CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

SNOWMAKING PIPE REPLACEMENT

Volume 1 of 2
Specifications

Jordanelle

Jordanelle Special Service District

For Information Regarding this Project Contact:
Brandon Ashcroft, P.E.
154 East 14075 South
Draper, Utah 84020
(801) 495-2224

BOWEN COLLINS & ASSOCIATES

December 2025

SNOWMAKING PIPE REPLACEMENT

CONSULTANT PROJECT NO.: 056-25-02

December 2025

OWNER
JORDANELLE SPECIAL SERVICE DISTRICT
5360 N HIGHWAY 40
HEBER CITY, UT 84032

ENGINEER

BOWEN COLLINS & ASSOCIATES

154 East 14075 South
Draper, Utah 84020

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ADVERTISEMENT FOR BIDS

Jordanelle Special Service District

Heber City, Utah

Snowmaking Pipe Replacement

GENERAL NOTICE

Jordanelle Special Service District (Owner) is requesting Bids for the construction of the following Project:

Snowmaking Pipe Replacement

Bids for the construction of the Project will be received at the JSSD office located at 5360 Old Hwy 40, Heber City, UT 84032 or via email to Dave Fuller at dave@jssd.us until Monday, January 12, 2026 at 2:00 pm local time. At that time the Bids received will be publicly opened and read.

The Project includes the following Work:

Project includes removing existing 36" steel casing, spray foam insulation, and 30" HDPE pipe across utility bridge spanning the Provo River and replacing with 24" restrained (TR Flex) ductile iron pipe, wrapped in wax tape, 5" thick Foamglas insulation, and a heavy duty protective UV resistant outerwrap.

Bids will be received for the following Contract: Snowmaking Pipe Replacement.

Project has an expected duration of 60 calendar days.

OBTAINING BIDDING DOCUMENTS

Information and Bidding Documents for the Project can be found at the following designated website:

https://utah.bonfirehub.com/portal/?tab=openOpportunities

Bidding Documents may be downloaded from the designated website. Prospective Bidders are urged to register with the designated website as a plan holder, even if Bidding Documents are obtained from a plan room or source other than the designated website in either electronic or paper format. The designated website will be updated periodically with addenda, lists of registered plan holders, reports, and other information relevant to submitting a Bid for the Project. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.

PRE-BID CONFERENCE

A virtual pre-bid conference for the Project will be held on Monday, December 22, 2025 at 11:00 am using the following link Snowmaking Pipe Replacement Pre-Bid Conference . Attendance at the pre-bid conference is highly encouraged but is not mandatory.

INSTRUCTIONS TO BIDDERS

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

THIS ADVERTISEMENT IS ISSUED BY:

Owner: Jordanelle Special Service District

By: Dave Fuller

Title: Assistant General Manager

Date: Tuesday, December 16, 2025

+ + END OF ADVERTISEMENT FOR BIDS + +

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INSTRUCTIONS TO BIDDERS

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ARTICLE 1 – DEFINED TERMS

1.01 *Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:*

A. Issuing Office—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2 – BIDDING DOCUMENTS

2.01 *Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.*

2.02 *Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.*

2.03 *Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidders may rely on that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.*

2.04 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions

to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Electronic Documents that are available in native file format include:

a. Base Map as a DWG file

2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 *Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:*

A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.

B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.

C. Bidder's state or other contractor license number, if applicable.

D. Subcontractor and Supplier qualification information.

E. Other required information regarding qualifications.

3.02 *A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.*

3.03 *No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.*

ARTICLE 4 – PRE-BID CONFERENCE

4.01 *A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to*

discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.

4.02 *Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.*

ARTICLE 5 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:

a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.

b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.

c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

a.

B. Underground Facilities: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding

the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

A. In addition to the documents regarding existing Site conditions referred to in Paragraph 5.02.A, the following other documents relating to conditions at or adjacent to the Site are known to Owner and made available to Bidders for reference. Owner will make copies of these other Site-related documents available to any Bidder on request.

1. Shop drawings of existing utility bridge

B. Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.

C. The other Site-related documents are not part of the Contract Documents.

D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.

5.04 *Site Visit and Testing by Bidders*

A. Contractor may visit the site on their own initiative to observe conditions generally.

5.05 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 *Other Work at the Site*

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6 – BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.01 *Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.*

7.02 *Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Owner via email. Contact information and submittal procedures for such questions are as follows:*

A. Dave Fuller – Assistant General Manager
Email: david@jssd.us

7.03 *Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.*

7.04 *Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.*

ARTICLE 8 – BID SECURITY

8.01 *A Bid must be accompanied by Bid security made payable to Owner in an amount of 10% percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.*

8.02 *The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.*

8.03 *The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the*

Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 *Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.*

ARTICLE 9 – CONTRACT TIMES

9.01 *The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.*

9.02 *Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.*

ARTICLE 10 – SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 *The Contract for the Work, as awarded, will be based on materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.*

10.02 *All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.*

ARTICLE 11 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.01 *A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.*

11.02 *The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work within five days after Bid opening:*

A. Ductile Iron Pipe

B. Wax Tape

C. Pipe Insulation

D. Protective Pipe Outerwrap

11.03 *If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or*

decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.04 *If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.*

ARTICLE 12 – PREPARATION OF BID

12.01 *The Bid Form is included with the Bidding Documents.*

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable".

12.02 *If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms*

which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 *A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.*

12.04 *A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.*

12.05 *A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.*

12.06 *A Bid by an individual must show the Bidder's name and official address.*

12.07 *A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.*

12.08 *All names must be printed in ink below the signatures.*

12.09 *The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.*

12.10 *Postal and e mail addresses and telephone number for communications regarding the Bid must be shown.*

12.11 *The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.*

12.12 *If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.*

ARTICLE 13 – BASIS OF BID

13.01 *Lump Sum*

A. Bidders must submit a Bid on a lump sum basis as set forth in the Bid Form.

ARTICLE 14 – SUBMITTAL OF BID

14.01 *The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.*

14.02 *A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with*

the notation "BID ENCLOSED". A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 *Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.*

ARTICLE 15 – MODIFICATION AND WITHDRAWAL OF BID

15.01 *An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.*

15.02 *If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.*

15.03 *If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.*

ARTICLE 16 – OPENING OF BIDS

16.01 *Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.*

ARTICLE 17 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 *All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.*

ARTICLE 18 – EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 *Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.*

18.02 *Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.*

18.03 *If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes*

of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 *If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.*

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

18.06 *In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.*

18.07 *Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.*

ARTICLE 19 – BONDS AND INSURANCE

19.01 *Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.*

19.02 *Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.*

ARTICLE 20 – SIGNING OF AGREEMENT

20.01 *When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.*

END OF SECTION

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BID FORM

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

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ARTICLE 1 – OWNER AND BIDDER

1.01 *This Bid is submitted to:*

Jordanelle Special Service District
5360 N. Old Hwy 40
Heber City, Utah 84032

1.02 *The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.*

ARTICLE 2 – ATTACHMENTS TO THIS BID

2.01 *The following documents are submitted with and made a condition of this Bid:*

A. Required Bid security.

B. List of Proposed Subcontractors.

C. List of Proposed Suppliers.

D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids.

E. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;

F. Required Bidder Qualification Statement with supporting data; and

ARTICLE 3 – BASIS OF BID – LUMP SUM BID AND UNIT PRICES

3.01 *Lump Sum Bids*

A. Bidder will complete the Work in accordance with the Contract Documents for the following lump sum (stipulated) price(s)::

1. Lump Sum Price (Single Lump Sum)

Lump Sum Bid Price	$

ARTICLE 4 – TIME OF COMPLETION

4.01 *Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.*

ARTICLE 5 – BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

A. Bidder accepts all the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6 – BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:

a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

5.

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____

(typed or printed name of organization)

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Address for giving notices:

_____

_____

Bidder's Contact:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

Bidder's Contractor License No.: (if applicable) _____

END OF SECTION

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SECTION 00 43 13
BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Bid**
Name: Jordanelle Special Service District	Project *(name and location)*:
Mailing address *(principal place of business)*:	Snowmaking Pipe Replacement
5360 Old Hwy 40	7130 Old Hwy 40
Heber City, UT 84032	Heber City, UT 84032
	Bid Due Date January 12, 2026
Bond	
Penal Sum:	
Date of Bond:	

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
(Full formal name of Bidder)	*(Full formal name of Surety) (corporate seal)*
By: _____	By: _____
(Signature)	*(Signature) (Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation will be null and void if:

   3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

   3.2 All Bids are rejected by Owner, or

   3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

END OF SECTION

SECTION 00 45 13
BIDDER'S QUALIFICATIONS

TABLE OF CONTENTS

ARTICLE 1 – GENERAL INFORMATION

1.01 *Provide contact information for the Business:*

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 *Provide information on the Business' organizational structure:*

Form of Business:	☐ Sole Proprietorship ☐ Partnership ☐ Corporation		
☐ Limited Liability Company ☐ Joint Venture comprised of the following companies:			
	1.		
	2.		
	3.		
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?	☐ Yes ☐ No ☐ Pending		

1.03 *Identify all businesses that own Business in whole or in part (25% or greater), or that are wholly or partly (25% or greater) owned by Business:*

Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			

1.04 *Provide information regarding the Business' officers, partners, and limits of authority.*

Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	

Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	

ARTICLE 2 – LICENSING

2.01 *Provide information regarding licensure for Business:*

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3 – DIVERSE BUSINESS CERTIFICATIONS

3.01 *Provide information regarding Business' diverse Business Certification, if any. Provide evidence of current certification.*

Certification	Certifying Agency	Certification Date
☐ Disadvantaged Business Enterprise		
☐ Minority Business Enterprise		
☐ Woman-Owned Business Enterprise		
☐ Small Business Enterprise		
☐ Disabled Business Enterprise		
☐ Veteran-Owned Business Enterprise		
☐ Service-Disabled Veteran-Owned Business		
☐ HUBZone Business (Historically Underutilized) Business		
☐ Other		
☐ None		

ARTICLE 4 – SAFETY

4.01 *Provide information regarding Business' safety organization and safety performance*

Name of Business's Safety Officer:		
Safety Certifications		
Certification Name	Issuing Agency	Expiration

4.02 *Provide Worker's Compensation Insurance Experience Modification Rate (EMR), Total Recordable Frequency Rate (TRFR) for incidents, and Total Number of Recorded Manhours (MH) for the last 3 years and the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Provide documentation of the EMR history for Business and Subcontractor(s).*

Year									
Company	EMR	TRFR	MH	EMR	TRFR	MH	EMR	TRFR	MH

ARTICLE 5 – FINANCIAL

5.01 *Provide information regarding the Business's financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.*

Financial Institution:		
Business address:		
Date of Business's most recent financial statement:		☐ Attached
Date of Business's most recent audited financial statement:		☐ Attached
Financial indicators from the most recent financial statement		
Contractor's Current Ratio (Current Assets ÷ Current Liabilities)		
Contractor's Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)		

ARTICLE 6 – SURETY INFORMATION

6.01 *Provide information regarding the surety company that will issue required bonds on behalf of the business, including but not limited to performance and payment bonds.*

Surety Name:		
Surety is a corporation organized and existing under the laws of the state of:		
Is surety authorized to provide surety bonds in the Project location?	☐ Yes ☐ No	
Is surety listed in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? ☐ Yes ☐ No		
Mailing Address (Principal place of business):		
Physical Address		

(Principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 7 – INSURANCE

7.01 *Provide information regarding Business' insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.*

Name of insurance provider, and type of policy (CLE, auto, etc.):			
Insurance Provider		Type of Policy (Coverage Provided)	
Are providers licensed or authorized to issue policies in the Project location?			☐ Yes ☐ No
Does provider have an A.M. Best Rating of A-VII or better?			☐ Yes ☐ No
Mailing Address (Principal place of business):			
Physical Address (Principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 8 – CONSTRUCTION EXPERIENCE

8.01 *Provide information that will identify the overall size and capacity of the Business.*

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

8.02 *Provide information regarding the Business's previous contracting experience.*

Years of experience with projects like the proposed project:				
As a general contractor:		As a joint venturer:		
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:				
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been barred from contracting by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been released from a bid in the past 5 years? ☐ Yes ☐ No				
Defaulted on a project or failed to complete any contract awarded to it? ☐ Yes ☐ No				

Refused to construct or refused to provide materials defined in the contract documents or in a change order? ☐ Yes ☐ No
Been a party to any currently pending litigation or arbitration? ☐ Yes ☐ No
Provide full details in a separate attachment if the response to any of these questions is Yes.

8.03 *List all projects currently under contract in Schedule A and provide indicated information.*

8.04 *List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business's experience with projects similar in type and cost of construction.*

8.05 *In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business's key leaders as well.*

ARTICLE 9 – REQUIRED ATTACHMENTS

9.01 *Provide the following information with the Statement of Qualifications:*

A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.

B. Diverse Business Certifications if required by Paragraph 3.01.

C. Certification of Business's safety performance if required by Paragraph 4.02.

D. Financial statements as required by Paragraph 5.01.

E. Attachments providing additional information as required by Paragraph 8.02.

F. Schedule A (Current Projects) as required by Paragraph 8.03.

G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.

H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.

I. Additional items as pertinent.

END OF SECTION

This Statement of Qualifications is offered by:

Business: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(date signed)

(If Business is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

Schedule A—Current Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

SECTION 00 45 30
E-VERIFY AGREEMENT AND AFFIDAVIT

By executing this affidavit, the undersigned Contractor verifies its compliance with Utah Code Ann. § 63G-12-302 and 13-47-201, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of services on behalf of Owner has registered with, and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in Utah Code Ann. § 63G-12-302 and 13-47-201.

Contractor agrees that it will continue to use the federal work authorization program throughout the Contract period, and should it employ or contract with any Subcontractor(s) in connection with the physical performance of services pursuant to this Agreement with Owner, Contractor will secure from each such Subcontractor(s) similar verification of compliance with Utah Code Ann. § 63G-12-302 and 13-47-201 using a similar affidavit.

Contractor agrees to maintain records of such compliance and provide a copy of each verification to Owner within five days of the time that Subcontractor is retained to perform such services.

Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Bidder/Contractor	**Owner/Public Entity**
Name:	Name: Jordanelle Special Service District
Federal User ID Number:	Address *(principal place of business)*:
Date of Authorization:	5360 Old Hwy 40 Heber City, UT 84032
Address *(principal place of business)*:	

I hereby declare under penalty of perjury that the foregoing is true and correct. Executed on the _____ day of _____, 20___.

Bidder/Contractor as Principal	Notary Public
_____	Subscribed and sworn before me on this _____ day of _____, 20___.
(Full formal name of Contractor)	
_____	
(Signature)	
Name: _____	_____
(Printed or typed)	*(Notary Signature & Seal)*
Title: _____	My Commission Expires _____
	(date)

END OF SECTION

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SECTION 00 51 00
NOTICE OF AWARD

Date of Issuance:	[Pick Date]		
Owner:	Jordanelle Special Service District	Owner's Contract No.:	
Engineer:	Bowen Collins & Associates	Engineer's Project No.:	
Project:	Snowmaking Pipe Replacement	Contract Name:	
Bidder:			
Bidder's Address:			

You are notified that Owner has accepted your Bid dated [_____] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

[_____].

[Describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is: $ [_____] *[note if subject to unit prices, or cost-plus]*

[_____] unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically. *[Revise if multiple copies accompany the Notice of Award]*

☐ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner [_____] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security (e.g., performance and payment bonds) and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): Describe other conditions that require Successful Bidder's complaince.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner**:**

By: _____

Authorized Signature

Name (printed): _____

Title: _____

Copy: Engineer

END OF SECTION

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SECTION 00 52 13
AGREEMENT

TABLE OF CONTENTS

This agreement is by and between Jordanelle Special Service District ("Owner") and [Specify formal name of Contractor] ("Contractor"). Owner and Contractor hereby agree as follows:

ARTICLE 1 – THE WORK

1.01 *Work*

A. Work includes all labor, materials, equipment, services, and documentation necessary to construct the Project defined herein. The Work may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

B. The Contractor shall complete all Work as specified or indicated in the Contract Documents. The Project is generally described as follows:

1. Snowmaking Pipe Replacement which consists of removing existing 36" steel casing, spray foam insulation, and 30" HDPE pipe across utility bridge spanning the Provo River and replacing with 24" restrained (TR Flex) ductile iron pipe, wrapped in wax tape, 5" thick Foamglas insulation, and a heavy duty protective UV resistant outerwrap..

2. The Site of the Work includes property, easements, and designated work areas described in greater detail in the Contract Documents but generally located immediately south of Jordanelle Dam at the north end of Old Hwy 40, where the utility bridge crosses the Provo River.

ARTICLE 2 – CONTRACT DOCUMENTS

2.01 *Intent of Contract Documents*

A. It is the intent of the Contract Documents to describe a functionally complete Project. The Contract Documents do not indicate or describe all the Work required to complete the Project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with Owner and Engineer. This Contract constitutes the entire agreement between Owner and Contractor, and supersedes prior negotiations, representations, and agreements, whether written or oral. The Contract Documents are complementary; what is required by one part of the Contract Documents is as binding as if required by other parts of the Contract Documents.

B. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work under the Contract Documents. During the performance of the Work and until final payment, Contractor and Owner shall submit to Engineer all matters in question concerning the requirements of the Contract Documents or relating to the acceptability of the Work. Engineer will render a written clarification, interpretation, or decision on the issue submitted, or initiate a modification to the Contract Documents.

C. Contractor, and its subcontractors and suppliers, shall not have or acquire any title to or ownership rights to any of the Drawings, Specifications, or other documents (including copies or electronic media versions) prepared by Engineer or its consultants.

D. Contract Price or Contract Times: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

E. Nothing in the Contract Documents creates any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity.

2.02 *Contract Documents Defined*

A. The Contract Documents consist of the following documents:

1. This Contract for Construction of a Small Project.
2. Performance bond.
3. Payment bond.
4. Specifications as listed in the Specifications Table of Contents.
5. Drawings as listed on the Index of Drawings.
6. Addenda.
7. The following which may be delivered or issued on or after the Effective Date of the Contract:

a. Notice to Proceed (EJCDC® C-550).

b. Work Change Directives (EJCDC® C-940).

c. Change Orders (EJCDC® C-941).

d. Field Orders (EJCDC® C-942)

ARTICLE 3 – ENGINEER

3.01 *Engineer*

A. The Engineer for this Project is Bowen Collins and Associates.

ARTICLE 4 – CONTRACT TIMES

4.01 *Contract Times*

A. The Work will be substantially complete on or before April 30, 2026 and completed and ready for final payment on or before May 14, 2026.

4.02 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence in the performance of the Contract, and that Owner will incur damages if Contractor does not complete the Work according to the requirements of Paragraph 4.01. Because such damages would be difficult and costly to determine, Owner and Contractor agree that as liquidated damages for delay in completion (but not as a penalty) Contractor shall pay Owner $ 1,000 for each day that expires after the Contract Time for substantial completion.

4.03 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times or Contract Price.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor or its subcontractors or suppliers.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times.

D. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor or Contractor's subcontractors or suppliers.

4.04 *Progress Schedules*

A. Contractor shall develop a progress schedule and submit it to Engineer for review and comment before starting Work on the Site. Contractor shall modify the schedule in accordance with Engineer's comments.

B. Contractor shall update and submit the progress schedule to Engineer each month. Owner may withhold payment if Contractor fails to submit the schedule.

ARTICLE 5 – CONTRACT PRICE

5.01 *Payment*

A. Owner shall pay Contractor, in accordance with the Contract Documents, the lump sum amount of $ [Enter $ value] for all Work.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Bonds*

A. When Contractor delivers the signed counterparts of the Contract to Owner, Contractor shall also deliver the performance bond and payment bond to Owner. Each bond must be in an amount equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds must remain in effect until the completion of the correction period specified in Paragraph 7.12 but, in any case, not less than one year after the date when final payment becomes due.

B. Upon request, Owner will provide a copy of the payment bond to any person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work.

