY: R. TORDELLA	
DRAWN BY: R. PAWAR	
SHEET CHK'D BY: C. CERRETA	
CROSS CHK'D BY: T. CHARLES	
APPROVED BY: R. TORDELLA	
DATE: OCTOBER 2023	

REV. NO.	DATE	DRWN	CHKD	REMARKS



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

SEGMENT C
W. 74TH AVE.
EROSION CONTROL PLAN

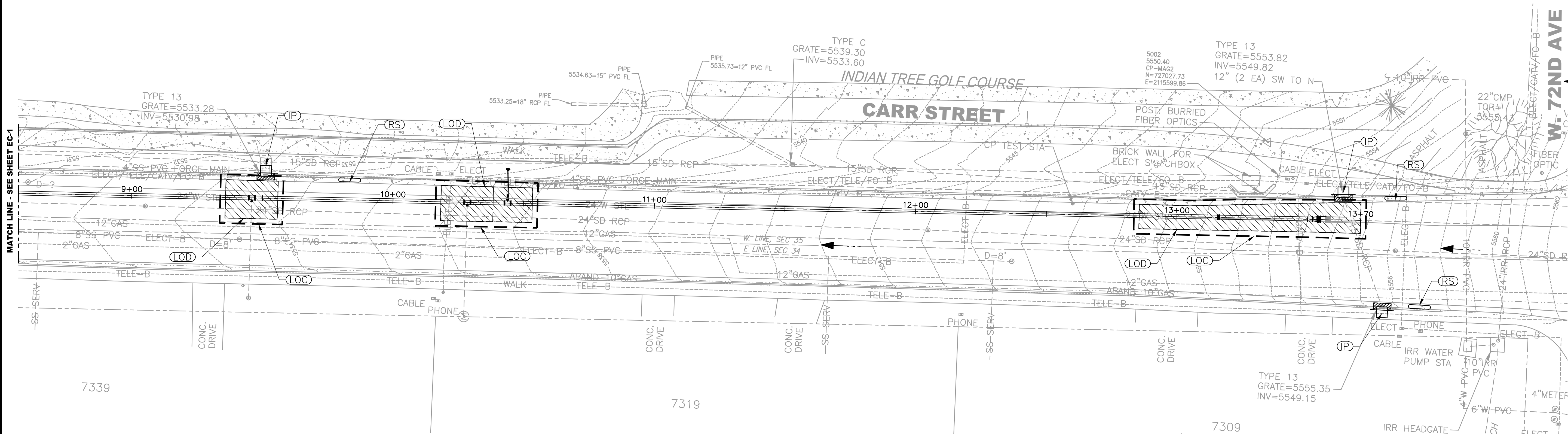
APPROVED:
City Engineer 10/26/23 21-WA-02
Date Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: EC001STPL.DWG
SHEET NO.
EC-1

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PLAN
SCALE: 1" = 20'

LEGEND :

- ASPHALT REPLACEMENT
- LANDSCAPING / SEEDING (REFER TO SWMP FOR SEED MIX AND APPLICATION)
- CLAY
- SIDEWALK REPLACEMENT

NOTES :

- THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
- CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
- TOTAL DISTURBED AREA = 0.05 ACRES

BMP LEGEND

- CWA CONCRETE WASHOUT AREA
- RS ROCK SOCK
- IP INLET PROTECTION
- SF SILT FENCE
- SSA STABILIZED STAGING AREA
- VTC VEHICLE TRACKING CONTROL
- LOC LIMITS OF CONSTRUCTION
- LOD LIMITS OF DEMOLITION
- FLOW ARROW
- SP STOCKPILE MANAGEMENT
- SCL SEDIMENT CONTROL LOG

DESIGNED BY:	R. TORDELLA
DRAWN BY:	R. PAWAR
SHEET CHK'D BY:	C. CERRETA
CROSS CHK'D BY:	T. CHARLES
APPROVED BY:	R. TORDELLA
DATE:	OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

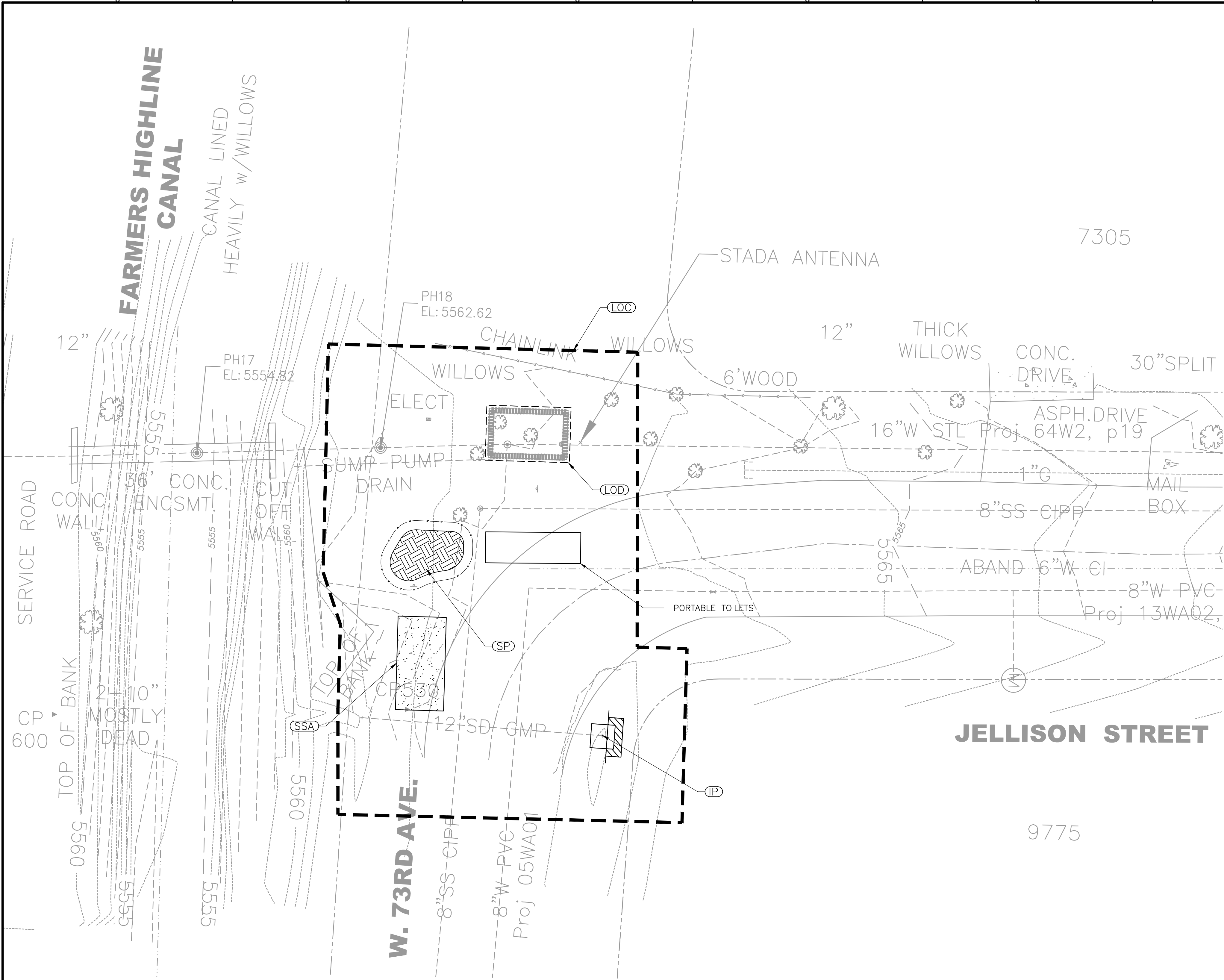
SEGMENT C
CARR ST.
EROSION CONTROL PLAN

APPROVED: 10/26/23 21-WA-02
City Engineer Date Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: EC002STPL.DWG
SHEET NO.
EC-2

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PLAN

SCALE: 1" = 10'

- NOTES :
- THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
 - CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
 - CONTRACTOR TO COORDINATE EROSION CONTROLS WITH OWNERS DOWNGRADEMENT.

BMP LEGEND

	(CWA)	CONCRETE WASHOUT AREA
	(RS)	ROCK SOCK
	(IP)	INLET PROTECTION
	(SF)	SILT FENCE
	(SSA)	STABILIZED STAGING AREA
	(VTC)	VEHICLE TRACKING CONTROL
	(LOC)	LIMITS OF CONSTRUCTION
	(LOD)	LIMITS OF DEMOLITION
		FLOW ARROW
	(SP)	STOCKPILE MANAGEMENT
	(SCL)	SEDIMENT CONTROL LOG

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

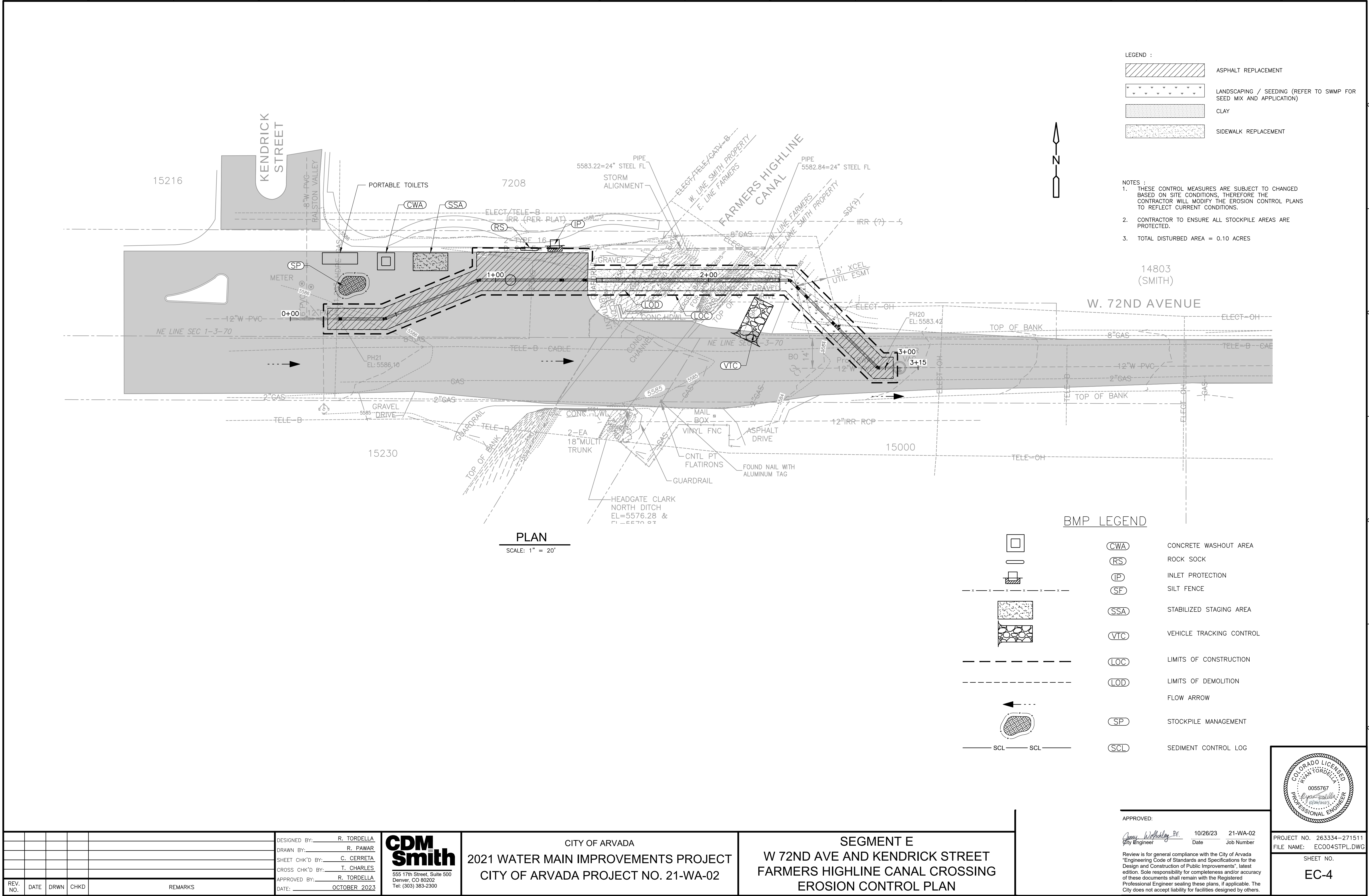
SEDIMENT D
JELLISON ST. VAULT DEMOLITION AND
MODIFICATION EROSION CONTROL PLAN

APPROVED:
City Engineer
10/26/23 Date
21-WA-02 Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: EC003PLPR.DWG
SHEET NO.
EC-3

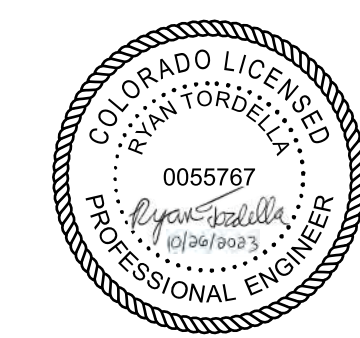
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CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

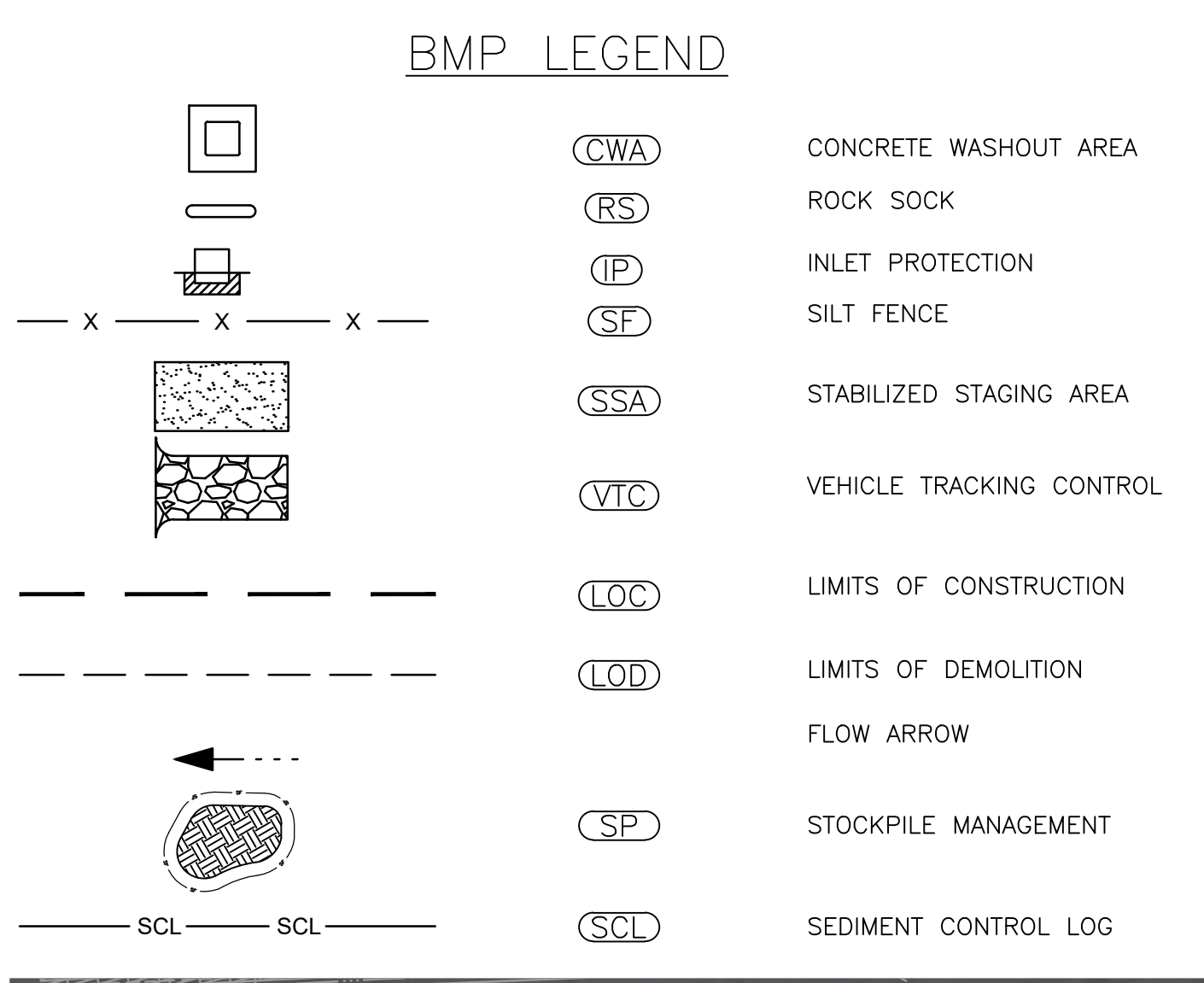
SEGMENT E
W 72ND AVE AND KENDRICK STREET
FARMERS HIGHLINE CANAL CROSSING
EROSION CONTROL PLAN

APPROVED:
[Signature]
City Engineer
10/26/23
Date
21-WA-02
Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: EC004STPL.DWG
SHEET NO.
EC-4

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- NOTES :
1. THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
 2. CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
 3. TOTAL DISTURBED AREA = 0.35 ACRES

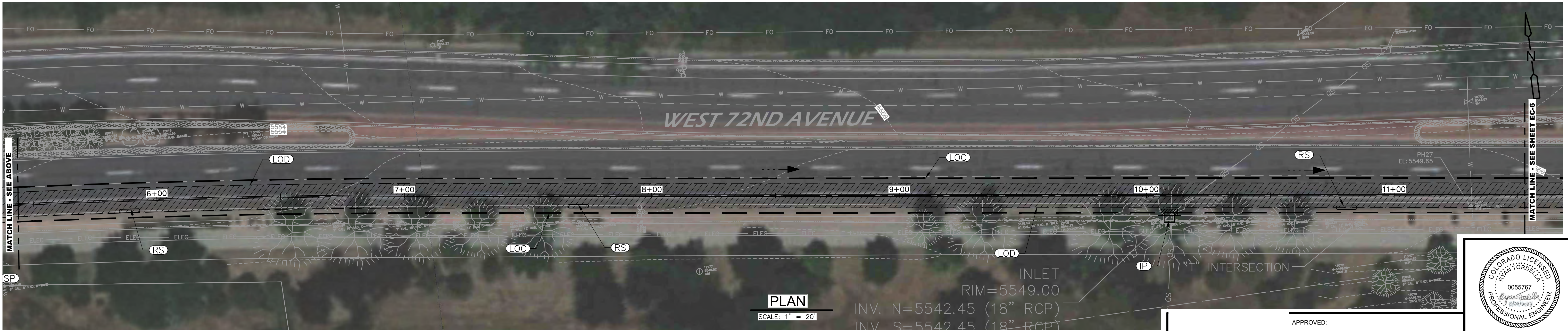


LEGEND :

	ASPHALT REPLACEMENT
--	---------------------

PLAN

SCALE: 1" = 20'



PLAN

SCALE: 1" = 20'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:	R. TORDELLA
DRAWN BY:	R. PAWAR
SHEET CHK'D BY:	C. CERRETA
CROSS CHK'D BY:	T. CHARLES
APPROVED BY:	R. TORDELLA
DATE:	OCTOBER 2023

CDM Smith
555 17th Street, Suite 500
Denver, CO 80202
Tel: (303) 383-2300

CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

SEGMENT F
W. 72ND AVE.
EROSION CONTROL PLAN

APPROVED:

	10/26/23	21-WA-02
City Engineer	Date	Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: EC005STPL.DWG
SHEET NO.
EC-5

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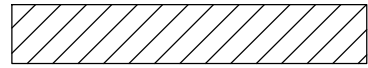
MATCH LINE - SEE SHEET EC-5



PLAN

SCALE: 1" = 20'

LEGEND :



ASPHALT REPLACEMENT

BMP LEGEND



(CWA)

CONCRETE WASHOUT AREA



(RS)

ROCK SOCK



(IP)

INLET PROTECTION

(SF)

SILT FENCE

(SSA)

STABILIZED STAGING AREA

(VTC)

VEHICLE TRACKING CONTROL

(LOC)

LIMITS OF CONSTRUCTION

(LOD)

LIMITS OF DEMOLITION

FLOW ARROW

(SP)

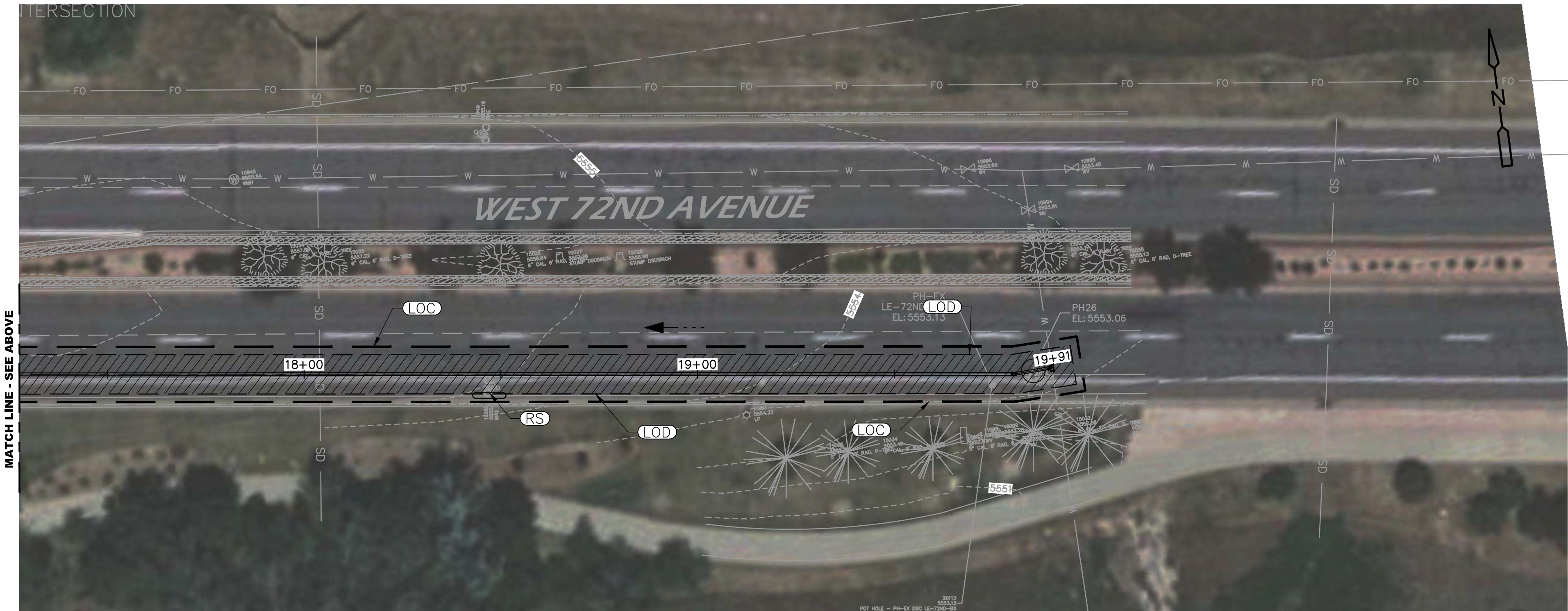
STOCKPILE MANAGEMENT

(SCL)

SEDIMENT CONTROL LOG

NOTES :

1. THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
2. CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
3. TOTAL DISTURBED AREA = 0.27 ACRES



PLAN

SCALE: 1" = 20'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

SEGEMNT F
W. 72ND AVE.
EROSION CONTROL PLAN

APPROVED:

Amey Wadhvani, PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

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PROJECT NO. 263334-271511
FILE NAME: EC006STPL.DWG

SHEET NO.