6.02 *Insurance*

A. When Contractor delivers the signed counterparts of the Contract to Owner, Contractor shall furnish certificates, endorsements, and any other evidence of insurance requested by Owner. Insurance is to be provided by companies that are duly licensed or authorized in the jurisdiction in which the Project is located with a minimum A.M. Best rating of A-VII or better. Contractor shall provide insurance in accordance with the following:

1. Contractor shall provide coverage for not less than the following amounts, or greater where required by Laws and Regulations:

a. Workers' Compensation and Employer's Liability

Workers' Compensation	Statutory
Employer's Liability	
Each Accident	$ 1,000,000
Each Employee	$ 1,000,000
Policy Limit	$ 1,000,000

b. Commercial General Liability

General Aggregate	$ 2,000,000
Products - Completed Operations Aggregate	$ 2,000,000
Personal and Advertising Injury	$ 1,000,000
Bodily Injury and Property Damage—Each Occurrence	$ 1,000,000

c. Automobile Liability

Combined Single Limit (Bodily Injury and Property Damage)	$ 1,000,000

d. Excess or Umbrella Liability

Per Occurrence	$ 4,000,000
General Aggregate	$ 4,000,000

e. Contractor's Pollution Liability

Each Occurrence/Claim	$ 2,000,000
General Aggregate	$ 2,000,000

B. All insurance policies required to be purchased and maintained will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days after notice has been received by the purchasing policyholder. Within three days of receipt of any such notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

C. Automobile liability insurance provided by Contractor will be written on an occurrence basis and provide coverage against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle.

D. Contractor's commercial general liability policy will be written on a 1996 or later ISO commercial general liability occurrence form and include the following coverages and endorsements:

1. Products and completed operations coverage maintained for three years after final payment;
2. Blanket contractual liability coverage to the extent permitted by law;
3. Broad form property damage coverage; and
4. Severability of interest; underground, explosion, and collapse coverage; personal injury coverage.

E. The Contractor's commercial general liability and automobile liability, umbrella or excess, and pollution liability policies will include and list Owner and Engineer and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each as additional insureds; and the insurance afforded to these additional insureds will provide primary coverage for all claims covered thereby (including, as applicable, those arising from both ongoing and completed operations) on a non-contributory basis.

1. Additional insured endorsements will include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

2. Contractor shall provide ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent for design professional additional insureds.

F. Umbrella or excess liability insurance will be written over the underlying employer's liability, commercial general liability, and automobile liability insurance. The coverage afforded must be at least as broad as that of each and every one of the underlying policies. Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy.

G. The Contractor shall provide property insurance covering physical loss or damage during construction to structures, materials, fixtures, and equipment, including those materials, fixtures, or equipment in storage or transit.

H. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 15.

I. Workers' Compensation - No owner or officer that is excluded on any contractor or subcontractors workers' compensation policies may work on district premises or district projects.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without notice to and approval by the Owner and Engineer except under extraordinary circumstances.

C. Contractor shall maintain good discipline and order at the Site.

D. Except as otherwise required for the safety or protection of the Work or persons or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday.

7.03 *Other Work at the Site*

A. In addition to and apart from the Work of the Contractor, other work may occur at or adjacent to the Site. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

B. Contractor shall notify Owner, the owners of adjacent property, the owners of underground facilities and other utilities (if the identity of such owners is known to Contractor), and other contractors and utility owners performing work at or adjacent to the Site when Contractor knows that prosecution of the Work may affect them; and Contractor shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

7.04 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for everything necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work must be new and of good quality, and be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise may be provided in the Contract Documents.

7.05 *Subcontractors and Suppliers*

A. Just as Contractor is responsible for its own acts and omissions, Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of suppliers and subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work. Contractor's retention of a subcontractor or supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

7.06 *Licenses, Fees and Permits*

A. Contractor shall pay all license fees and royalties and assume all costs incident to performing the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others.

B. Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy, unless otherwise provided in the Contract Documents.

7.07 *Laws and Regulations; Taxes*

A. Contractor shall give all notices required by, and shall comply with, all local, state, and federal laws and regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any laws or regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to laws or regulations, Contractor shall bear all resulting costs and losses, and to the fullest extent permitted by law Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all such claims, costs, losses, and damages.

C. Contractor shall pay all applicable sales, consumer, use, and other similar taxes.

7.08 *Record Documents*

A. Contractor shall maintain one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved shop drawings in a safe place at the Site. Contractor shall annotate them to show changes made during construction. Contractor shall deliver these record documents to Engineer upon completion of the Work.

7.09 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. All persons on the Site or who may be affected by the Work;

2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

D. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by Contractor, or anyone for whose acts the Contractor may be liable, will be remedied by Contractor at its expense (except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of Owner or Engineer and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor).

E. Contractor shall be responsible for coordinating any exchange of safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with laws or regulations.

F. In emergencies affecting the safety or protection of the Work or persons or property at the Site or adjacent thereto, Contractor shall act to prevent damage, injury, or loss. Contractor shall give Engineer prompt notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.10 *Submittals*

A. Contractor shall review and coordinate shop drawings, samples, and other submittals with the requirements of the Work and the Contract Documents, and shall verify all related field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information. Contractor shall confirm that the submittal is complete with respect to all related data included in the submittal.

B. Shop drawings and samples must bear a stamp or specific written certification that Contractor has satisfied its obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

C. With each shop drawing or sample submittal, Contractor shall give Engineer specific written notification, in a communication separate from the shop drawing or sample, of any variations that the shop drawing or sample may have from the requirements of the Contract Documents.

D. Engineer will provide timely review of submittals. Engineer's review and approval of submittals will not extend to the means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs.

E. Engineer's review of shop drawings and samples will be only to determine if the items covered will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole.

F. Engineer's review and approval of a separate item in a shop drawing or sample does not indicate approval of the assembly in which the item functions.

G. Contractor shall make corrections required by Engineer, return the required number of corrected copies of shop drawings, and submit new samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

H. Shop drawings are not Contract Documents.

7.11 *Warranties and Guarantees*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its consultants are entitled to rely on Contractor's warranty and guarantee.

7.12 *Correction Period*

A. If within one year after the date of substantial completion, any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, or other adjacent areas used by Contractor as permitted by laws and regulations, is found to be defective, then Contractor shall promptly correct any such defective Work and repairs, at no cost to Owner.

7.13 *Indemnification*

A. To the fullest extent permitted by law, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from all

losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Responsibilities*

A. Except as otherwise provided in the Contract Documents, Owner shall issue all communications to Contractor through Engineer.

B. Owner shall make payments to Contractor as provided in this Contract.

C. Owner shall provide the Site and easements required to construct the Project.

D. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

E. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

F. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, unless stated elsewhere in the Contract Documents, Owner shall have sole authority and responsibility for such coordination.

G. Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or for related safety precautions and programs, or for any failure of Contractor to comply with laws and regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Engineer's Status*

A. Engineer will be Owner's representative during construction.

B. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility, or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, its subcontractors, suppliers, or sureties, or to any employee or agent of any of them.

C. Engineer will make visits to the Site at intervals appropriate to the various stages of construction. Engineer will not be required to make exhaustive or continuous inspections to check the quality or quantity of the Work.

D. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or for related safety precautions and programs, or for any failure of Contractor to comply with laws and regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

ARTICLE 10 – CHANGES IN THE WORK

10.01 *Authority to Change the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work.

10.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in the Work which are: (a) ordered by Owner or (b) agreed to by the parties or (c) resulting from the Engineer's decision, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

3. Changes in the Contract Price or Contract Times or other changes which embody the substance of any final binding results under Article 12.

B. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.03 *Work Change Directive*

A. A Work Change Directive may be issued to Contractor ordering an addition, deletion, or revision in the Work. A Work Change Directive will not change the Contract Price or Contract Times but is evidence that the parties expect that the modification ordered or documented by the Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on Contract Price or Contract Times.

10.04 *Field Orders*

A. Engineer may issue a Field Order to authorize minor changes in the Work, provided that the changes do not involve an adjustment in the Contract Price or Contract Times.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then Contractor shall request such adjustment before proceeding with the Work.

ARTICLE 11 – DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS

11.01 *Differing Site Conditions Process*

A. If Contractor believes that any subsurface or physical condition (including but not limited to utilities or other underground facilities) that is uncovered or revealed at the Site either (1) differs materially from that shown or indicated in the Contract Documents, or (2) is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents, then Contractor shall promptly notify Owner and Engineer about such condition. Contractor shall not further disturb such condition or perform any Work in connection with the condition (except with respect to an emergency) until receipt of authorization to do so.

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if Contractor knew of, or should have known of, the existence of the condition prior to entry into the Contract.

B. After receipt of notice regarding a possible differing subsurface or physical condition, Engineer will promptly:

1. Review the condition in question;

2. Determine if it is necessary for Owner to obtain additional exploration or tests with respect to the condition;

3. Determine whether the condition falls within one of the two differing site condition categories described in Paragraph 11.01.A.;

4. Obtain any pertinent cost or schedule information from Contractor;

5. Advise Owner of Engineer's findings, conclusions, and recommendations, including recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question, the need for any change in the Drawings or Specifications, and possible Contract Price or Contract Times adjustments.

C. After receipt of Engineer's findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part, and granting any equitable adjustment in Contract Times or Contract Price to which Contractor is entitled.

ARTICLE 12 – CLAIMS AND DISPUTE RESOLUTION

12.01 *Claims Process*

A. The party submitting a claim shall deliver it directly to the other party to the Contract and the Engineer promptly (but in no event later than 10 days) after the start of the event giving rise thereto.

B. The party receiving a claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the claim through the exchange of information and direct negotiations. All actions taken on a claim must be stated in writing and submitted to the other party.

C. If efforts to resolve a claim are not successful, the party receiving the claim may deny it by giving notice of denial to the other party. If the receiving party does not take action on the claim within 45 days, the claim is deemed denied.

D. If the dispute is not resolved to the satisfaction of the parties, Owner or Contractor shall give notice to the other party of the intent to submit the dispute to a court of competent jurisdiction unless the Owner and Contractor both agree to an alternative dispute resolution process.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION OF DEFECTIVE WORK

13.01 *Tests and Inspections*

A. Owner and Engineer will have access to the Site and the Work at reasonable times for observation, inspection, and testing. Contractor shall provide proper and safe conditions for such access.

B. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections and tests and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

C. Except as otherwise provided in the Contract Documents, Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required: (1) by the Contract Documents; (2) by codes, laws, or regulations; (3) to attain Owner's and Engineer's acceptance of materials or equipment; and (4) to obtain Engineer's approval prior to purchase of materials, mix designs, or equipment.

D. If any Work that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense.

13.02 *Defective Work*

A. Contractor warrants that the Work is not defective.

B. Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. The Contractor shall promptly correct all defective Work.

E. When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's warranty and guarantee on said Work.

F. If the Work is defective or Contractor fails to supply sufficient skilled workers or suitable materials or equipment or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

ARTICLE 14 – PAYMENTS TO CONTRACTOR

14.01 *Progress Payments*

A. Contractor shall prepare a schedule of values that will serve as the basis for progress payments. The schedule of values will be in a form acceptable to Engineer. Lump sum items will be broken into units that allow for measurement of Work in progress. For unit price work, the unit price breakdown in Article 5 will be used as the schedule of values.

14.02 *Applications for Payments*

A. Contractor shall submit signed applications for payment to Engineer monthly, in a form acceptable to the Engineer. Contractor shall provide supporting documentation required by the Contract Documents. Owner will pay for Work completed as of the date of the application for payment.

B. Beginning with the second application for payment, each application must include an affidavit of Contractor stating that all previous progress payments have been applied to discharge Contractor's obligations associated with the prior applications for payment.

14.03 *Retainage*

C. The Owner shall retain 5% of each progress payment until the Work is substantially complete.

14.04 *Review of Applications*

A. Within 10 days after receipt of each application for payment, Engineer will either recommend payment and present the application for payment to Owner or return the application for payment to Contractor indicating Engineer's reasons for refusing to recommend payment. The Contractor will make the necessary corrections and may resubmit the application for payment.

B. Engineer will recommend reductions in payment (set-offs) which, in the opinion of Engineer, are necessary to protect Owner from loss because the Work is defective and requires correction or replacement.

C. Owner is entitled to impose set-offs against payment based on any claims that have been made against Owner, or any incurred costs, losses, or damages, on account of Contractor's conduct in the performance of the Work; for defective Work; or for liquidated damages that have accrued as a result of Contractor's failure to complete the Work.

14.05 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

14.06 *Substantial Completion*

A. When Contractor considers the Work ready for its intended use, Contractor shall request that Engineer issue a certificate of substantial completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's request, Engineer will inspect the Work with Owner and Contractor to determine the status of completion. If Engineer does not consider the

Work substantially complete, Engineer will notify Contractor and Owner of the reasons for Engineer's decision.

C. If Engineer considers the Work substantially complete, or upon resolution of all reasons for non-issuance of a certificate, Engineer will deliver to Owner and Contractor a certificate of substantial completion that will fix the date of substantial completion and include a punch list of items to be completed or corrected before final payment.

14.07 *Final Inspection*

A. Upon notice from Contractor that the entire Work is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work and remedy such defects.

14.08 *Final Payment*

A. Contractor may make application for final payment after satisfactorily completing all Work, including providing all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents, and other documents.

B. The final application for payment must be accompanied (except as previously delivered) by:

1. All documentation called for in the Contract Documents;
2. Consent of the surety to final payment;
3. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any liens or other title defects, or will so pass upon final payment;
4. A list of all pending claims; and
5. Complete and legally effective releases or waivers (satisfactory to Owner) of all lien rights arising out of the Work, and of liens filed in connection with the Work.

C. The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

14.09 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding claim, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a claim.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 60 consecutive days by notice to Contractor and Engineer.

Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or Contract Times, to the extent directly attributable to any such suspension.

15.02 *Owner May Terminate for Cause*

A. Contractor's failure to perform the Work in accordance with the Contract Documents or other failure to comply with a material term of the Contract Documents will constitute a default by Contractor and justify termination for cause.

B. If Contractor defaults in its obligations, then after giving Contractor and any surety 10 days' notice that Owner is considering a declaration that Contractor is in default and the termination of the Contract, Owner may proceed to:

1. Declare Contractor to be in default, and give Contractor and any surety notice that the Contract is terminated; and

2. Enforce the rights available to Owner under any applicable performance bond.

C. Owner may not proceed with termination of the Contract under Paragraph 15.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

D. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

E. In the case of a termination for cause, if the cost to complete the Work, including related claims, costs, losses, and damages, exceeds the unpaid contract balance, Contractor shall pay the difference to Owner.

F. If Contractor has provided a performance bond, the provisions of that bond will govern over any inconsistent provisions of Paragraph 15.02.

15.03 *Owner May Terminate for Convenience*

A. Upon 7 days' notice to Contractor, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for the following, without duplication of any items:

1. Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, less any set-offs, and including fair and reasonable sums for overhead and profit on such Work;

2. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. Other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits, or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 60 consecutive days by Owner or under an order of court or other public authority, or (2) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' notice to Owner, and provided Owner does not remedy such suspension or failure within that time, either stop the Work until payment is received, or terminate the Contract and recover payment from Owner.

ARTICLE 16 – CONTRACTOR'S REPRESENTATIONS

16.01 *Contractor Representations*

A. Contractor makes the following representations when entering into this Contract:

1. Contractor has examined and carefully studied the Contract Documents.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

4. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that, without exception, all prices in the Contract are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of notice to Owner, Engineer, or Contractor, such notice must be in writing, and delivered in person (by commercial courier or otherwise); by registered or certified mail; or by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

17.02 *Cumulative Remedies*

A. The duties and obligations expressly imposed by this Contract, and the rights and remedies expressly available to the parties under this Contract, are in addition to, and are not to be construed in any way as a limitation of, any duties, obligations, rights, or remedies otherwise imposed or available by laws or regulations, by warranty or guarantee, or by other provisions of the Contract.

17.03 *Limitation of Damages*

A. Neither Owner, Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

17.04 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

17.05 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

17.06 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or entering into the Contract.

17.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on [Pick date of agreement] (which is the Effective Date of the Contract).

Owner:	**Contractor:**
_____ *(typed or printed name of organization)*	_____ *(typed or printed name of organization)*
By: _____ *(individual's signature)*	By: _____ *(individual's signature)*
Date: _____ *(date signed)*	Date: _____ *(date signed)*
Name: _____ *(typed or printed)*	Name: _____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)* *(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest: _____ *(individual's signature)*	Attest: _____ *(individual's signature)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
Designated Representative:	Designated Representative:
Name: _____ *(typed or printed)*	Name: _____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address:	Address:
_____	_____

Phone:	Phone:
Email:	Email:
Agreement.)	License No.: *(where applicable)*
	State:

END OF SECTION

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SECTION 00 55 00
NOTICE TO PROCEED

Owner:	JSSD	Owner's Contract No.:	
Engineer:	Bowen Collins & Associates	Engineer's Project No.:	
Contractor:		Contractor's Project No.:	
Project:	Snowmaking Pipe Replacement		
Contract Name:			
Effective Date of Contract:	[Pick Date]		

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [Pick Date] pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date.
In accordance with the Agreement, the date of Substantial Completion is [Pick Date] and the date of readiness for final payment is [Pick Date].

Before starting any work at the Site, Contractor must comply with the following:
Submittal requirements of Part 3.2 of Mobilization 01 71 00.

Owner**:**

Authorized Signature

By:

Title:

Date Issued: [Pick Date]

Copy: Engineer

END OF SECTION

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SECTION 00 61 14
PERFORMANCE BOND

Contractor	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Contract**
Name: Jordanelle Special Service District	Description *(name and location)*:
Mailing address *(principal place of business)*: 5360 Old Hwy 40 Heber City, UT 84032	Contract Price: Effective Date of Contract:

Bond

Bond Amount:

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:
☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____	_____
(Full formal name of Contractor)	*(Full formal name of Surety) (corporate seal)*
By: _____	By: _____
(Signature)	*(Signature)(Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If Contractor performs the Construction Contract, Surety and Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, Surety's obligation under this Bond will arise after:

    3.1 Owner first provides notice to Contractor and Surety that Owner is considering declaring a Contractor Default. Such notice may indicate whether Owner is requesting a conference among owner, Contractor, and Surety to discuss contractor's performance. If owner does not request a conference, surety may, within five (5) business days after receipt of owner's notice, request such a conference. If surety timely requests a conference, owner shall attend. Unless owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of surety's receipt of owner's notice. If owner, contractor, and surety agree, contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive owner's right, if any, subsequently to declare a Contractor Default;

    3.2 Owner declares a Contractor Default, terminates the Construction Contract and notifies surety; and

    3.3 Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to surety's obligations, or release surety from its obligations, except to the extent surety demonstrates actual prejudice.

5. When owner has satisfied the conditions of Paragraph 3, surety shall promptly and at surety's expense take one of the following actions:

    5.1 Arrange for contractor, with the consent of owner, to perform and complete the Construction Contract;

    5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

    5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by owner and a contractor selected with owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by owner as a result of contractor Default; or

    5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

        5.4.1 After investigation, determine the amount for which it may be liable to owner and, as soon as practicable after the amount is determined, make payment to owner; or

        5.4.2 Deny liability in whole or in part and notify owner, citing the reasons for denial.

6. If surety does not proceed as provided in Paragraph 5 with reasonable promptness, surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from owner to surety demanding that surety perform its obligations under this Bond, and owner shall be entitled to enforce any remedy available to owner. If surety proceeds as provided in Paragraph 5.4, and owner refuses the payment, or surety has denied liability, in whole or in part, without further notice, owner shall be entitled to enforce any remedy available to owner.

7. If surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of surety to owner will not be greater than those of contractor under the Construction Contract, and the responsibilities of owner to surety will not be greater than those of owner under the Construction Contract. Subject to the commitment by owner to pay the Balance of the Contract Price, surety is obligated, without duplication for:

    7.1 the responsibilities of contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from contractor's Default, and resulting from the actions or failure to act of surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of contractor.

8. If surety elects to act under Paragraph 5.1, 5.3, or 5.4, surety's liability is limited to the amount of this Bond.

9. Surety shall not be liable to owner or others for obligations of contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than owner or its heirs, executors, administrators, successors, and assigns.

10. Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after contractor ceased working or within two years after surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to surety, owner, or contractor must be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 *Balance of the Contract Price*—The total amount payable by owner to contractor under the Construction Contract after all proper adjustments have been made including allowance for contractor for any amounts received or to be received by owner in settlement of insurance or other claims for damages to which contractor is entitled, reduced by all valid and proper payments made to or on behalf of contractor under the Construction Contract.

14.2 *Construction Contract*—The agreement between owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 *Contractor Default*—Failure of contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 *Owner Default*—Failure of owner, which has not been remedied or waived, to pay contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 *Contract Documents*—All the documents that comprise the agreement between owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows:

16.1 Describe modifications or select "None"

END OF SECTION

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SECTION 00 61 15
PAYMENT BOND

Contractor	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Construction Contract**
Name: Jordanelle Special Service District	Description *(name and location)*:
Mailing address *(principal place of business)*: 5360 Old Hwy 40 Heber City, UT 84032	Contract Price: Effective Date of Contract:

Bond

Bond Amount:

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:
☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____	_____
(Full formal name of Contractor)	*(Full formal name of Surety) (corporate seal)*
By: _____	By: _____
(Signature)	*(Signature)(Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then surety and contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, surety's obligation to owner under this Bond will arise after owner has promptly notified contractor and surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against owner or owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to contractor and surety.