EC-6

BID SET

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BMP LEGEND



(CWA)

(RS)

(IP)

(SF)

(SSA)

(VTC)

(LOC)

(LOD)

(SP)

(SCL)

CONCRETE WASHOUT AREA

ROCK SOCK

INLET PROTECTION

SILT FENCE

STABILIZED STAGING AREA

VEHICLE TRACKING CONTROL

LIMITS OF CONSTRUCTION

LIMITS OF DEMOLITION

FLOW ARROW

STOCKPILE MANAGEMENT

SEDIMENT CONTROL LOG

- NOTES :
1. THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
 2. CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
 3. TOTAL DISTURBED AREA = 0.11 ACRES

PLAN

SCALE: 1" = 20'

LEGEND :

 ASPHALT REPLACEMENT

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA

DRAWN BY: R. PAWAR

SHEET CHK'D BY: C. CERRETA

CROSS CHK'D BY: T. CHARLES

APPROVED BY: R. TORDELLA

DATE: OCTOBER 2023

CDM
Smith

555 17th Street, Suite 500
Denver, CO 80202
Tel: (303) 383-2300

CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

SEGEMNT G
HOME DEPOT SHOPPING CENTER
EROSION CONTROL PLAN

APPROVED:


City Engineer

10/26/23
Date

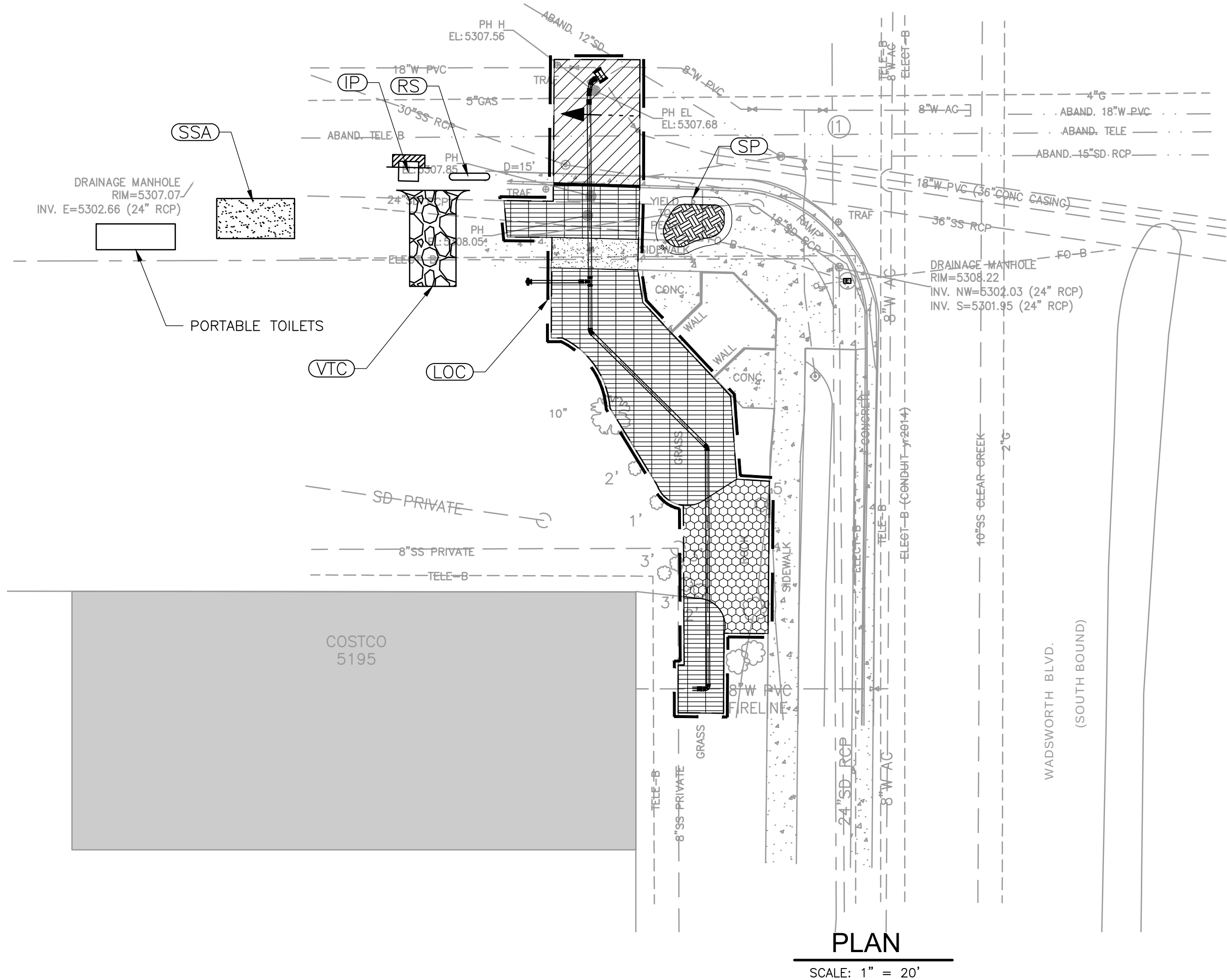
21-WA-02
Job Number

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PROJECT NO. 263334-271511
FILE NAME: EC007STPL.DWG
SHEET NO.
EC-7

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LEGEND :

	ASPHALT REPLACEMENT
	LANDSCAPING / SEEDING (REFER TO SWMP FOR SEED MIX AND APPLICATION)
	CLAY
	SIDEWALK REPLACEMENT

BMP LEGEND

	(CWA)	CONCRETE WASHOUT AREA
	(RS)	ROCK SOCK
	(IP)	INLET PROTECTION
	(SF)	SILT FENCE
	(SSA)	STABILIZED STAGING AREA
	(VTC)	VEHICLE TRACKING CONTROL
	(LOC)	LIMITS OF CONSTRUCTION
	(LOD)	LIMITS OF DEMOLITION
		FLOW ARROW
	(SP)	STOCKPILE MANAGEMENT
	(SCL)	SEDIMENT CONTROL LOG

- NOTES :
- THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
 - CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
 - TOTAL DISTURBED AREA = 0.07 ACRES

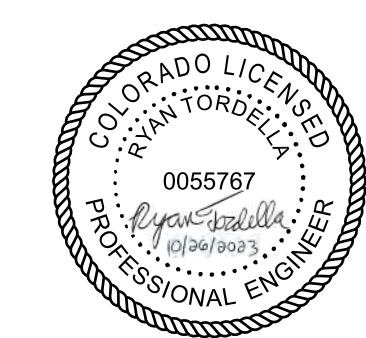
					DESIGNED BY: R. TORDELLA
					DRAWN BY: R. PAWAR
					SHEET CHK'D BY: C. CERRETA
					CROSS CHK'D BY: T. CHARLES
					APPROVED BY: R. TORDELLA
					DATE: OCTOBER 2023
REV. NO.	DATE	DRWN	CHKD	REMARKS	



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

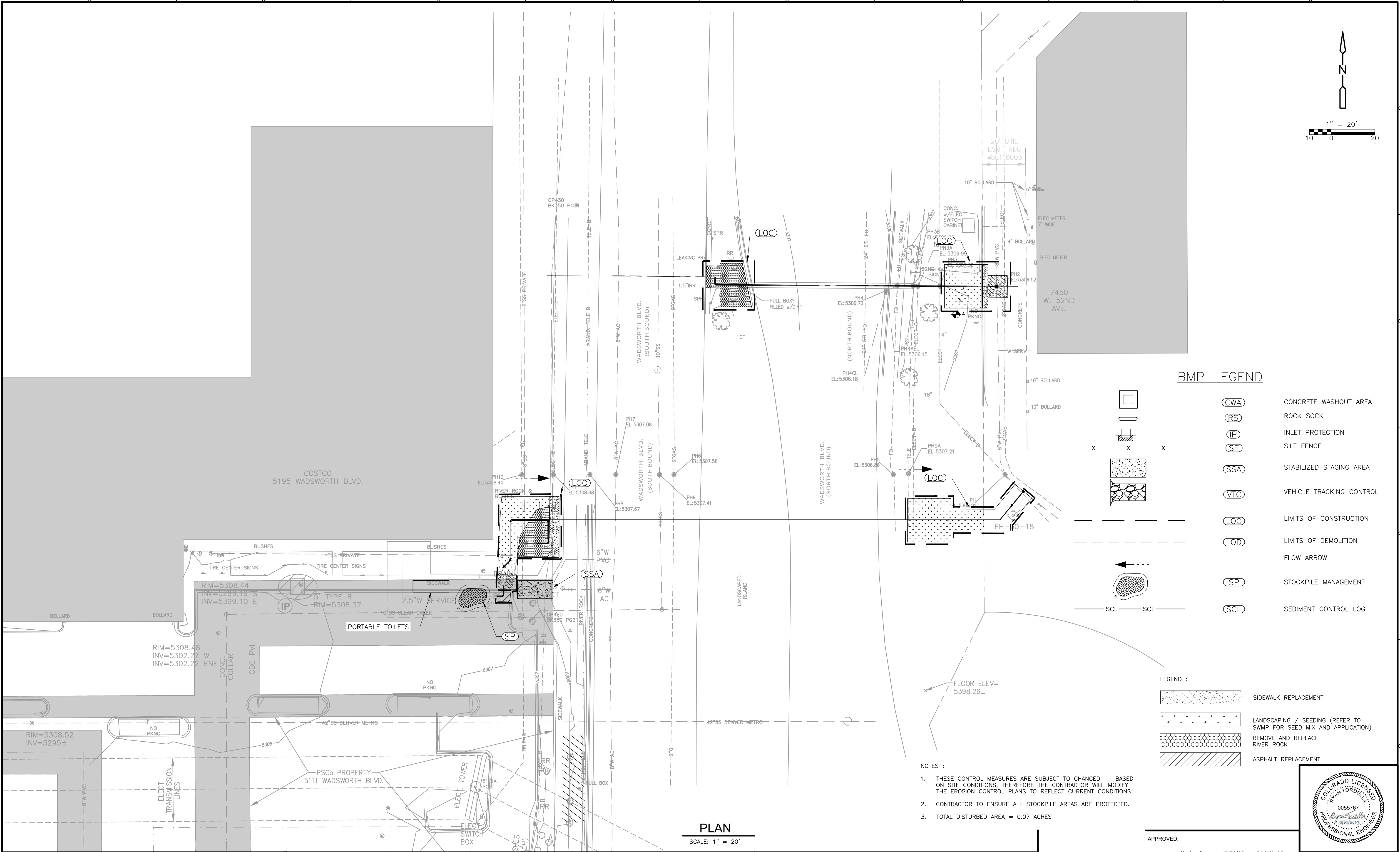
SEGMENT G
W. 52ND AVE. AND WADSWORTH BLVD.
EROSION CONTROL PLAN

APPROVED:
City Engineer
10/26/23 Date
21-WA-02 Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: EC008STPL.DWG
SHEET NO.
EC-8

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

SEGMENT G
COSTCO SERVICE LINE
EROSION CONTROL PLAN

- NOTES :
1. THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
 2. CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
 3. TOTAL DISTURBED AREA = 0.07 ACRES

APPROVED: James Wolfshagen PE 10/26/23 21-WA-02
City Engineer Date Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.

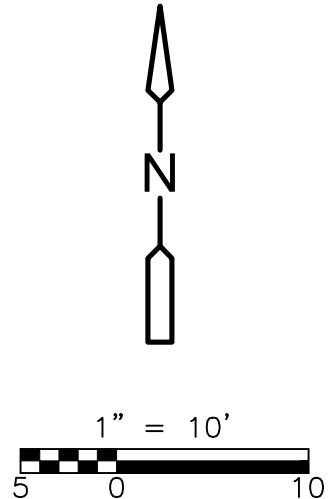
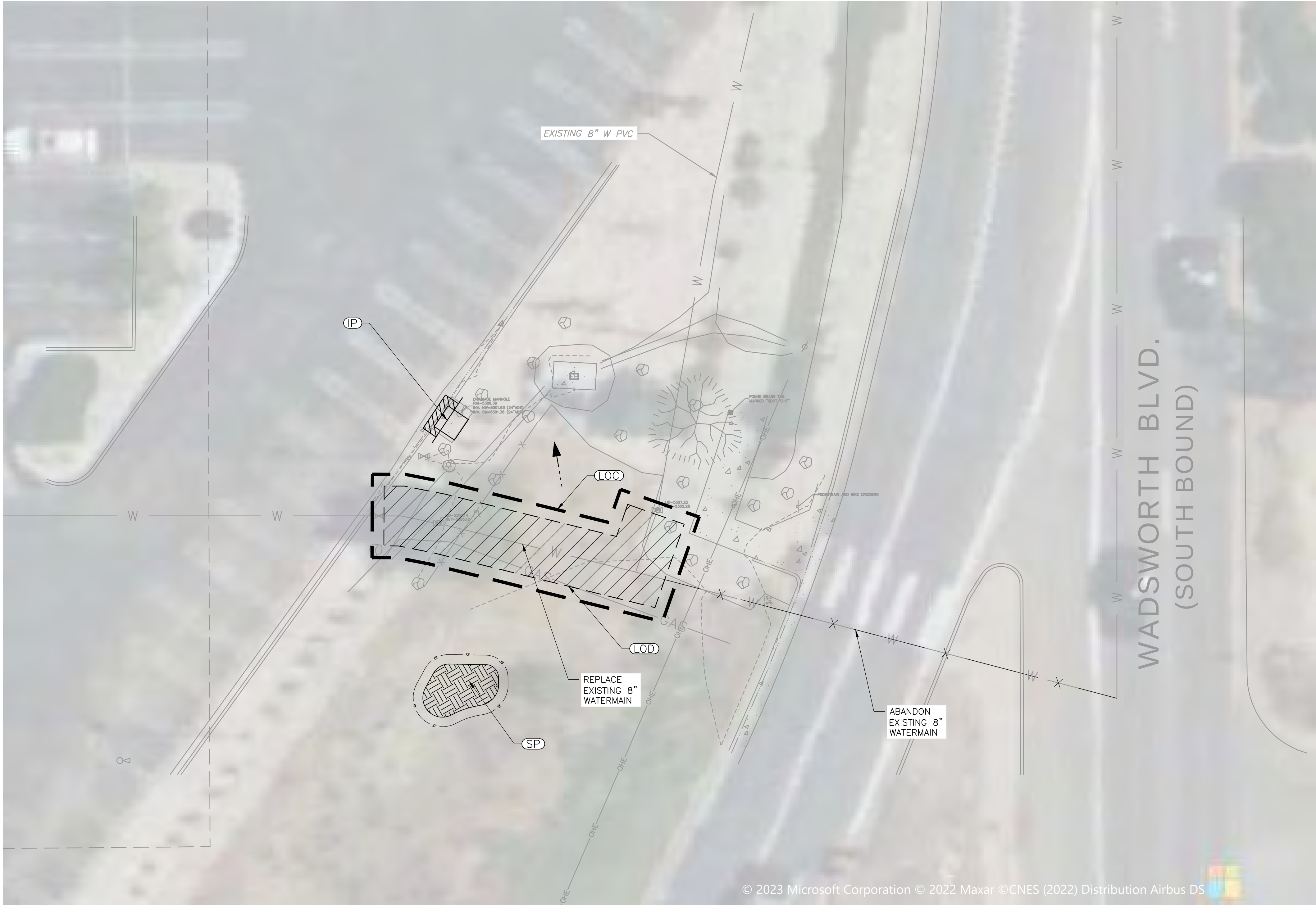
LEGEND :

- SIDEWALK REPLACEMENT
- LANDSCAPING / SEEDING (REFER TO SWMP FOR SEED MIX AND APPLICATION)
- REMOVE AND REPLACE RIVER ROCK
- ASPHALT REPLACEMENT

PROJECT NO. 263334-271511
FILE NAME: ECO09STPL.DWG

SHEET NO.
EC-9

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BMP LEGEND

	(CWA)	CONCRETE WASHOUT AREA
	(RS)	ROCK SOCK
	(IP)	INLET PROTECTION
	(SF)	SILT FENCE
	(SSA)	STABILIZED STAGING AREA
	(VTC)	VEHICLE TRACKING CONTROL
	(LOC)	LIMITS OF CONSTRUCTION
	(LOD)	LIMITS OF DEMOLITION
		FLOW ARROW
	(SP)	STOCKPILE MANAGEMENT
	(SCL)	SEDIMENT CONTROL LOG

LEGEND :

	SIDEWALK REPLACEMENT
	LANDSCAPING / SEEDING (REFER TO SWMP FOR SEED MIX AND APPLICATION)
	REMOVE AND REPLACE RIVER ROCK

- NOTES :
1. THESE CONTROL MEASURES ARE SUBJECT TO CHANGED BASED ON SITE CONDITIONS, THEREFORE THE CONTRACTOR WILL MODIFY THE EROSION CONTROL PLANS TO REFLECT CURRENT CONDITIONS.
 2. CONTRACTOR TO ENSURE ALL STOCKPILE AREAS ARE PROTECTED.
 3. TOTAL DISTURBED AREA = 0.01 ACRES

PLAN
SCALE: 1" = 10'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: R. TORDELLA
DRAWN BY: R. PAWAR
SHEET CHK'D BY: C. CERRETA
CROSS CHK'D BY: T. CHARLES
APPROVED BY: R. TORDELLA
DATE: OCTOBER 2023



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

SEGMENT G
COSTCO AC PIPE REPLACEMENT
EROSION CONTROL PLAN

APPROVED:
10/26/23 Date
21-WA-02 Job Number
Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.

PROJECT NO. 263334-271511
FILE NAME: EC010STPL.DWG
SHEET NO.
EC-10

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Rock Sock (RS)

SC-5

ROCK SOCK MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.
5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.
6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

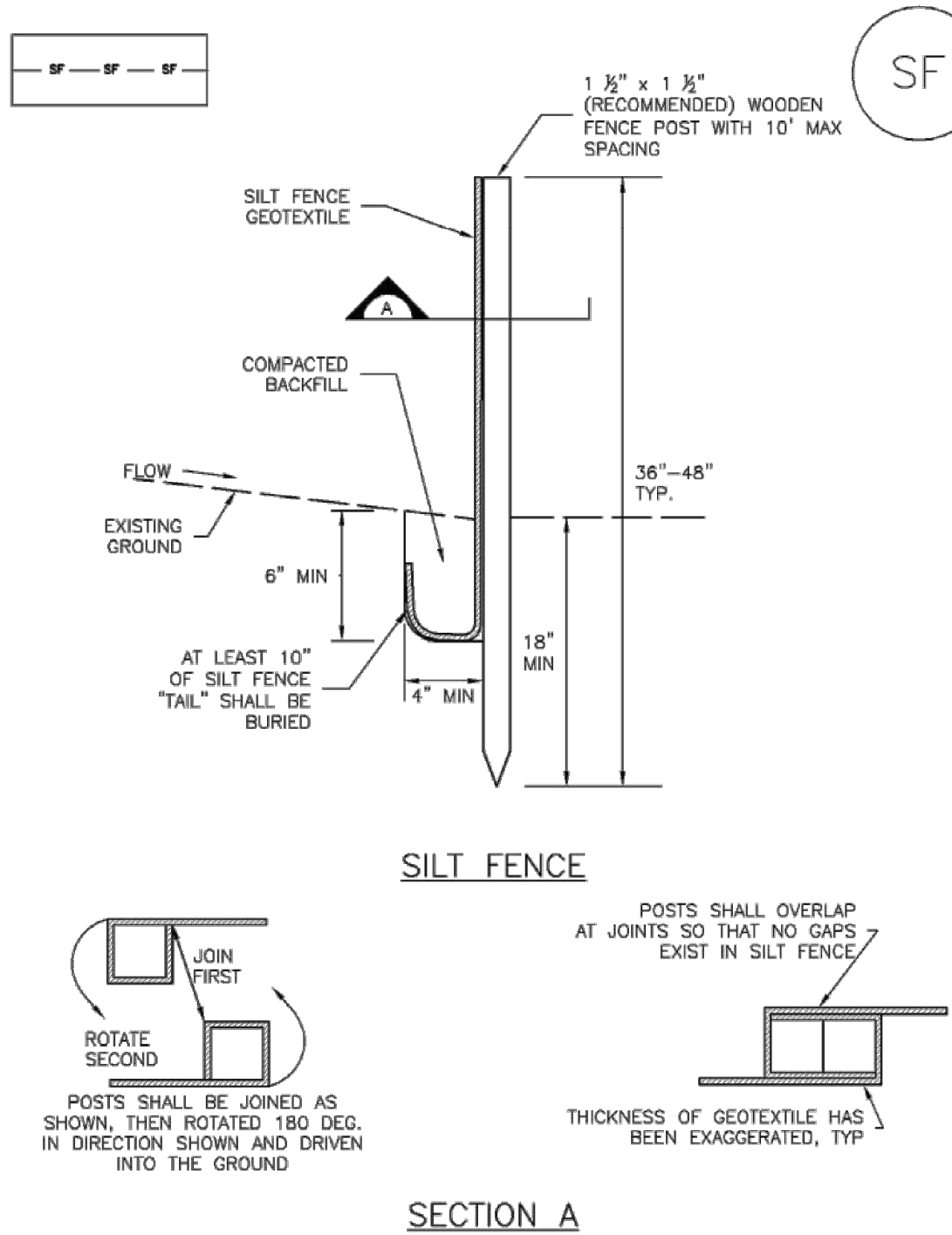
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

Silt Fence (SF)

SC-1



DETAIL

NTS

A

DETAIL

NTS

B

MM-2

Stockpile Management (SM)

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

STOCKPILE PROTECTION MAINTENANCE NOTES

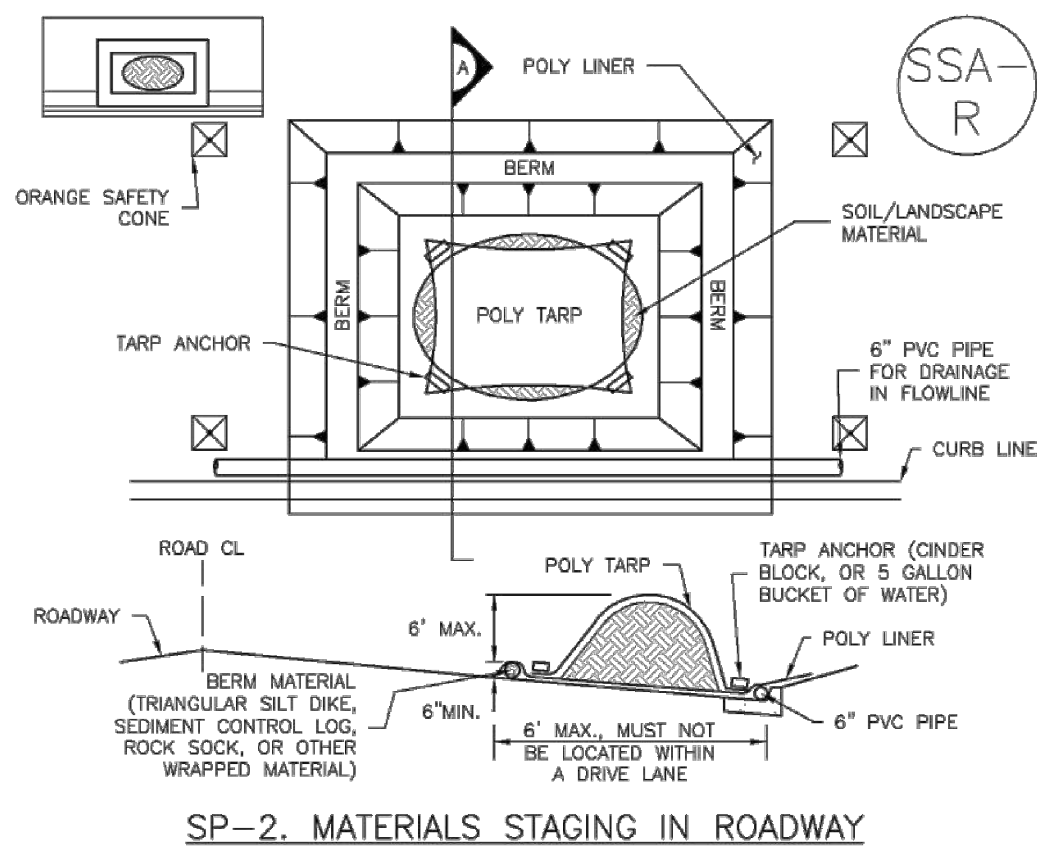
4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.
5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Stockpile Management (SP)

MM-2



SP-2. MATERIALS STAGING IN ROADWAY

MATERIALS STAGING IN ROADWAYS INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
 - LOCATION OF MATERIAL STAGING AREA(S).
 - CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
2. FEATURE MUST BE INSTALLED PRIOR TO EXCAVATION, EARTHWORK OR DELIVERY OF MATERIALS.
3. MATERIALS MUST BE STATIONED ON THE POLY LINER. ANY INCIDENTAL MATERIALS DEPOSITED ON PAVED SECTION OR ALONG CURB LINE MUST BE CLEANED UP PROMPTLY.
4. POLY LINER AND TARP COVER SHOULD BE OF SIGNIFICANT THICKNESS TO PREVENT DAMAGE OR LOSS OF INTEGRITY.
5. SAND BAGS MAY BE SUBSTITUTED TO ANCHOR THE COVER TARP OR PROVIDE BERMING UNDER THE BASE LINER.
6. FEATURE IS NOT INTENDED FOR USE WITH WET MATERIAL THAT WILL BE DRAINING AND/OR SPREADING OUT ON THE POLY LINER OR FOR DEMOLITION MATERIALS.
7. THIS FEATURE CAN BE USED FOR:
 - UTILITY REPAIRS.
 - WHEN OTHER STAGING LOCATIONS AND OPTIONS ARE LIMITED.
 - OTHER LIMITED APPLICATION AND SHORT DURATION STAGING.