4. When owner has satisfied the conditions in Paragraph 3, surety shall promptly and at surety's expense defend, indemnify, and hold harmless owner against a duly tendered claim, demand, lien, or suit.

5. Surety's obligations to a Claimant under this Bond will arise after the following:

   5.1 Claimants who do not have a direct contract with contractor

      5.1.1 have furnished a written notice of non-payment to contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

      5.1.2 have sent a Claim to surety (at the address described in Paragraph 13).

   5.2 Claimants who are employed by or have a direct contract with contractor have sent a Claim to surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by owner to contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, surety shall promptly and at surety's expense take the following actions:

   7.1 Send an answer to the Claimant, with a copy to owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

   7.2 Pay or arrange for payment of any undisputed amounts.

   7.3 Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which surety and Claimant have reached agreement. If, however, surety fails to discharge its obligations under Paragraph 7.1 or 7.2, surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by surety.

9. Amounts owed by owner to contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By contractor furnishing and owner accepting this Bond, they agree that all funds earned by contractor in the performance of the Construction Contract are dedicated to satisfying obligations of contractor and Surety under this Bond, subject to owner's priority to use the funds for the completion of the work.

10. Surety shall not be liable to owner, Claimants, or others for obligations of contractor that are unrelated to the Construction Contract. Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond and shall have

under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to surety, owner, or contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1 *Claim*—A written statement by the Claimant including at a minimum:

16.1.1 The name of the Claimant;

16.1.2 The name of the person for whom the labor was done, or materials or equipment furnished;

16.1.3 A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

16.1.4 A brief description of the labor, materials, or equipment furnished;

16.1.5 The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6 The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7 The total amount of previous payments received by the Claimant; and

16.1.8 The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 *Claimant*—An individual or entity having a direct contract with contractor or with a subcontractor of contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of contractor and contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 *Construction* Contract—The agreement between owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 Owner Default—Failure of owner, which has not been remedied or waived, to pay contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 Contract Documents—All the documents that comprise the agreement between owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows:

18.1 Describe modifications or select "None"

END OF SECTION

SECTION 00 61 16
WARRANTY BOND

Contractor	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Construction Contract**
Name: Jordanelle Special Service District	Description *(name and location)*:
Mailing address *(principal place of business)*: 5360 Old Hwy 40 Heber City, UT 84032	Contract Price: Effective Date of Contract: Contract's Date of Substantial Completion
Bond	
Bond Amount: Date of Bond: Modifications to this Bond form: ☐ None ☐ See Paragraph 9	Bond Period: Commencing 364 days after Substantial Completion of the Work under the Construction Contract and continuing until years after such Substantial Completion.

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
(Full formal name of Contractor)	*(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Construction Contract's Correction Period Obligations. The Construction Contract is incorporated herein by reference.

2. If Contractor performs the Correction Period Obligations, Surety and Contractor shall have no obligation under this Warranty Bond.

3. If Owner gives written notice to Contractor and Surety during the Bond Period of Contractor's obligation under the Correction Period Obligations, and Contractor does not fulfill such obligation, then Surety shall be responsible for fulfillment of such Correction Period Obligations. Surety shall either fulfill the Correction Period Obligations itself, through its agents or contractors, or, in the alternative, Surety may waive the right to fulfill the Correction Period Obligations itself and reimburse Owner for all resulting costs incurred by Owner in performing Contractor's Correction Period Obligations, including but not limited to correction, removal, replacement, and repair costs.

4. Surety's liability is limited to the amount of this Warranty Bond. Renewal or continuation of the Warranty Bond will not modify such amount, unless expressly agreed to by Surety in writing.

5. Surety shall have no liability under this Warranty Bond for obligations of the Contractor that are unrelated to the Construction Contract. No right of action will accrue on this Warranty Bond to any person or entity other than Owner or its heirs, executors, administrators, successors, and assigns.

6. Any proceeding, legal or equitable, under this Warranty Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and must be instituted within two years after Surety refuses or fails to perform its obligations under this Warranty Bond.

7. Written notice to Surety, Owner, or Contractor must be mailed or delivered to the address shown in this Warranty Bond.

8. Definitions

    8.1 *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page of this Warranty Bond, including all Contract Documents and changes made to the agreement and the Contract Documents.

    8.2 *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

    8.3 *Correction Period Obligations*—The duties, responsibilities, commitments, and obligations of the Contractor with respect to correction or replacement of defective Work, as set forth in the Construction Contract's Correction Period clause, EJCDC® C 700, Standard General Conditions of the Construction Contract (2018), Paragraph 15.08, as duly modified.

    8.4 *Substantial Completion*—As defined in the Construction Contract.

    8.5 *Work*—As defined in the Construction Contract.

9. Modifications to this Bond are as follows:

    9.1 [Describe modifications or select "None"]

END OF SECTION

SECTION 00 62 76
CONTRACTOR'S APPLICATION FOR PAYMENT

Contractor's Application for Payment No. _____

	Application Period: From To	Application Date:
To (Owner):	From (Contractor):	Via (Engineer):
Project:	Contract:	
Owner's Contract No:	Contractor's Project No:	Engineer's Project No:

Application For Payment

Change Order Summary

Approved Change Orders

Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1. ORIGINAL CONTRACT PRICE ..... _____
2. Net change by Change Orders ..... _____
3. Current Contract Price (Line 1 ± Line 2) ..... _____
4. TOTAL COMPLETED AND STORED TO DATE (Column F total on Progress Estimates) ..... _____
5. RETAINAGE
   a. 5.00% X Work Completed ..... _____
   b. 5.00% X Stored Material ..... _____
   c. Total retainage (Line 5a + Line 5b) ..... _____
6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c) ..... _____
7. LESS PREVIOUS PAYMENTS (Line 6 of prior Application) ..... _____
8. AMOUNT DUE THIS APPLICATION ..... _____
9. BALANCE TO FINISH, PLUS RETAINAGE (Column G total on Progress Estimates + Line 5c above) ..... _____

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies, to the best of its knowledge, the following:
(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and
(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor Signature

By		Date	

Payment of: _____
(Line 8 or or other - attach explaination of othe other amount)

is recommended by: _____ _____
(Engineer) (Date)

Payment of: _____
(Line 8 or other - attach explaination of othe other amount)

is approved by: _____ _____
(Owner) (Date)

Approved By: _____ _____
(Funding or Financing Entity (if applicable) (Date)

Progress Estimate - Lump Sum work

Contractor's Application

For (Contract):	Application Number:
Application Period: From To	Application Date:

A		B	C	D	E	F		G
			Value of Work Completed ($)					
Specification Section No.	Description	Scheduled Value ($)	From Previous Application (C+D)	This Period	Value of Materials Presently Stored (not in C or D)	Total Value Completed and Stored to Date (C+D+E)	% (F/B)	Balance to Finish (B-F)
	Totals							

SECTION 00 63 36
FIELD ORDER FORM

Field Order No.

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Field Order:

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Description:

Attachments:

ISSUED:

By: _____
Engineer (Authorized Signature)

Title:
Date:

END OF SECTION

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SECTION 00 63 49
WORK CHANGE DIRECTIVE

Work Change Directive No.

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Work Change Directive:

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments:

Purpose for Work Change Directive:
Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to:

☐ Non-agreement on pricing of proposed change.
☐ Necessity to proceed for schedule or other Project reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price $
Contract Time days

BASIS OF ESTIMATED CHANGE IN CONTRACT PRICE:

☐ Lump Sum ☐ Unit Price
☐ Cost of the Work ☐ Other

RECOMMENDED BY ENGINEER:	AUTHORIZED BY OWNER:
By: _____	By: _____
Engineer (Authorized Signature)	Owner (Authorized Signature)
Title:	Title:
Date:	Date:

END OF SECTION

SECTION 00 63 63
CHANGE ORDER

Change Order No.

Owner:	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer:	Engineer's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Change Order:

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments:

CHANGE IN CONTRACT PRICE	**CHANGE IN CONTRACT TIMES** *note changes in Milestones if applicable*
Original Contract Price: $	Original Contract Times: Substantial Completion: Ready for Final Payment: _____ days or dates
[increase] [decrease] from previously approved Change Orders No. ____ to No. ____: $	[increase] [decrease] from previously approved Change Orders No. ____ to No. ____: Substantial Completion: Ready for Final Payment: _____ days
Contract Price prior to this Change Order: $	Contract Times prior to this Change Order: Substantial Completion: Ready for Final Payment: _____ days or dates

[increase] [decrease] of this Change Order:	[increase] [decrease] of this Change Order: Substantial Completion: Ready for Final Payment: _____ days or dates
$	
Contract Price incorporating this Change Order:	Contract Times with all approved Change Orders: Substantial Completion: Ready for Final Payment: _____ days or dates
$	

RECOMMENDED BY ENGINEER:	ACCEPTED BY OWNER:	ACCEPTED BY CONTRACTOR:
By: _____ Engineer (if required)	By: _____ Owner (Authorized)	By: _____ Contractor (Authorized)
Title: _____	Title: _____	Title _____
Date: Pick a date	Date: Pick a date	Date Pick a date

Approved by Funding Agency (if applicable)

By: _____ Date: Pick a date

Title:

END OF SECTION

SECTION 00 65 16
CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Owner's Contract No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	

This Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

Date of Substantial completion:

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's responsibilities: ☐ None ☐ As follows

Amendments to Contractor's responsibilities: ☐ None ☐ As follows

The following documents are attached to and made a part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

ENGINEER:

By: (signature): _____
(Authorized signature)

Name (printed): _____

Title: _____

Date: _____

END OF SECTION

SECTION 00 65 18
NOTICE OF ACCEPTABILITY OF WORK

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Notice Date:	Effective Date of Construction Contract:

Engineer hereby gives notice to Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract's Contract Documents ("Contract Documents") and of the Agreement between Owner and Engineer for Professional Services dated ("Owner Engineer Agreement"). This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

1. This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.

2. This Notice reflects and is an expression of the Engineer's professional opinion.

3. This Notice has been prepared to the best of Engineer's knowledge, information, and belief as of the Notice Date.

4. This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor's Work) under the Owner Engineer Agreement and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner Engineer Agreement.

5. This Notice is not a guarantee or warranty of Contractor's performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.

6. This Notice does not relieve Contractor of any surviving obligations under the Construction Contract and is subject to Owner's reservations of rights with respect to completion and final payment.

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

ENGINEER:

By: (signature): _____
(Authorized signature)

Name (printed): _____

Title: _____

Date: _____

END OF SECTION

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. The Work to be performed under this Contract consists of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all Work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all Work, materials, and services not expressly indicated or called for in the Contract Documents, which may be necessary for the complete, safe, and proper construction of the Work in good faith shall be provided by Contractor as though originally so indicated, at no increase in cost to Owner.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of this Contract comprises replacing the existing 30" HDPE waterline and 36" steel casing across the utility bridge and replacing it with 24" restrained ductile iron pipe wrapped in foam insulation.

B. The Work is located just south of Jordanelle Reservoir as indicated on the Drawings.

1.3 CONTRACT METHOD

A. The Work hereunder will be constructed under a single lump-sum contract.

1.4 STREAMLINED SPECIFICATIONS

A. These specifications are written in streamlined or declarative style, often using incomplete sentences. This imperative language is directed to Contractor unless specifically noted otherwise.

B. Omissions of such words and phrases as “Contractor shall,” “in conformity therewith,” “shall be,” “as shown on the Drawings,” “a,” “an,” “the,” and “all” are intentional in streamlined sections.
   1. Omitted words shall be supplied by inference in the same manner as when a note appears on the Drawings.
   2. Omission of such words shall not relieve Contractor from providing the items and work described herein or indicated on the Drawings.
   3. Words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

1.5 WORK BY OTHERS

A. Owner reserves the right to perform or award other work concurrent with the Work included in this Contract

1. Work may be conducted at or adjacent to the Site by other contractors during the performance of the Work under this Contract. Conduct operations to cause a minimum of interference with the Work of such other contractors and cooperate fully with such contractors to provide continued safe access to their respective portions of the Site, as required to perform Work under their respective contracts.

B. Interference With Work On Utilities:
   1. Cooperate and coordinate fully with all utility forces of Owner or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the Work.
   2. Schedule the Work to minimize interference with said relocation, altering, or other rearranging of facilities.

1.6 WORK SEQUENCE AND SCHEDULING CONSTRAINTS

A. Schedule and perform the Work in such a manner as to result in the least possible disruption to the public's use of roadways, driveways, and utilities. Utilities shall include but not be limited to water, sewerage, drainage structures, ditches and canals, gas, electric, cable television, and telephone. Refer to Utility Adjustment and other plan and profile sheets for approximate location of utilities. However, there is no guarantee as to accuracy or completeness. Contractor shall incorporate as-built locations on the reproducible record plans, in red ink, showing proper location on each sheet where these utilities are located.

B. Access to the site is limited to the hours of 7:00 am to 7:00 pm Monday through Friday.

1.7 CONTRACTOR USE OF PROJECT SITE

A. Use of the Project Site shall be limited to construction operations, including on-Site storage of materials, on-Site fabrication facilities, and field offices.

1.8 OWNER USE OF THE PROJECT SITE

A. Cooperate and coordinate with Owner to facilitate Owner's operations and projects and to minimize interference with Contractor's operations at the same time. In any event, Owner shall be allowed safe access to the Project Site during the period of construction.

1.9 CONTRACTOR'S WORKING HOURS

A. Perform work within working hours from 7:00 am to 5:00 pm Monday through Friday. If Contractor desires to work overtime or work on a Saturday, Sunday, or any legal holiday, obtain prior approval from Owner and Engineer.

1.10 STORAGE

A. Storage conditions shall be acceptable to Owner for all materials and equipment not incorporated into the Work but included in Applications for Payment. Such storage arrangements and conditions shall be presented in writing for Owner's review and approval and shall afford adequate and satisfactory security and protection. Off-site storage facilities shall be accessible to Engineer. The stored materials shall be insured for full value. Certificates of liability insurance coverage must be submitted to Engineer with the request

for payment by Contractor. All arrangements and costs for storage facilities shall be paid by Contractor, unless specifically designated in the Contract Documents to be furnished by Owner.

1.11 NOTICES TO OWNERS OF ADJACENT PROPERTIES AND UTILITIES

A. Notify Owners of adjacent property and utilities when prosecution of the Work may affect them.

B. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, Give notices sufficiently in advance to enable the affected person(s) to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, shall include appropriate information concerning the interruption and instructions on how to limit any resulting inconvenience.

C. Utilities and other concerned agencies shall be contacted at least seven days prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.

D. Review with the various utility companies the construction methods, safety procedures, and Work to be done in the vicinity of utilities. When temporary relocation of utilities is necessary, provide sufficient advance notice to the utility involved.

1.12 LINES AND GRADES

A. Perform all Work to the lines, grades, and elevations shown on the Drawings.

B. Basic horizontal and vertical control points will be established or designated as provided in General Conditions paragraphs. Use these points as datum for the Work. Perform any additional survey, layout, or measurement work needed for proper construction of the Work as a part of the Work at no additional cost to Owner.

C. Employ experienced instrument personnel, competent assistants, and such instruments, tools, stakes, and other materials required to complete the survey, layout, and measurement work. In addition, furnish, without additional charge, competent personnel and such tools, stakes, and other materials as Engineer may require in establishing or designating control points or in checking survey, layout, and measurement of Work performed.

D. Keep Engineer informed, a reasonable time in advance, of the times and places at which Work is to be done, so that horizontal and vertical control points may be established, and any checking deemed necessary by Engineer may be done with minimum delay to the Project.

E. Remove and reconstruct Work, which is improperly located.

1.13 PROJECT MEETINGS

A. Preconstruction Conference
   1. Prior to the commencement of Work at the Site, a preconstruction conference will be held at a mutually agreed time and place which shall be attended by Contractor's

Project Manager, its Superintendent, its Safety Representative, and its Subcontractors as Contractor deems appropriate. Other attendees will be:

a. Engineer
b. Representatives of Owner
c. Governmental representatives as appropriate
d. Others as requested by Contractor, Owner, or Engineer
e. Engineer's Representative

2. Bring to the conference, any submittals so indicated in Section 01 33 20 - Contractor Submittals.
3. The purpose of the conference is to designate responsible personnel, discuss contract requirements and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The complete agenda will be furnished by Engineer prior to the meeting date. However, be prepared to discuss all the items listed below.
   a. Contractor's assignments for safety and first aid, including Designated Competent person(s) and Contractor's safety Representative.
   b. Status of Contractor's insurance and bonds.
   c. Contractor's tentative schedules.
   d. Transmittal, review, and distribution of Contractor's submittals.
   e. Processing applications for payment.
   f. Maintaining record documents.
   g. Critical Work sequencing.
   h. Field decisions and Change Orders.
   i. Use of project site, office and storage areas, security, housekeeping, and Owner's needs.
   j. Major equipment deliveries and priorities.
   k. Permits required for construction.
   l. Utilities required for construction.
   m. Contract Owner and channels of communication.
   n. Coordination with others.
4. Engineer will preside at the preconstruction conference and will arrange for keeping and distributing the minutes to all persons in attendance.

B. Progress Meetings

1. Engineer will schedule and hold regular on-Site progress meetings at least weekly and at other times as deemed necessary by Engineer or as required by progress of the Work. Contractor, Engineer, and all Subcontractors active on the Site must attend each meeting. Contractor may at its discretion request attendance by representatives of its Suppliers, manufacturers, and other Subcontractors.
2. Engineer will preside at the meetings and will arrange for keeping and distributing the minutes. The purpose of the meetings will be to review the progress of the Work, discuss safety, maintain coordination of efforts, discuss commercial issues, discuss changes in scheduling, and resolve other problems, which may develop. During each meeting, all parties are required to present any issues, which may impact its Work, with a view toward resolving these issues expeditiously.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 14 40
CONSTRUCTION AND SCHEDULE RESTRAINTS

PART 1 - GENERAL

1.1 SUMMARY

A. Schedule, sequence, and perform the Work in a manner, which minimizes disruption to the public and to the operation and maintenance of existing facilities.

B. Allow for construction and schedule constraints in preparing the construction schedules required under Section 01 32 16 – Construction Progress Schedule. Include all the activities necessary to satisfy all constraints included and referenced in the Contract Documents.

1.2 PERMITS

A. Abide by the conditions of all permits, easements, and private agreements made and obtain written acceptance of the constructed conditions from each issuer of the permit, easement, or private agreement prior to acceptance of Work by Owner, at no additional expense to Owner.

1.3 COORDINATION WITH OTHER CONSTRUCTION

A. Be responsible for coordinating the Work depicted in the Contract Documents with Owner, Engineer, and all other contractors or suppliers working at, or near the Project Site in accordance with the General Conditions and Supplementary General Conditions.

1.4 SCHEDULE CONSTRAINTS

A. Be responsibility to coordinate and plan the construction activities to integrate each schedule constraint into performance of the overall Work.

B. The listing of schedule constraints below does not mean that all constraints or special conditions have been identified. The list is not a substitute for the duty to coordinate and plan for completion, all Work by the Substantial/Contract Completion Dates specified in the Contract Documents.

C. Special Listing: The following constraints affect the construction schedule.
   1. Yellow-Billed Cuckoo Nesting Season: Heavy equipment construction must be completed by April 30th, in order to avoid interfering with the breeding and nesting season of the Yellow-Billed Cuckoo which has potential habitat in the project area.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 20 00
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Lump Sum Bid Items
   1. All Work Required by the Contract Documents
      a. The sum allowed for Bid Item No. 1 as set forth in the Bid Form includes all Work for and in connection with construction of the Contract in its entirety, including but not limited to all costs associated with dust control mitigation measures, permit fees and other related costs to ensure compliance with the Board of Health Air Pollution Control Regulations.
      b. Payment for Work under this Bid item will be based on the breakdown of costs for each scheduled activity in the Construction Schedule and the percentage of completion for each activity in accordance with the Contract Documents.
      c. Preparing the Construction Progress Schedule shall be a separate activity on the Construction Schedule and shall also be a separate activity on the Schedule of Values. Payment for the Construction Progress Schedule is not in addition to, but is incidental to the other lump-sum items included in the Work.