DETAIL

NTS

E

DETAIL

NTS

F

SC-1

Silt Fence (SF)

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
2. A UNIFORM 6\"/>
3. COMPACT ANCHOR TRENCH BY HAND WITH A \"JUMPING JACK\" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1\"/>
6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A \"J-HOOK.\" THE \"J-HOOK\" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10\"/>
7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½
5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

DETAIL

NTS

C

MM-2

Stockpile Management (SM)

MATERIALS STAGING IN ROADWAY MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. INSPECT PVC PIPE ALONG CURB LINE FOR CLOGGING AND DEBRIS. REMOVE OBSTRUCTIONS PROMPTLY.
5. CLEAN MATERIAL FROM PAVED SURFACES BY SWEEPING OR VACUUMING.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM AURORA, COLORADO)

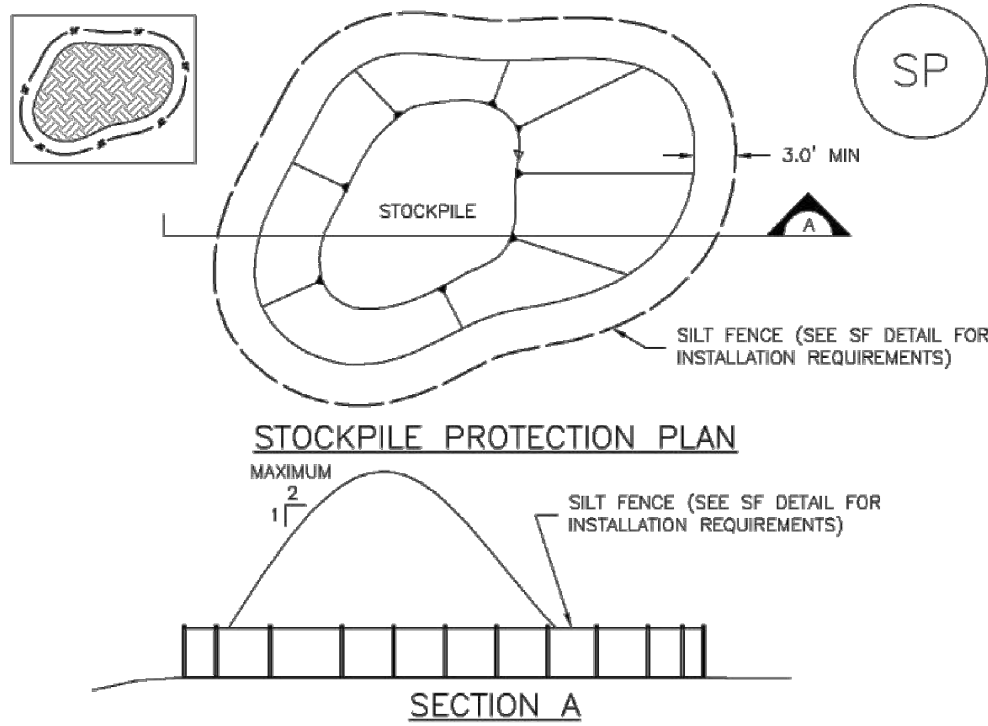
DETAIL

NTS

G

Stockpile Management (SP)

MM-2



SP-1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
 - LOCATION OF STOCKPILES.
 - TYPE OF STOCKPILE PROTECTION.
2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.
3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30-60 DAYS).
4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER CONFORMANCE CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

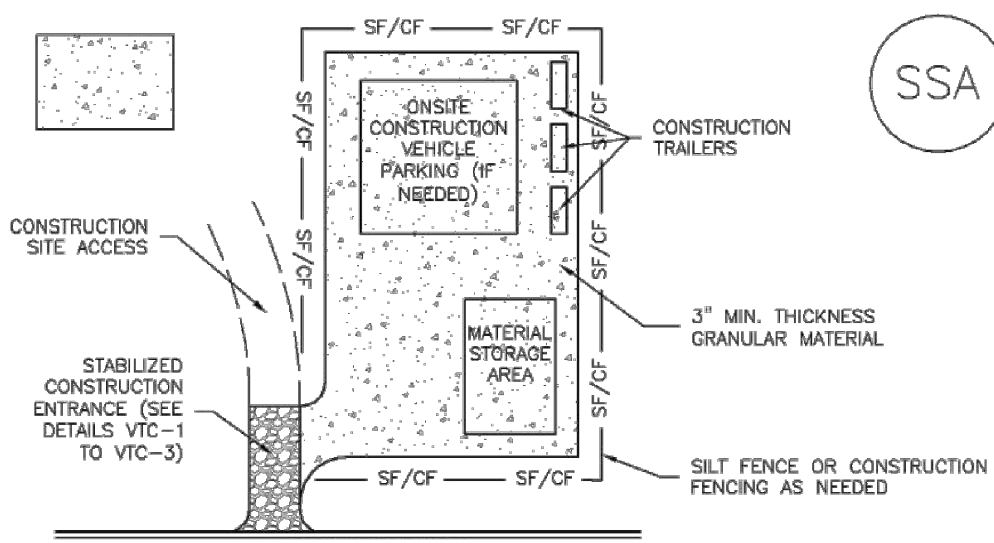
DETAIL

NTS

D

Stabilized Staging Area (SSA)

SM-6



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
 - LOCATION OF STAGING AREA(S).
 - CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.
3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.
4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3\"/>
5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6\"/>
6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

DETAIL

NTS

H

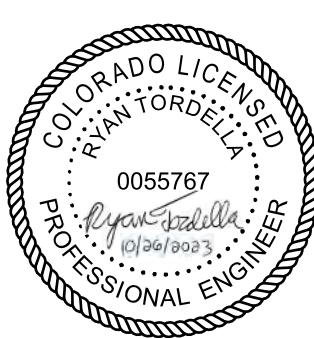
APPROVED:

James Wolfshagen, PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.

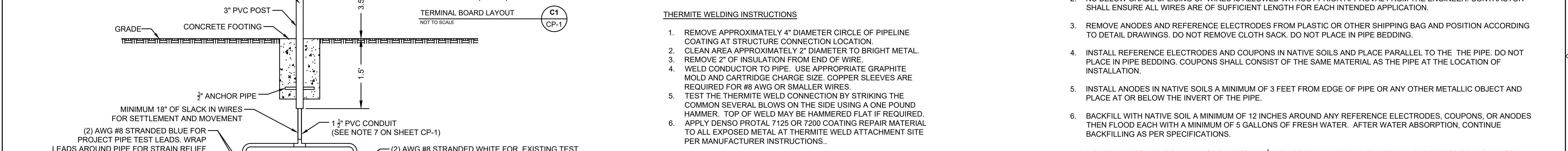
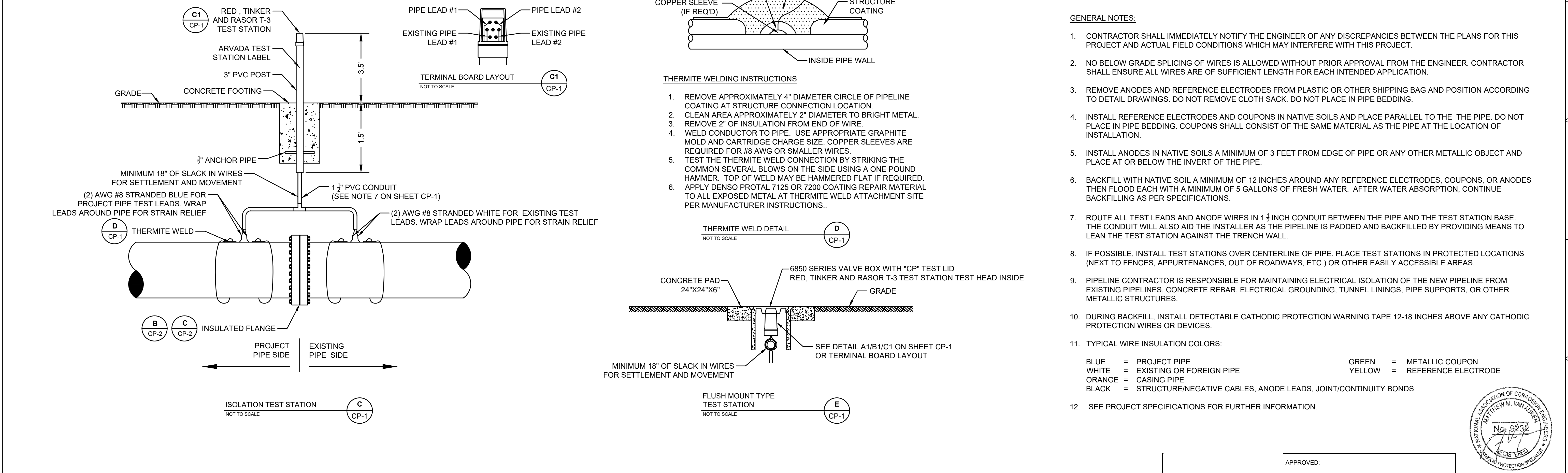
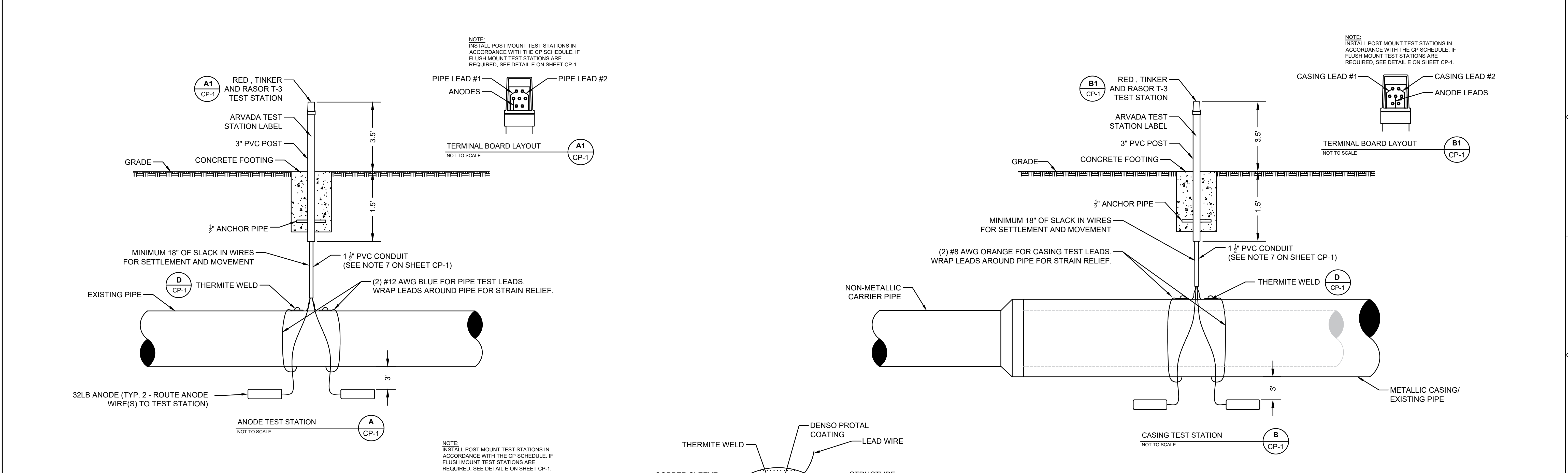


PROJECT NO. 263334-271511
FILE NAME: EC012STD.DWG

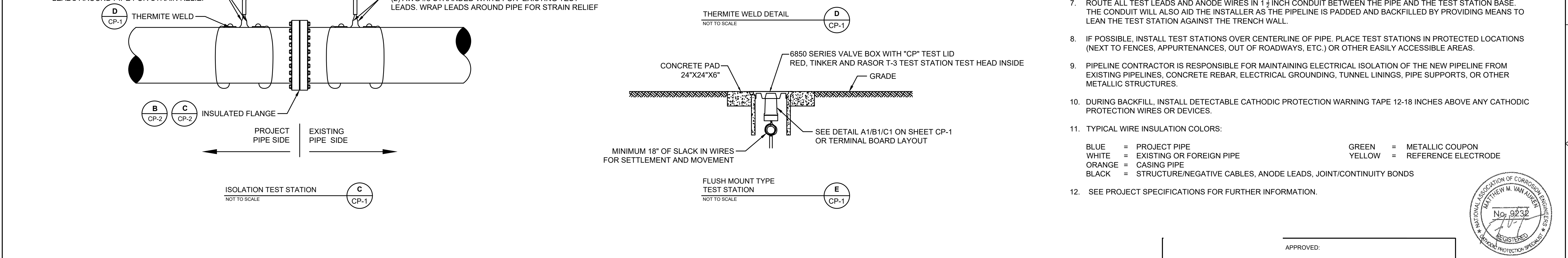
SHEET NO.

EC-12

BID SET



- | | | | | | |
|--------|---|--|--------|---|---------------------|
| BLUE | = | PROJECT PIPE | GREEN | = | METALLIC COUPON |
| WHITE | = | EXISTING OR FOREIGN PIPE | YELLOW | = | REFERENCE ELECTRODE |
| ORANGE | = | CASING PIPE | | | |
| BLACK | = | STRUCTURE/NEGATIVE CABLES, ANODE LEADS, JOINT/CONTINUITY BONDS | | | |



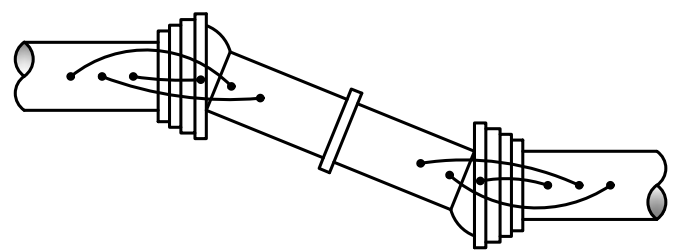
CDM Smith 555 17th Street, Suite 500 Denver, CO 80202 Tel: (303) 393-2300	CITY OF ARVADA 2021 WATER MAIN IMPROVEMENTS PROJECT CITY OF ARVADA PROJECT NO. 21-WA-02	CATHODIC PROTECTION TEST STATION DETAILS	James Winkley, P.E. 10/26/2321-WA-02 DateJob Number Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.	PROJECT NO. 263334-271511 FILE NAME: CP-1.DWG SHEET NO. CP-1
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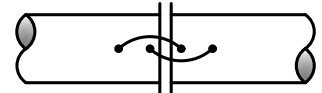
NOMINAL PIPE Ø	WIRE SIZE	# OF WIRES
12" OR LESS	#8	2
13"-36"	#4	2
>36"	#2	3

CONTINUITY BONDING NOTES:

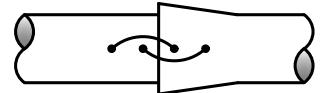
1. TYPICAL FOR NON-WELDED PIPING OR WELDED PIPING WITH MECHANICAL COUPLINGS.
2. CLEAN PIPE PRIOR TO THERMITE WELDING BONDS TO PIPING.
3. RHW INSULATED WIRE STRANDED COPPER BOND WIRES SHALL BE SIZED ACCORDING TO THE FOLLOWING TABLE UNLESS OTHERWISE NOTED.
4. UTILIZE COPPER SLEEVES ON ALL #8 AWG OR SMALLER WIRES.
5. ENSURE ALL BLOW-OFF AND RISER PIPING ARE BONDED AND ELECTRICALLY CONTINUOUS WITH ADJACENT WATER MAIN (IF METALLIC AND NO ISOLATION FLANGE IS CALLED OUT ON PLANS).
6. ALL FITTING BONDS TO METALLIC FITTINGS SHALL HAVE A SINGLE #8 AWG JOINT BOND WIRE ATTACHED.
7. DO NOT BOND ACROSS ANY INSULATING FLANGES, COUPLING, OR UNIONS UNLESS DIRECTED BY ENGINEER.



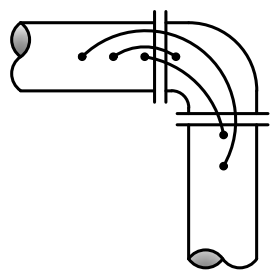
FLEXIBLE JOINT



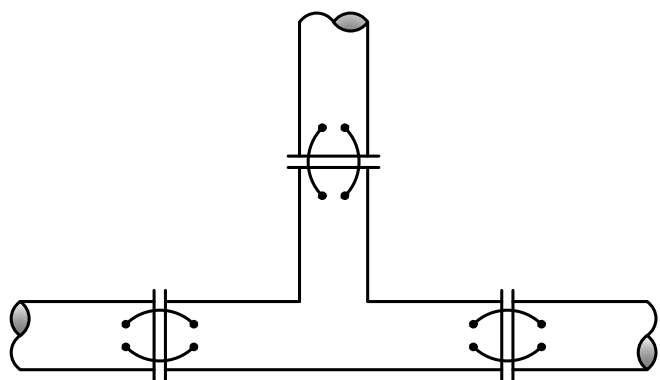
FLANGE TO FLANGE



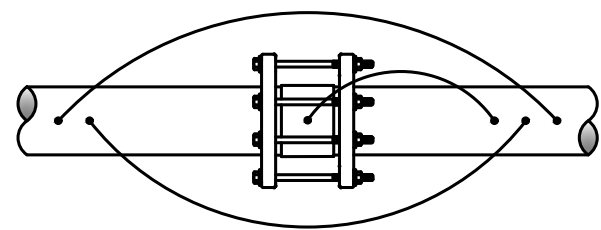
BELL & SPIGOT



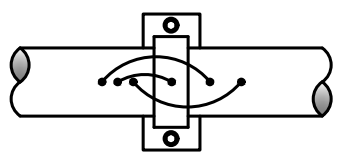
BEND



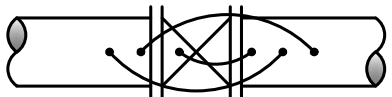
TEE



NON-INSULATING (FLEX) COUPLING



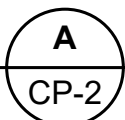
VICTAULIC COUPLING



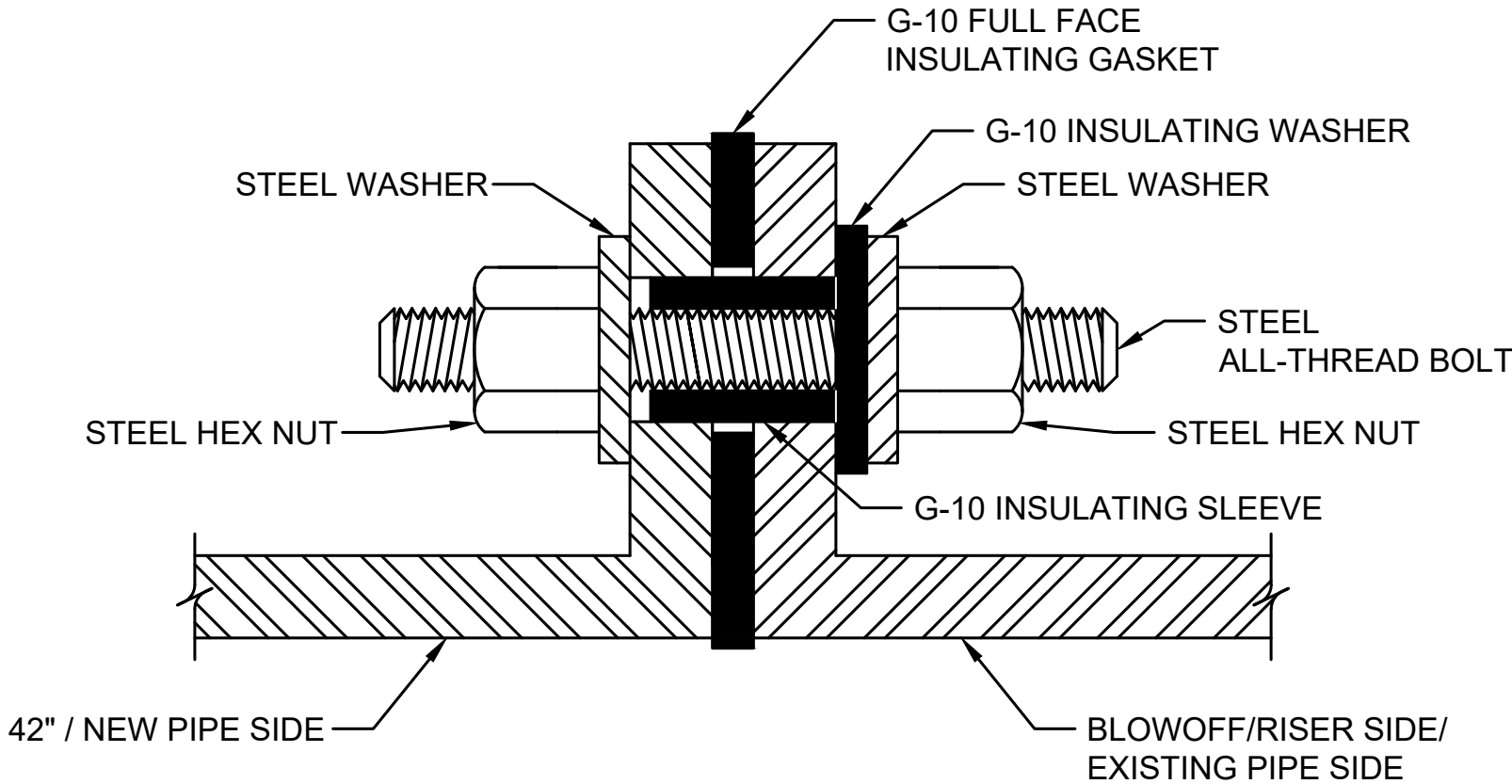
VALVE

CONTINUITY BONDING DETAILS

NOT TO SCALE

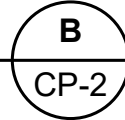


NOTE:
ALL ELECTRICAL ISOLATION FLANGES, COUPLINGS,
UNIONS, OR OTHER DEVICES MUST BE PROPERLY
TESTED PRIOR TO BACKFILL AND/OR PUTTING THE LINE IN
SERVICE IN ACCORDANCE WITH SPECIFICATION 264213.

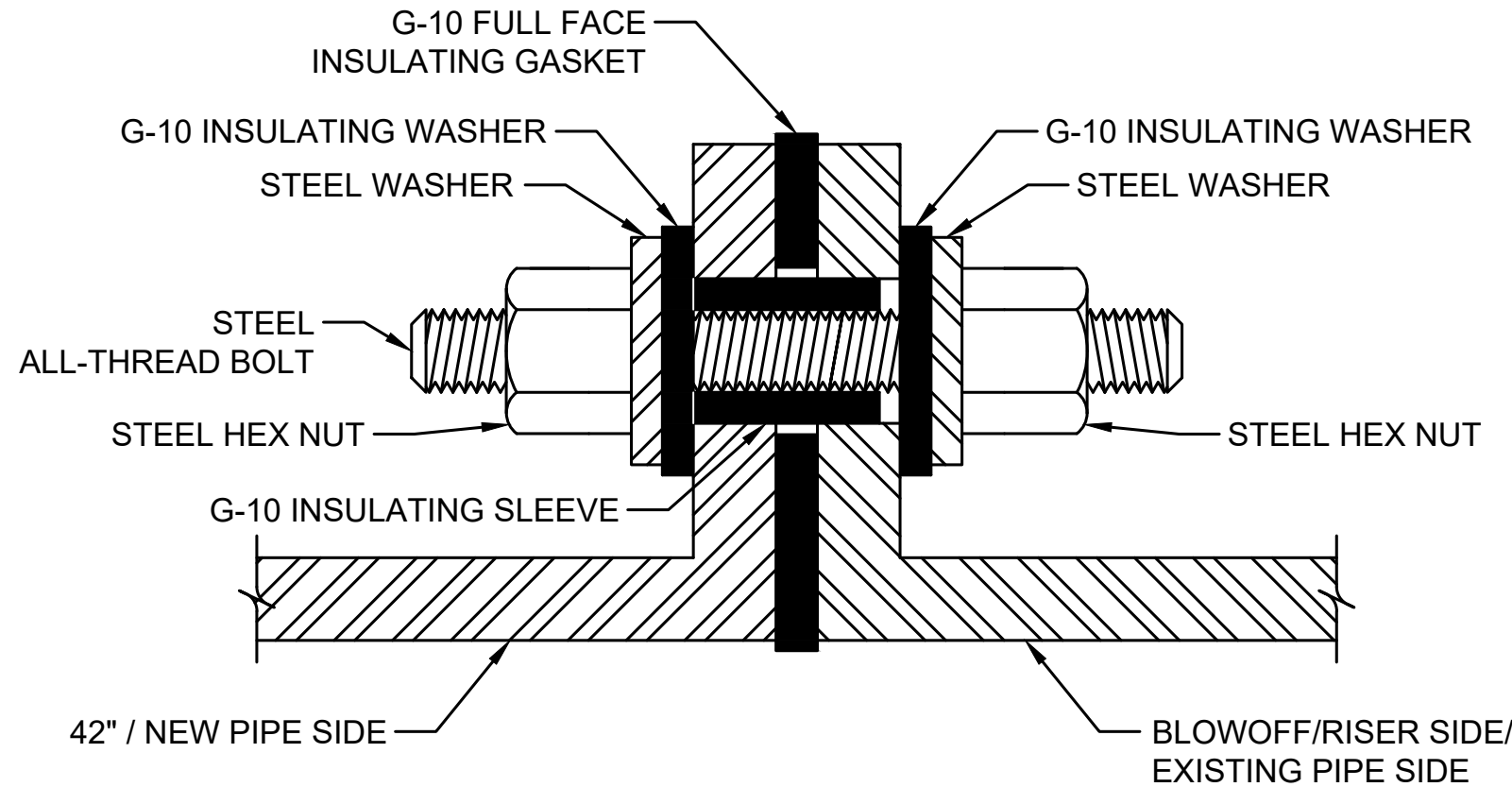


FLANGE ISOLATION KIT DETAIL
(SINGLE WASHER SET FOR
BURIED APPLICATIONS)

NOT TO SCALE

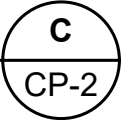


NOTE:
ALL ELECTRICAL ISOLATION FLANGES, COUPLINGS,
UNIONS, OR OTHER DEVICES MUST BE PROPERLY
TESTED PRIOR TO BACKFILL AND/OR PUTTING THE LINE IN
SERVICE IN ACCORDANCE WITH SPECIFICATION 264213.



FLANGE ISOLATION KIT DETAIL
(DOUBLE WASHER SET FOR ABOVE
GRADE OR VAULTED APPLICATIONS)

NOT TO SCALE



ARVADA 2021 WATER MAIN IMPROVEMENTS PROJECT
PROJECT NO. 21-WA-02

TEST STATION ID	STATION	PIPE SEGMENT	ALIGNMENT DRAWING/ PROFILE	OFFSET	PIPE DIAMETER	TYPE	DETAIL DRAWING	TEST STATION TYPE	ANODE QUANTITY	NOTES / COMMENTS
1	0+00	C	C-1/A	CENTER	24" STL	POST	A/CP-1	ANODE	6	INSTALL ON EXISTING STEEL
2	0+09	C	C-1/A	CENTER	24" DIP	POST	A/CP-1	ANODE	2	ARV
3	0+85	C	C-1/A	CENTER	36" STL	POST	B/CP-1	CASING	2	CROKE CANAL NORTH SIDE
4	1+95	C	C-1/A	CENTER	36" STL	POST	B/CP-1	CASING	2	CROKE CANAL SOUTH SIDE
5	1+50	C	C-1/B	CENTER	10" STL	POST	A/CP-1	ANODE	2	PROFILE B, CONNECTION TO EXISTING 10" PRV. INSTALL ISOLATION FLANGE PER DETAIL C/CP2 AT CONNECTION TO EXISTING PIPING WITHIN PRV
6	6+51	C	C-2	CENTER	24" STL	POST	A/CP-1	ANODE	4	
7	7+74	C	C-2	CENTER	24" STL	POST	A/CP-1	ANODE	4	
8	7+94	C	C-2	CENTER	24" STL	POST	A/CP-1	ANODE	4	
9	9+36	C	C-3	CENTER	24" STL	POST	A/CP-1	ANODE	4	
10	9+56	C	C-3	CENTER	24" STL	POST	A/CP-1	ANODE	4	
11	10+18	C	C-3	CENTER	24" STL	POST	A/CP-1	ANODE	4	
12	10+53	C	C-3	CENTER	24" STL	POST	A/CP-1	ANODE	4	
13	12+95	C	C-3	CENTER	24" STL	POST	A/CP-1	ANODE	4	
14	13+58	C	C-1/A	CENTER	24" STL	POST	A/CP-1	ANODE	6	INSTALL ON EXISTING STEEL
15	N/A	D	D-1/CD-7	CENTER	16" STL	N/A	C/CP-2	N/A	N/A	INSTALL ISOLATION FLANGES AT UPSTREAM AND DOWNSTREAM CONNECTIONS TO EXISTING FLANGES. INSTALL CONTINUITY BONDS FROM EXISTING UPSTREAM PIPE TO EXISTING DOWNSTREAM PIPE PER DETAIL A/CP-2. TAPE CP CONTINUITY BOND WIRES TO TOP OF NEW PIPE USING POLYETHYLENE TAPE SPACED EVERY 10 INCHES.
16	1+07	E	E-1	CENTER	12" DIP	POST	A/CP-1	ANODE	2	
17	1+47	E	E-1	CENTER	24" STL	POST	B/CP-1	CASING	2	FARMERS HIGHLINE CANAL WEST SIDE
18	2+33	E	E-1	CENTER	24" STL	POST	B/CP-1	CASING	2	FARMERS HIGHLINE CANAL EAST SIDE
19	0+18	F	F-1	CENTER	8" DIP	POST	A/CP-1	ANODE	2	INSTALL TEST STATION OUTSIDE OF ROADWAY NEXT TO ARV VENT PIPE
20	16+50	F	F-4	CENTER	8" DIP	POST	A/CP-1	ANODE	2	INSTALL TEST STATION OUTSIDE OF ROADWAY NEXT TO ARV VENT PIPE

DESIGNED BY: MMV	MTJ	VWJ	MMV
DRAWN BY: MTJ	MTJ	MMV	MMV
SHEET CHK'D BY: VWJ	MMV	MMV	MMV
CROSS CHK'D BY: MMV	MMV	MMV	MMV
APPROVED BY: MMV	MMV	MMV	MMV
DATE: OCTOBER 2023	MMV	MMV	MMV



CITY OF ARVADA
2021 WATER MAIN IMPROVEMENTS PROJECT
CITY OF ARVADA PROJECT NO. 21-WA-02

CATHODIC PROTECTION
STANDARD DETAILS

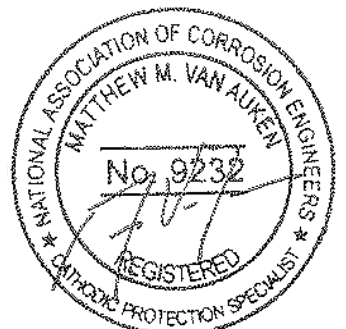
APPROVED:

James Wolfshagen, PE
City Engineer

10/26/23
Date

21-WA-02
Job Number

Review is for general compliance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition. Sole responsibility for completeness and/or accuracy of these documents shall remain with the Registered Professional Engineer sealing these plans, if applicable. The City does not accept liability for facilities designed by others.



PROJECT NO. 263334-271511
FILE NAME: CP-2.DWG

SHEET NO.

CP-2

Contractor Response

An Agreement By And Between The City Of Arvada And
SMH West, LLC For The 2021 Water Main Improvements,
Project No. 21-Wa-02, In An Amount Not To Exceed
\$4,199,999.00

REQUIRED CONTRACTOR SUBMITTAL FORM

SUBMITTAL CHECKLIST:

Bids shall be submitted in the order listed below with each section clearly identified. **Missing information or required documents may result in submission being deemed non-responsive.** Imbedded links for required information are NOT acceptable.

- ☒ Submit completed City Submittal Forms including this sheet, Bid Bond, Bid Proposal, Bid Form, and any other attachments requested.
- ☒ **MINIMUM REQUIRED QUALIFICATIONS:** Evidence of these qualifications must be submitted. (see page 10 SC-A-1)
- ☐ Submit implementation timeline and warranties, if applicable.
- ☒ Attach Contractor's Licensing, if applicable.
- ☒ Insurance – Checking this box accepts that the insurance requirements listed by the City are acceptable.
- ☒ Please initial to acknowledge Addenda, if any, have been considered in your proposal:

#1 November 22, 2023 #2 November 30, 2023 #3 December 4, 2023

REFERENCES:

- ☐ Check here if Contractor's standard reference sheet is attached, otherwise, use the space below.

Name: Left Hand Water District Contact Person: Steve Buckee

Address: P.O. Box 210 Niwot, CO 80544

Telephone No: 303-530-4200 Email: sbuckee@lefthandwater.gov

Describe type of work/service performed or items supplied: Waterline construction along E. County Line Rd including ~590 lineal feet of HDD pipeline installation & ~125 lineal feet of bored steel casing beneath SH 52.

Name: City of Sterling Contact Person: George Good

Address: 421 N 4th Street, Sterling, CO 80751

Telephone No: 970-522-9700 Email: good@sterlingcolo.com

Describe type of work/service performed or items supplied: Construction of ~19,000 LF of 16" diameter sliplining of the existing & new wastewater force main.

Name: Town of Johnstown Contact Person: Doug Gossett

Address: 450 S Parish Ave Johnstown, CO 80534

Telephone No: 970-829-7878 Email: dgossett@johnstown.co.gov

Describe type of work/service performed or items supplied: Installing ~37,300 LF of 16" C905 (DR 18) PVC pipeline, 12" & 16" fittings, 1 HDD river crossing in conjunction with the Town's new South Water Tank.

BID PROPOSAL

TO: City of Arvada, Colorado (hereinafter called "CITY").

FROM: SMH West LLC (hereinafter called "BIDDER"), organized and existing under the laws of the State of Colorado doing business as (a corporation), (a partnership), (an individual).

The Bidder, in compliance with your Advertisement for Bids, hereby proposes to perform all Work in strict accordance with the Contract Documents, for the construction of City of Arvada Project No. **21-WA-02** entitled **Water Main Improvements Project** within the time set forth therein, and at the prices stated on the included Bid Form as totaled herein.

By submission of this Bid Proposal, each Bidder certifies, and in the case of a joint venture each party thereto certifies as to his/her own organization, that this Bid Proposal has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid Proposal with any other Bidder or with any competitor.

Bidder acknowledges receipt of **Addendum Nos.**

Initials: 1 M 2 M 3 M

Bidder states that their:

Major Material Suppliers are:

Ferguson Waterworks
Burnco
Rinker

Material They Will Supply

PVC/Fitting
Aggregate
ARV Vaults

Major Subcontractors are:

Metro Pavers
Global Underground
Road Safe

Work They Will Perform

Asphalt/Concrete
Slip Line/HDD
Traffic Control

CONTRACT TIME AND LIQUIDATED DAMAGES: All work shall be completed, including clean-up, within **365** working days after the date to be specified in the Notice to Proceed. A Notice to Proceed is anticipated to be issued beginning of November 2023. The bidder shall agree to pay the owner the sum of \$1,400 for each calendar day that the work exceeds the allotted contract time. Contract time may be adjusted by Change Order.

Total from included Bid Form:

TOTAL BID \$ 4,199,999.00

SUBMITTED BY:

Company Name: SMH West LLC

Contact Names: Rob Richardson, Justin Moore

Address: 900 Castleton Road, Suite 125, Castle Rock, Colorado 80109

Phone: (720) 520-5097 Email(s): justin.moore@smhwest.com

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the Contractor;
- He/she has read all Terms and Conditions and technical specifications made available in conjunction with this solicitation and fully accept and acknowledge this bid is consistent with the specifications and terms and conditions.
- The bid is in all respects fair, without outside collusion or otherwise illegal action.

By: 
Signature of Authorized Agent

December 5, 2023
Date

86-2474495
FEIN

Rob Richardson
Typed/Printed Name of Agent

Division Manager
Title of Agent

rob.richardson@smhwest.com
Agent email

PAYMENT TERMS: The City standard is net thirty (30) days but every effort is made to meet net fifteen (15) days after the approved partial payment date when the Contractor is satisfactorily performing the contract. The final 5% of total payment will be paid once the contract is completed satisfactorily, advertisement for final settlement is complete, and the project is accepted by the City. Payment is the date of the check mailing or date of the credit card transaction.

City of Arvada
23-PW-091 2021 Water Main Improvements
Project Number: 263334-271511
City of Arvada Project Number: 21-WA-02
Bid Workbook (Only complete the prices in yellow cells)

Contractor: SMH West LLC

Date: December 5, 2023

Prepared By: Justin Moore

Item No.	Description	Quantity	Unit	Unit Price	Total Price
BASE BID ITEMS - WATER MAIN REPLACEMENT AT C-SEGMENT, D-SEGMENT, E-SEGMENT, F-SEGMENT, G-SEGMENT					
1	MOBILIZATION	1	LS	\$71,174.00	\$71,174
2	TRAFFIC CONTROL	1	LS	\$476,803.00	\$476,803
3	EROSION CONTROL	1	LS	\$58,724.00	\$58,724
4	CONNECT TO EXISTING 8" PIPE	7	EA	\$7,887.00	\$55,209
5	CONNECT TO EXISTING 10" PIPE	1	EA	\$20,019.00	\$20,019
6	CONNECT TO EXISTING 12" PIPE	2	EA	\$14,403.00	\$28,806
7	CONNECT TO EXISTING 18" PIPE	2	EA	\$11,390.00	\$22,780
8	CONNECT TO EXISTING 24" PIPE	2	EA	\$24,519.00	\$49,038
9	8" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	2505	LF	\$190.00	\$475,950
10	10" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	30	LF	\$479.00	\$14,370
11	12" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	300	LF	\$490.00	\$147,000
12	18" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	600	LF	\$448.00	\$268,800
13	24" WATER MAIN W/ FITTINGS AND RESTRAINED JOINTS	270	LF	\$761.00	\$205,470
14	DIRECTIONAL DRILL HDPE WATER MAIN AND CASING PIPE, ASSOCIATED CONNECTIONS AND RESTORATION - SHEET G-4A	1	LS	\$75,120.00	\$75,120
15	DIRECTIONAL DRILL HDPE WATER MAIN AND CASING PIPE, ASSOCIATED CONNECTIONS AND RESTORATION - SHEET G-4B	1	LS	\$98,581.00	\$98,581
16	18" FUSIBLE PVC WATER MAIN	645	LF	\$523.00	\$337,335
17	SLIP LINING ACCESS PITS	2	EA	\$9,225.00	\$18,450
18	SLIP LINING SERVICE RECONNECTIONS	2	EA	\$12,228.00	\$24,456
19	24" STEEL CASING PIPE	90	LF	\$644.00	\$57,960
20	36" STEEL CASING PIPE	110	LF	\$1,135.00	\$124,850
21	REMOVAL OF EXISTING AERIAL CROSSING (SEGMENT C)	1	LS	\$14,569.00	\$14,569
22	JELISON STREET VAULT MODIFICATIONS	1	LS	\$14,117.00	\$14,117
23	8" GATE VALVE W/ BOX	5	EA	\$3,278.00	\$16,390
24	10" GATE VALVE W/ BOX	1	EA	\$4,619.00	\$4,619
25	12" GATE VALVE W/ BOX	3	EA	\$5,596.00	\$16,788
26	18" BUTTERFLY VALVE W/ BOX	1	EA	\$8,005.00	\$8,005
27	24" BUTTERFLY VALVE W/ BOX	1	EA	\$13,188.00	\$13,188
28	SINGLE AIR RELEASE VALVE ASSEMBLY W/ VAULT	3	EA	\$16,684.00	\$50,052
29	DUAL AIR RELEASE VALVE ASSEMBLY W/ VAULT	1	EA	\$28,404.00	\$28,404
30	W. 74TH AVE AT CARR STREET VAULT PIPING REPLACEMENT	1	LS	\$13,759.00	\$13,759
31	CARR ST DRAIN MANHOLE PIPING REPLACEMENT	1	LS	\$7,566.00	\$7,566
32	CONCRETE CUT-OFF WALL (SEGMENT C)	2	EA	\$20,250.00	\$40,500
33	CONCRETE CUT-OFF WALL (SEGMENT E)	2	EA	\$20,250.00	\$40,500
34	ASPHALT ROADWAY OPEN CUT R&R	4055	SY	\$126.00	\$510,930
35	CONCRETE SIDEWALK R&R	100	SY	\$217.00	\$21,700
36	CURB & GUTTER R&R	2100	LF	\$73.00	\$153,300
37	SOD REPLACEMENT	170	SY	\$18.00	\$3,060
38	SEEDING/LANDSCAPING	255	SY	\$9.00	\$2,295
39	BED ROCK EXCAVATION	185	CY	\$190.00	\$35,150
40	FIRE HYDRANT ASSEMBLY	5	EA	\$19,391.00	\$96,955
41	DISCONNECT EXISTING METER (SHEET F-5)	1	LS	\$59,474.00	\$59,474
42	CAP EXISTING WATER MAIN AND ABANDON IN PLACE	4	EA	\$1,609.00	\$6,436
43	ABANDON IN PLACE EXISTING 12" WATER MAIN	38	LF	\$201.00	\$7,638
44	ABANDON IN PLACE EXISTING 24" WATER MAIN	508	LF	\$87.00	\$44,196
45	CROKE CANAL BYPASS (SHEET C-1)	1	LS	\$23,189.00	\$23,189
46	FARMERS HIGHLINE CANAL BYPASS (SHEET E-1)	1	LS	\$23,189.00	\$23,189
47	8" LINE STOP (SHEET G-2)	1	LS	\$31,722.00	\$31,722
48	RIVER ROCK AND LANDSCAPE REPLACEMENT (SHEET G-3)	1	LS	\$2,100.00	\$2,100
49	COSTCO AC PIPE REMOVAL (SHEET G-5)	1	LS	\$7,215.00	\$7,215
50	HOME DEPOT SURFACE AND LANDSCAPE RESTORATION (DETAIL B, SHEET CD-8)	1	LS	\$46,676.00	\$46,676
51	CROKE CANAL AND FARMERS HIGHLINE CANAL BED RESTORATION	195	SY	\$126.00	\$24,570
52	TEST HOLING	1	LS	\$61,176.00	\$61,176
53	DEWATERING - C SHEETS	1	LS	\$28,654.00	\$28,654
54	DEWATERING - E SHEETS	1	LS	\$14,327.00	\$14,327
55	DEWATERING - F SHEETS	1	LS	\$7,164.00	\$7,164
56	DEWATERING - G SHEETS	1	LS	\$14,327.00	\$14,327
57	CITIZEN NOTIFICATION	1	LS	\$8,086.00	\$8,086
58	CATHODIC PROTECTION	1	LS	\$67,118.00	\$67,118
TOTAL BASE BID					\$4,199,999

BID BOND

We, the undersigned SMH West LLC as Principal, and Liberty Mutual Insurance Company as Surety, are hereby held and firmly bound unto the City of Arvada, Colorado, in the penal sum of Five Percent (5%) of the Total Amount Bid----- for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

THE CONDITION of this obligation is such that whereas the Principal has submitted to the City of Arvada, Colorado the accompanying Bid Proposal, and hereby made a part hereof to enter into a Contract Agreement for the construction of City of Arvada Project No. 21-WA-02, Water Main Improvements Project.

WHEREAS, the City, as a condition for receiving said Bid Proposal, requires the Principal to deposit with the City a Bid Proposal Guaranty, equivalent to not less than 5 Percent of the amount of said Bid Proposal.

NOW THEREFORE,

- (B) If said Bid Proposal shall be rejected; or in the alternate,
- (C) If said Bid Proposal shall be accepted and the Principal shall execute and deliver a Contract Agreement (properly completed in accordance with said Bid Proposal) and shall furnish a Performance and Payment Bond upon the forms prescribed by the City for the faithful performance of said Contract; and for the payment of all persons performing labor or furnishing materials in connection therewith; and shall in all other respects perform the agreement created by the acceptance of said Bid Proposal;

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the City may accept such Bid and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, this 16th, day of November, 2023, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL

Name: SMH West LLC

Address: 900 Castleton Rd, Ste. 125, Castle Rock, CO 80109

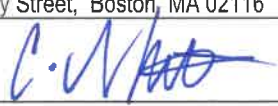
By: 

Title: Division Manager, Rob Richardson

SURETY

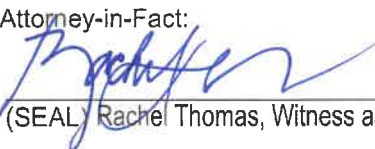
Liberty Mutual Insurance Company

175 Berkeley Street, Boston, MA 02116

By: 

Title: Attorney-in-Fact, C. White

Attorney-in-Fact:


(SEAL) Rachel Thomas, Witness as to Surety

NOTE: Surety Companies executing bonds must be authorized to transact business in the State of Colorado and be acceptable to the City.

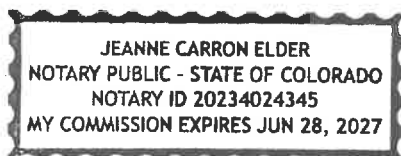
ACKNOWLEDGEMENT OF PRINCIPAL

STATE OF Colorado

COUNTY OF Douglas

On this 16th day of November, in the year 2023, before me personally appeared Rob Richardson,
Division Manager of
SMH West LLC, known to me to be
the person whose name is subscribed to the instrument, and acknowledge that he/she executed the same.

In WITNESS WHEREOF, I have hereunto set my hands and affixed my official seal, the day and year in
this certificate first above written.



Jeanne C Elder, Notary Public
My Commission Expires: June 28, 2027

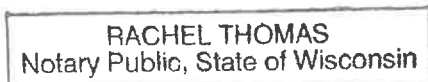
ACKNOWLEDGEMENT OF SURETY

STATE OF Wisconsin

COUNTY OF Polk

On this 16th day of November, in the year 2023, before me personally come(s)
Colby D White, Attorney-in-Fact of
Liberty Mutual Insurance Company, with whom
I am personally acquainted, and who, being by me duly sworn, says that he/she is the Attorney-in-Fact of
Liberty Mutual Insurance Company, the company described in and
which executed the within instrument; that he/she know(s) the corporate seal of such Company; and that the seal
affixed to the within instrument is such corporate seal and that it was affixed by order of the Board of Directors of
said Company, and that he/she signed said instrument as Attorney-in-Fact of the said Company by like order.