1.2 GENERAL PROGRESS PAYMENT REQUIREMENTS

A. A Payment for Work performed shall be in accordance with installed quantities as assessed in comparison to the Schedule of Values and the Construction Schedule. Engineer will verify measurements and quantities. Each activity necessary to manage and complete the Work is identified on the Contract schedules. Each activity will be assigned its respective value, a portion of the Contract Price, as shown on the Schedule of Values (Roll-up), and detailed cost loaded activity schedule.

B. Payment for all lump sum costs and services incurred on this Agreement shall be based on the earned value of Work accomplished during the reporting period. Earned value is determined by the completion percentage of each activity as determined by the Schedule of Values and the Construction Schedule applied to the total value of the activity. No construction activity shall be deemed 100 percent complete until Contractor has completed the physical check out and inspection of the completed Work and has submitted the signed inspection form to Engineer.

C. Earned value is derived from the current status of Contractor Construction Schedule as determined by the monthly schedule status submittals. Each schedule status submittal is reviewed and approved by Engineer prior to Contractor obtaining approval for the Summary of Earned Values or quantities installed and the Application for Payment.

1.3 APPLICATION FOR PAYMENT

A. Submit application for payment on Owner's form and be certified by signature of an Authorized Officer of Contractor.

B. The Application for Payment shall contain all necessary references and attachments that substantiate the invoice for progress payment (e.g., certified payrolls, labor reports, progress schedule data, and Summary of Earned Values). It shall substantiate the invoice for progress payment and shall be preceded or accompanied by the schedule and status data as a condition of payment, in accordance with the Construction Schedule and the Schedule of Values.

1.4 REVIEWS/APPLICATION FOR PAYMENT

A. Review meetings between Contractor and Engineer will be held weekly and within 7 Days prior to the payment application date designated by Engineer. Three Days prior to the last review meeting of the month, submit an updated schedule and a signed application for payment showing a Summary of Earned Values for the reporting and payment period so that Engineer can compare earned values to available status data. Make any adjustments to the Master Record Documents, updated schedule, and payment applications required by Engineer. Upon completion of the adjustments, Engineer will sign the payment request and forward it to Owner. Engineer will determine payment amounts if agreement with Contractor is not reached.

1.5 PAYMENT FOR SUPPLIES AND MATERIALS

A. Payment based on the actual cost of supplies, materials and equipment on hand shall be made by Owner with or without a paid invoice. "Actual cost" of materials shall be the invoice amount, whether paid or not, and shall not include any costs associated with installation, testing, etc. Contractor shall be entitled to payment of the actual cost of supplies, materials, and equipment only if it (1) presents an invoice to Owner with the application for payment and (2) states in the application for payment that the materials have been delivered and stored in the time and manner specified in the contract between Contractor and his Supplier or Subcontractor. If Contractor fails to comply with those conditions, Owner may withhold payment in accordance with the provisions. Owner expressly reserves the right to withhold retention until Contractor presents to Owner a paid invoice, or some other proof of payment satisfactory to Owner, for Owner's use in verifying the accuracy of the actual cost of the supplies, materials or equipment. If the amount paid does not match the actual cost, Owner will adjust the amount of retention accordingly. Payment for supplies, materials or equipment on hand does not alter the responsibility of Contractor for all supplies, materials and equipment until Final Acceptance of the Work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 25 10
PRODUCTS, MATERIALS, EQUIPMENT, AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for delivery and storage of products and materials specified for use in the Project. It also includes requirements for handling requests for equals and substitutions made after award of the Contract.

1.2 RELATED SECTIONS

A. Section 01 32 00 – Electronic Project Management System

1.3 DEFINITIONS

A. Definitions in this Article are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," “special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.

B. The word "Products," as used herein, is defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for the Project or taken from stock of previously purchased products.

C. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work.

D. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items).

E. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying and erection of the Work.

1.4 QUALITY ASSURANCE

A. Source Limitations: To the greatest extent possible for each unit of work, provide products, materials, and equipment of a singular generic kind from a single source.

B. Compatibility of Options: Where more than one choice is available as options for selection of a product, material, or equipment, select an option, which is compatible with other products, materials, or equipment. Compatibility is a basic general requirement of product, material, and equipment selections.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance
   1. Deliver and store products, materials, and equipment in accordance with manufacturer's written recommendations and by methods and means which will prevent damage, deterioration, and loss including theft.
   2. Manage delivery schedules to minimize long-term storage of products at Site and overcrowding of construction spaces. Ensure coordination to minimize holding or storage times for flammable, hazardous, easily damaged, or sensitive materials to deterioration, theft, and other sources of loss.

B. Transportation and Handling
   1. Transport products by methods to avoid damage. Deliver in undamaged condition in manufacturer's unopened containers and packaging.
   2. Furnish equipment and personnel to handle products, materials, and equipment, including those provided by Owner, by methods to prevent soiling and damage.
   3. Provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

C. Storage and Protection
   1. Products shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible. Sensitive products shall be stored in weather-tight climate-controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.
   2. For exterior storage of fabricated products, products shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.
   3. Loose granular materials shall be stored on solid flat surfaces in a well-drained area and shall be prevented from mixing with foreign matter.
   4. Storage shall be arranged to provide access for inspection. Periodically inspect to assure products are undamaged and are maintained under required conditions.
   5. Storage shall be arranged in a manner to provide access for maintenance of stored items and for inspection.

D. Maintenance of Storage
   1. Periodically inspect stored products on a scheduled basis. Maintain a log of inspections and make the log available on request.
   2. Comply with manufacturer's product storage requirements and recommendations.
   3. Maintain manufacturer-required environmental conditions continually.
   4. Ensure that surfaces of products exposed to the elements are not adversely affected and that weathering of finishes does not occur.
   5. For mechanical and electrical equipment, provide a copy of the manufacturer's service instructions with each item and the exterior of the package shall contain notice that instructions are included.
   6. Service products on a regularly scheduled basis. Maintain a log of services and submit as a record document prior to acceptance by Owner in accordance with the Contract Documents.

1.6 PROPOSED SUBSTITUTIONS AND "OR EQUAL" ITEMS

A. Substitution and “or equal” determination shall be submitted and evaluated per the General Conditions included in the Contract Documents.

B. When proposing a substitution, transmit all documents to Engineer in electronic format (single PDF), via web-based construction management software as specified in Section 01 32 00 – Electronic Project Management System.

C. Unless otherwise provided by law or authorized in writing by Engineer, submit the "Substitution Request Form(s)" within 35 days after award of the Contract.

D. Whenever products, materials, or equipment are indicated in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the manufacturer is intended to establish the type, function, and quality required. The Contract Price is understood to be based upon furnishing the item specified.

E. If a named item is not available or a supplier is no longer doing business, the following shall apply:
   1. When a named supplier is no longer doing business under the name indicated, furnish the specified product from the legal successors to the named supplier.
   2. When a named product is no longer available from the named supplier due to acquisition or sale of the given product line, but the product is available from another supplier, provide the named product. In such cases, submit a substitution request form and include certification from the supplier that the product being supplied is materially and functionally identical to the product named in the Contract Documents.
   3. When the named product is no longer available from the named supplier or any other supplier, notify Owner in writing and Owner will direct Engineer to identify suitable substitute products. Provide one of the suitable substitute products.

F. The procedure for review by the Engineer will include the following:
   1. Wherever a proposed substitution has not been submitted within said 35-day period, or wherever the submission of a proposed substitution material or equipment has been judged to be unacceptable by Engineer, provide the product, material, or equipment indicated in the Contract Documents.
   2. Certify that the proposed substitution will adequately perform the functions and achieve the results called for by the general design and be similar and of equal substance to that indicated and be suited to the same use as that indicated.
   3. Engineer will evaluate each proposed substitution within a reasonable period.
   4. As applicable, do not make shop drawing submittals for a substitution without Engineer's prior written acceptance of the request for substitution. Do not order, install, or utilize any substitution item prior to written acceptance of the request for substitution.
   5. Engineer will record the time required by Engineer in evaluating substitutions and in making changes by Contractor in the Contract Documents occasioned thereby.

G. Application for substitution must contain the following statements and information, which will be considered by Engineer in evaluating the proposed substitution:

1. Submit "Substitution Request Form," at end of this Section, fully executed.
2. The evaluation and acceptance of the proposed substitution shall not prejudice the achievement of substantial completion on time.
3. Whether or not acceptance of the substitution for use in the Work will require a change in any of the Contract Documents to adapt the design to the proposed substitution.
4. Whether or not incorporation or use of the substitution in connection with the Work is subject to payment of any license fee or royalty.
5. All variations of the proposed substitution from the items originally specified shall be identified.
6. Available maintenance, repair, and replacement service shall be indicated. The manufacturer shall have a local service agency (within 50 miles of the site) which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.
7. Itemized estimate of all costs that will result directly or indirectly from acceptance of such substitution, including cost of redesign and claims of other contractors affected by the resulting change.

H. Without any increase in cost to Owner, be responsible for, and pay all costs in connection with proposed substitutions and costs of inspections and testing of equipment or materials submitted for review prior to purchase thereof for incorporation in the Work, whether or not Engineer accepts the proposed product, equipment, or material. Reimburse Owner for the charges of Engineer and other authorized representatives for evaluating each proposed substitution.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

BOWEN COLLINS & ASSOCIATES

SUBSTITUTION REQUEST FORM

To: _____ Project: _____

_____ Date: _____

_____ Owner: _____

Specified Item:

Section	Page	Paragraph	Description

The undersigned requests consideration of the following:

Proposed Substitution: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request. Applicable portions of the data are clearly identified.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings and will not require a change in any of the Contract Documents.
2. The undersigned will pay for changes to the design, including engineering design, detailing, and construction costs caused by the request substitution which is estimated to be $_____.
3. The proposed substitution will have no adverse effect on other contractors, the construction schedule (specifically the date of substantial completion), or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The incorporation or use of the substitute in connection with the work is not subject to payment of any license fee or royalty.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by **Contractor:**		Reviewed by **Engineer:**	
Firm:		☐ Accepted as Submitted	☐ Accepted as Noted
By:		☐ Not Accepted	☐ Received too Late
Signature:		By:	
Telephone:		Title:	
Attachments:		Date:	
Comments:		Comments:	

SECTION 01 26 13
REQUESTS FOR INTERPRETATION (RFI)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes procedures for submitting Requests for Interpretation (RFI) and limitations on use of RFI to obtain interpretation and clarification.

1.2 RELATED SECTIONS

A. Section 01 25 10 – Products, Materials, Equipment, and Substitutions.

B. Section 01 32 00 – Electronic Project Management System.

C. Section 01 33 20 – Submittal Procedures.

1.3 DEFINITIONS

A. Request for Interpretation: A document submitted to Engineer by Contractor, requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.

1.4 CONTRACTOR'S REQUESTS FOR INTERPRETATION (RFI)

A. Contractor's Requests for Interpretation (RFI): Should Contractor be unable to determine from the Contract Documents, the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of Work is described differently at more than one place in the Contract Documents; request that Engineer make an interpretation of the requirements of the Contract Documents to resolve such matters. Comply with procedures specified herein to make Requests for Interpretation (RFI).

B. Submission of RFI: Prepare RFI and submit electronically utilizing the Electronic Project Management System. Refer to Section 01 33 20 – Submittal Procedures.
   1. Fill in transmittal form completely, and if supplemental drawings or other information is prepared by hand, it shall be fully legible and attached with the transmittal form.
   2. The Project Management System will automatically assign each RFI a discrete, consecutive number. Include this number in the title of the RFI. For instance, Revision #1 to RFI 029 should be noted in the title as "original title name, Rev 1".
   3. Each page of the RFI and each attachment to the RFI shall bear Owner's project name, project number, date, RFI number and a descriptive title. Merge all into a single PDF document for attachment in the system.
   4. Clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, indicate presumed interpretation or understanding of the requirement along with reasons for such understanding.

Include proposed solutions that may be set forth to complete the Work with associated cost and schedule impact, if any.

5. Engineer will review all RFI to determine whether they are RFI within the meaning of the term. If Engineer determines that the transmittal is not an RFI, it will be returned, unreviewed as to content, for resubmittal in the proper manner.
6. Frivolous RFI or simply passing on the RFI without first vetting the RFI will be subject to reimbursement from Contractor to Owner for fees charged by Engineer and other design professionals engaged by Owner.

C. Subcontractor-Initiated and Supplier-Initiated RFI: RFI from subcontractors and material suppliers shall be submitted through, be reviewed by, and be attached to an RFI prepared, signed, and submitted by Contractor. RFI submitted directly by subcontractors or material suppliers will be returned unanswered to Contractor.

1. Review all subcontractor- and supplier-initiated RFI and take actions to resolve issues of coordination, sequencing, and layout of the Work. Coordination of the work, sequence, and layout are not the responsibility of Owner or Engineer.
2. RFI submitted to request clarification of issues related to means, methods, techniques, and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without interpretation. Such issues are solely Contractor's responsibility.

D. Requested Interpretation: Carefully study the Contract Documents to ensure that information sufficient for interpretation of requirements of the Contract Documents is not included therein. RFI that request interpretation of requirements clearly indicated in the Contract Documents will be returned without interpretation.

1. In all cases in which RFI are issued to request clarification of issues related to means, methods, techniques and sequences of construction; for example, pipe and duct routing, clearances, specific locations of Work shown diagrammatically, apparent interferences and similar items, furnish all information required for Engineer or Owner to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to how to proceed.
2. If information included with this type of RFI is insufficient, the RFI will be returned unanswered.

E. Unacceptable Uses for RFI: RFI shall not be used to request the following:

1. Approval of submittals (use procedure specified in Section 01 33 20 - Submittal Procedures).
2. Approval of substitutions (refer to Section 01 25 10 – Products, Materials, Equipment and Substitutions).
3. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Contract General Conditions).
4. Different methods of performing Work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Contract General Conditions).

F. Disputed Requirements: If Engineer’s response to an RFI is believed to cause a change to the requirements of the Contract Documents, immediately give written notice to Engineer stating why this is believed to be true. Failure to give such written notice immediately shall waive any right to seek additional time or compensation under the Contract.

PART 2 - PRODUCTS

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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BOWEN COLLINS & ASSOCIATES

REQUEST FOR INTERPRETATION

RFI No: _____

Project No: _____

Project: _____ **Date:** _____

Owner: _____

Engineer: _____ Construction Mgr: _____

Contractor: _____ Contractor PM: _____

Subject: _____

Drawing No: _____ Specification Sect: _____

Contractor's Request for Interpretation (RFI)
Contractor's Signature: Date:

Engineer's Response
Engineer's Signature: Date:

SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 GENERAL

A. This Section defines the process whereby the Schedule of Values shall be developed and incorporated into the Construction Progress Schedule as specified in Section 01 32 16 – Construction Progress Schedule. Monthly progress payment amounts shall be determined from the weekly progress updates of the scheduled activities. The schedule of values shall, as a minimum, list the value of every activity on the schedule, and shall include such additional breakdowns as required herein. The values in the Schedule of Values do not establish a commitment by either Contractor or Owner when negotiating changes to the Contract Documents.

1.2 DETAILED SCHEDULE OF VALUES

A. Prepare and submit a detailed Schedule of Values to Engineer as part of the Construction Progress Schedule submittal. Because the ultimate requirement is to develop a detailed Schedule of Values sufficient to determine appropriate monthly progress payment amounts, sufficient detailed breakdown shall be provided to meet this requirement. The Schedule of Values shall have a one-to-one relationship to the work activities of the Construction Progress Schedule even though additional detailed breakdowns for the Schedule of Values may be required. Engineer will be the sole judge of acceptable breakdowns, details, and descriptions of the values established. If, in the opinion of Engineer, a greater number of Schedule of Values items than proposed is necessary, add the additional items so identified.

B. The minimum details of a breakdown of the major Work components are indicated below. Provide greater detail when directed by Engineer.
   1. Mobilization: Six percent of Contract Price.
   2. Construction Progress Schedule shall be broken down by initial submittal and monthly updates.
   3. Break down Civil site Work into fencing, clearing and grubbing, surface restoration, and any other items determined to be necessary for the establishment of pay and activity items.
   4. Break down pipe installation into individual items including pipe, wax tape wrapping, insulation wrapping, and outerwrap wrapping.
   5. Provide breakdown for testing, and commissioning of pipelines.
   6. Operations and Maintenance (O & M) Manuals shall be broken down into one O & M Manual per piece of equipment or one O & M Manual per group of like-kind pieces of equipment for establishment of pay and schedule activity items.
   7. Break down all other Work not specifically included in the above items as necessary for establishment of pay and schedule activity items.

C. After submittal of the Schedule of Values, as part of the Construction Progress Schedule submittal, meet with Engineer and jointly review the schedules. Review the value allocations and extent of detail to determine any necessary adjustments to the values and to determine if sufficient detail has been proposed. Make adjustments deemed necessary to the value

allocation or level of detail and submit a revised detailed Schedule of Values within 5 work days from receipt of comments from Engineer.

1.3 CHANGES TO SCHEDULE OF VALUES

A. Assign values, approved by Engineer, for changes to the Construction Schedule which add activities not included in the original Construction Schedule but are included in the original Work (schedule omissions). Reduce other activity values to provide equal value adjustment increases for added activities as approved by Engineer.

B. If Contractor and Engineer agree to adjust the original Schedule of Values because of inequities discovered in the original accepted detailed Schedule of Values, increases, and equal decreases to values for activities may be made. Engineer may direct changes to the schedule when inequities are discovered and agreement on the reallocation cannot be achieved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 30
SAFETY

PART 1 - GENERAL

1.1 SUMMARY

A. Contractor's safety program shall conform to the requirements specified in the General Conditions and Supplementary Conditions.

1.2 DEFINITIONS

A. For the purposes of this Section, an "active construction area" is any area where construction activities are occurring, or construction activities could be considered a potential hazard to people.

B. A "Designated Safety Officer" or "Safety Representative" for the purposes of this Contract, means anyone who can identify the existing and predictable hazards in the areas surrounding a construction project or those working conditions at a construction project that are unsanitary or dangerous to employees. A "Designated Safety Officer" has the authority to make prompt corrective measures to eliminate those hazards.

1.3 SUBMITTALS

A. Demonstrate compliance action with the stipulations of Utah Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), and other applicable local, state, and federal safety requirements by submitting to Engineer a copy of all safety plans, programs, and permits. Such plans and programs shall include, but are not limited to:

1. Emergency Plan.
2. Rigging and Hoisting Plans.
3. Excavation and Trenching Plans.
4. Fall Protection.
5. Heavy Equipment Operations.
6. Training Plan.
7. Project Site Rules and Regulations (hazard protection plan).
8. Material Handling (storage-disposal).
9. Personal Protective Equipment (hearing, eye, face).
10. Traffic Control.
11. Environmental Controls.
12. Safety Meetings.

B. Engineer's receipt of safety plans or programs will not relieve Contractor in any way from the full and complete responsibility for safety and training of its personnel, and the onsite personnel of Owner, Engineer, and other visitors to areas of active construction areas. Daily, inform Engineer of changes to the boundaries of the active construction areas.

C. Be responsible for safety training all personnel who will have access to the active construction areas to meet state, federal, local and Contractor requirements. Maintain reasonable, regularly scheduled training sessions in mutually accessible facilities through entire Contract. Training costs for all personnel and visitors, except those costs associated with training personnel of Contractor, subcontractors, suppliers, and visitors will be considered incidental to other lump-sum portions of the Work and no additional compensation for such training will be provided.

D. Safety Program Requirements:
   1. Safety Representative Requirements:
      a. Assign a full-time Safety Representative as defined in the General Conditions of the Contract.
      b. The Safety Representative's duties and responsibilities will be hazard recognition, accidents prevention, new employee orientation (including subcontractors), and the maintaining and supervising of safety precautions and program. The Safety Representative or a qualified and approved deputy shall be onsite at all times while Work is ongoing.
      c. Qualifications of the Safety Representative and assigned deputies shall be submitted to Engineer for review. Acceptance of their qualifications by Engineer is required prior to the start of any activity on the Project. The Safety Representative will, as a minimum, meet the requirements of regulations for the Utah Occupational Safety & Health Enforcement Program.
   2. Hazardous Substances:
      a. Provide Engineer with a list of all hazardous substances anticipated to be brought on-site.
      b. Maintain on site Material Safety Data Sheets (MSDS) prior to arrival of any hazardous substances on the Project.
      c. Use storage area(s) as outlined in the spill control plan.
   3. Job Safety Analysis (JSA):
      a. Outline the sequence of the Work, equipment to be used, identify hazards that may exist or may be created and what procedures and/or safety equipment will be used to eliminate or reduce these hazards. A Scope of Work JSA shall be prepared and provided to the Engineer prior to the start of unusual, hazardous, or have risk potential activities on the Project. The name of the competent person assigned to this activity will be included on the JSA.
      b. Complete a JSA for any activity, which may be of an unusual nature or involves unique hazards.
   4. Reports
      a. Provide to Engineer copies of Contractor's and subcontractor's:
         1) First aid, recordable, lost time and near miss, monthly logs.
         2) OSHA 200 injury log (annually).
         3) Safety meeting reports and topics (weekly).
         4) List of competent persons as required by OSHA and the Project Health and Safety Manual for each required task and their qualification as such.
         5) Injury and accident reports will be submitted to Engineer within 24 hours of any incident. **Immediate** notification to Engineer of an accident is **required**. Full cooperation with Engineer in accident investigation is required.

b. Conduct weekly safety inspections. Corrective actions shall be taken within 24 hours to address all deficiencies identified during inspections. Deficiency reports shall be prepared and submitted to Engineer within 48 hours indicating corrective actions taken. Failure to comply with required corrective measures identified in the safety inspection will result in the delayed signing of the monthly application for progress payment by Engineer.

c. Provide Engineer with a report of any periodic audit of Contractor's safety performance and/or records.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 GENERAL

A. Employ a bar chart schedule for the planning and scheduling of all Work required under the Contract Documents.

B. In addition to the scheduling aspect, the same chart shall show an "S" curve for scheduled dollar expenditures versus time.

C. In the process of preparing baseline schedule and monthly updates, consult with all key subcontractors and suppliers to assure concurrence with the feasibility and achievability of planned start dates, sequencing, durations, and completion dates.

1.2 RELATED SECTIONS

A. Section 01 20 00 – Measurement and Payment

1.3 QUALIFICATIONS

A. Demonstrate competence through the submission of a fully compliant Construction Progress Schedule with the initial schedule submission. Upon failure to so demonstrate competence in scheduling, Engineer may direct Contractor to employ the services of a scheduler that can demonstrate competence. Comply with such directives.

1.4 SUBMITTAL PROCEDURES

A. Submittal Requirements
   1. Submit Construction Progress Schedule on a standard drawing sheet, size 24 inches by 36 inches.
   2. The time scale (horizontal) shall be in weeks. The activities shall be listed on the left-hand side (vertical).
   3. Break down activities into sufficient detail to show all work activities. The listing from top to bottom shall be in a logical manner of which the Work will be accomplished. Provide space between activities or within bars to allow for marking of actual progress.
   4. Provide a written narrative of the planning logic along with a description of Work and quantities included in each activity of the bar chart schedule.
   5. Duration: The duration indicated for each activity shall be in units of whole working days and shall represent the single best time considering the scope of the Work and resources planned for the activity, including time for holidays and inclement weather. The calendar for the network shall be in calendar days. Except for certain non-labor activities, such as curing concrete or delivering materials, activity durations shall not exceed 14 days, be less than one day, nor exceed $ 50,000 in value unless otherwise accepted by Engineer.

B. Time of Submittals

1. Submit the bar chart schedule with "S" curves and narrative within fifteen (15) working days after Notice to Proceed for review by Engineer. The schedule submitted shall indicate a project completion date the same as the contract completion date.
2. Submit a copy of the schedule, clearly showing progress made and actual "S" curves, on a two or four week basis depending on the duration of the project and reporting time agreed to in the preconstruction meeting.

C. Acceptance

1. The bar chart schedule and "S" curves, when accepted by Engineer, constitute the Construction Progress Schedule unless a revised schedule is required due to one or more of the following:
   a. Substantial changes in the Work scope.
   b. A change in Contract time.
   c. Delinquency by Contractor that requires a recovery schedule.
2. Owner's review and acceptance of the Construction Progress Schedule is for conformance to the requirements of the Contract Documents only. Review and acceptance by Owner of Contractor's Construction Progress Schedule does not relieve Contractor of any of its responsibility whatsoever for the accuracy or feasibility of the Construction Progress Schedule, or of Contractor's ability to meet interim milestone dates and the Contract completion date, nor does such review and acceptance expressly or impliedly warrant, acknowledge, or admit the reasonableness of the logic and durations of the Construction Progress Schedule.

1.5 SCHEDULE UPDATES

A. The Construction Progress Schedule shall be updated to reflect the as-built conditions of the Work and to accurately forecast the status of incomplete activities. Provide progress reports at each weekly progress meeting, stating actual percent earned versus percent planned. Submit Construction Progress Schedule updates to Engineer with each payment request, including approved changes in the Work and accurately depicting the current status and sequence of all activities.

B. Submit the updated Construction Progress Schedule in the form, sequence, and number of copies requested for the initial schedule.

C. Engineer will review each submitted Construction Progress Schedule update and provide comments within seven days of the submittal. Revise and resubmit the schedule within five days of receipt of comments from Engineer. Engineer will review the re-submittal within five days and provide comments if the schedule update is still unacceptable. Revise and resubmit the schedule within five days of receipt of comments from Engineer.

1.6 PROGRESS MEETINGS AND LOOK-AHEAD SCHEDULES

A. For the weekly progress meetings, submit a look-ahead schedule. This schedule will cover four weeks: the immediate past week, the current week, and the forthcoming two weeks. List all activities from the accepted Construction Progress Schedule, which are complete, are scheduled for Work during the period, are currently planned to be worked, even if out of sequence, and Work which is unfinished but scheduled to be finished. Provide actual start

and completion dates for the Work that has been completed the prior week. Forecast early start and early finish dates for the Work that is in process or upcoming.

B. Identify each activity noted above by activity number corresponding to the accepted Construction Progress Schedule and detailed description of the activity.

C. Deliver the look-ahead schedule to Engineer 24 hours prior to the weekly progress meeting in a format approved by Engineer.

1.7 CONSTRUCTION SCHEDULE REVISIONS

A. Engineer may direct and, if so directed, Contractor shall propose, revisions to the Construction Progress Schedule upon occurrence of any of the following instances:
   1. The actual physical progress of the Work falls more than five percent (5%) behind the accepted Construction Progress Schedule, as demonstrated by comparison to the accepted monthly Construction Progress Schedule updates or as determined by Engineer if a current accepted Construction Progress Schedule does not exist.
   2. Engineer considers milestone or completion dates to be in jeopardy because of "activities behind schedule". "Activities behind schedule" are all activities that have not or cannot be started or completed by the dates shown in the Construction Progress Schedule.
   3. A Change Order has been issued that changes, ads, or deletes scheduled activities, or affects the time for completion of scheduled activities.

B. When instances requiring revision to the Construction Progress Schedule occur, submit the proposed revised Construction Progress Schedule within ten (10) working days after receiving direction from Engineer to provide such schedule. No additional payment will be made for preparation and submittal of proposed revised Construction Progress Schedules. However, if Engineer accepts the proposed revised Construction Progress Schedule, it shall replace and supersede all previous Construction Progress Schedules and substitute for the next monthly Construction Progress Schedule update that would otherwise be required.

C. Revisions to the Construction Progress Schedule shall comply with all the same requirements applicable to the original schedule.

1.8 SCHEDULE RECOVERY

A. If a revised Construction Progress Schedule accepted by Engineer requires additional manpower, equipment, hours of work or work shifts, or to accelerate procurement of materials or equipment, or any combination thereof, as schedule recovery measures to meet Contract milestones, implement such schedule recovery measures without additional charge to Owner.

1.9 EARLY COMPLETION SCHEDULES

A. Early completion schedules are generally not acceptable to Owner but may be accepted as a convenience to Contractor and under the following conditions.
   1. Submit a specific written request outlining the specific reasons for using the early completion schedule.

2. Acknowledge and agree in writing that the proposed reduction in time represents Project time already paid for by Owner as part of the Bid Price, and available to both Contractor and Owner for the mitigation of impacts to the Project from any source. Contractor is not entitled to any increase in Contract price for failure to achieve the early completion and waives all claim to same.
3. Early completion schedules shall not be based upon or rely on expedited approvals by Owner or Engineer.
4. Early completion schedules must meet all other requirements of the Contract.

B. Revise early completion schedules, which have activities behind schedule, when and as requested by Engineer.

1.10 BASIS OF SCHEDULE NARRATIVES

A. Furnish a basis of schedule narrative to Engineer with each Application for Payment. If the Work falls behind schedule, submit additional narrative at such intervals as Engineer may request.

B. In each narrative, include a summary of progress for the month, description of any current and anticipated delaying factors, a variance analysis for varying activities, impacts on the construction schedule, and proposed corrective actions. Any Work reported complete, but which is not readily apparent to Engineer, must be substantiated with satisfactory evidence.

C. In each narrative, include a list of the activities completed during the preceding month and a list of the activities started during the month but not yet completed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 20
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for submittals required in performance of the Work, including shop drawings, schedules, surveys, reports, samples, plans, lists, drawings, documents, warranties, certifications, findings, programs, manuals, data sheets, or any other item of information required by the Contract Documents to be submitted in accomplishing the Work.

1.2 DEFINITIONS

A. Action Submittal: Written and graphic information submitted by Contractor that requires Engineer's approval for inclusion in the Work.

B. Deferred Submittal: Information in accordance with the applicable Building Code, submitted by Contractor for portions of the design that are to be submitted to permitting agency after the time of permit application and prior to installation of that portion of Work. Deferred Submittals must include Engineer's review documentation stating that submittal has been found to be in general conformance with overall Project design.

C. Informational Submittal: Information submitted by Contractor to represent compliance with Contract Requirements included in the Work, but which are not part of the Work itself. Informational Submittals must be submitted to Engineer for information and for determination that submitted information is in accordance with Contract requirements.

D. Shop Drawing: The term "Shop Drawing" as used herein shall be understood to include detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, lists, graphs, and similar items.

E. PDF: Abbreviation for "Portable Document Format", used for transmittal of electronic documents.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Whenever submittals are required hereunder, transmit all documents to Engineer in electronic format, via web-based construction management software as specified in Section 00 73 00 – Supplementary Conditions.

B. Be responsible for the accuracy, completeness, and coordination of all submittals. Do not delegate this responsibility in whole or in part to any subcontractor. Submittals may be prepared by Contractor, subcontractor, or supplier, but Contractor shall ascertain that each submittal meets the requirements of the Contract and the Project. Ensure that there is no conflict with other submittals and notify Engineer in each case where a submittal may affect the work of another contractor or Owner.

C. Coordination
   1. Ensure coordination of submittals of related crafts and subcontractors.
   2. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently ahead of performance of related construction activities to avoid delay.
   3. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
   4. Carefully review all submittals prior to submission. Sign and date each transmittal with a direct statement acknowledging that the equipment or material in the submittal meets all the requirements specified or shown in the Contract Documents without exception. No consideration or review of any submittals will be made for any items, which have not been so certified. All non-certified submittals will be returned without action taken, and any delays caused thereby shall be the total responsibility of Contractor. Submittals which cannot bear this certification because they contain an exception or deviation to the Contract Documents shall be so noted in the electronic transmittal and shall only be submitted in accordance with Section 01 25 10 – Products, Materials, Equipment and Substitutions.

D. Processing: Allow sufficient review time so that installation will not be delayed because of the time required to process submittals, including time for resubmittals.
   1. Except as may otherwise be indicated herein, Engineer will return each submittal, with comments noted thereon, within 14 calendar days following receipt by Engineer.
   2. For resubmittal, Engineer will be allowed the same review period as for the original submittal.
   3. It is considered reasonable that Contractor will make a complete and acceptable submittal to Engineer by the second submission of an item. Owner reserves the right to withhold monies due Contractor to cover additional costs of any review beyond the second submittal.
   4. Allow additional time if processing must be delayed for coordination with subsequent submittals. Engineer will promptly advise Contractor when a submittal being processed must be delayed for coordination.
   5. If an intermediate submittal is necessary, process the same as the initial submittal.
   6. No extension of Contract Time will be authorized resulting from non-compliant submittals or failure to transmit submittals to Engineer sufficiently in advance of the Work to permit processing.
   7. If an incomplete submittal is made, the submittal may be returned without review. A complete submittal will contain sufficient data to demonstrate that the items contained therein comply with the Contract Documents, meet the minimum requirements for submittals as described in the Contract Documents, and include all corrections as required from previous submittals.

E. Submittal Schedule
   1. Within 30 days of the Notice to Proceed, submit a complete list of anticipated submittals, which includes Specification and Drawing references.
      a. Coordinate submittal schedule with any subcontracts, schedule of values, the list of products, and Contractor's construction schedule.
      b. Prepare schedule in chronological order.

c. Update the list with “early start” submittal dates within 15 days of submittal of the Construction Progress Schedule.
d. Update submittal dates whenever the schedule is updated and include any additional submittals identified after the initial submittal in the updates.

F. Unsolicited Submittals: Unsolicited submittals may be returned without being reviewed.

G. Changes in Work: Changes in the Work will not be authorized by submittal review actions. No review action, implicit or explicit, will be interpreted to authorize changes in the Work. Changes will only be authorized by separate written direction from Owner, in accordance with the General Conditions.

1.4 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

A. Product Data:
1. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard published data is not suitable for use, submit as "Shop Drawings."
2. Mark each data sheet to show applicable choices and options pertinent to the Project. Where printed Product Data includes information on several products, some of which are not required for the Project, mark the data sheets to indicate the applicable information. Include the following information:
a. Manufacturer's printed recommendations.
b. Compliance with recognized trade association standards.
c. Compliance with recognized testing agency standards.
d. Application of testing agency labels and seals.
e. Notation of dimensions verified by field measurement.
f. Notation of coordination requirements.
3. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

B. Samples
1. Whenever in the Specifications, samples are required, submit not less than 3 samples of each item or material to Engineer for acceptance at no additional cost to Owner.
2. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
3. Submit samples for acceptance, a minimum of 21 days prior to ordering such material for delivery to the jobsite. Submit in an orderly sequence so that dependent materials or equipment can be assembled and reviewed without causing delays in the Work.
4. Transmit a submittal as a single PDF document with list of samples via the web-based project management software.
5. Individually and indelibly label and tag all samples to indicate all specified physical characteristics and Manufacturer's name for identification. Upon receiving acceptance by Engineer, one set of the samples will be stamped, dated, and returned.

One set of samples will be retained by Engineer, and one set of samples will remain at the Project site until completion of the Work.

6. Unless indicated otherwise, all colors and textures of specified items presented in sample submittals shall be from the manufacturer's standard colors and standard materials, products, or equipment lines. If the samples represent non-standard colors, materials, products, or equipment lines and their selection will require an increase in Contract time or Price, clearly indicate this information in the submittal.

C. Shop Drawings

1. Wherever called for in the Contract Documents, or where required by Engineer, transmit an electronic Shop Drawing Submittal to Engineer for review, using the web-based project management software. Whenever required to submit design calculations as part of a Submittal, such calculations shall bear the signature and seal of a professional engineer registered in the appropriate discipline in the state of Utah unless otherwise directed.
2. Organization
    a. Prepare a single shop drawing submittal for each item or class of material or equipment for which submittal is required. At a minimum, separate submittals are required for different Specification Sections except as follows. A single submittal covering multiple sections will not be accepted unless the primary specification references other sections for components. Example: If a pump section references other sections for the motor, protective coating, anchor bolts, local control panel, and variable frequency drive, a single submittal would be accepted; a single submittal covering vertical turbine pumps and horizontal split case pumps would not be acceptable.
    b. Index the components for the submittal and reference the specification sections and paragraph numbers for all components in the description field of the electronic submittal. Relate the submittal components to drawing number, detail number, schedule title, or room number and building name, as applicable.
    c. Unless indicated otherwise, terminology and equipment names and numbers used in submittals shall match the Contract Documents.
    d. Engineer will assign a single review action to each submittal, which action shall pertain to every part of the submittal as a whole.
    e. Disorganized submittals, which do not meet the requirements specified herein will be returned without review.
3. Format
    a. Assemble submittals into a single PDF file for each transmittal. Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on PDF sheets at least 8-1/2” x 11” and no larger than 36” X 48”
    b. Where product data from a manufacturer is submitted, clearly mark which model is proposed, with all pertinent data, capacities, dimensions, clearances, diagrams, controls, connections, anchorage, and supports. Present sufficient level of detail for assessment of compliance with the Contract Documents.
    c. Assign each Submittal a unique number, including the specification section under which it is submitted. Number all submittals sequentially within the applicable specification section. Original submittals will be assigned a numeric submittal number. Resubmittals shall be numbered with a revision number in addition to the original submittal number.

D. Engineer's Action
   1. If submittal is returned to Contractor marked "NO ACTION TAKEN", indicating that the submittal has been received and is being retained for record-keeping purposes. Formal revision and resubmission of said submittal will not be required.
   2. If submittal is returned to Contractor marked "NO EXCEPTIONS TAKEN", formal revision and resubmission of said Submittal will not be required and construction may proceed.
   3. If submittal is returned to the Contractor marked "MAKE CORRECTIONS NOTED", formal revision and resubmission of said submittal will not be required but construction must proceed according to the review comments included with the submittal.
   4. If submittal is returned marked "REVISE AND RESUBMIT", revise said submittal and resubmit. Construction may not proceed.
   5. If submittal is returned marked "REJECTED-RESUBMIT", revise said submittal and resubmit. Construction may not proceed.
   6. Resubmittal of portions of multi-page or multi-drawing submittals will not be allowed. For example, if a Shop Drawing Submittal that consists of ten drawings contains only one drawing that needs to be amended and resubmitted, the submittal as a whole is deemed as "REVISE AND RESUBMIT", and all ten drawings included in the submittal are required to be resubmitted.
   7. On resubmittals, flag any changes made, other than those made or requested by Owner or Engineer.

E. Commence fabrication of an item only after Engineer has reviewed the pertinent submittals and Engineer has assigned action as either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED". Corrections indicated on submittals are considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the Contract requirements.

F. Owner's and/or Engineer's review of shop drawing submittals does not relieve Contractor of the responsibility for correctness of details and dimensions and for compliance with the Contract Documents. Assume responsibility and risk for misfits due to errors in submittals. Be responsible for dimensions and design of adequate connections and details.

G. Deferred Design Submittals: Items noted on the Contract Documents as "Deferred Submittals" must be submitted to Engineer, who will review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and found to be in general conformance with the design of the Project. Do not install Deferred Submittal items until the deferred submittal documents have been approved by the permitting agency.

H. Test and Evaluation Reports: Submit technical data, test reports, calculations, surveys, and certifications based on field tests and inspections by independent inspection and testing agency and by authorities having jurisdiction.
   1. Reports of results of inspections and tests will not be considered Contract Documents.
   2. Refer to Section 01 45 00 - Quality Control for additional requirements.

1.5 PRECONSTRUCTION CONFERENCE SUBMITTALS

A. At the preconstruction conference referred to in Section 01 11 00 - Summary of Work, submit the following items to Engineer for review:
   1. A preliminary schedule of Shop Drawings, Samples, and proposed Substitute ("Or-Equal") submittals listed in the Bid.
   2. A list of all permits and licenses to be obtained, indicating the agency required to grant the permit, the expected date of submittal for the permit, and required date for receipt of the permit.
   3. A preliminary Schedule of Values in accordance with Section 01 29 73 – Schedule of Values.
   4. A preliminary Construction Project Schedule in accordance with requirements of Section 01 32 16 – Construction Progress Schedule.
   5. The name and qualifications of the Designated Safety Representative in accordance with requirements of Section 01 31 30 - Safety.

1.6 SITE CONDITION SURVEYS

A. Submit the site conditions survey data as required in Section 01 71 30 – Site Conditions Surveys.

1.7 CONSTRUCTION PROGRESS REPORTS

A. Transmit a progress report to Engineer with each Application for Payment. If the Work falls behind schedule, submit additional progress reports at such intervals as Engineer may request.

B. In each progress report, include sufficient narrative to describe any current and anticipated delaying factors, effect on the construction schedule, and proposed corrective actions. Any Work reported complete, but which is not readily apparent to Engineer, must be substantiated with satisfactory evidence.

C. In each progress report, include a list of the activities completed with their actual start and completion dates, a list of the activities currently in progress, and the number of working days required to complete each.

1.8 SURVEY DATA

A. Make available for examination throughout the construction period, all field books, notes, and other data developed while performing the surveys required by the Work and submit all such data to Engineer with documentation required for final acceptance of the Work.

1.9 UTILITY INVESTIGTION

A. Transmit the findings of the utility investigation in accordance with Section 01 71 50 – Protection and Restoration of Existing Facilities.

1.10 QUALITY ASSURANCE/QUALITY CONTROL PLAN

A. Prepare and submit a Quality Assurance/Quality Control Plan for the Work contained in the Contract in accordance with Section 01 45 00 – Quality Control.