In WITNESS WHEREOF, I have hereunto set my hands and affixed my official seal, the day and year in
this certificate first above written.



Rachel Thomas, Notary Public
My Commission Expires: 06/21/2025



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: **8210698 - 190054**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Brian J. Oestreich, Colby D White, Emily White, Joshua R. Loftis, Lin Ulven, Melinda C. Blodgett, Michelle Morrison, Nathan Weaver, Nicole Stillings, R. C. Bowman, R. W. Frank, Rachel Thomas, Ross S. Squires, Sandra M. Engstrum, Sarah Dragt, Ted Jorgensen, Tina Domask

all of the city of Minneapolis state of MN each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 31st day of August, 2023.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By:

David M. Carey
David M. Carey, Assistant Secretary

State of PENNSYLVANIA ss
County of MONTGOMERY

On this 31st day of August, 2023 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2025
Commission number 1126044
Member, Pennsylvania Association of Notaries

By:

Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 16th day of November, 2023.



By:

Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary



SC-A-1 #1 - QUALIFICATIONS

(10,000 LF or more of 8"-24" Waterline)
Front Range CO

Project #	Job Name	Owner	Location	Project Description	Value	Start Date	Project Manager	Superintendent
21-1188	JOHNSTOWN SOUTH WATER TANK WDS	TOWN OF JOHNSTOWN	5936 CO RD 46 JOHNSTOWN, CO	Furnishing and installing approximately 37,300 LF of 16-inch C905 (DR 18) PVC pipeline, 12" and 16" fittings, isolation valves, 2 air relief valves, 40 fire hydrants, pipe restraints, one HDD river crossing, four bored canal crossings, two tunneled railroad crossings, two county road crossings, and related work in conjunction with construction of the Town's new South Water Tank.	\$ 9,044,000.00	12/2/2021	Dan Jones	Trent Foley
21-1191	WASTEWATER SYSTEM IMPROVEMENTS - FORCE MAIN	CITY OF STERLING	14580 COUNTY RD 370 STERLING, CO	Construction of approximately 19,000 linear feet of new 16-inch diameter siphoning of the existing wastewater force main with owner furnished 16-inch EPVC, construction of approximately 19,500 linear feet of 16-inch diameter new wastewater force main, and construction of approximately 2,900 linear feet of new 18-inch diameter wastewater force main. Project also includes valves, communication conduits and boxes, approximately 1,300 linear feet of CIPP, site restoration, traffic control and temporary connections.	\$ 8,098,000.00	1/12/2022	Dan Jones	Leo Zavala
23-1270	LHWD 2023 WATERLINE REPLACEMENTS	LEFT HAND WATER DISTRICT	1) N. 63rd ST from NIWOT RD, SOUTH OF MONARCH RD 2) N. 65th ST from St VRAIN RD NORTH OF NELSON	This work more specifically consists of the construction of approximately 3,915 lineal feet of 4-inch diameter treated water pipeline, approximately 6,735 lineal feet of 8-inch diameter treated water pipeline, and approximately 5,500 lineal feet of 16-inch diameter treated water pipeline.	\$ 4,460,468.15	7/17/2023	Dan Jones	Trent Foley



SC-A-1 #4 # SLIP LINING & ANNULAR GROUT

(Five Years Experience)

JOB NAME	LOCATION	COMPLETION DATE	EXPERIENCE
WASTEWATER SYSTEM IMPROVEMENTS - FORCE MAIN	14580 CO ROAD 370 STERLING, CO	~4/2024	Approximately 19,000 LF of new 16-in diameter sliplining existing wastewater force main with owner furnished 16-inch FPVC
COLSMAN TUNNEL REHABILITATION	GREENWOOD VILLAGE, CO	12/2018	Slipline and install 7,614 LF of 48" IPS SDR 13.5 HDPE pipe through an approximately seven-foot-tall hand-built arched tunnel on non-interruptible wastewater flow. The 1.66 million pounds of pipe were installed in the tunnel utilizing a directional drill. Project included fusion and datalogging in excess of 154 joints using the DL6, ID and OD de-banding and all pipe testing.
CLIMAX - ARKANSAS WELL PUMP SYSTEM	LEADVILLE, CO	10/2023	Slipline and install a supplied 8" HDPE pipe through an existing 10" existing pipe across Hwy 91 140 LF, and 8" HDPE pipe through an existing 21" pipe along Hwy 91 for 230 LF.
FLYING HORSE 115kv UNDERGROUND	COLORADO SPRINGS, CO	02/2019	Slipline and install (3) 3", (1) 4" and (4) 6" HDPE Sleeves pipe for 1,500 LF through a 30" HDPE casing that crosses a creek/wetland. The HDPE carrier pipes were equipped with casing spacers. The bundle of pipes were pulled and sliplined utilizing a directional drill. The annular space around the HDPE Sleeves were backfill grouted by pumping cellular grout through grout tubes.
30/36 TRANSMISSION IRRIGATION PROJECT	COMMERCE CITY, CO	02/2022	Slipline and install a 30" Ductile Iron Pipe for 260' and 242' through a 42" Steel Casing that crosses US Hwy 85 for one crossing, and I-76 for the other crossing. The DIP carrier pipe was equipped with casing spacers. The pipe was pulled and sliplined utilizing a Winch. Pipe was assembled one stick at a time and pulled in.
EAST 64TH AVENUE WATER LINE AT E-470	AURORA, CO	2021	Slipline and install a 24" Class 350 Ductile Iron Pipe for 812' through a 51" Steel casing that crosses E-470. The DIP carrier pipe was equipped with casing spacers and grout lines. The pipe was pulled and sliplined utilizing a 20 ton Winch. Pipe was assembled one stick at a time and pulled in.
SPECIALIZED MAINS - LITTLETON GOLF & TENNIS CLUB	LITTLETON, CO	2022	Slipline and install a 6" FPVC pipe through an existing 12" CI pipe for approximately 655' utilizing a horizontal directional drill.
LUPTON LAKES INLET OUTLET FACILITY	BRIGHTON, CO	2021	Slipline and install a 54" HDPE Pipe for 800' through a 66" Hobas Pipe that crosses HWY 85. The HDPE carrier pipe was equipped with casing spacers and grout lines. The pipe was pulled and sliplined utilizing a 20 ton Winch. Pipe was fused one stick at a time and pulled in.



SC-A-1 #5 - INSTALLATION EXPERIENCE

(At Least Five Installations - Horizontal Directional Drilling)
Front Range CO

#	JOB NAME	LOCATION	COMPLETION DATE	Experience
1	LHWD 2023 WATERLINE REPLACEMENT	EAST COUNTY LINE RD LONGMONT, CO	~4/2024	The construction of the waterline along E. County Line Road will include approximately 590 LF of HDD pipeline installation and approximately 125 LF of bored steel casing beneath SH 52.
2	SPECIALIZED MAINS 2022-2023 (Open bid project)	LITTLETON GOLF & TENNIS CLUB LITTLETON, CO	02/2023	Installation of approximately 650' of 8-inch water main via HDD through the Columbine Country Club for replacement of an existing 6" cast iron main. The project also consisted of Slipline 650' of 6" FPVC and 120 feet of 12-inch main via open cut and appurtenances within the Littleton Golf and Tennis Club and Bowles Ave.
3	CSU BRIARGATE 16	COLORADO SPRINGS, CO	8/2023	Directional drill and install 2,100 LF of 16" DR9 HDPE for a waterline crossing under Kettle Creek. The soil conditions included Dawson Formation bedrock, fine to coarse sand, clay, clay stone, and gravel. Fused 2,100 LF of 16" DR9 HDPE, Waterline.
4	COTTAGES AT WOODMEN HEIGHTS	COLORADO SPRINGS, CO	3/2023	Directional drill and install 1,350 LF of 30" DIPS HDPE pipe under sand creek on the south side of Woodmen Rd. Subsurface conditions were sand, sandy clay, sandstone, blue shale, and claystone. Fusion of 1,350 pf 30" DIPS HDPE.
5	EAST PLUM CREEK OSWF PROJECT	CASTLE ROCK, CO	7/2023	Directional drill and install 1,350 LF of 30" DIPS HDPE pipe under sand creek on the south side of Woodmen Rd. Subsurface conditions were sand, sandy clay, sandstone, blue shale, and claystone. Fusion of 1,350 pf 30" DIPS HDPE.
6	NOBLE MIDSTREAM/LOST CREEK	KEENESBURG, CO	6/2018	Directional drill and install 1,350 LF of 30" DIPS HDPE pipe under sand creek on the south side of Woodmen Rd. Subsurface conditions were sand, sandy clay, sandstone, blue shale, and claystone. Fusion of 1,350 pf 30" DIPS HDPE.



DAN JONES

Professional Summary

Over twenty years of combined construction experience including earthwork, drainage, and utilities construction. Provides comprehensive background in project management, project engineer, field engineer, and foreman.

Technical Skills & Qualifications

- Strong safety and safe work practices
- Excellent Customer/Owner relationships
- Outstanding verbal and written technical and professional communication.
- Heavy Civil Construction in Design-Build, CM/GC, and Bid-Build project delivery methods.
- Proficient in management of overall operations of projects, project controls, contracts, budgets, schedules, and estimating as well as coordinating subcontractors, personnel, equipment, and daily reporting.
- Skilled in computer programs including: Bid2Win, B2W Track, Viewpoint V6, Enterprise, Primavera P6, Salesforce, FIS Heavy Job/Bid, On-Screen Takeoff, Pro-Log, Aconex, MS- Project, Word, Excel, and Bluebeam.

Experience

2021-Present SMH West | Castle Rock, CO

Comprehensive Project Management from award to closeout. Tracking project budget, weekly costs, and cost to complete forecasting. Develop and manage project schedule and 5-week forecast schedule. Facilitate communications with owner representatives, engineers, and stakeholders. Coordinate and oversee weekly meetings and formal owner correspondence, change orders, payment applications, RFI's and Submittals. Supervise all Superintendents, Foreman, Crews, and Subcontractors.

Projects

- Loretto Heights Infrastructure – (Bid-Build 8.6MM)
- Johnstown South Tank Water Distribution System – (Bid-Build \$9.1MM)
- Sterling Wastewater System Improvements – (Bid-Build \$8.1MM)

2019-2021 Area Wide Protective (AWP) | Greeley, CO

As the Estimating & Business Development Manager, developed strategic business planning for 2020 & 2021, along with business development and customer outreach. Developed and implemented the



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standard operating procedures & integration of NCTC acquisition into AWP systems. Researched, tracked, and reviewed all bid letting and projects for Colorado. Built detailed estimates for traffic control for heavy civil, oil & gas, utility, and commercial & residential construction projects, as well as prime bid proposals for CDOT contracts and local entities. Reviewed all contracts and provided detailed project turnover information for operations.

2016-2019 Kraemer North America | Golden, CO

Project Manager/Project Engineer: managed subcontracts for earthwork, drainage, asphalt paving, fencing, and guardrail work scopes (\$65MM). Performed scheduling, RFI's, FDC's, estimating change orders, contract management, coordination, and project direction, along with execution of work scopes and contracts. Managed and updated 5-week construction schedule. Communicated & coordinated work scopes and issues with Owner Representatives. Reviewed MHT's, coordinated traffic control with TCS for traffic switches and closures.

Projects

- North I-25 Express Lanes Johnstown to Fort Collins – (Design Build \$260MM)
- North I-25 Express Lanes Johnstown to Fort Collins – (Design Build \$260MM)
- Little Thompson Bridge Replacement Project – (Bid-Build \$2.1MM)
- E470 Widening Parker to Quincy Avenue – (CMGC \$85MM)

2015-2016 Blackeagle Energy Services | Berthoud, CO

Project Manager for DCP Midstream, Noble Energy, Anadarko Petroleum – Oil and Gas Facility Projects (100k-800k). Performed comprehensive project management of all projects from start to finish. Attended pre-bid meetings and job walks. Created and compiled estimates and proposal packages, including coordination with budgets in cost tracking systems. Created and updated CPM project schedule. Facilitated weekly meetings and owner correspondence, managed RFI's and change orders, and submitted project closeout documentation. Supervised all Construction Managers, Superintendents, Foreman, and Crews on all projects. Subcontractor & vendor management including pay applications, invoice review and approval, schedules, RFI's, change orders, contract management, coordination, direction, and execution of performance of scope and contract.

Project

- DCP Midstream, Noble Energy, Anadarko Petroleum – Oil and Gas Facility Projects (100k-800k)

2012-2015 Granite Construction | Utah / Guam / Colorado

Project Engineer II

- US-36 Managed Lanes Project Phase I (Design-Build \$230MM) & Phase II (Design-Build \$109MM)
- JFY09 Mamizu J-001 Utilities and Site Improvements Phase I (Design-Build \$105MM)
- Rio Tinto/ Kennecott Utah Copper Mine- Cornerstone Project Flotation Expansion (\$45MM)





2011 American Civil Constructors | Littleton, CO

Field Engineer Intern

- CDOT I-70 West Vail Pass Improvements Project (8.9MM) & US 24 Bridge Replacement Project (4.6MM)

2002-2011 Previous Professional Experience

Foreman/Heavy Equipment Operator: Earthwork, Drainage, and Utilities.

Heavy Equipment Experience: Excavator, 8yrs; Front-end Loader, 8yrs; Backhoe, 10yrs; Skid-loader, 12yrs; Dozer, 2yrs; Forklift, 6yrs; Man-lift, 3yrs

Education

Bachelor of Science in Construction Management | Colorado State University, Fort Collins, CO

Certifications

- OSHA 10 Hour Certification
- OSHA Competent Person/ Trench Safety Training
- MSHA 40 Hour Part 46 Training Certification
- EM385 16 Hour Training Certification
- CDOT Transportation Erosion Control Supervisor Certification
- CCA Design & Operation of Work Zone Traffic Control Training
- CCA Bridge Girder Erection Training
- CPR/AED, First Aid Certification



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ADAM FRADY

Professional Summary

Seventeen years of combined consulting, management and construction experience including earthwork, utilities, and civil construction. Provides comprehensive background in mechanical piping and heavy equipment projects.

Skills

Efficient in all phases of civil, pipeline and earthwork construction and management. Great client relation, and communication skills. Efficient in finishing projects within time frame and within budget. Read and interpret blueprints, grade stakes, submittals, specs etc. Familiar with obtaining permits, contract negotiation and execution, Procore, Excel, Bluebeam etc. Great organizing skills. Team player.

Experience

2023-Present SMH West | Castle Rock, CO

Construction Manager. Manage field operations. Manage all projects with day-to-day operations in the field. Make sure we are installing a quality product in an efficient and safe manner. Make sure client is happy with quality and schedule. Manage equipment, manpower, quality control and schedule with leading crews.

2020-2023 HEI Civil | Castle Rock, CO

General Superintendent role. I manage and oversee schedule, budget, manpower and direct all field operations. This includes but not limited to concrete, utilities, structures, and earthwork.

2019-2020 P.E.I Premier Earthworks and Infrastructure | Denver, CO

Superintendent for utilities, but also over seeing concrete and earthwork on multiple projects. Oversee budget, installation, and invoicing on all assigned projects. Work closely with estimating, project managers, clients/developers, city representatives, foremen and subcontractors to ensure an ideal product is delivered on time and within budget.

2018-2019 TB Contractors | Tucson, AZ

Project Manager for Pipeline, Mechanical and Mine crews. Estimate, execute and invoice all projects assigned.

2014-2017 Owner at Alpha Consulting | Williston, ND

Project consultant for Oasis Petroleum. Overseeing budget and quality control on multiple pipeline and mechanical projects.





2011-2014 Mountain Peak Builders | Williston, ND

Pipeline superintendent overseeing multiple pipelines and well pad construction. Managed costs and labor on multiple projects for Whiting Petroleum, Oxy Petroleum and Kinder Morgan.

2007-2011 Petty Construction | Grand Junction, CO

Directional Boring, heavy equipment operator and pipeline foreman

2003-2007 Roper Plumbing | Camp Verde, AZ

Commercial pipefitter.

Education

Camp Verde High School Diploma 2003

Mesa community college 2013- 2015 (construction management)

Certifications

- OSHA 30
- MSHA
- OSHA Trenching and excavation competent person
- Confined space
- PEC Safe land
- Red Cross CPR
- HDPE fusion certification including data logger
- Many more available upon request

Subdivision Projects

Banning Lewis | Richmond – Colorado Springs, CO

High Point | Taylor Morrison – Aurora, CO

Ceilo | Toll Brothers – Parker, CO

Terrian | KB homes – Castle Rock, CO

Buckley Yard | Doug Richer – Aurora, CO



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Arbor Peak | AHFR – Aurora, CO

Beacon Point | AHFR – Aurora, CO

Horizon Uptown | Lendlease – Aurora, CO

Utilities, earthwork, concrete and paving.

Public Work

WISE Waterline | Meridian Water District- Lonetree, CO

Dual 18" C900 waterlines from wells to pump booster station, including bore under E470. 5,500 ft.

Westminster Lift Station | Westminster, CO

Force main and lift station including all infrastructure.

Rock River Waterline | Rock River Water Department – Rock River, WY

18 miles of 16" C900 from river intake to treatment plant to town.

York Street Waterline Improvement | Denver Water – Denver, CO

Rehab, R&R water mains and install 10" C900 in replace of older lines.

Trailhead Communities Off-Site | K2 Builders – Jefferson County, CO

Utility infrastructure, bring all utilities to the site, including watermain, sanitary and rehabbing the existing pond.

Victory Ridge | Garret – Colorado Springs, CO

Utilities on and off-site for large apartment complex.



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Contractor Licenses

City and County of Denver:

ROW Paving	LIC00250807
ROW Sewer	LIC00250403
ROW Sidewalk	LIC00250805
ROW Special	LIC00250402

City of Aurora:

ROW Contractor	2022 2175615 00 CL
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Town of Johnstown:

Contractor	AEC-1017
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City of Sterling:

Building Contractor	2022-235
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Greenwood Village:

Commercial Contractor License	OL-23-00025
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Certificate of Corporate Authority

I, Jeanette M. Hentges, being the duly elected Secretary of SMH West LLC, a limited liability company organized and existing under and by virtue of the laws of the State of Colorado (hereinafter called "this company"), do hereby certify that the following is a true and complete copy of the resolutions duly adopted at a meeting of the Board of Governors of this company, duly called and held on January 05, 2023, at which a quorum was present and voting; that said resolutions amend a similar resolution passed on April 09, 2019, that they are still enforced and have not been rescinded; and that said resolutions are not in conflict with the articles, bylaws, or operating agreement of this company:

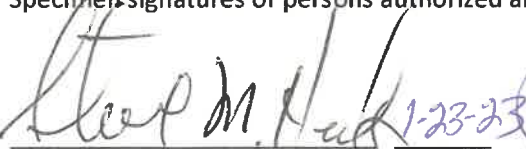
RESOLVED that any of the following persons, to wit:

Steven M. Hentges, President,
Jeanette M. Hentges, Vice President
John A. Abbott, Senior Estimator, and
Robert J. Richardson, Division Manager

of this company be, and they are, fully authorized and empowered to execute and deliver bid documents, bid bonds, contracts, payment and performance bonds, and notices of award for this company.

Further resolved that the Secretary of the Corporation then in office is hereby authorized to execute a certificate from time to time setting forth these resolutions.

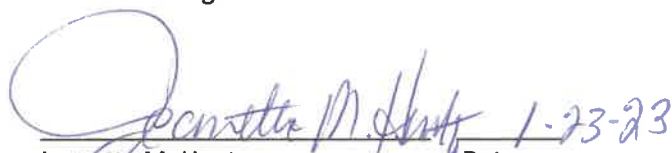
Specimen signatures of persons authorized above:


Steven M. Hentges
President /CEO
Date 1-23-23


Jeanette M. Hentges
Vice President/CFO
Date 1-23-23


John A. Abbott
Senior Estimator
Date 1/19/23


Robert J. Richardson
Division Manager
Date 19 Jan 2023


Jeanette M. Hentges
Secretary
SMH West LLC
Date 1-23-23



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.4.

TO: THE HONORABLE CITY COUNCIL

DATE: January 22, 2024

SUBJECT: R24-014, A Resolution Authorizing a Four Month Extension of Two Leases by and Between the City of Arvada and The United States Postal Service for Lease of The Building At 5885 Allison Street and For Lease of The Parking Lot At 5886 Ammons Street

Report in Brief

The United States Postal Service, hereinafter the Postal Service, has requested to extend their lease agreement for the post office facility and their lease agreement for the parking lot for an additional period of four months. The original lease agreements were set to terminate on September 30, 2022.

- On September 19, 2022, the City Council approved a six-month extension of the lease agreements for a fixed term basis beginning October 1, 2022 and ending March 31, 2023.
- On March 20, 2023, the City Council approved a three-month extension of the lease agreements for a fixed term basis beginning April 1, 2023 and ending June 30, 2023.
- On July 17, 2023, the City Council approved a three-month extension of the lease agreements for a fixed term basis beginning July 1, 2023 and ending August 31, 2023.
- On October 16, 2023, the City Council approved a four-month extension of the lease agreements for a fixed term basis beginning October 1, 2023 and ending January 31, 2024.

All extensions as previously approved by City Council were requested by the Postal Service in order to complete internal processes which it requires prior to commencing negotiations with the City for a new lease. The Postal Service has completed some of these internal requirements, to include obtaining appraisals of the premises, but will need additional time to commence and complete negotiations with the City.

The Postal Service just recently submitted their lease agreement proposal based on terms, conditions, and lease values will require additional time to reach a fair conclusion to the lease negotiations. Based on the amount of revisions that will need to be negotiated, we will need additional time to reach a fair and equitable conclusion to the terms, conditions, and cost of the lease agreement. Arvada recently received our appraisal of the facility to determine fair market value for the rentable space of the post office building and the parking lot of 70 spaces. The appraisal came in higher than the appraisal conducted by the USPS and thus will require additional time to reach a fair agreement.

Upon completion of a new lease for the premises, the Postal Service agrees that the rental rate in effect at the commencement of the new lease will be retroactive to October 1, 2022.

The Arvada team recommends that City Council approve R24-014, A Resolution Authorizing a Four Month Extension of Two Leases By and Between the City of Arvada and the United States Postal Service For the Lease of the Building at 5885 Allison Street and For the Lease of the Parking Lot at 5886 Ammons Street.

Financial Impact

The financial impact will be determined after the negotiation of the new lease is finalized.

Background

The City Council Strategic Plan adopted on June 17, 2013 included a strategic result associated with the future need to expand Police and Municipal Court facilities to meet the City's growth. The 2013 Strategic Result was as follows:

By December 31, 2014, a conceptual plan and location for a new Justice Center will be completed in order to accommodate emerging safety requirements of the public.

When the City received notification of the post office sale, we tasked our master plan design consultant to review the use of the post office as a Justice Center that would meet the needs of the Police Department and the Municipal Court. The consultant determined the facility could be a viable option and provided concept plans in the final master plan documents.

While acknowledging the viability of the site to be developed as a Justice Center, other higher capital project priorities were identified, including the need to increase funding for street maintenance, construction of the Olde Town Hub and several other projects that were recommended by the Citizens Capital Improvements Project Committee when they completed their work in 2015. The impact of the Police community stations coming on line slightly reduced the need for additional space and the Municipal Court reevaluated priorities with the appointment of Judge Kurtz. Therefore, there are neither the funds nor the urgency to develop the Justice Center at this time.

Discussion

Internally, the Postal Service processes and lack of communication by JLL Brokage initially took a substantial amount of time. The rental rate requested by the Postal Service is low. This extension of time will allow the City to gather necessary information to adequately represent the interests of the City in lease negotiations.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

The recommended action aligns with the Infrastructure Priority Area of the City Council Strategic Plan. Specifically, the recommended action supports Strategic Result 6 (SR6):

By 12/25, complete a comprehensive plan for City facilities and properties that would be utilized for City business operations post COVID-19, including the City Hall campus, Indiana Shops, and other appropriate satellite facilities to ensure optimal usage of space.