1.11 CONTRACTOR DAILY REPORT

A. Submit to Engineer, or designee, a daily report. Upload report not later than 9:00 A.M. of the workday following the report date and include the following:
   1. Day of week, date, Contractor name and Report number.
   2. Summary of work in process (segregated by Contractor and Subcontractor).
   3. Details of work accomplished including quantities of Work installed.
   4. Summary of equipment working and where working.
   5. Summary of manpower by work element and Subcontractor.
   6. Receipt of major equipment or materials.
   7. All required testing performed and, if available, documented results.
   8. Notification of percent of Work delayed by abnormal weather conditions.
   9. Notification of percent of Work delayed by other utility conflicts or conditions.

1.12 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Manual
   1. Submit technical operation and maintenance information for each item of mechanical, electrical and instrumentation equipment in an organized manner in the *Operations and Maintenance Manual*, written so that it can be used and understood by the Owner's operation and maintenance staff.
   2. Furnish initial submittal of the *Operations and Maintenance Manual* to Engineer upon delivery of the respective equipment.
   3. Subdivide the *Operations and Maintenance Manual* first by Specification Section number; second, by equipment item; and last, by "Part." Conform "Parts" to the following (as applicable):
      a. Part 1 – Equipment Summary:
         1) Summary: In a summary table, indicate the equipment name, equipment number, and process area in which the equipment is installed.
         2) Form: Furnish an Equipment Summary Form for each item of mechanical, electrical and instrumentation equipment in the Work. Fill in the relevant information on the form and include it in Part 1.
      b. Part 2 – Operational Procedures:
         1) Procedures: Include manufacturer-recommended procedures on the following in Part 2:
            a) Installation
            b) Adjustment
            c) Startup
            d) Location of controls, special tools, equipment required, or related instrumentation needed for operation
            e) Operation procedures
            f) Load changes
            g) Calibration
            h) Shutdown

i) Troubleshooting
j) Disassembly
k) Reassembly
l) Realignment
m) Testing to determine performance efficiency
n) Tabulation of proper settings for all pressure relief valves, low and high- pressure switches, and other protection devices
o) List of all electrical relay settings including alarm and contact settings
p) Lubrication.

c. Part 3 – Preventive Maintenance Procedures:
   1) Procedures: Preventive maintenance procedures shall include all manufacturer-recommended procedures to be performed on a periodic basis, both by removing and replacing the equipment or component, and by leaving the equipment in place.
   2) Schedules: Include recommended frequency of preventive maintenance procedures. Cover lubrication schedules, including lubricant SAE grade, type, and temperature ranges.

d. Part 4 – Parts List:
   1) Parts List: Furnish a complete parts list, including a generic description and manufacturer's identification number for each part. Include addresses and telephone numbers of the nearest supplier and parts warehouse.
   2) Drawings: Include cross-sectional or exploded view drawings with the parts list.

e. Part 5 – Wiring Diagrams:
   1) Diagrams: In this part, include complete internal and connection wiring diagrams for electrical equipment items.

f. Part 6 – Shop Drawings:
   1) Drawings: In this part, include approved shop or fabrication drawings, complete with dimensions.

g. Part 7 – Safety:
   1) Procedures: This part describes the safety precautions to be taken when operating and maintaining the equipment or working near it.

h. Part 8 – Documentation:
   1) Place all equipment warranties, affidavits, and certifications required by the Technical Specifications in this part.

4. Transmit to Engineer, one copy of the *Operations and Maintenance Manual* in digital format. In addition to the digital copy, furnish Engineer with four identical hard copies of the *Operations and Maintenance Manual*. Each set shall consist of one or more volumes, each of which shall be bound in a standard size, 3-ring, loose-leaf, vinyl plastic hard cover binder suitable for bookshelf storage. Binder ring size shall not exceed 2.5 inches. Prepare a table of contents indicating all equipment in the manuals. Display the title of each volume on the cover and spine.
5. Submit *Operations and Maintenance Manuals* in final form, not later than the 75 percent of construction completion date. Correct all discrepancies found by Owner or Engineer in the *Operations and Maintenance Manual* within 30 days from the date of written notification.
6. Incomplete or unacceptable *Operations and Maintenance Manuals* at the 75 percent construction completion point constitute sufficient justification to withhold the

amount stipulated in paragraph "*Operations and Maintenance Manual* Submittals" of Section 01 77 00 – Project Closeout, from any monies due.

B. Certificates
   1. When specified in individual specification sections, submit manufacturers' certificates to Engineer for review as specified.
   2. Submit in form of letter or company standard forms, signed by officer of manufacturer.
   3. Include the following with each certification
      a. Project name and location.
      b. Contractor's name and address.
      c. Quantity and date or dates of shipment or delivery to which certificate applies.
      d. Manufacturer's name.
      e. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
      f. Certificates may be recent or previous test results on material or product but must be acceptable to Engineer.

C. Record Documents
   1. Prepare and maintain one set of record documents at the Project Site per the requirements of Section 01 78 39 – Project Record Documents. Submit to Engineer at close of Project.

1.13 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts: Submit list of spare parts information for all mechanical, electrical, and instrumentation equipment. Include the current list price of each spare part. Limit the spare parts list to those spare parts which each manufacturer recommends be maintained by Owner in inventory at the plant site. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet of spare parts to facilitate Owner in ordering. Cross-reference all spare parts lists to the equipment numbers designated in the Contract Documents. In addition to electronic submittal, bind the spare parts lists in standard size, 3-ring, loose-leaf, vinyl plastic hard cover binders suitable for bookshelf storage. Binder ring size not to exceed 2.5 inches.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 35 53
SECURITY

PART 1 - GENERAL

1.1 SUMMARY

A. Protect the active construction areas of the Work, including all material, equipment, field office trailers, and their contents from theft, vandalism, and unauthorized entry.

1.2 DEFINITIONS

A. For the purposes of this Section, an "active construction area" is any area where construction activities are occurring, or construction activities could be considered a potential hazard to people.

1.3 RELATED SECTIONS

A. Section 01 57 19 – Temporary Environmental Controls

1.4 SUBMITTALS

A. Prior to performance of any work at the Project Site, submit to Engineer for record only, two copies of the security plan commensurate with the needs of the Project, signed by officer of Contractor. Be solely responsible for adequacy of the security plan.

B. Provide Engineer with drawing and data showing temporary fencing and gate locations, along with materials to be used.

C. Provide Engineer with a list of 24-hour emergency phone numbers for Contractor personnel.

D. Submit to Engineer an updated progressive inventory of materials and equipment received on-site.

E. Submit log of workmen and visitors to Project Site.

1.5 SECURITY PROGRAM

A. Protect Work and existing premises, including the field office trailers and their contents, from theft, vandalism, and unauthorized entry during working and non-working hours.

B. Accept sole responsibility for Project Site security and protection of the Work.

C. Initiate the security program at job mobilization and maintain the security program throughout construction period.

D. Limit lighting to basic safety and security requirements, and shield when possible.

E. Be responsible for the security of storage compound and lay down area, and for all plant material, equipment, and tools always.

F. Prohibit firearms for the Project Site.

G. Prohibit dogs from the Project Site, except for those clearly used for security purposes within fenced areas.

1.6 ENTRY CONTROL

A. Entry control shall not unreasonably limit the personnel of Owner, Engineer, and their operations and maintenance groups from performing assigned duties. Temporary access limitations will be identified to Engineer and the operations and maintenance groups at least 24 hours prior to such limitation.

B. Restrict entry of unauthorized persons and vehicles into Project Site.

C. Allow entry only to authorized persons with proper identification.

D. When requested by Owner, implement a security badge system for the Project Site, approved by Owner.

E. Maintain a log of workmen and visitors and make log available to Owner on request. This log shall be submitted to Engineer biweekly or as necessary.

F. Require all visitors to sign the visitor log acknowledgment of the project rules included in this Section. A copy of the project rules shall be given to each visitor. Submit copies of these forms to Engineer biweekly.

G. Contractor has the right to refuse access to the Project Site or require that a person or vehicle be removed from the Project Site if found violating any of the project rules.

H. Give jobsite security orientation training to all affected employees, including subcontractor employees. Employee participation in the security orientation shall be acknowledged by their respective individual signatures affixed to an orientation roster.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 41 26
PERMITS

PART 1 - GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

A. Obtain permits required for the execution of Work in accordance with the Contract Documents. Provide copies of these permits to Owner.

B. The intent of this Section is to furnish the known list of required permits for the Work under the Contract Documents. Owner does not guarantee that this list is complete. Be responsible for determining and verifying the extent of all permits required and for obtaining such permits.

C. In the Bid Price, include costs for obtaining all necessary permits, including application fees and other costs, and the costs of complying with the conditions of all permits. Any fees listed in this section are estimates and are for information only. Verify and pay all actual fees.

D. Within 30 Days of the Limited Notice to Proceed, submit a list of all permits and licenses to be obtained, indicating the agency required to grant the permit, the expected date of submittal for the permit, and required date for receipt of the permit.

1.2 SUMMARY OF PERMITS TO BE OBTAINED BY CONTRACTOR

A. Obtain the following permits. Submit copies of these permits to Engineer and maintain copies on-site. Comply with all conditions of the permits.
   1. Utah Occupational Safety and Health Administration:
      a. Construction Permit: Covers worker safety and health for all project features.
   2. Utah Department of Environmental Quality, Division of Water Quality:
      a. UPDES General Permit for Construction Dewatering/Hydrostatic Testing of Pipelines: Covers discharge waters associated with dewatering operations and hydrostatic testing of pipelines.
         1) Agency: Utah Department of Environmental Quality, Division of Drinking Water
         2) Contact Person: Harry Campbell
         3) Telephone No.: (801) 538-6923
         4) Email: hcampbell@utah.gov
      b. Notification of Chlorinated Water Discharge: This notification provides 30 days' notice prior to disinfection of pipeline and discharge of pipeline and discharge of chlorinated water.
   3. Utah Division of Environmental Protection, Bureau of Water Pollution Control
      a. Temporary Groundwater Discharge Permit is necessary if groundwater is present.
   4. Utah Division of Environmental Protection, General Storm Water Permit for Construction Activities:
      a. As a condition of contract award, sign a certification of agreement to comply with the terms and conditions of the permit. Permit not required if area of disturbance is less than one acre.

b. Agency:
1) Agency: Utah Department of Environmental Quality, Division of Drinking Water

1.3 SUMMARY OF PERMITS OBTAINED BY OWNER

A. The following permits have been or will be obtained by Owner for this Project. Verify and comply with conditions of said permits.
1. Utah Department of Natural Resources, Division of Water Rights:
a. Joint Permit Application Form
1) Agency: U.S. Army Corps of Engineers and Utah State Engineers Office
2) Contact Person: Chuck Williamson
3) Telephone No.: (801) 538-7404
4) Email: charleswilliamson@utah.gov

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Titles of Sections and Paragraphs: Captions accompanying Specification Sections and Paragraphs are for convenience of reference only, and do not form a part of the Specifications.

B. Applicable Publications: Whenever in these Specifications, references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies, which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.

C. Specialists, Assignments: In certain instances, Specification text requires (or implies) that specific Work is to be assigned to specialists or expert entities, who must be engaged for the performance of that Work. Such assignments shall be recognized as special requirements with no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the Work; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of Work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, accept the final responsibility for fulfillment of the entire set of contract requirements.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all Work specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.

B. References herein to "Building Code", “Plumbing Code”, “Mechanical Code”, “Fuel Gas Code”, or “Fire Code” shall mean the latest adopted version of the International Building Code (IBC), the International Plumbing Code (IPC), the International Mechanical Code (IMC), the International Fuel Gas Code (IFGC), and the International Fire Code (IFC) as published by the International Code Council (ICC). Similarly, references to the "Uniform Mechanical Code" or the "Uniform Plumbing Code" shall mean the Uniform Mechanical Code or the Uniform Plumbing Code as published by the International Association of Plumbing and Mechanical Officials (IAPMO) References to the "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). The latest edition of any “building” code as approved by the Municipal Code and adopted by the authority having jurisdiction, shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflict between codes, reference standards, Drawings and the other Contract Documents, the most stringent requirements shall govern. Bring all conflicts to the attention of Engineer for clarification and directions prior to ordering or providing any materials or furnishing labor. Bid the most stringent requirements.

D. Construct the Work indicated herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.

E. Applicable Standard Specifications: References in the Contract Documents to the "Standard Specifications" shall mean the *Manual of Standard Specifications* (APWA), latest version.

F. References herein to "OSHA Regulations for Construction" shall mean *Title 29, Part 1926, Construction Safety and Health Regulations***,** Code of Federal Regulations (OSHA), including all changes and amendments thereto.

G. References herein to "OSHA Standards" shall mean *Title 29, Part 1910, Occupational Safety and Health Standards***,** Code of Federal Regulations (OSHA), including all changes and amendments thereto.

H. References herein to "UDOT Standards" shall mean *Standard Specifications for Road and Bridge Construction*.

I. References herein to "MSHA Standards" shall mean *Mine Safety and Health Administration Standards*, latest version.

1.3 REGULATIONS RELATED TO HAZARDOUS MATERIALS

A. Be responsible that all Work included in the Contract Documents, whether shown or not, complies with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

B. Where no specific regulations exist, all chemical, hazardous, and petroleum product piping and storage in underground locations must be installed with double containment piping and tanks, or in separate concrete trenches and vaults, or with an approved lining which cannot be penetrated by the chemicals, unless waived in writing by Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. The requirements of this Section apply to, and are a component part of, each Section of the Specifications.

1.2 REFERENCES

A. ASTM International (ASTM) standards, most recent editions:

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3740	Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 20 – Submittal Procedures.

B. Submit Quality Control Plan.

C. Submit credentials for field Quality Control Representative showing experience acceptable to Engineer.

D. Submit credentials for testing laboratory showing compliance with Specifications and acceptable to Engineer.

E. Submit results of testing as specified below.

1.4 SITE INVESTIGATION AND CONTROL

A. Check and verify all dimensions and conditions in the field continuously during construction. Be solely responsible for any inaccuracies built into the Work due to Contractor's (including Subcontractor's) failure to comply with this requirement.

B. Inspect related and appurtenant Work and report in writing to Engineer, any conditions which will prevent proper completion of the Work. Failure to report any such conditions constitutes acceptance of all Site conditions. Required removal, repair, or replacement caused by unsuitable conditions shall be performed at no additional cost to Owner.

1.5 INSPECTION OF THE WORK

A. Inspect all Work performed by both Contractor and Subcontractors. Nonconforming Work and any safety hazards in the work area shall be noted and promptly corrected. Be responsible for the Work to be performed safely and in conformance with the Contract Documents.

B. The Work shall be conducted under the general observation of Engineer and is subject to inspection by representatives of Owner acting on behalf of Owner to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. Owner, Engineer, or any inspector(s) shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.

C. The presence of Engineer, or any inspector(s), shall not relieve Contractor of responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is the responsibility of Contractor. No act or omission on the part of Engineer, or any inspector(s) shall be construed as relieving Contractor of this responsibility. Inspection of Work later determined to be nonconforming shall not be cause or excuse for acceptance of the nonconforming Work. Owner may accept nonconforming Work when adequate compensation is offered, and it is in Owner's best interest as determined solely by Owner.

D. All materials and articles furnished shall be subject to rigid documented inspection by qualified personnel. No materials or articles shall be used in the Work until they have been inspected and accepted by Contractor's Quality Control Representative and Engineer or other designated representative. No Work shall be backfilled, buried, cast in concrete, covered, or otherwise hidden until it has been inspected. Any Work covered in the absence of inspection shall be subject to uncovering. Where uninspected Work cannot be easily uncovered, such as in concrete cast over reinforcing steel, all such Work shall be subject to demolition, removal, and reconstruction under proper inspection.

E. All Owner furnished materials and articles shall be subject to rigid inspection by Contractor's Quality Control Representative before being used or placed in the Work. Inform Engineer, in writing, of the results of said inspections within one working day after completion of inspection. If any material or articles provided by Owner are considered to be of insufficient quality for use in the Work, immediately notify Engineer.

1.6 TIME OF INSPECTION AND TESTS

A. Furnish and prepare samples and test specimens required under these Specifications and for testing in ample time for the completion of the necessary tests and analyses before said articles or materials are to be used. Furnish and prepare all required test specimens without additional expense to Owner. As provided in the Contract Documents, performance of certain tests will be by Owner, and all costs therefore will be borne by Owner, except that the costs of any test, which shows unsatisfactory results shall be back charged to Contractor.

B. Notify Engineer at least three Workdays before being ready to backfill, bury, cast in concrete, hide, or otherwise cover any Work under this Contract and request inspection before beginning any such Work of covering. Failure to notify Engineer at least three Workdays in

advance of any such inspections shall be reasonable cause for Engineer to order a sufficient delay in scheduled operations to allow time for such inspection. Be responsible for costs of any remedial or corrective work required, and all costs of such delays, including its impact on other portions of the Work.

1.7 SAMPLING AND TESTING

A. Unless otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered. However, Engineer reserves the right to use any generally-accepted system of inspection which, in the opinion of Engineer, will ensure Engineer that the quality of the workmanship is in full accord with the Contract Documents.

B. Owner reserves the right to waive tests or quality control measures. However, waiver of any specific testing or other quality control measure, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality control requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.

C. Notwithstanding the existence of such waiver, Owner reserves the right to make independent investigations and tests as specified in the following paragraph and failure of any portion of the Work to meet qualitative requirements of the Contract Documents shall be reasonable cause for Owner to require the removal or correction and reconstruction of any such Work.

D. In addition to any other inspection or quality control provisions that may be specified, Owner reserves the right to independently select, test, and analyze, at the expense of Owner, additional test specimens of any or all the materials to be used. Results of such additional tests and analyses shall be considered along with the tests or analyses made by the Contractor to determine compliance with the applicable specifications for the materials so tested or analyzed provided that wherever any portion of the Work is discovered, as a result of such independent testing or investigation by Engineer, which fails to meet the requirements of the Contract Documents, all costs of such independent inspection and investigation and all costs of removal, correction, reconstruction, or repair of any such Work shall be borne by Contractor.

1.8 RIGHT OF REJECTION

A. Engineer or designated representative, acting for Owner, always reserves the right to reject any articles or materials furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the Work at the Site. If Engineer or designated representative, through an oversight or otherwise, has accepted materials or Work which are defective or in any way contrary to the Contract Documents, such materials, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected.

B. Promptly remove or replace rejected articles or materials from the Site of the Work after notification of rejection.

C. Bear all costs of removal and replacement of rejected articles or materials.

D. Failure to promptly remove and replace rejected Work shall be considered a breach of this Contract and Owner may, after 7 days' notice, terminate Contractor's right to proceed with the affected Work and remove and replace the Work and issue a back charge to cover the cost of the Work.

1.9 QUALITY CONTROL REQUIREMENTS

A. Establish and execute a Quality Control program for the services, which are being provided. The program shall provide adequate measures for verification and conformance to defined requirements of all personnel, including lower-tier subcontractors (including fabricators, suppliers, and sub-subcontractors). Prepare and submit a plan responsive to this Section for review by Engineer.

B. Furnish Engineer with a project specific Quality Control Plan. The plan shall contain a comprehensive account of quality control procedures applicable to this Project. The detailed requirements for this Plan are delineated in the following paragraphs. No progress payments will be made until the Quality Control Plan is fully accepted by Engineer.

C. Using the Quality Control Plan, describe and define the personnel requirements described herein. Provide personnel with assigned quality control functions reporting to a field Quality Control Representative. The field Quality Control Representative shall report to a senior manager of Contractor and shall not have supervisory or managerial responsibility over the work force. Persons performing quality control functions shall have sufficient qualifications, authority, and organizational freedom to identify quality problems and to initiate and recommend solutions. Contractor's Quality Control representative(s) shall be on-site as often as necessary (but not less than the daily hours specified in the Contract Documents) to remedy and demonstrate that Work is being performed properly and to make multiple observations of all Work in progress. The Quality Control Plan shall include a statement by the senior manager designating the Quality Control Representative and specifying authorities delegated to the Quality Control Representative to direct cessation or removal and replacement of defective Work.

D. The Quality Control Plan shall ensure the achievement of adequate quality throughout all applicable areas of the contract. In the Quality Control Plan, describe the program and include procedures, work instructions and records. In addition, describe methods relating to areas that require special testing and procedures as noted in the Specifications.

E. Identification and Control of Items and Materials: Describe procedures in the Quality Control Plan to ensure that items or materials that have been accepted at the site are properly used and installed. Provide procedures for proper identification and storage, and to prevent the use of incorrect or defective materials.

F. Inspection and Tests: Provide written procedures defining a program for control of inspections performed. These procedures shall be described in the Quality Control Plan.

1. Inspections and tests shall be performed and documented by qualified individuals. At a minimum, "qualified" shall mean having performed similar quality control functions on similar type projects. Records of personnel experience, training and qualifications shall be maintained and made available for review by Engineer upon request.

2. Maintain and provide to Engineer, within two working days of completion of each inspection and test, adequate records of all such inspections and tests. Inspection and test results shall be documented and evaluated to ensure that requirements have been satisfied.
3. Procedures shall include:
    a. Specific instructions defining procedures for observing all Work in process and comparing this Work with the Contract requirements (organized by specification section).
    b. Maintaining and providing Daily Inspection Reports. Such reports shall, at a minimum, include the following:
        1) Item(s) inspected
        2) Quality characteristics in compliance
        3) Quality characteristics not in compliance
        4) Corrective/remedial actions taken
        5) Statement of certification
        6) QC Manager's signature
    c. Specific instructions for recording all observations and requirements for demonstrating through the reports that the Work observed complied, or a deficiency was noted and action to be taken.
    d. Procedures to preclude the covering of deficient or rejected Work.
    e. Procedures for halting or rejecting Work.
    f. Procedures for resolution of differences between the Quality Control Representative(s) and the production representative(s).
4. The Quality Control Plan shall identify all contractual hold/inspection points as well as any Contractor imposed hold/inspections points.
5. The Quality Control Plan shall include procedures to provide verification and control of all testing provided, including:
    a. Maintaining and providing to Engineer Daily Testing Records. Such records shall, at a minimum, contain the following:
        1) Item(s) tested
        2) Quality characteristics in compliance
        3) Statement of correctness & certification
        4) Quality characteristics not in compliance
        5) Corrective/remedial actions taken
        6) QC Manager's signature
    b. Individual test records will contain the following information:
        1) Item tested –item number and description
        2) Test results
        3) Test designation
        4) Test work sheet including location sample was obtained
        5) Acceptance or rejection
        6) Date sample was obtained
        7) Retest information, if applicable
        8) Control requirements
        9) Tester signature
        10) Testing QC staff initials
    c. Providing for location maps for all tests performed or location of Work covered by the tests.
    d. Maintaining copies of all test results.
    e. Ensuring Engineer receives independent copy of all tests.

f. Ensuring testing lab(s) are functioning independently and in accordance with the specifications.
g. Ensuring re-tests are properly taken and documented.

G. Control of Measuring and Test Equipment: Measuring and/or testing instruments shall be adequately maintained, calibrated, and adjusted to maintain accuracy within prescribed limits. Perform calibration at specified periods against valid standards traceable to nationally recognized standards and documented.

H. Supplier Quality Assurance: The Quality Control Plan shall include procedures to ensure that procured products and services conform to the requirements of the Contract Documents. Requirements of these procedures shall be applied, as appropriate, to lower-tier suppliers and/or Subcontractors.

I. Deficient and Nonconforming Work and Corrective Action: The Quality Control Plan shall include procedures for handling of deficiencies and non-conformances. Deficiencies and non-conformances are defined as documentation, drawings, material, equipment, and Work not conforming to the specified requirements or procedures. The procedure shall prevent non-conformances by identification, documentation, evaluation, separation, disposition, and corrective action to prevent recurrence. Conditions having adverse effects on quality shall be promptly identified and reported to the senior level management. The cause of conditions adverse to quality shall be determined and documented and measures implemented to prevent recurrence. In addition, at a minimum, this procedure shall address:
1. Personnel responsible for identifying deficient and non-complying items within the work.
2. How and by whom deficient and non-compliant items are documented “in the field”.
3. The personnel and process utilized for logging deficient and non-compliant work at the end of each day onto a Deficiency Log.
4. Tracking processes and tracking documentation for deficient and non-compliant items.
5. Personnel responsible for achieving resolution of outstanding deficiencies.
6. Once resolved, how are the resolutions documented and by whom.

J. Special Processes and Personnel Qualifications
1. The Quality Control Plan shall include detailed procedures for the performance and control of special process (e.g., welding, soldering, heat treating, cleaning, plating, nondestructive examination, etc.).
2. Personnel performing special process tasks shall have the experience, training, and certifications commensurate with the scope, complexity, or nature of the activity. They shall be approved by Engineer before the start of Work on the Project.

K. Audits: The Quality Control Plan shall provide for documented audits to verify that quality control procedures are being fully implemented by Contractor as well as its subcontractors. Audit records shall be made available to Engineer upon request.

L. Documented Control/Quality Records
1. Establish methods for control of Contract Documents, which describe how Drawings and Specifications are received and distributed to assure the correct issue of the document being used. The methods shall also describe how as-built data are documented and furnished to Engineer.

2. Maintain evidence of activities affecting quality, including operating logs, records of inspections and tests, audit reports, material analyses, personnel qualification and certification records, procedures, and document review records.
3. Quality records shall be maintained in a manner that provides for timely retrieval, and traceability. Quality records shall be protected from deterioration, damage, and destruction.
4. Provide a list with specific records as specified in the Contract Documents, which will be furnished to Engineer at the completion of activities.

M. Acceptance of Quality Control Plan: Engineer's review and acceptance of the Quality Control Plan shall not relieve Contractor from any of its obligations for the performance of the Work. Contractor's quality control staffing is subject to Engineer's review and continued acceptance. Owner, at its sole option, without cause, may direct Contractor to remove and replace the Quality Control Representative. No Work covered by the Quality Control Plan shall start until Engineer's acceptance of the Quality Control Plan has been obtained.

N. Engineer may perform independent quality assurance audits to verify that actions specified in the Quality Control Plan have been implemented. No Engineer audit finding or report shall in any way remove any requirements of this Contract.

1.10 TESTING SERVICES

A. All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to Engineer. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped and fully qualified to perform the tests in accordance with the specified standards.

B. Independent testing laboratory shall be accredited by the American Association of State Highway and Transportation Officials (AASHTO) for the tests they will perform and as appropriate for the Work being performed. The laboratory shall also be accredited under ASTM C1077, ASTM D3740, and ASTM D3666.

C. Engineer shall have the right to inspect work performed by the independent testing laboratory both at the project and at the laboratory. This shall include inspection of the independent testing laboratory's internal quality assurance records (quality assurance manual, equipment calibrations, proficiency sample performance, etc.).

D. Obtain Engineer's acceptance of the testing firm before having services performed. Pay all costs for these testing services.

E. Testing services provided by Owner, if any, are for the sole benefit of Owner. However, test results shall be available to Contractor. Testing necessary to satisfy Contractor's internal quality control procedures shall be the sole responsibility of Contractor.

F. Testing Services furnished by Contractor: Unless otherwise specified, and in addition to all other specified testing requirements, provide all testing services in connection with the following materials as required for Engineer's review:
1. Concrete materials and mix designs.
2. Embankment, fill, and backfill materials.

3. Quality control testing of all precast concrete.
4. All other tests and engineering data required for Engineer's review of materials and equipment proposed to be used in the Work.

G. Testing Services furnished by Owner: Unless otherwise specified, Owner will provide quality control testing services in connection with the following materials and equipment incorporated in the Work.
1. Concrete strength tests.
2. Moisture-density and relative density tests on embankment, fill, and backfill materials.
3. In-place field density test on embankments, fills, and backfill.
4. Other materials and equipment as specified herein.
5. Testing, including sampling, shall be performed by Engineer or testing firm's laboratory personnel, in general manner and frequency indicated in the Specifications.
6. Furnish all sample materials and cooperate in the testing activities, including sampling. Interrupt the Work when necessary to allow testing, including sampling to be performed. There shall be no claim for an increase in Contract Price or Contract Times due to such interruption. When testing activities, including sampling, are performed in the field by the testing firm's laboratory personnel, furnish personnel and facilities to assist in the activities.
7. The testing firm's laboratory shall perform all laboratory tests within a reasonable time consistent with the specified standards and will furnish a written report of each test. Distribution of the reports shall be as directed by Engineer.

H. Transmittal of Test Reports: Written reports of tests and engineering data furnished for Engineer's review of materials and equipment proposed to be used in the Work shall be submitted per Section 01 33 20 - Submittal Procedures.

I. The testing firm retained for material field testing shall furnish a minimum of five copies of written report of each test. Three copies of each test report will be transmitted to Engineer within three Workdays after each test is completed. Consecutively number each report for each type of test.

J. Testing firm shall furnish one copy of each field and laboratory quality control test to Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 50 10
SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.1 REFERENCES

A. U.S. Dept. of Transportation, Federal Highway Administration (FHWA) standards.

MUTCD	Manual of Uniform Traffic Control Devices

B. U.S. Dept. of Labor, Occupational Safety and Health Administration (OSHA) standards.

Subpart G, Part 1926	Safety and Health Standards for Construction

1.2 SUBMITTALS

A. Provide design and engineering calculations for custom temporary bridges or steel plates to be employed.

B. Submit hazardous materials storage plan.

C. Submit the EPA issued number for wastes generated at the site.

1.3 ROADWAY AND TRAFFIC LIMITATIONS

A. Investigate the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the Work. Comply with the provisions specified in the Traffic Management Plan. Accept responsibility to construct and maintain any haul roads required for construction operations.

B. Maintain a maximum speed limit of 25 mph while on the Project Site.

C. Confine all vehicles to the designated construction area. Cross-country travel is prohibited.

1.4 TEMPORARY CROSSINGS

A. General: Provide continuous, unobstructed, safe, and adequate pedestrian and vehicular access to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, fire and police stations, and hospitals. Provide safe and adequate public transportation stops and pedestrian crossings at intervals not exceeding 300 feet. Cooperate with parties involved in the delivery of mail and removal of trash and garbage to maintain existing schedules for such services. Maintain vehicular access to residential driveways to the property line except when required construction precludes such access for reasonable periods of time.

B. Temporary Bridges: Wherever necessary, provide suitable temporary bridges or steel plates over unfilled excavations, except where written consent of the individuals or authorities concerned to omit such temporary bridges or steel plates has been secured. Any such

obtained written consent shall be delivered to Engineer prior to excavation. Maintain all such bridges or steel plates in service until access is provided across the backfilled excavation. Temporary bridges or steel plates for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case. Adopt designs furnished by said authority for such bridges or steel plates, or submit designs to said authority for approval, as may be required. New designs shall be stamped and signed by a professional engineer, licensed to practice in Utah.

C. Street Use: Nothing herein shall be construed to entitle Contractor to the exclusive use of any public street, alleyway, or parking area during the performance of the Work hereunder. Conduct operations so as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed to the public without first obtaining permission of Engineer and proper governmental authority. Where excavation is being performed in primary streets or highways, always maintain one lane in each direction open to traffic unless otherwise indicated. Provide toe boards to retain excavated material if required by Engineer or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the Work shall always BE kept accessible to fire-fighting equipment. Temporary provisions shall be made to assure the use of sidewalks and the proper functioning of all gutters, storm drain inlets, and other drainage facilities.

D. Traffic Control: For the protection of traffic in public or private streets and ways, provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the requirements of the MUTCD, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations."

E. Take all necessary precautions for the protection of the Work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. Station such guards or flaggers and conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to OSHA Safety and Health Standards for Construction.

F. Temporary Street Closure: If closure of any street is required during construction, apply in writing to the authority having jurisdiction at least 30 days in advance of the required closure for signage and detour requirements.

G. Temporary Driveway Closure: Notify property owner or occupant (if not owner-occupied) of the closure of the driveways to be closed more than one eight-hour workday at least three working days prior to the closure. Minimize the inconvenience and minimize the time that the driveways will be closed. Fully explain to the owner/occupant how long the work will take and when closure is to start.

1.5 WORK AND STORAGE AREA

A. Owner will designate as indicated in the Contract Documents, and arrange for the Contractor's use, a portion of the property [Specify location of Contractor storage/work site] for use during the term of the Contract as a storage and shop area for construction operations on the Work. Provide a plot plan of intended storage/work area use to Engineer.

B. Make independent arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the Work.

C. Lands to be furnished by Owner for construction operation and other purposes are indicated. Should it be necessary to use any additional land for staging or for other purposes during the construction of the Work, independently arrange for the use of such lands and pay any required rental or use fees. Unless otherwise shown, specified, or agreed, all sites shall be returned to their original condition or better upon completion of the Work.

D. Nothing herein shall imply granting an exclusive use of roadways or public and/or private land employed to perform the Work.

E. Temporary Storage Buildings and Enclosures
   1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials to be stored therein.
   2. Arrange and partition to provide security of contents and ready access for inspection and inventory.

F. Construct and use a separate storage area with adequate spill containment for hazardous materials used in constructing the Work.
   1. For the purpose of this paragraph, hazardous materials to be stored in the separate area are all products labeled with any of the following terms: Warning, Caution, Poisonous, Toxic, flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, two-part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
   2. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.
   3. Develop and submit to Engineer a plan for storing and disposing of the materials above.
   4. The separate storage area shall meet the requirements of authorities having jurisdiction over the storage of hazardous materials.
   5. Hazardous materials which are delivered in containers, shall be stored in the original containers until use. Hazardous materials which are delivered in bulk, shall be stored in containers which meet the requirements of authorities having jurisdiction.
   6. Obtain and submit to Engineer a single EPA number for wastes generated at the site.
   7. The separate storage area shall be inspected by the proper authorities prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.

G. In the event machinery and equipment need servicing on site, be responsible to clean environmentally hazardous materials from the site immediately.

1.6 PARKING/CONSTRUCTION TRAILER

A. Provide a level pad sufficient for setting a 10-foot x 40-foot office trailer by others. The pad shall include a gravel area for parking of minimum 7 vehicles. This work will be done within three days of mobilization at the jobsite.

B. Provide a 25 KVA diesel electrical generator to power Owner's jobsite trailer within three days of mobilization to the jobsite. Provide power feed conductor, terminate at the trailer main panel, and assure activation of power. Service, lubricate, fuel, and otherwise care for the generator throughout the life of the Contract to assure continuous power availability.

C. Employees shall park in areas indicated or as directed by Engineer.

D. Traffic and parking areas shall be maintained in a sound condition, free of excavated material, construction equipment, mud, and construction materials. Repair breaks, potholes, low areas, which collect standing water, and other deficiencies.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 55 26
TRAFFIC CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Traffic Control Plan requirements and materials and labor necessary for implementation.

B. Traffic Control Maintainer and Flagging.

C. Work zone traffic control devices, arrow boards, and pilot cars.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO) standards, latest edition:

Roadside Design Guide

B. American Traffic Safety Services Association (ATSSA) standards, latest edition:

Quality Guidelines for Temporary Traffic Control Devices & Features

C. National Cooperative Highway Research Program (NCHRP) standards, latest edition:

Report 350	Recommended Procedures for the Safety Performance Evaluation of Highway Features

D. U.S. Dept. of Transportation, Federal Highway Administration (FHWA) standards:

MUTCD	Manual of Uniform Traffic Control Devices
	Standard Highway Signs

E. Utah Department of Transportation (UDOT) standards and specifications, latest edition:

	Flagger Training Handbook
	Guidelines for Crash Cushions and Barrier End Treatments
Standard Section 2891	Traffic Signs
Operations Policy 06C-23	Use of Variable Message Signs (VMS)

1.3 SUBMITTALS

A. Administrative Submittals: Copies of permits, licenses, and approvals for construction as required by Laws and Regulations and governing agencies.

B. Shop Drawings:
   1. Approved Traffic Control and Routing Plans: As specified herein.

C. Traffic Control Supervisor(s) qualifications: Qualifications of proposed traffic control supervisor(s) and traffic control plan signatory.

1.4 TRAFFIC CONTROL SUPERVISOR

A. The traffic control supervisor shall be responsible for initiating, installing, and maintaining all traffic control devices as shown on the Traffic Control and Routing Plans, and as specified in the MUTCD and these specifications, or as directed. The traffic control supervisor shall be an employee of the Contractor and shall be assigned full time to the Project while work is underway on public roadways. The traffic control supervisor shall work exclusively with traffic control services. The designated traffic control supervisor shall also be available to be contact by the Engineer 24 hours a day for the life of this contract. The persons so designated shall have at least one year of experience directly related to work site traffic control in a supervisory capacity and shall be certified as a work sit traffic control supervisor by ATSSA. Submit the name and qualifications of this person for review 7 days in advance of the date set for the preconstruction conference.

B. The traffic control supervisor shall be capable of being onsite within 45 minutes of notification. The traffic control supervisor shall make at least four inspections of all traffic controls devices each day as follows:
   1. Before beginning work.
   2. At mid-shift.
   3. Half an hour after the end of the shift.
   4. Once during the period of nonworking hours.

C. The traffic control supervisor shall make a daily record of traffic control activities using a form provided to and approved by the Engineer. Submit completed forms within 24 hours.

D. The traffic control supervisor shall oversee the security of the message boards to be implemented by the Contractor's field staff. Security measures shall be implemented daily and shall include locking the tires to the message boards, chaining the message boards to a fixed item, and other measures to prevent theft.

E. Each day the traffic control supervisor shall develop the messages for the message boards, determine the locations of the message boards, coordinate with field labor to locate the message boards, and program the message boards.

F. The traffic control supervisor shall oversee the flagging operations. For road closures, the traffic control supervisor shall prepare information handouts showing schedules and maps of the crew locations. The traffic control supervisor shall keep the handouts updated and furnish copies of the flaggers for distribution to drivers approaching closure barricades and drivers waiting to drive through single-lane zones. The traffic control supervisor shall manage the distribution of radios to flaggers and oversee the proper functioning of radios.

G. Each evening and morning, signs shall be covered and uncovered as needed to inform the public of roadway closures, detours, work zones, and other traffic information. Each evening just before crews leave, all signs not required shall be covered and all signs required shall be

uncovered. Each morning before start of construction, all signs not required shall be covered and all signs required shall be uncovered. The traffic control supervisor shall oversee the covering and uncovering of signs each evening and morning.

H. Traffic control supervisor shall oversee storage of materials and construction equipment along right-of-way, as needed to ensure compliance with the Contract Documents.

I. Traffic control supervisor shall be responsible for verifying that property owner notifications are made in accordance with Contract requirements.

1.5 FLAGGER

A. Flaggers must have a current Utah flagging certificate and must present proof of certification upon request by the Engineer.
   1. Acceptable Certifications
      a. Refer to http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:1385 for a list of certified instructors.

1.6 TRAFFIC CONTROL AND ROUTING PLANS

A. The Traffic Control and Routing Plans shall be prepared and/or certified as to conformance with these Specifications by a Professional Traffic Operation Engineer (PTOE) or an ATSSA certified Work Site Traffic Control Supervisor and shall include the PTOE registration number or ATSSA certification number of the certifying person.

B. Submit the initial phase Traffic Control and Routing Plans at the preconstruction conference. Submit plans for future phases of construction a minimum of 28 days before start of that construction phase to allow review and resubmittal, if necessary, and public notification. Meet with the Engineer and affected agency having jurisdiction to review each of the Traffic Control and Routing Plans for each phase of construction. Do not begin construction on any given phase before receiving written acceptance by Wasatch County Traffic Division of the Traffic Control and Routing Plans for that phase.

C. Failure to submit the Traffic Control and Routing Plans within the specified time frames will not be justification for additional working days. Failure to adequately address comments in any required resubmittal also will not justify additional working days.

D. Changes to this plan shall be made only by written approval of Engineer. Secure approvals for necessary changes so as not to delay progress of the Work.

E. If multiple road closures are desired simultaneously, detours must be coordinated and approved in advance by the Engineer and the agency or agencies having jurisdiction. Allow a minimum of 14 working days for the Engineer and the agency or agencies having jurisdiction review followed by 14 working days of prior notification of residents. Multiple simultaneous road closures will require additional message boards (at each end of the closure) which shall be provided by Contractor at no additional cost for the duration of simultaneous closures.

F. Traffic Routing Plan: Show sequences of construction affecting the use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to

provide passages for pedestrians, bicycles, and vehicles. Include schedule for covering traffic control signs (including detour signs) when not in use and uncovering just prior to use.

G. The Traffic Control Plans in the Contract Documents are guidelines only and shall not be used in lieu of detailed Contractor-prepared plans. Detailed Traffic Control Plans shall show the location of traffic cones, barrier rail, construction zones, flaggers, stored pipe and materials, construction truck access, barricades, detours, signs, message boards, and other traffic control facilities.

H. On a time and day agreed upon between the Contractor and Engineer to describe the following week's construction operations and the traffic control provisions. At each meeting, submit a detailed update of traffic control provisions and construction crew locations. This shall be submitted in hardcopy and electronic form using a Word file. The update shall contain a list of signs and the time and location for covering and uncovering signs. The update shall include the location and wording of message control boards.