Alternative Courses of Action

No other alternatives at this time.

Recommendation for Action

The Arvada team recommends that the City Council approve R24-014, A Resolution Authorizing a Four Month Extension of Two Leases By and Between the City of Arvada and the United States Postal Service For the Lease of the Building at 5885 Allison Street and for the Lease of the Parking Lot at 5886 Ammons Street.

Suggested Motion:

SUBJECT: R24-014, A Resolution Authorizing a Four Month Extension of Two Leases by and Between the City of Arvada and The United States Postal Service for Lease of The Building At 5885 Allison Street and For Lease of The Parking Lot At 5886 Ammons Street

PAGE: 3
ITEM: 8.A.4.

I move that R24-014, A Resolution Authorizing a Four Month Extension of Two Leases By and Between the City of Arvada and the United States Postal Service For the Lease of the Building at 5885 Allison Street and for the Lease of the Parking Lot at 5886 Ammons Street, be (approved) (rejected).

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Kim Vagher, Manager of City Facilities	1/5/2024
Jacqueline Rhoades, Public Works Director	1/8/2024
Bryan Archer, Director of Finance	1/8/2024
Tammy Hedlund, Legal Specialist	1/8/2024
Jessica Morales, Assistant City Attorney	1/8/2024
Rachel Morris, City Attorney	1/11/2024
Don Wick, Deputy City Manager	1/11/2024
Lorie Gillis, City Manager	1/11/2024

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R24-014

A RESOLUTION AUTHORIZING A FOUR MONTH EXTENSION OF TWO LEASES BY AND BETWEEN THE CITY OF ARVADA AND THE UNITED STATES POSTAL SERVICE FOR LEASE OF THE BUILDING AT 5885 ALLISON STREET AND FOR LEASE OF THE PARKING LOT AT 5886 AMMONS STREET

WHEREAS, the City of Arvada currently leases the property located at 5885 Allison Street to the United States Postal Service (“USPS”) for its use of the property as a Postal Office at an annual rent of \$48,386.00; and

WHEREAS, the City of Arvada currently leases the property located at 5886 Ammons Street to the USPS for its use of the property as a parking lot for USPS employees, at an annual rent of \$10.00; and

WHEREAS, the lease agreements were set to terminate on September 30, 2022: and

WHEREAS, on September 19, 2022, the City Council approved a six-month extension of the lease agreements for a fixed term basis beginning October 1, 2022 and ending March 31, 2023; and

WHEREAS, on March 20, 2023, the City Council approved a three-month extension of the lease agreements for a fixed term basis beginning April 1, 2023 and ending June 30, 2023; and

WHEREAS, on July 17, 2023, the City Council approved a three-month extension of the lease agreements for a fixed term basis beginning July 1, 2023 and ending September 30, 2023; and

WHEREAS, on October 16, 2023, the City Council approved a four-month extension of the lease agreements for a fixed term basis beginning October 1, 2023 and ending January 31, 2024; and

WHEREAS, additional time is needed for negotiation of new lease agreements; and

WHEREAS, this additional four month extension of the existing leases will be for a fixed term basis beginning February 1, 2024 and ending May 31, 2024; and

WHEREAS, the USPS agrees that upon completion of negotiations of new leases for both the properties, the rental rate in effect at the commencement of the new leases will be retroactive to October 1, 2022, and if that rental rate is in excess of the current rent, the USPS will make one lump sum payment to the City of Arvada for the difference between the rental rate in the new leases and the current rental rate within 30 days of the execution the new leases.

NOW, THEREFORE, 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, Agreements, which are in substantially the same form as

that attached hereto.

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

APPROVED AND ADOPTED this 22nd day of January, 2024.

Lauren Simpson, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____



Lease Extension

Facility Name/Location

MAIN OFFICE (070414-001)

5885 ALLISON ST, ARVADA, CO 80004-9998

Lease Extension No: 005

Lease: E00000000774

This refers to the Lease accepted by the United States Postal Service, hereinafter called the Postal Service, under date of 01/02/1969, whereby there is leased to the Postal Service the above-described facility.

WHEREAS, the Postal Service desires and Landlord is willing to extend said Lease as specified below;

NOW THEREFORE, in consideration of the mutual covenants and agreements herein set forth, and for other good and valuable consideration, the sufficiency of which is hereby acknowledged, the parties do hereby agree as follows:

To extend the terms and conditions of the said Lease, as the same may have been modified or amended, for a fixed term basis beginning 02/01/2024 and ending 05/31/2024 at an annual rental of \$48,386.00.

See Addendum

In all other respects, the Lease shall remain the same and is hereby confirmed.

Facility Name/Location

MAIN OFFICE (070414-001)

5885 ALLISON ST, ARVADA, CO 80004-9998

County: Jefferson

Lease: E00000000774

1. Upon completion of negotiation of a new Lease for the premises, the Postal Service agrees that the rental rate in effect at the commencement of the new Lease will be retroactive to 10/01/2022. If that rental rate is in excess of the current rent, the Postal Service will make one lump sum payment for the difference of between the rental rate in the new Lease and the current rent. The lump sum payment will be made within thirty (30) days of execution of the new Lease. If the new Lease term begins before the expiration date of this lease extension, 05.31.2024, the new Lease will supersede and terminate this current lease as of the effective date of the new Lease.
2. The parties agree that if the signature(s) of either Landlord or the Postal Service on this Lease or any amendments, addendums, assignments, or other records associated with this Lease is not an original but is an electronic signature, scanned signature or a digitally encrypted signature, then such electronic signature, scanned signature or digitally encrypted signature shall be as enforceable, valid and binding as, and the legal equivalent to, an authentic original wet signature penned manually by its signatory. Signatures required under this Lease, or any amendments, addendums, assignments, or other records associated therewith, may be transmitted by email or by fax and, once received by the party to whom such signatures were transmitted, shall be binding on the party transmitting its signatures as though they were an original signature of such party.



Lease Extension

EXECUTED BY LANDLORD this _____ day of _____, _____.

GOVERNMENTAL ENTITY

By executing this Lease Amendment, Landlord certifies that Landlord is not a USPS employee or contract employee (or an immediate family member of either), or a business organization substantially owned or controlled by a USPS employee or contract employee (or an immediate family member of either).

Name of Governmental Entity: CITY OF ARVADA

Name & Title LAUREN SIMPSON, MAYOR

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Landlord's Address: CITY OF ARVADA

8101 RALSTON RD

ARVADA, CO

APPROVED AS TO FORM:

Rachel A. Morris, Arvada City Attorney

By: _____

Zip+4 80002-2400

Landlord's Telephone Number(s): _____

Federal Tax Identification No.: XX-XXX0633

ATTEST:

Witness _____

Witness _____

Arvada City Clerk _____

- Where the Landlord is a governmental entity or other municipal entity, the Lease must be accompanied by documentary evidence affirming the authority of the signatory(ies) to execute the Lease to bind the governmental entity or municipal entity for which he (or they) purports to act.
- Any notice to Landlord provided under this Lease or under any law or regulation must be in writing and submitted to Landlord at the address specified above, or at an address that Landlord has otherwise appropriately directed in writing. Any notice to the Postal Service provided under this Lease or under any law or regulation must be in writing and submitted to "Contracting Officer, U.S. Postal Service" at the address specified below, or at an address that the Postal Service has otherwise directed in writing.

ACCEPTANCE BY THE POSTAL SERVICE

Date: _____

Terrence P Brennan

Contracting Officer

Signature of Contracting Officer

Western FSO 7500 E 53RD PL RM 1108, DENVER, CO 80266-9918

Address of Contracting Officer



Lease Extension

Facility Name/Location

MAIN OFFICE PARKING (070414-002)

5886 AMMONS ST, ARVADA, CO 80004-9998

Lease Extension No: 005

Lease: E00000000775

This refers to the Lease accepted by the United States Postal Service, hereinafter called the Postal Service, under date of 06/03/1975, whereby there is leased to the Postal Service the above-described facility.

WHEREAS, the Postal Service desires and Landlord is willing to extend said Lease as specified below;

NOW THEREFORE, in consideration of the mutual covenants and agreements herein set forth, and for other good and valuable consideration, the sufficiency of which is hereby acknowledged, the parties do hereby agree as follows:

To extend the terms and conditions of the said Lease, as the same may have been modified or amended, for a fixed term basis beginning 02/01/2024 and ending 05/31/2024 at an annual rental of \$10.00.

See attached Addendum

In all other respects, the Lease shall remain the same and is hereby confirmed.

Facility Name/Location

MAIN OFFICE PARKING (070414-002)
5886 AMMONS ST, ARVADA, CO 80004-9998

County: Jefferson

Lease: E00000000775

1. Upon completion of negotiation of a new Lease for the premises, the Postal Service agrees that the rental rate in effect at the commencement of the new Lease will be retroactive to 10/01/2022. If that rental rate is in excess of the current rent, the Postal Service will make one lump sum payment for the difference of between the rental rate in the new Lease and the current rent. The lump sum payment will be made within thirty (30) days of execution of the new Lease. If the new Lease term begins before the expiration date of this lease extension, 05.31.2024, the new Lease will supersede and terminate this current lease as of the effective date of the new Lease.
2. The parties agree that if the signature(s) of either Landlord or the Postal Service on this Lease or any amendments, addendums, assignments, or other records associated with this Lease is not an original but is an electronic signature, scanned signature or a digitally encrypted signature, then such electronic signature, scanned signature or digitally encrypted signature shall be as enforceable, valid and binding as, and the legal equivalent to, an authentic original wet signature penned manually by its signatory. Signatures required under this Lease, or any amendments, addendums, assignments, or other records associated therewith, may be transmitted by email or by fax and, once received by the party to whom such signatures were transmitted, shall be binding on the party transmitting its signatures as though they were an original



Lease Extension

EXECUTED BY LANDLORD this _____ day of _____, _____.

GOVERNMENTAL ENTITY

By executing this Lease Amendment, Landlord certifies that Landlord is not a USPS employee or contract employee (or an immediate family member of either), or a business organization substantially owned or controlled by a USPS employee or contract employee (or an immediate family member of either).

Name of Governmental Entity: CITY OF ARVADA

Name & Title LAUREN SIMPSON, MAYOR

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Name & Title _____

Landlord's Address: CITY OF ARVADA

8101 RALSTON RD

ARVADA, CO

APPROVED AS TO FORM:

Rachel A. Morris, Arvada City Attorney

By: _____

Zip+4 80002-2400

Landlord's Telephone Number(s): _____

Federal Tax Identification No.: XX-XXX0633

ATTEST:

Witness _____

Witness _____

Arvada City Clerk

- Where the Landlord is a governmental entity or other municipal entity, the Lease must be accompanied by documentary evidence affirming the authority of the signatory(ies) to execute the Lease to bind the governmental entity or municipal entity for which he (or they) purports to act.
- Any notice to Landlord provided under this Lease or under any law or regulation must be in writing and submitted to Landlord at the address specified above, or at an address that Landlord has otherwise appropriately directed in writing. Any notice to the Postal Service provided under this Lease or under any law or regulation must be in writing and submitted to "Contracting Officer, U.S. Postal Service" at the address specified below, or at an address that the Postal Service has otherwise directed in writing.

ACCEPTANCE BY THE POSTAL SERVICE

Date: _____

Terrence P Brennan

Contracting Officer

Signature of Contracting Officer

Western FSO 7500 E 53RD PL RM 1108, DENVER, CO 80266-9918

Address of Contracting Officer

Facility Name: ARVADA-MAIN OFFICE
Fin/Sub No: 070414-001
Address: 5885 ALLISON ST
City, ST, ZIP: ARVADA, CO 80004-9998

Real Estate Conflict of Interest Certification

To avoid actual or apparent conflicts of interest, the United States Postal Service ("Postal Service") requires the following certification from you as a potential Landlord/Supplier/Contractor to the Postal Service. Please check all that apply in item A below. Further, please understand that the Postal Service will be relying on the accuracy of the statements made by you in this certification in determining whether to proceed with any possible transaction with you.

I, LAUREN SIMPSON hereby certify to the Postal Service as follows:
[PRINT: name of potential Landlord/Supplier/Contractor]

- A. (Check all that apply) I am:
- (i) ☐ A Postal Service employee;
 - (ii) ☐ The spouse of a Postal Service employee;
 - (iii) ☐ A family member of a Postal Service employee; (*Relationship*) _____
 - (iv) ☐ An individual residing in the same household as a Postal Service employee;
 - (v) ☐ I am one of the individuals listed in (i) through (iv) above AND a controlling shareholder or owner of a business organization leasing space or intending to lease space to the Postal Service; OR
 - (vi) ☒ None of the above.
- B. (Complete as applicable):
- i. I have the following job with the Postal Service(*Title*)_____ (*Location*)_____
 - ii. My Spouse who works for the Postal Service holds the following job: (*Title*)_____ (*Location*)_____
 - iii. My family member who works for the Postal Service holds the following job: (*Title*)_____ (*Location*)_____
 - iv. My household member who works for the Postal Service holds the following job: _____ (*Title*)_____ (*Location*)_____
- C. If you have checked "none of the above" and during the lease term or any renewal term, you do fall into any of the categories listed in A (i) through (v) above, you shall notify the Postal Service Contracting Officer in writing within 30 days of the date you fall into any of the such categories and shall include an explanation of which of the above categories now applies.
- D. The person signing this certification has full power of authority to bind the potential Landlord/Supplier/Contractor named above.

Executed this _____ day of _____, 20____ by

BY: _____
[Insert Signature]

BY: LAUREN SIMPSON
[PRINT: name of entity or person]

Title: MAYOR
[Insert title]

APPROVED AS TO FORM:
Rachel A. Morris, Arvada City
Attorney

By: _____

ATTEST:

Arvada City Clerk

Facility Name: ARVADA-MAIN OFFICE PARKING
Fin/Sub No: 070414-002
Address: 5886 AMMONS ST
City, ST, ZIP: ARVADA, CO 80004-9998

Real Estate Conflict of Interest Certification

To avoid actual or apparent conflicts of interest, the United States Postal Service ("Postal Service") requires the following certification from you as a potential Landlord/Supplier/Contractor to the Postal Service. Please check all that apply in item A below. Further, please understand that the Postal Service will be relying on the accuracy of the statements made by you in this certification in determining whether to proceed with any possible transaction with you.

I, LAUREN SIMPSON hereby certify to the Postal Service as follows:
[PRINT: name of potential Landlord/Supplier/Contractor]

- A. (Check all that apply) I am:
- (i) ☐ A Postal Service employee;
 - (ii) ☐ The spouse of a Postal Service employee;
 - (iii) ☐ A family member of a Postal Service employee; (*Relationship*) _____
 - (iv) ☐ An individual residing in the same household as a Postal Service employee;
 - (v) ☐ I am one of the individuals listed in (i) through (iv) above AND a controlling shareholder or owner of a business organization leasing space or intending to lease space to the Postal Service; OR
 - (vi) ☒ None of the above.
- B. (Complete as applicable):
- i. I have the following job with the Postal Service(*Title*)_____ (*Location*)_____
 - ii. My Spouse who works for the Postal Service holds the following job: (*Title*)_____ (*Location*)_____
 - iii. My family member who works for the Postal Service holds the following job: (*Title*)_____ (*Location*)_____
 - iv. My household member who works for the Postal Service holds the following job: _____ (*Title*)_____ (*Location*)_____
- C. If you have checked "none of the above" and during the lease term or any renewal term, you do fall into any of the categories listed in A (i) through (v) above, you shall notify the Postal Service Contracting Officer in writing within 30 days of the date you fall into any of the such categories and shall include an explanation of which of the above categories now applies.
- D. The person signing this certification has full power of authority to bind the potential Landlord/Supplier/Contractor named above.

Executed this _____ day of _____, 20____ by

BY: _____
[Insert Signature]

BY: LAUREN SIMPSON
[PRINT: name of entity or person]

Title: MAYOR
[Insert title]

APPROVED AS TO FORM:
Rachel A. Morris, Arvada City
Attorney

By: _____

ATTEST:

Arvada City Clerk

Request for Taxpayer Identification Number and Certification

Give Form to the
requester. Do not
send to the IRS.

► Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type. See Specific Instructions on page 3.	1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. CITY OF ARVADA	
	2 Business name/disregarded entity name, if different from above	
	3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes. ☐ Individual/sole proprietor or single-member LLC ☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ► Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner. ☐ Other (see instructions) ►	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ <i>(Applies to accounts maintained outside the U.S.)</i>
	5 Address (number, street, and apt. or suite no.) See instructions. 8101 RALSTON RD	Requester's name and address (optional)
	6 City, state, and ZIP code ARVADA CO 80004-9998	
7 List account number(s) here (optional)		

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number									
			-				-		
or									
Employer identification number									
8	4		-	6	0	0	0	6	3

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here	Signature of U.S. person ►	Date ►
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General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting*, later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515, *Withholding of Tax on Nonresident Aliens and Foreign Entities*).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the instructions for Part II for details),
3. The IRS tells the requester that you furnished an incorrect TIN,
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code*, later, and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships*, earlier.

What is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code*, later, and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note: ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C corporation, or S corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box on line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3.

IF the entity/person on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation
• Individual • Sole proprietorship, or • Single-member limited liability company (LLC) owned by an individual and disregarded for U.S. federal tax purposes.	Individual/sole proprietor or single-member LLC
• LLC treated as a partnership for U.S. federal tax purposes, • LLC that has filed Form 8832 or 2553 to be taxed as a corporation, or • LLC that is disregarded as an entity separate from its owner but the owner is another LLC that is not disregarded for U.S. federal tax purposes.	Limited liability company and enter the appropriate tax classification. (P= Partnership; C= C corporation; or S= S corporation)
• Partnership	Partnership
• Trust/estate	Trust/estate

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

- 1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
- 2—The United States or any of its agencies or instrumentalities
- 3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities
- 5—A corporation
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission
- 8—A real estate investment trust
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940
- 10—A common trust fund operated by a bank under section 584(a)
- 11—A financial institution
- 12—A middleman known in the investment community as a nominee or custodian
- 13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 5 ²
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

¹ See Form 1099-MISC, Miscellaneous Income, and its instructions.

² However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note: You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, write NEW at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note: See *What Name and Number To Give the Requester*, later, for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at www.SSA.gov. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/Businesses and clicking on Employer Identification Number (EIN) under Starting a Business. Go to www.irs.gov/Forms to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to www.irs.gov/OrderForms to place an order and have Form W-7 and/or SS-4 mailed to you within 10 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code*, earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983.

You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABLE accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor ²
5. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee ¹
b. So-called trust account that is not a legal or valid trust under state law	The actual owner ¹
6. Sole proprietorship or disregarded entity owned by an individual	The owner ³
7. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	Give name and EIN of:
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity ⁴
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee

For this type of account:	Give name and EIN of:
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

¹ List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

² Circle the minor's name and furnish the minor's SSN.

³ You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴ List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships*, earlier.

***Note:** The grantor also must provide a Form W-9 to trustee of trust.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records From Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes.

Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at spam@uce.gov or report them at www.ftc.gov/complaint. You can contact the FTC at www.ftc.gov/idtheft or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see www.IdentityTheft.gov and Pub. 5027.

Visit www.irs.gov/IdentityTheft to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.



REPORT TO CITY COUNCIL WORKSHOP

AGENDA ITEM
11.A.

TO: THE HONORABLE CITY COUNCIL

DATE: January 22, 2024

SUBJECT: City Budget and Financial Resilience

Report in Brief

Presenter: Lorie Gillis - City Manager

The City Leadership Team will provide the City Council with an update on the City's Financial Resilience work. The presentation will include high level information on funding, staffing, service levels, themes, gaps and information from the Citizen Survey for all work systems including Safe Community, Infrastructure, Vibrant Community and Neighborhoods, Community and Economic Development, and Organizational and Service Effectiveness.

Background

The City Council Strategic Plan includes the Strategic Result:

By 12/24 based on long-term financial projections and updated master plans, develop financial resiliency recommendations to ensure adequate and on-going investments in city infrastructure and core services.

As part of the 2023-2024 Adopted Revised Budget development process the team included additional focus in the areas of Financial resilience and service level sustainability . Throughout 2023, all programs and services were assessed considering funding, staffing, services, future themes and gaps. The presentation included herein provides information and findings resulting from the work.

The purpose of the City Council Budget and Fiscal Policy is to guide City budget and financial management decisions based on strategic planning, performance measures, long-term financial stability, delivery of basic City services and protection of past and future investments in the City's infrastructure and facilities. This financial resilience update is responsive to the City Council Strategic Result and is in support of the City Council Budget and Fiscal Policy.

Strategic Alignment

The Financial Resilience update is responsive to the City Council Strategic Result and supports the Organizational Service and Effectiveness Work System Principle : *Provides a sustainable government that operates effectively and efficiently while identifying revenue requirements to sustain current service levels and achieve future requested levels of service.* This also supports the Council's Budget and Fiscal Policy: *To guide City budget and financial management decisions based on strategic planning, performance measures, long-term financial stability, delivery of basic City services and protection of past and future investments in the City's infrastructure and facilities.*

Next Steps

The City team will present proposed updates to the Fiscal Policy on January 22, 2024.

Following the City Council Strategic Planning Retreat on February 9, 2024, the City team will continue financial resilience work and bring recommendations to the City Council.

Prepared by:
Bryan Archer, Director of Finance

Reviewed by:

Approved by:

Gail Walker, Legal Specialist-Contracts	12/27/2023
Laura Hemler, Assistant City Attorney	12/27/2023
Don Wick, Deputy City Manager	12/27/2023
Lorie Gillis, City Manager	12/28/2023

Enclosure, exhibits & attachments required to support the report

2024 City Budget and Financial Resilience

City Council Meeting, January 22, 2024

Overview of Presentation

- Why - City Council Strategic Result, Financial Stewardship
- Who - Department Heads/Subject Matter Experts
- What - Financial Resilience & Level of Service
- How - Budget/FTE, Service Delivery, Themes, Gaps, and Takeaways

Success

- **KNOW:** We have a strategic result. We performed a 5 x 5 analysis. This yielded information about gaps. These gaps inform how we decide to budget funds and raise revenue. The 5X5 also pointed out things we are doing well. There will be trade-offs. Council has a specific and important role in budgeting.
- **FEEL:** We are a cohesive team for the city. We listened to community input. You can trust that our decisions and recommendations are sound and in the best interest of the city.
- **DO:** Learn about financial resilience concepts and current system gaps so you can provide informed direction on priorities and strategy at the February 9 strategic planning retreat. Be curious about what you don't know.

Community and Economic Development

CED Overview

2024 Funding: \$12,957,915	2024 FTE: 41
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The Department of Community and Economic Development (CED) enhances the quality of life for everyone in the community by ensuring high-quality, balanced and sustainable development that also supports a healthy, thriving, local economy.

- Development Review
- Building Services
- Housing Services
- Economic Development Services (AEDA)

CED Service Delivery

- Administrative Support
- Building Services Division
- Economic Development Division
- Housing Division
- Development Review & Long-Range Planning
- Annually facilitate development of 150,000 sf of new commercial real estate, tracked by retail, industrial and office segments
- Annually retain 99% of net existing brick and mortar businesses
- 98% of building permit inspections conducted on the scheduled day.
- All 1st review, non-over the counter commercial building permits reviewed within 20 business days.
- 95% of development project approvals conform to the City's Comprehensive Plan

CED Top 3 Themes

- Affordable housing
- Current high level of development activity
- Limited economic development resources



OLDE TOWN ARVADA STRATEGIC REINVESTMENT PLAN

(November 2023)

CED Top Gaps

- Slowing Growth
- Increased need for affordable and workforce housing
- Business attraction
- Technology

CED Key Takeaways

- The team must meet the diverse needs of the community to ensure safe, attainable, sustainable and innovative development occurs throughout the City.
- We must engage employers and businesses in order to understand and adapt to changing economic conditions.
- We need to provide increased learning and more efficient services to the community, including development and permit review, inspections, grant funding and partnerships, and community engagement.
- As societal conditions change, expectations and demands will require increased patience, flexibility and education.

Infrastructure

Public Works and Utilities

Public Works Overview

2024 Funding: \$42,856,447

2024 FTE: 133

We provide and maintain Arvada's network of roadway, traffic, pedestrian, utilities, and facilities infrastructure so everyone can access services and get to where they need to go safely and comfortably.

- ADA compliance
- Facilities maintenance
- Snow and ice control
- Streets maintenance
- Pavement management
- Engineering
- Traffic O&M and mobility
- Parking management
- Floodplain administration
- Stormwater engineering
- Stormwater regulatory
- Utilities engineering

Public Works Service Delivery

- > 1 million sf in 100 city facilities (FCI)
- 397 lane miles of snow priority routes
- Street sweeping 7 passes per year
- ROW mowing 4 system passes per year
- Filling potholes within 24 hrs
- Pavement for >1500 lane miles (PQI)
- ADA Compliant curb ramps (% deficient)
- Infrastructure master planning
- System maintenance plans
- Engineering Standards and Specs
- \$315 million in active CIP
- 114 traffic signals and 32 RRFBs, associated roadway striping and >19,000 signs
- >\$7.7 million in active grants
- Parking (11 hr/day, 365/yr in Olde Town)
- Community Rating System Class 5
- Compliance with MS4, Pesticide Permits
- Development Review (64 active apps)

Public Works Top 3 Themes

Resilient Workforce



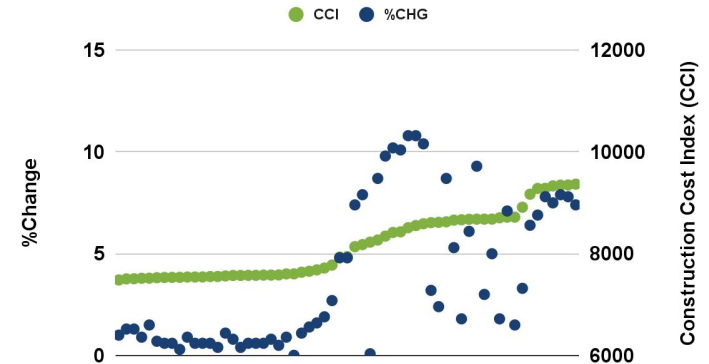
Aging Infrastructure

SEWERLINK
BY WINCAN
UNDERGROUND UNDERSTO
08/09/2022 12:38 PM
1.0X
100P
1.6DEG
DIST N/A
105.08165DEG W
39.82011DEG N
5.474.1FT



Inflation

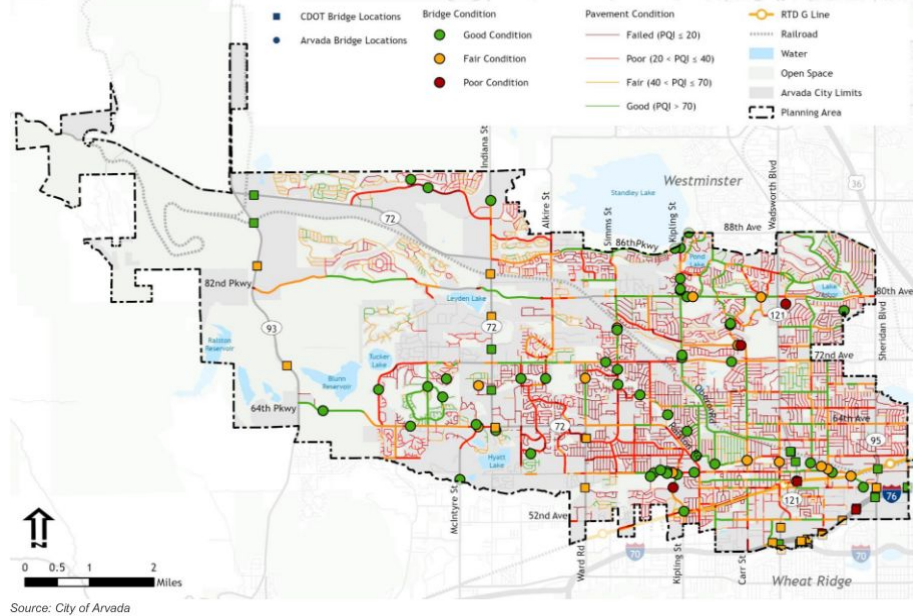
ENR COST INDICES IN DENVER (Jan-2019 to Jan-2024)



Public Works Top 3 Gaps

Pavement Management and Streets Maintenance

Figure 14. Pavement and Bridge Conditions



Building Fund and Facilities Maintenance



Traffic and Transportation System Needs



Utilities Overview

2024 Funding: \$169,606,647	2024 FTE: 109.25
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The Mission of the Utilities Department is to provide safe and reliable drinking water, wastewater and stormwater collection, waste hauling, fleet management, and billing services to the Arvada community.

The Utilities team also includes these internal services:

- Fleet Management
- City Mailroom
- Enterprise Fund Revenue Forecasting and Rate-Setting
- Armory Services

Utilities Service Delivery

- ~40,000+ households, 120,000+ residents, ~40 square miles
- 109 full time employees
- Water supply ~75% Denver Water (Gross Reservoir), 25% Clear Creek, valued at over \$1 billion
- ~6.4 billion gallons of treated water per year
- Ralston WTP treatment capacity is 36 million gal/day
- Arvada WTP treatment capacity is 16 million gal/day
- 11 water storage tanks and 7 pump stations
- 630+ miles of distribution pipes
- 38,000 water meters & 6,000 hydrants
- 400 miles of sewer line maintained by Arvada
- Over 10,000 maintenance holes and 2 lift stations
- 221 miles of storm drains
- 620 Vehicles and equipment
- 200 Small and off-road equipment

Utilities Top 3 Themes

Aging Infrastructure



Affordability



2024 RATES AND FEES WATER, SEWER AND STORMWATER

Effective January 1, 2024

IN-CITY RESIDENTIAL USER

BI-MONTHLY WATER RATES

TIER RATES

0-30,000 GALLONS
PLUS 13,000 GALLONS FOR EACH ADDITIONAL UNIT

\$5.63 per 1,000 Gallons

30,001-60,000 GALLONS
PLUS 26,000 GALLONS FOR EACH ADDITIONAL UNIT

\$7.04 per 1,000 Gallons

60,001-90,000 GALLONS
PLUS 39,000 GALLONS FOR EACH ADDITIONAL UNIT

\$8.47 per 1,000 Gallons

ALL ABOVE 90,000 GALLONS

\$11.28 per 1,000 Gallons

BI-MONTHLY SERVICE CHARGES

NUMBER OF UNITS SERVICE CHARGE

Single Family Meter

\$17.83

2-6 Units

\$27.99

7-18 Units

\$48.93

19-60 Units

\$66.41

61-144 Units

\$150.30

Over 144 Units

\$255.16

8,000 GALLONS
AVERAGE SINGLE FAMILY HOUSEHOLD BI-MONTHLY WATER USAGE BASED ON WINTER TIME USAGE

SEWER CHARGES

Service charge

\$0.44

Usage, per 1,000 Gallons
BASED ON WINTER TIME USAGE
Rate: \$6.52

STORMWATER RATES

\$0.0033 per square feet of impervious area located on property per bi-monthly billing.

Development Pressures



CITY OF
ARVADA

A group of four men, members of the ARCADIA team, are standing under a blue canopy. From left to right: a man in a dark blue ARCADIA t-shirt and sunglasses holding a red valve; a man in a tan jacket with the ARCADIA logo and sunglasses; a man in a plaid shirt; and a man in a grey hoodie and a baseball cap with sunglasses. In the foreground, there is a red valve and a blue bucket. An inset image in the bottom left corner shows a close-up of a large industrial valve.



20230430_Water financial plan_2052 CG ED15202

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Clipboard Font Alignment

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	A	B	C	D	E	F
			Actuals 2021	Actuals 2022	Budget 2023	Projected 2024
7						
8						
9		Description				
10		Operating and Maintenance Expenses	\$25,902,193	\$24,494,907	\$30,002,615	\$31,022,276
11		Annual Debt Service - Outstanding Debt	0	0	2,723,396	2,874,550
12		Annual Debt Service - Projected Issues	0	0	0	0
13		Capital Projects	14,903,603	29,562,774	91,656,742	68,084,175
14		Bond Issuance Costs	0	0	0	0
15		Payment to Development Fund Debt Prepayment	0	0	0	0
16		Change in Fund Balance	(10,452,147)	43,111,710	(71,845,701)	(43,604,181)
17						
18		Total Revenue Requirement	\$30,353,649	\$97,169,391	\$52,637,062	\$58,376,820
19						
20		Other Revenues	934,320	2,145,748	1,839,872	1,983,307
21		Development Revenues	4,273,115	8,652,843	10,409,560	13,485,240
22		Debt Proceeds	0	50,000,000	0	0
23		Other Development Revenues	757,393	6,315,858	6,500,000	6,000,000
24						
25		Interest Earnings	(598,336)	905,966	848,449	468,646
26						
27		Total Non-Rate Related Revenue/Income	\$5,367,092	\$68,020,415	\$19,597,881	\$21,937,153
28						
29		Required User Charge Revenue	\$24,986,557	\$29,148,976	\$32,939,171	\$36,439,627
30						
31		User Charges at Present Rate	\$24,986,557	\$29,148,976	\$32,939,171	\$33,171,849
32						
33						

Ready Accessibility: Investigate

General Assumptions Re Assumptions Existing Rev Assump

Infrastructure Key Takeaways

- For Infrastructure, **financial resiliency means the ability to afford the resources required to support defined levels of services** for internal and external stakeholders.
- In the next 5 years, operational expenditures are expected to increase. Many of the factors that will govern those expenses are **outside our control, including inflation and interest rates.**
- In order to be sustainable, we will continue to wrestle with the competing priorities of aging infrastructure and planned development. **Being financially resilient will require the courage to continue to advance and champion tough decisions on raising revenue.**
- **Without raising new revenue, including rates, fees, system development charges, and issuing debt in the next 5 years, the City of Arvada will not be able to ensure long-term sustainable and reliable infrastructure services.**

Safe Community

Police Department and Municipal Courts

Police Department Overview

2024 Funding: \$48,544,932	2024 FTE: 257
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The purpose of the Arvada Police Department (APD) is to ensure Arvada is a safe place to live, work, play, and stay.

- APD is authorized 190 sworn officers for a metropolitan city of approximately 125,000 residents. Additionally, APD has another 63 professional staff employees, including Records, Police Service Technicians, Neighborhood Services, Evidence, and Administration Bureau employees.
- APD utilizes a sector-based policing model which deploys from a central headquarters and three community stations. This model allows the APD to better provide community policing strategies in the natural neighborhoods that exist in the community.

Police Department Service Delivery

- Sworn Staff
- Neighborhood Services Team: Code Enforcement and Animal Management.
- Police Operations Bureau



Police Department Top 3 Themes

- Recruiting and Retention
- Service Delivery
- Homelessness

Police Department Top 3 Gaps

- Service Delivery
- Evidence Storage
- Leadership Succession / Experience

Police Department Key Takeaways

- Staffing is the most significant issue that APD is facing. It will take roughly five years to get back to full staffing given current vacancies.
- The need for an evidence facility is dire. We have more pieces of evidence than we've ever had before, storage conditions are not ideal for preserving vital pieces of evidence, plus the increase in homelessness drives up the items we must store in our very limited space.
- Budget shortfalls at the State and County level are being passed down to us due to our numerous partnerships (Jeffcom, JCRCL, JAC, Jeffco Jail, JCMH/Detox, etc.).

Municipal Courts Overview

2024 Funding: \$1,552,987	2024 FTE: 13
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- Provides a forum for community members to litigate their municipal ordinance violations. The goal of the Municipal Court is to hold citizens accountable for violations of the Arvada City Code while also providing services and resources to enable defendants to make better choices moving forward.
- Supports the Safe Community objective of ensuring that Arvada is a safe place to live, work, play and stay.

Municipal Courts Service Delivery

- Court dockets (5774 cases total)
- Juvenile and adult violations (599 juvenile/ 5175 adult)
- Speciality court docket, the One Small Step Court (54 active participants currently)
- Probation services that supervise both Juvenile and Adult defendants who need additional assistance and supervision.
 - 234 PSI reports completed (219 juvenile/14 adult)
 - 42 Def's sentenced to probation (38 Juvenile/ 4 adults)
- Operational support of the judicial functions and community members



Municipal Courts Top 3 Themes

- Paperless Court
- Staff Retention
- One Small Step/Probation Services



Municipal Courts Top 3 Gaps

- Court Management Staffing
- Workforce plan
- Long term efficacy of Full Court software

Municipal Courts Key Takeaways

- The Paperless Court Project is the Court's largest project right now. The Court recently hired a 2 year Deputy Court Administrator to allow give the Court Administrator time and space to dedicate to moving the paperless court project forward. The Court additionally anticipates the addition of the 2nd Deputy Court Administrator will allow the court management team to work on projects such as data compilation, statistical analysis, budgeting, financial planning, reporting out, and software improvements.
- The Court will assess the long term efficacy of the Full Court software platform as a case management database
- The Court will also be focusing on improving our service delivery in the One Small Step docket as well as through probation services.

Vibrant Community and Neighborhoods

VCN Overview

2024 Funding: \$22,873,882

2024 FTE: 89

The purpose of the Vibrant Community and Neighborhoods Worksystem is to enhance quality of life and community health for the residents of Arvada through people, parks and programs. The VCN team includes the following services and programs:

- Parks Maintenance
- Parks and Urban Design
- Majestic View Nature Center
- Sustainability
- Athletic Field Programming
- Golf Courses
- Festivals
- Arts and Culture

VCN Service Delivery

The VCN team maintains over 5,500 acres of open space, parks and trails; manages 146 parks and 70 playgrounds; and maintains over 150 miles of trail.

- **Level of Service:**

- City of Arvada: 51 acres of parkland/1,000 residents
- National median level of service: 8.9 acres of parkland/1,000 residents

- **Level of Service:**

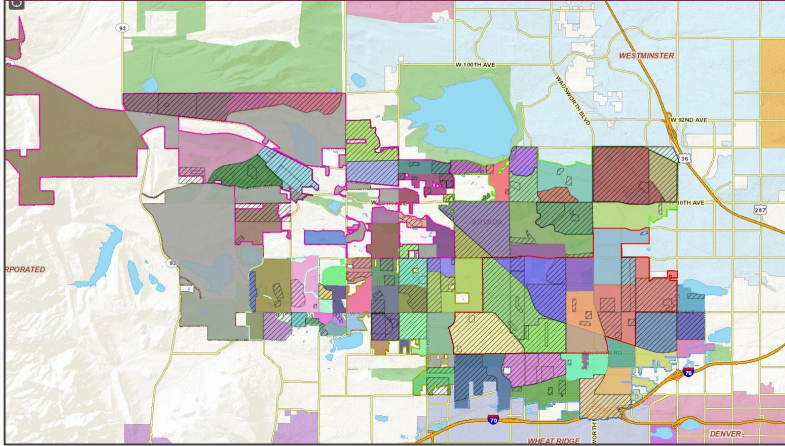
- 96% of Arvada residents live within a 10-minute walk of a park
- Denver = 92%; Westminster = 85%; Fort Collins = 73%; Lakewood = 88%
- Median City, all urban cities and towns in the US: 55%

- **Service Delivery:**

- Arvada Parks Maintenance = 5 FTE per 10,000 residents
- Median national FTE per 10,000 residents = 8 FTE per 10,000 residents

VCN Top 3 Themes

Impacts of Changing Demographics on Community Expectations and Needs



Addressing Deferred Maintenance Backlog



Evolving Maintenance Best Practices



VCN Top 3 Gaps

Impacts of a Changing Climate on Infrastructure and Operations



Volunteer Coordination



Sustainable Funding for Aging Infrastructure



VCN Key Takeaways

- Arvada residents are satisfied with and well-served by the city's parks, open space and trail network
- Inflation has impacted the cost of doing business
- Growth, changing environment necessitate new approaches to preserve and protect what Arvada residents value
- Demographic change will influence demand for city services, sales tax revenue, and the voice of the customer

Organizational and Service Effectiveness

City Attorney's Office, City Manager's Office, Human Resources, Finance, and Information Technology

City Attorney's Office Overview

2024 Funding: \$6,494,660	2024 FTE: 20
----------------------------------	---------------------

- Provide legal services and advice to City Council, all Boards and Commissions and all work systems in order to maintain compliance with local, state and federal law and to protect the legal interests of the City.
- Provide risk management services to the City for the purpose of avoiding, or mitigating risks, and promoting safety associated with City operations.

City Attorney's Office Service Delivery

Legal Services

- Legal advice and counsel
- Legal documents
(transactional / legislative)
- Litigation
- Prosecution
- Law office administration

Risk and Safety Services

- Program leadership and administration
- Risk and insurance services
- Claims management
- Safety program

City Attorney's Office Top 3 Themes

- Lack of control over Legal's work plan
- Technology and operational efficiency
- Claims cost increases

City Attorney's Office Top 3 Gaps

- Addressing backlog of work
- Response to social, economic, and political changes that impact City operations
- Prevention activities are underfunded

City Attorney's Office Key Takeaways

- Maintaining high quality legal and risk management services will require investment in people and tools over the next 5 years.
- In order to reduce claims and litigation and increase safety, we need to invest in more prevention measures.
- CAO's workload will continue to be somewhat unpredictable related to claims and litigation.

City Manager's Office Overview

2024 Funding: \$5,623,553	2024 FTE: 26
----------------------------------	---------------------

- Provides overall leadership, vision, direction, policy, guidance, and communication services to City Council, the organization, and the community.
- Provides services related to community outreach, emergency management, homelessness, neighborhood services, city administration, communications, including the Arvada Report, and follow-up on resident issues and concerns.

City Manager's Office Service Delivery

- Administrative Support and Customer Service
- City Council meetings and minutes
- City-Wide Communication Strategy
- Creative Design & Print Services
- Community Engagement
- Emergency Management
- Record Management and CORA Requests
- Liquor Licenses
- Organizational Leadership
- Special Projects: DEI, Legislative Agenda, Homelessness, CRM Management, Employee Recognition

City Manager's Office Top 3 Themes

- Financial Resilience
- Managing the influences, impacts and opportunities of Federal, State, and Regional initiatives
- Providing organization-wide vision, leadership, and direction

City Manager's Office Top 3 Gaps

- Customer Service:
 - CRM needs and expectations
 - Strategy for managing incoming phone calls
- Sustainable funding sources for various program needs: Homelessness, Print Shop, Volunteers, DEI
- Regional homelessness strategy

City Manager's Office Key Takeaways

- Customer Relations Management tool replacement in 2025 for enhanced customer service.
- Strategize sustainable funding sources to ensure long-term stability of communications and engagement functions.
- Anticipate and plan for external initiatives that could impact organizational strategy.

Human Resources Overview

2024 Funding: \$3,065,688	2024 FTE: 13
----------------------------------	---------------------

- Provides strategic partnership and workforce management and development services to all city departments so they can recruit, develop and retain the healthy, engaged and high performing workforce they need to achieve operational and strategic results.
- Fosters a top workplace environment that attracts and retains a highly engaged, inclusive workforce and promotes a culture of wellness, safety, cycles of learning and performance excellence.

Human Resources Service Delivery

- Administration
- Office of the Director/HR Strategy and Policy
- Organizational Development
- Employee Relations and Performance
- Compensation, Benefits and Wellness
- Recruitment and Onboarding

2023 Highlights

- Nearly 1000 employees supported
- 264 recruitments
- Multiple Personnel Rules and Policy Updates
- New Extended Care Leave
- 97% employee evaluations completed on time
- 95% jobs graded competitively with market
- Executive, Leadership and Emerging Leaders Training
- Project Nascar/Change management
- 0% health care renewal/health care enhancements

Human Resources Top 3 Themes

- Recruitment and retention
- Total Rewards
- Employee & Leadership Development
- Technology

Human Resources Top 3 Gaps

- Team Capacity/Employment Legislation
- ERP (Workday Implementation)
- Resources/staffing

Human Resources Key Takeaways

- Strong team- skilled, engaged and motivated professionals, dedicated to delivering superior services to a diverse workforce and maintaining an employer of choice work environment.
- Additional staffing/ resources needed in the next 5 years to support
 - Transition from legacy technology system to new ERP system, change management and process improvement
 - Increasingly challenging and complex employment legislation and administration of policies, programs and services necessary for compliance
 - Innovative solutions to support recruitment, development and retention of a high performing workforce under challenging and competitive employment conditions.

Finance Overview

2024 Funding: \$42,891,342	2024 FTE: 31
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- Provide strategic partnerships, revenue and financial management and procurement services to City Council, Departments and the Community so they can make informed decisions, achieve desired results and thrive in a financially stable City.
- Provides a well-managed, fiscally responsible government that operates effectively and efficiently while identifying revenue requirements to sustain current service levels and achieve future requested levels of service.

Finance Service Delivery

- Administrative Support
- Fund Administration
- ARPA
- Revenue
- Financial & Economic Strategies
- Payments
- Specialized Accounting
- Financial Analysis & Reporting
- Purchasing

Finance Top 3 Themes

- Technology improvements/enhancements
- Staff growth and development
- What will Finance look like in 5-10 years (AI, digital currency, tax base)

Finance Top 3 Gaps

- Staffing Levels (procurement, grants, budget)
- ERP implementation (backfill, training)
- Department knowledge (28 position changes in last 18 months)

Finance Key Takeaways

- ERP implementation in 2024 and 2025
- Additional grant opportunities are available. Focused efforts will be critical to the success of the grant applications. Depending on the reporting requirements, staffing resources will need to be added to support the grants.
- Cross training and department wide expertise will need to be expanded in the upcoming years.

Information Technology (IT) Overview

2024 Funding: \$15,755,709	2024 FTE: 45
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- Provides critical core services to all City departments, including managing all computer and software assets across the City with nearly 1100 computers and 3300 software titles used daily.
- Implements, manages, and supports the digital work delivered across the City.

Information Technology Service Delivery

- A robust technology infrastructure including nearly 250 networking devices, more than 200 servers, and nearly 850 desk phones
- The Service Desk supporting all City users (handling more than 500 tickets per month)
- More than 600 public safety radios and dedicated radio infrastructure (servers/radio towers)
- An application portfolio including nearly 80 specialized and general business enterprise applications with more than 100 integrations between systems
- Nearly 1200 mobile devices (phones/tablets)
- Data and Analytics services
- GIS services
- Cybersecurity services

Information Technology Top 3 Themes

- Digital transformation/modernizing legacy systems
- Cybersecurity and Data Privacy
- Upskilling and talent development

Information Technology Top 3 Gaps

- Cybersecurity and Data Privacy
- Team capacity
- Resilience and disaster recovery

Information Technology Key Takeaways

- **Good:** Over the past couple years, we have reshaped the IT function within the City and have very good momentum on a number of fronts.
- **Challenge:** Predicting the future in technology is always a challenge. Over the next few years, one of the big things we are trying to keep an eye on is the use of Quantum computing by bad actors. The impact we could see over the next few years could be dramatic.
- **Opportunity:** Demands for new technology are increasing across the City. As our numerous applications/systems become more integrated and complex, we are actively working on upskilling in new areas to better meet the new demands.

Success

- **KNOW:** We have a strategic result. We performed a 5 x 5 analysis. This yielded information about gaps. These gaps inform how we decide to budget funds and raise revenue. The 5X5 also pointed out things we are doing well. There will be trade-offs. Council has a specific and important role in budgeting.
- **FEEL:** We are a cohesive team for the city. We listened to community input. You can trust that our decisions and recommendations are sound and in the best interest of the city.
- **DO:** Learn about financial resilience concepts and current system gaps so you can provide informed direction on priorities and strategy at the February 9 strategic planning retreat. Be curious about what you don't know.

What's Next

- Budget and Fiscal Policy Workshop - January 22
- City Council Strategic Planning Retreat - February 9
- Revenue Requirements Analysis
- 2025-2026 Budget Cycle

Thank you.



REPORT TO CITY COUNCIL WORKSHOP

AGENDA ITEM
11.B.

TO: THE HONORABLE CITY COUNCIL

DATE: January 22, 2024

SUBJECT: City Council Policy - Arvada Budget & Fiscal Policy

Report in Brief

PRESENTER: Bryan Archer, Finance Director

City Council Policy 300.4, Arvada Fiscal and Budget Policy, was adopted by the City Council on March 2, 2015. Policy updates are being recommended to align with new language, to gain efficiencies in practices and to ensure a clear direction and focus on the City's budget and fiscal policy for years to come. The City will present recommended updates to the policy during this workshop.

Background

City Council Policy 300.4 titled "Arvada Budget and Fiscal Policy" was created by City Council and City staff in 2015 to support efforts to achieve and maintain service excellence by using data, measuring results, and being responsive to our community.

In 2015, the policy's purpose was to guide City budget and financial management decisions based on strategic planning, performance measures, long-term financial stability, delivery of basic City services and protection of past and future investments in the City's infrastructure and facilities. This purpose remains, and with staff recommended enhancements, it will continue to provide foundational guidance and structure. It has been almost nine years since this policy was adopted, and it is time to review the language and ensure the overall scope and intent of the policy is in alignment with current and future best practices.

The contents of the policy include procedural guidance in the following areas:

- Alignment to City Council Strategic Plan
- Integration of Strategic Plan with City Operations
- Performance Based Budgeting
- Preparation of Biennial Operating and Capital Budgets
- 10-year financial plans for Major City Funds
- 10-year Capital Improvement Plan
- City Council Annual Review of Strategic Results

The City team has reviewed each of these areas and will provide recommended changes for City Council consideration and approval.

Strategic Alignment

The updates to this policy are needed in order to ensure alignment with current and future City Council Strategic Planning procedures.

Next Steps

The City team will take City Council's feedback on the recommended updates and will follow the direction of City Council to update the policy accordingly. The updated policy will then be approved via resolution at an upcoming City Council meeting in early 2024.

Prepared by:

Bryan Archer, Director of Finance

Reviewed by:

Approved by:

Elizabeth Blythe, Strategic Planning and Performance Alignment Manager	1/9/2024
Don Wick, Deputy City Manager	1/10/2024
Linda Haley, Deputy City Manager	1/10/2024
Lorie Gillis, City Manager	1/11/2024

Enclosure, exhibits & attachments required to support the report



CITY OF ARVADA

CITY COUNCIL POLICY

Authorized by City Council: Resolution No. 15-038

Policy No. 300.4
Page 1 of 5

Original Effective date: March 2, 2015
Revision date: January 22, 2024

TITLE: Arvada Budget and Fiscal Policy

PURPOSE:

To establish a budget and fiscal policy that will support efforts to achieve and maintain service excellence by using data, measuring results, and being responsive to our community.

POLICY:

It is the policy of the City Council that the City's budget and financial management decisions are based on Council's strategic goals. The City will measure its performance against these goals, and will ensure long-term financial sustainability and resilience in the delivery of City services and future investments.

PROCEDURE:

Section 1 – City Council Strategic Plan

Every six years the City Council will conduct a comprehensive review of community needs in order to develop the City Council Strategic Plan. The City Council Strategic Plan will set the vision for the organization including priority strategic results. The City Council Strategic Plan will provide City leadership with the foundation for the alignment of service levels, operating principles, and employee performance.

Section 2 – Integration of Strategic Plan and City Operations

The Strategic Plan shall be the foundation for the allocation of resources for the City's Biennial Operating and Capital Budget. Each Strategic Result will be aligned with the work system and incorporated within that work system's performance measures. The integration of the Strategic Results and City services within the Biennial Operating and Capital Budget creates alignment between the City Council direction and the day-to-day operation of the City.

Section 3 – Performance-based Budgeting

Performance-based budgeting provides the framework for accomplishing the Council's Strategic Results and other key results identified by the departments. Each department will present its proposed budget in a consistent manner by utilizing the following elements:

- A. A summary of services, customer(s) and what the customer(s) will experience;
- B. An alignment to one or more Council Strategic Results, work system principles or other strategic plan elements;
- C. Programs that define levels of service and the cost as well as the FTE's required to provide the service levels, and what changes (up or down) would be necessary to continue to deliver the program.
- D. Known future challenges and opportunities should also be identified.

This Performance-based budgeting framework links the allocation of resources to the services offered to customers, what the customers will experience, and performance measures that determine success.

Section 4 – Preparation of Biennial Operating and Capital Budgets

Performance-based budgeting will be used to develop and present each Biennial Operating and Capital Budget for consideration by the City Council. Each Biennial Operating and Capital budget is presented in late August and Council approval must be completed by October 31 of the even-numbered year prior to the odd-numbered year the budget is implemented. Council approval authorizes expenditure authority for only one year. Staff must develop and present an updated budget for the second year which Council will consider and approve in the same manner in order to authorize expenditures for the second year of the Biennial Operating and Capital Budget.

Budget Directives:

Council directs the City Manager to require that 50% of all excess revenues (year-end actual General Fund revenues over budgeted revenues) be appropriated to the street infrastructure as a supplemental budget appropriation in the first quarter of the subsequent year.

Section 5 – Ten-Year Financial Plans for Major City Funds

Each year staff will develop and present Ten-Year Financial Plans for each of the City's major funds. The Ten-Year Plans allow expenditures and revenues to be evaluated over a longer framework in order to improve understanding of revenue and expenditure impacts. The Finance Department will work with internal stakeholders to develop revenue and expenditure forecasts for each fund over the ten-year planning horizon. The Ten-Year Plans are submitted with each Biennial Operating and Capital Budget and updated as part of the budget process described in Section 4.

In association with each Ten-Year Plan, it is important to establish adequate reserves that will ensure financial stability and the capacity for the City to deliver essential local government services. Therefore, a

minimum level of reserves is established for each fund. A fund is considered balanced if the minimum level of reserves is met at the end of the ten-year planning horizon. The following minimum reserve levels stated as a percentage of annual expenditures are established for each fund:

General Fund	
General Fund	17%
Special Revenue Funds	
Parks	11%
Police Tax .21	11%
Police Tax .25	11%
Enterprise Funds	
Water	25%
Wastewater	25%
Storm Water	25%
Solid Waste	25%
Golf	11%
Internal Service Funds	
Arvada Medical	Set by Actuary
Insurance Services	Set by Actuary
Computers	Varies
Print Shop	11%
Vehicles	Varies
Buildings	Varies

The minimum reserve fund levels for funds which cover a broad range of services and are typically used to fund capital projects and debt service require higher reserves. Therefore, the General, Water, Wastewater, Storm Water and Solid Waste Funds have reserve levels established at 17% - 25% of annual expenditures.

The minimum reserve levels for funds that support more limited activities and are not typically used to fund capital projects can be operated effectively with lower reserve levels. Therefore, the Parks, Golf,

Police Tax .21, Police Tax .25 and Print Shop Funds have reserve levels established at 11% of annual expenditures.

The Medical and Insurance Services Funds have reserve levels that vary based on the annual actuarial projection.

The Computers, Vehicles, and Buildings Funds are replacement funds that will carry varying balances throughout the assets' lifecycles. The goal is to set aside funds so that when the asset needs to be replaced, sufficient funds are available.

Section 6 – Ten-Year Capital Improvement Plan (CIP)

Each Biennial Operating and Capital budget will include a Ten-Year Capital Improvement Plan that identifies projects, funding sources, inflationary assumptions and any associated operating costs. The Ten-Year CIP also facilitates the allocation of all resources to complete capital projects identified in the Strategic Plan. In addition, the Ten-Year CIP will be based on community engagement and must be consistent with other long-term planning efforts, such as the City's Comprehensive Plan.

Section 7 – Council Annual Review of Strategic Results

The City Manager will transmit the annual report to the City Council ahead of the Council's annual performance evaluation of the City Manager. Within the first quarter of each year, the City Manager will present a status report on each of the Strategic Results within the Strategic Plan. This status report will be presented during a public workshop or retreat in a manner that facilitates interaction and discussion between Council and staff. As determined by the Mayor and Council, community members may be invited to discuss the Strategic Results or Council may direct staff to conduct additional public meetings in order to encourage community discussion. The City Manager will utilize performance data in the review of the strategic results.

DEFINITIONS:

Biennial Operating and Capital Budget – The two-year budgeting process that allocates resources for operations and capital projects.

Budget Directives - Instructions provided by the City Council to the City Manager on how to prepare the proposed budget.

City Comprehensive Plan - The City's guiding policy document with respect to how the community should develop in the future which is used to review land use proposals.

City Council Strategic Plan – A planning document that establishes community priorities and Strategic Results scheduled for accomplishment during a six-year implementation horizon.

Performance-based budgeting- A process that aligns the City Council Strategic Plan with the allocation of resources to deliver the desired results.

Strategic Results – High-level strategic direction that Council has identified to guide the organization's priorities, resource allocation, and efforts across a six-year implementation horizon.

Ten-Year Financial Plans - Long-range financial models developed for all major city funds and submitted with each biennial operating and capital budget and updated annually.

Ten-Year Capital Improvement Plan (CIP) – A schedule of capital projects to be completed over the ten-year planning horizon that includes inflationary assumptions, projected operating costs and policy justification for each project that is submitted with each biennial budget and updated annually.

300.4 - Arvada Budget And Fiscal Policy

PURPOSE: To establish a consistent Budget and Fiscal Policy that will support efforts to achieve and maintain service excellence by building a data-driven, results-oriented, customer-focused and responsive organization.

POLICY: To guide City budget and financial management decisions based on strategic planning, performance measures, long-term financial stability, delivery of basic City services and protection of past and future investments in the City's infrastructure and facilities.

DEFINITIONS:

City Council Strategic Plan – A planning document that establishes community priorities and Strategic Results scheduled for accomplishment during a six-year implementation horizon.

Strategic Results – Specific actions that Council has identified to be accomplished during the six-year implementation horizon defined in measurable terms of “how much” and “by when”.

FOCUS Arvada – The performance based budgeting process that aligns the City Council Strategic Plan with the allocation of resources.

Biennial Operating and Capital Budget – The two-year budgeting process that allocates resources for operations and capital projects.

Ten-Year Financial Plans - Long range financial models developed for all major city funds and submitted with each biennial operating and capital budget and updated annually.

Ten-Year Capital Improvement Plan (CIP) – A schedule of capital projects to be completed over the ten-year planning horizon that includes inflationary assumptions, projected operating costs and policy justification for each project that is submitted with each biennial budget and updated annually.

City Comprehensive Plan - The City's guiding policy document with respect to how the community should develop in the future which is used to review land use proposals over a 5 - 7 year period.

PROCEDURE:

Section 1 – City Council Strategic Plan

Every six years the City Council will conduct a comprehensive review of community needs in order to develop the City Council Strategic Plan. The Strategic Plan will identify Strategic Results which will be accomplished over a six-year implementation horizon.

Section 2 – Integration of Strategic Plan and City Operations

The Strategic Plan shall be the foundation for the allocation of resources for the City's Biennial Operating and Capital Budget. Each Strategic Result will be assigned to at least one department and incorporated within that department's performance measures. The integration of the Strategic Results within the Biennial Operating and Capital Budget is the “Golden Thread” that connects specific City Council direction with the day to day operation of the City.

Section 3 – FOCUS Arvada

FOCUS Arvada provides the framework for accomplishing the Council Strategic Results and other key results identified by the departments through the performance budgeting process. Each department presents their proposed budget in a consistent manner by utilizing the following elements: a) A Mission Statement that summarizes services, identifies the customer(s) and describes what the customer(s) will experience; b) Issue Statements that describe the impacts of the services; c) Department Strategic Results that align to or may include one or more Council Strategic Results; c) Lines of Business that more specifically define services, customers and experiences associated with a set of inter-related Programs; and d) Programs with Purpose Statements that define individual services and performance measures stated as results, outputs, demands and efficiencies.

This framework links the allocation of resources to the services offered to customers, what the customers will experience and performance measures that determine success.

Section 4 – Preparation of Biennial Operating and Capital Budgets

FOCUS Arvada will be used to develop and present each Biennial Operating and Capital Budget for consideration by the City Council. Each Biennial Operating and Capital budget is presented in late August and Council approval must be completed by October 31 of the even numbered year prior to the odd numbered year the budget is implemented. Council approval authorizes expenditure authority for only one year. Staff must develop and present an updated budget for the second year which Council will consider and approve in the same manner in order to authorize expenditures for the second year of the Biennial Operating and Capital Budget.

Section 5 – Ten-Year Plans for Major City Funds

Each year staff will develop and present Ten-Year Financial Plans for each of the City’s major funds. The Ten-Year Plans allow expenditures and revenues to be evaluated over a longer framework in order to improve understanding of revenue and expenditure impacts. The Finance Department will work with internal stakeholders to develop revenue and expenditure forecasts for each fund over the ten year planning horizon. The Ten-Year Plans are submitted with each Biennial Operating and Capital Budget and updated as part of the second year budget process described in Section 4.

In association with each Ten-Year Plan, it is important to establish adequate reserves that will ensure financial stability and the capacity for the City to deliver essential local government services. Therefore, a minimum level of reserves is established for each fund. A fund is considered balanced if the minimum level of reserves is maintained through each year of the ten-year planning horizon. The following minimum reserve levels stated as a percentage of annual expenditures are established for each fund:

General Fund	17%
Arvada Center	11%
Parks	11%
Police Tax .21	11%
Police Tax .25	11%
Water	25%
Waste Water	25%
Golf	11%
Storm Water	25%

Hospitality	11%
Arvada Medical	Set by Actuary
Insurance Services	Set by Actuary
Computers	Varies
Print Shop	11%
Vehicles	Varies
Buildings	Varies

The minimum reserve fund levels for funds which cover a broad range of services and are typically used to fund capital projects and debt service require higher reserves. Therefore, the General, Water, Waste Water and Storm Water Funds have reserve levels established at 17% - 25% of annual expenditures.

The minimum reserve levels for funds that support more limited activities and are not typically used to fund capital projects can be operated effectively with lower reserve levels. Therefore, the Arvada Center, Parks, Police Tax .21, Police Tax .25, Golf, Hospitality and Print Shop Funds have reserve levels established at 11% of annual expenditures.

The Medical and Insurance Services Funds have reserve levels that vary based on the annual actuarial projection.

The Computers, Vehicles and Buildings Funds are replacement funds that will carry varying balances through the assets lifecycles.

Section 6 – Ten-Year Capital Improvement Plan (CIP)

Each Biennial Operating and Capital budget will include a Ten-Year Capital Improvement Plan that identifies projects, funding sources, inflationary assumptions and any associated operating costs.

The Ten-Year CIP also facilitates the allocation of all resources to complete capital projects identified in the Strategic Plan. In addition, the Ten-Year CIP must be consistent with other long-term planning efforts, such as the City’s Comprehensive Plan. The Ten-Year CIP will be updated each year as part of the second year budget process described in Section 4.

Section 7 – Council Review of Strategic Results

Within the first quarter of each year, the City Manager will present a status report on each of the Strategic Results within the Strategic Plan. This status report will be presented during a public workshop or retreat in a manner that facilitates interaction and discussion between Council and staff. As determined by the Mayor and Council, community members may be invited to discuss the Strategic Results or Council may direct staff to conduct additional public meetings in order to encourage community discussion.

The purpose of the Council review of the Strategic Results is to receive the update and discuss potential changes, additions and/or deletions to the Strategic Plan. Changes to the Strategic Plan will require Council consideration of a resolution during a regular Council business meeting. This process allows the Council to make changes to the Strategic Plan during the six-year implementation horizon.

Section 8 – Performance Data

Performance data will be evaluated by the City Manager, Deputy City Managers and Performance Budget Manager during quarterly performance review meetings. The purpose of the performance review meetings is

to evaluate progress of key performance measures, identify issues and concerns, celebrate successes, promote efficiencies, and determine “course corrections” as needed for programs and services.

Section 9 – Annual Report

All departments will submit an annual report to the City Manager or Deputy City Managers based on assigned reporting relationships. The schedule for submitting the annual reports will be announced in the first quarter of each year by the City Manager. The annual report will include the status of assigned Strategic Results and all other performance measures included within that department’s FOCUS Framework. This information will be summarized and included within the City Manager’s annual report to the City Council that is part of the process associated with the Council’s annual performance evaluation of the City Manager. Each department’s annual report will be reviewed in association with the annual evaluation process for the department head, managers and all employees.

HISTORY

Adopted by Res. [R15-038](#) on 3/2/2015

Adopted by Policy [300.4](#) 3/2/2105 version on 3/2/2015

2024 City Council Budget and Fiscal Policy

City Council Meeting, January 22, 2024

Overview of Presentation

- City Council Strategic Result, Financial Stewardship
- Last update was 2015
- Need Council Budget and Fiscal Policy to align to current best business practices

Section 1 – City Council Strategic Plan

- Updated language/terms
- Clarification and emphasis regarding *alignment of service levels, operating principles and employee performance*

Section 2 – Integration of Strategic Plan and City Operations

- Updated language around strategic plan alignment
- Integration between Strategic Results and City Services

Section 3 – FOCUS Arvada/Performance-based Budgeting

- Title - FOCUS Arvada to Performance-based Budgeting
- How budget will be prepared moving forward
 - Services and Customer experience
 - Alignment to Council Strategic Results, works system principles and strategic plan elements
 - Programs that define levels of service
 - Known future challenges & opportunities will be identified
- Links allocation of resources to services offered to customers, customers experience and performance measures that determine success

Section 4 - Preparation of Biennial Operating and Capital Budgets

- Minimal changes
- Budget Directives - Instructions provided by the City Council to the City Manager on how to prepare the proposed budget.
 - Streets infrastructure funding
 - Others?

Section 5 – Ten Year Financial Plans for Major City Funds

- Removal of Arvada Center, Hospitality
- Add Solid Waste
- Update Fund Balance Goals
 - Solid Waste – 25%

Section 6 – Ten-Year Capital Improvement Plan

- Removal of “update every other year”, “update now every year”
- No other changes

Section 7 – Council Review of Strategic Results

- Combine previous Section 8 and Section 9 into this section
- Clean up language to reflect current practices
 - Timing of annual report
 - Review of Strategic Results

Definitions

- Moved to back end of document
- Added “Budget Directives”

Next Steps

- Receive Council input
- Bring back policy for approval through Resolution

Thank you.



REPORT FROM CITY COUNCIL

AGENDA ITEM
13.A.

DATE: January 22, 2024

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

Lauren Simpson	Arvada City Attorney Committee Arvada Municipal Court/Judicial Committee Arvada Urban Renewal Authority Arvada Visitors Center Committee *Metro Mayors' Caucus Urban Drainage and Flood Control District West Connect Coalition E-470 Authority (Alternate) Olde Town Business Improvement (BID) (Alternate)
Shawna Ambrose	Adams County Regional Economic Partnership (ACREP) Arvada Audit Committee Bond Oversight Committee Jefferson County R-1 Schools Coordinating Committee Arvada Visitors Center Committee (Alternate)
Sharon Davis	Apex Coordinating Committee Arvada Municipal Court/Judicial Committee Arvada Parks Advisory Committee CML Policy Committee Jefferson Economic Development Council (JDEC) Denver Regional Council of Governments (DRCOG) (Alternate) E-470 Authority (Alternate) Jeffco Transportation Action & Advisory Group (JEFFTAAG) (Alternate) Jefferson County Community Corrections Board and West Connect Coalition (Alternate)

Lisa Feret	Arvada Chamber of Commerce Government Affairs Committee Arvada Fire Protection District Coordinating Committee Denver Regional Council of Governments (DRCOG) Housing Advisory Committee Jeffco Transportation Action & Advisory Group (JEFFTAAG) Jefferson County Community Corrections Board Smart City Advisory Committee Adams County Regional Economic Partnership (ACREP) (Alternate)
Bob Fifer	Apex Coordinating Committee Arvada City Attorney Committee Arvada Fire Protection District Coordinating Committee Arvada Transportation Committee Jefferson County R-1 Schools Coordinating Committee Jefferson Parkway Public Highway Authority Smart City Advisory Committee Northwest Parkway Authority (Alternate)
John Marriott	Arvada Economic Development Association Board Bond Oversight Committee Olde Town Business Improvement (BID) Rocky Mountain Metropolitan Airport Community Noise Roundtable
Randy Moorman	Arvada Audit Committee Arvada Center for the Arts and Humanities Arvada Sustainability Committee CML Policy Committee Jefferson Parkway Public Highway Authority The Rocky Flats Stewardship Council Northwest Parkway Authority (Alternate)

*asterisked committees are not appointed by Council



REPORT TO CITY COUNCIL

AGENDA ITEM
14.A.

TO: THE HONORABLE CITY COUNCIL

DATE: January 22, 2024

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 12/27/2023

Lorie Gillis, City Manager 1/11/2024

Enclosure, exhibits & attachments required to support the report

2024 CITY COUNCIL WORKSHOPS, STUDY SESSIONS, PRESENTATIONS AND RETREATS (TENTATIVE)

WORKSHOPS	Date	Lead
Fiscal Policy @Business meeting	Jan 22	Fin
Comp Plan and Land Use/Development Review	Jan 29	CED
Affordable Housing @Business meeting	Feb 5	
Overview of Emergency Management @Business meeting	Feb 5	CMO
Traffic Engineering @Business meeting	Feb 12	PW
Police Staffing @Business meeting	Mar 4	CMO
Traffic Calming @Business meeting	Mar 4	PW
Canceled	Mar 11	
DEI @Business Meeting	Mar 18	CMO
Quarterly Bond Projects Update	Mar 25	PW
Pavement Management @Business Meeting	Apr 1	PW
Utility Financial Strategy/Utility Master Planning	Apr 8	Utilities
Utilities Master Plan Implementation on Projects	Apr 8	Utilities
Strategic Plan	Apr 22	CMO
Sustainability @Business meeting The Arvada Sustainability Division will provide the City Council with an overview of division projects since the inception of the program in January 2023. The workshop will highlight achievements from 2023 and provide a vision for the future of Arvada Sustainability, with a focus on upcoming city-wide sustainability and climate action planning efforts.	Apr 22	VCN
Park Maintenance Standards	May 6	VCN
CDOT 101 CDOT will present "CDOT 101" to the Council. CDOT 101 is designed to provide a basic overview of CDOT, its responsibilities, and how CDOT works with local agencies.	May 13	
Waste Hauling Fees	May 13	Utilities
Quarterly Bond Projects Update	Jun 10	PW
	July 8	
Water, Wastewater & Stormwater 2025 Rates/Fees	July 22	Utilities
	Aug 12	
Water, Wastewater & Stormwater 2025 Rates/Fees	Aug 26	Utilities
Quarterly Bond Projects Updates	Sept 23	PW
Budget Workshop		
Final Water, Wastewater & Stormwater 2025 Rates/Fees	Sept 23	Utilities
Budget Workshop		
Transportation System Plan	Oct 14	PW
Updated ADA Transition Plan	Oct 28	PW
	Nov 11	
	Dec 9	
PRESENTATIONS		
STUDY SESSIONS		
BID and Chamber funding	TBD	
WORKSHOP TBD's		

Right of Way Acquisition @Business meeting	TBD	CED
Flood Plain Management	TBD	
Water Infrastructure for Fire Protection	TBD	Utilities
Smart Meters Update	TBD	Utilities
Capital Campaign Update and strategy discussion	TBD	CMO/Fin
Community Engagement	TBD	CMO
Fleet Electrification	TBD	Utilities
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
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
Problem Properties	TBD	P.D.
Activation of Historical Assets	TBD	VCN
Customer Service Philosophy	TBD	CMO
Ask Arvada Update	TBD	CMO
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		