I. Any days lost due to improper traffic control will be charged against the allowable working days.

PART 2 - PRODUCTS

2.1 PERFORMANCE CRITERIA

A. Use devices and systems, which meet NCHRP-350 Report crash test requirements as defined in the four categories by the Federal Highway Administration. Some exceptions will be acceptable as stated below.
   1. Category 1: Cones, tubular marker, delineators, and drums without lights must be certified by the manufacturer as meeting NCHRP-350 Report requirements.
   2. Category 2: Portable sign stands with signs, Type I, II and II barricades, vertical panels, Category 1 devices with light attachments and devices not expected to cause signification vehicle velocity change. These devices and systems must be certified by FHWA as meeting NCHRP-350. Report test requirements.
   3. Category 3: Portable/Temporary pre-cast concrete barrier manufactured after October 1, 2002, must be certified as meeting NCHRP-350 Report test requirements.
      a. Manufactured date to be stamped into top of each barrier section using a numeric format (ex: 10/2006) with 2-inch x 2-inch numerals, ¼ inch deep. See Standard Drawing BA 1A and BA 2.
      b. Portable/Temporary pre-cast concrete barrier manufactured prior to October 1, 2002 and meeting NCHRP 230 may be used until they are no longer serviceable.
   4. Category 3: Crash cushions and truck mounted attenuators must be certified by FHWA as meeting NCHRP-350 test requirements.
   5. Category 4: Advanced warning arrow boards and portable variable message signs do not have to meet NCHRP-350 test requirements.

2.2 PILOT CAR

A. Equip with a reflectorized sign:
   1. Comply with UDOT Standard Specifications, Section 02891 – Traffic Signs.

2. MUTCD Sign G20-4.

2.3 FLAGGER EQUIPMENT AND CLOTHING

A. Comply with UDOT's "Flagger Training Handbook".

B. Comply with Contract Drawings traffic control sheets.

C. Paddle:
1. Use a combination "STOP" and "SLOW" sign paddle. The paddles shall be a minimum of 18 inches wide with 6-inch series "C" letters and have a rigid fixed handle approximately 5 feet in length, from the bottom of the paddle to ground level.
2. Fabricate the combination sign paddle from sheet metal or other light semi-rigid material.
3. The background of the "STOP" face shall be red with white letters and border. The background of the "SLOW" shall be orange with black letters and border.
4. Use Type II reflective sheeting for the background, letters, and border on the faces of the STOP/SLOW paddles.

D. Clothing:
1. Flagger vest and hard hat:
   a. Color: Orange, red-orange, or fluorescent version of these colors.
   b. Safety vest with a minimum of 775 inches of background material. Night work requires a minimum of 20 inches of reflective material (100 inches on the front and 100 inches on the back). Reflective material will be white and/or strong yellow-green.
   c. Hard hat with 10 inches of white or strong yellow-green reflective tape places around the base of the hard hat and visible to traffic from all directions.

2.4 TRAFFIC CONTROL SIGNING AND DEVICES

A. Signs:
1. Comply with this section, Article 2.1.
2. Comply with UDOT Standard Specifications, Section 02891 – Traffic Signs.
3. Comply with Contract Drawings traffic control sheets.

B. Channelizing Devices:
1. Comply with Article 2.1.
2. Comply with Contract Drawings traffic control sheets.
3. Comply with UDOT Standard Specifications, Section 02891 – Traffic Signs, for reflective sheeting.
4. Use construction orange tubular markers and cones during daylight hours only.

C. Barricades:
1. Comply with Article 2.1.
2. Comply with Contract Drawings traffic control and routing sheets.
3. Do not use rocks, asphalt, or concrete pieces, construction materials, and other debris as weighting devices for barricades. Sand bags will be permitted as long as a low center of gravity is maintained as approved.

D. Precast Concrete Barrier:
   1. Comply with Article 2.1.
   2. Comply with Contract Drawings traffic control and routing sheets.
   3. Use an approved construction zone attenuator or permanent style end sections, as listed in UDOT Guidelines for Crash Cushions and Barrier End Treatments.
      a. Use a construction zone attenuator when approach ends of temporary precast barrier are within AASHTO clear zone.
         1) Use AASHTO Roadside Design Guide to determine proper clear zone distance requirements.
         2) Install crash cushions as per contract traffic control sheets and manufacturer's recommendations.
   4. Do not use a truck mounted attenuator (TMA) to protect temporary precast barrier end for more than 24 hours. Use properly rated TMA as directed in this Section, Article 2.4, Paragraph E.

E. Impact Attenuator: Use properly rated truck mounted attenuator for the posted speed limit prior to construction.
   1. NCHRP-350 Test Level 2 for speeds 45 mph or less.
   2. NCHRP-350 Test Level 3 for speeds greater than 45 mph.

2.5 ADVANCE WARNING ARROW BOARD

A. Meet all standards as specified in the MUTCD, Section 6F.61 Arrow Boards.

B. Perform all functions as specified in Contract Drawings traffic control sheets and the MUTCD.

2.6 VARIABLE MESSAGE SIGNS (VMS)

A. Design, placement, operation, maintenance, and message content of portable variable message signs will conform to the current edition of the MUTCD and UDOT Operations Policy 06C-23 were applicable.

B. Portable variable message boards shall be a transportable truck or trailer mounted programmable message sign. The message sign board shall be capable of displaying three lines of message text with characters of twelve-inch minimum height formed by a bulb type, LCD, LED, or electromagnetic disk matrix, and shall have a display area of 96-inches x 48-inches. At nighttime the sign display shall be self-illuminated.

C. Portable variable message boards shall be placed at least 14 calendar days before construction begins on the affected roadways and maintained by the Contractor at locations designated and provided by the Owner.

D. Provide at least two portable variable message boards throughout construction at each location impacting City streets. Additional signs may be required by Cities based upon review of Contractor's Traffic Control Plans.

PART 3 - EXECUTION

3.1 LIMITATIONS OF OPERATIONS

A. See Section 01 11 00 – Summary of Work for Contract information to coordinate construction and traffic control involving signalized intersections. Give maintaining agency a minimum of 72-hours' notice for the adjustment of signal phasing to accommodate the approved Traffic Control Plan.

B. During nonworking hours, Saturdays, Sundays, and holidays, the full width of the traveled way in both directions shall be open for use by the public.

C. Allow emergency vehicles immediate passage.

D. When construction operations are not actively in progress, one through lane of traffic in each direction shall be open to public traffic. A maximum of 15 percent vertical profile grade shall be constructed and always maintained to accommodate public traffic.

E. Minimum lane width shall be 10 feet, unless noted otherwise. Where cones are used to separate traffic lane from construction zone, do not use traffic lane for accessing construction zone, and do not store materials or equipment on or near shoulder of traffic lane side of roadway.

F. Whenever it is necessary to cross, close, or obstruct driveways and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.

G. Driveway and Private Road Closures: Maintain satisfactory means of exit for persons residing or having occasion to transact business along the route of the Work. When access to private driveways must be temporarily denied due to construction operations, notify the property owner or responsible part of such closure not less than 24 hours in advance of closure. Give notification in writing and include the estimated duration of the closure.

H. In making street crossings, do not block more than one-half the street at a time. Maintain one lane of traffic at all times. Ensure access for traffic both directions.

I. Notify the fire department, police/sheriff department, highway patrol, ambulance service, local school district, and transit 14 days before closing roadway or portion thereof. Notify said departments or agencies when streets are again passable for vehicles. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to the police or sheriff's department.

J. If Work will interfere with mail delivery, move mailboxes to temporary locations accessible to postal service, and on completion of Work in each area, replace them in their original location and in a condition equal to or better than original. When access to private driveways must be temporarily denied due to construction operations, notify the property owner or responsible part of such closure not less than 24 hours in advance of closure. Give notification in writing and include the estimated duration of the closure.

K. If Work will interfere with garbage pickup, move property owner's (resident's) garbage cans to areas accessible for garbage pickup. Garbage cans shall be returned to owner's driveway after pickup.

L. Pedestrian and cycle access along sidewalks and streets will be kept open and safe from construction activities.

M. Coordinate traffic routing with that of others working in the same or adjacent areas. Coordinate access for garbage pickup, mail delivery, and school buses.

N. Each evening prior to crew departure, sweep all Work areas to ensure all construction debris (including, but not limited to, AC waste, gravel, and dirt) has been removed from the surface of the road. Dispose of debris offsite and do not sweep into ditches or otherwise outside of Work area.

O. Barricades and Lights:
1. Provide as shown on the Traffic Control Details and in sufficient quantity to safeguard public and Work.
2. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Contractor's employees, other employer's employees, and others who may be affected by the Work.
3. Provide to protect existing facilities and adjacent properties from potential damage.
4. Locate to enable access by facility operators and property owners.
5. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
6. Locate barricades at the nearest intersecting public thoroughfare on each side of the blocked section.

P. Signs and Equipment:
1. Traffic control signs and equipment shall be as described herein, the MUTCD, and the Standard Highway Signs, shown on Traffic Control Details, and as directed by Engineer.
2. Maintain existing traffic control signs during construction.
3. Variable Message Signs: Provide two variable message signs conforming to the provisions of Section 2.6 of these Specifications for use as directed by Engineer. Be responsible for moving and programming message boards as required throughout the Project.
4. Portable TOW-AWAY-NO STOPPING Signs; Place wherever approved by police department or the agency having jurisdiction and Owner.
5. Business Access Signs: Place at accesses to businesses in the vicinity of construction activities.
6. Traffic Cones: Provide to delineate traffic lanes to guide and separate traffic movements. Provide at obstructions such as material piles and equipment, as directed by Engineer.
7. Illuminate barricades and obstructions with warning lights from sunset to sunrise, or as directed by Engineer.
8. Use to alert public of construction hazards, which would include surface irregularities, unramped walkways, grade changes, and trenches or excavations in roadways and in other public access areas.

9. Post-mount informational signs both sides of detour a minimum of 14 days before detouring any traffic as to the date, time, and duration of the detour. Sign shall be stenciled with 6-inch black letters on an orange background. Signs shall meet these specifications.
10. Place solar powered barricade-type lights on Road Work Ahead signs and construction speed limit signs.
11. All portable and night use signs shall use high intensity reflective sheeting.
12. Cover Detour signs when not in use and uncover just prior to use. Detour signs shall be covered with wood or metal. The use of easily displaced material such as plastic bags, burlap sacks, duct tape, etc. is not acceptable.
13. Each sign or piece of equipment shall be certified by the manufacturer to meet the requirements of these Specifications. Any sign or equipment, which is damaged, or appears to be in poor condition, must be recertified by the manufacturer. Engineer shall be the sole judge as to whether used signs or equipment supplied under this contract need recertification.

END OF SECTION

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SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 EXPLOSIVES AND BLASTING

A. The use of explosives on the Work will not be permitted.

1.2 DUST ABATEMENT

A. Furnish all labor, equipment, and methods required to prevent, control, and mitigate fugitive dust from the construction activities. In complying with this requirement, conform to all local requirements in all circumstances. Be responsible for damage resulting from dust generated by its activities. Dust abatement measures shall be continued until Engineer directs otherwise.

1. Unpaved Roads: Apply liquid dust palliative as appropriate for traffic areas as approved by Engineer.
2. All other Non-Paved Work Areas: Apply a liquid dust palliative (soil stabilizer type) derived from natural organic plant sources and containing no growth – or germination – inhibiting materials as approved by Engineer. Application shall be effective for dust suppression according to applicable County Health District Air Pollution Control Division dust regulations. Do not allow movement of vehicles or storage of materials on treated areas.

1.3 RUBBISH CONTROL

A. Prepare a trash abatement program and submit to Engineer for review. The program shall include placing all litter, trash, garbage, construction debris, and refuse in scavenger-proof, resealable containers. Trash includes, but is not limited to, cigarettes, cigars, gum wrappers, tissue, cans, paper, and bags. During the progress of the Work, keep the Project Site and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. Dispose of all rubbish and waste materials of any nature occurring at the Project Site, establish regular intervals of collection and disposal of such materials and waste. Keep haul roads free from dirt, rubbish, and unnecessary obstructions resulting from construction operations. Disposal of all rubbish and surplus materials shall be off the Site in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

B. Clean up and properly dispose of any oil, fuel, and other equipment leaks at the time of occurrence. Service and maintenance vehicles shall carry a bucket and pads to absorb leaks and spills. Notify Engineer of any spills or leaks at the time of occurrence.

1.4 SANITATION

A. Toilet Facilities: Provide fixed or portable chemical toilets wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.

B. Sanitary and Other Organic Wastes: Establish a regular collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities or organic material wastes from any other source related to the construction operations shall be disposed of away from the Site in a manner satisfactory to Engineer and in accordance with all laws and regulations pertaining thereto.

1.5 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether soil sterilant, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

1.6 CULTURAL RESOURCES

A. Direct attention to the National Historic Preservation Act of 1966 (16 U.S.C. 470) and 36 CFR 800, which provide for the preservation of potential historical architectural, archaeological, or cultural resources (hereinafter called "cultural resources").

B. Conform to the applicable requirements of the National Historic Preservation Act of 1966 as it relates to the preservation of cultural resources.

C. In the event potential cultural resources are discovered during subsurface excavations at the Site of construction, institute the following procedures:
   1. Engineer will issue a Field Order directing the cessation all construction operations at the location of such potential cultural resources find. Mark the area in an appropriate manner to ensure that all construction equipment, activities, and personnel remain clear of the area until further notice.
   2. Field Order shall be effective until such time as a qualified archaeologist can be called to assess the value of these potential cultural resources and make recommendations to the State Historic Preservation Office.

D. If the archaeologist determines that the potential find is a bona fide cultural resource, at the direction of the State Historic Preservation Office, suspend work at the location of the find under the provisions for changes contained in Articles 10, 11, and 12 of the General Conditions.

1.7 AIR QUALITY

A. Maintain all vehicles and equipment in proper tune.

B. Use Best Available Control Technology on construction equipment, including a timing retardation.

C. Use natural-gas powered construction equipment where possible.

D. Encourage employee car-pooling.

1.8 NOISE

A. Comply with the hours of work as allowed by the local jurisdiction or land management agency.

B. Noise limits on construction equipment will comply with the noise limits of the local jurisdiction or land management agency. All construction equipment shall be equipped with manufacturer's standard noise control devices (i.e., mufflers, acoustical lagging, and/or engineer enclosures). Take special care not to throttle the engine excessively and keep engine speed as low as possible. Do not leave the equipment running or idling needlessly, especially when near noise-sensitive land uses. Noise-sensitive land uses include, but are not limited to, residences, schools, hospitals, libraries, retirement and elderly care centers, religious and worship facilities, courts of law, certain noise-sensitive professional offices, and quiet recreational areas such as campgrounds and hiking trails.

C. Use newer equipment whenever possible. Inspect all construction equipment at periodic intervals to ensure proper maintenance and the presence of noise control devices (i.e., mufflers and shrouding, etc.)

D. Keep heavy, noisier equipment a minimum of 100 feet away from the property line of any noise-sensitive land use for any length of time. Avoid coming closer than 200 feet if multiple pieces of equipment are operating simultaneously. If such cases are unavoidable, avoid throttling the engine excessively or leaving the equipment running needlessly. Heavy equipment shall be operated in a manner to comply with the jurisdiction's noise ordinance and vibration performance standard. To comply with these requirements, it may be necessary to operate heavy equipment only 30 minutes out of each one-hour period at distances closer than 200 feet from an occupied property. During the remaining 30 minutes, the equipment should move further away or be shut down, but may resume 30 minutes later.

E. Locate stationary noisy equipment away from construction boundaries that are near noise-sensitive uses.

F. Concrete trucks shall perform initial mixing and other activities that require high revving of the truck engine a minimum of 600 feet from noise-sensitive land uses. Keep engine revolutions per minute as low as possible at closer distances.

G. Whenever possible, use electric hand tools rather than gas-powered tools.

H. If operation of dewatering pumps and generators is required between the hours of 6 p.m. and 7 a.m. and within 600 feet of a noise-sensitive land use, they shall be treated with acoustical noise control measures (e.g., mufflers, shrouding, and/or enclosures) so as not to exceed 56 dba at 50 feet or other appropriate requirements of the local jurisdiction.

I. If requested by the Engineer, install temporary noise barriers for construction activities, including staging areas that occur closer than 100 feet from noise-sensitive land uses. Noise barriers can be made of plywood, heavy vinyl curtain material, natural or temporary earth berms, or stockpiles of construction material.

1.9 BIOLOGICAL RESOURCES

A. The yellow-billed cuckoo is a threatened species with potential suitable habitat in the project area. Per the contract times in the agreement, construction is expected to be complete before the breeding and nesting season begins in June.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 71 00
MOBILIZATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Organization and mobilization of the forces.

B. Transporting construction plant and equipment to the jobsite and setting up of same.

C. Transporting various tools, materials, and equipment to the jobsite.

D. Erection of temporary buildings and facilities as required for field offices, staging, storage, and construction operations.

1.2 PAYMENT FOR MOBILIZATION

A. Payment for mobilization shall be as described in Section 01 20 00 – Measurement and Payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

A. Mobilization shall include the following principal items:
1. Provide all required insurance certificates and bonds.
2. Move onto the site, or portion of site as available, of all plant and equipment required for first month's operations including office and storage trailers.
3. Install temporary construction power, wiring, and lighting facilities.
4. Develop construction water supply.
5. Provide all on-site communication facilities, including telephones, cordless phone antenna, and radio pagers.
6. Provide on-site sanitary facilities and potable water facilities.
7. Arrange for and erection of work and storage yard.
8. Construct and implement security features and requirements complying with Section 01 31 30 – Safety.
9. Obtain all required permits.
10. Post all OSHA required notices and establish safety programs.
11. Provide Superintendent at the job site full time.

3.2 SUBMITTAL REQUIREMENTS

A. The following submittals are due by the day indicated and must be approved by Owner as a condition precedent to completion of mobilization.

No.	Submittal	Specification Section
1.	Quality Assurance / Control Plan	01 45 00
2.	Mobilization Plan	01 71 00
3.	Safety Program	01 31 30
4.	List of Permits and Licenses	01 41 26
5.	Schedule of Submittals	01 33 20
6.	TR Flex Ductile Iron Pipe Shop Drawings	33 41 05

3.3 MOBILIZATION PLAN

A. Within 15 Days after receipt of the Notice to Proceed, submit a mobilization plan to Engineer for approval, which shall include a breakdown showing the estimated value of each component of mobilization as described in paragraphs 3.1 and 3.2 herein.

B. Include a bar chart schedule showing each item of mobilization listed in paragraphs 3.1 and 3.2 herein and include scheduled start date, finish dates, and total duration. The plan shall also list each activity to be initiated in the first 90 Days following Notice to Proceed, complete, with scheduled start date, finish date, and total duration.

END OF SECTION

SECTION 01 71 30
SITE CONDITIONS SURVEYS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements to document conditions of the Project Site and adjacent properties before construction begins and after completion of the Work. Methods include still photographs, digital video recordings, and topographic surveys.

1.2 SUBMITTALS

A. Submit all photographs and topographic survey data of the preconstruction conditions to Engineer for record purposes prior to, but not more than three weeks before, commencement of any construction activities.

1.3 CLOSEOUT SUBMITTALS

A. Complete and submit all digital videos, still photographs, mapping, and survey data of the postconstruction conditions to Engineer prior to final inspection by Owner and Engineer.

B. Provide postconstruction survey data to Engineer as follows:
   1. Submit topographic mapping for each site hereinbefore identified for topographic mapping and surveys as a separate electronic map (drawing) in AutoCAD Release 2018, or later.
   2. The electronic mapping files shall be produced using field survey techniques with sufficient accuracy for reproduction and use as base maps at a scale of 1"=20' horizontal and 2-foot contour intervals as specified for National Map Accuracy Standards.
   3. All electronic mapping files shall be three-dimensional.
   4. Submit lists of survey points for all topographic surveys in ASCII text file format.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Conduct thorough preconstruction and postconstruction Site conditions surveys of the entire Project. Site conditions surveys shall consist of photographs and topographic mapping. Provide and submit sufficient photographs to Engineer to resolve any damage claims, which may arise due to the construction of this Project. Develop topographic mapping using the Project coordinates and referenced to the Project base lines and benchmarks. Mapping shall be adequate to ascertain preconstruction and postconstruction conditions (including elevations) of all public and private property within and adjacent to the construction limits.

B. Photographic surveys shall include, but not be limited to, the utility bridge and its abutments and wing walls, vehicular bridge, site fencing, and visible utilities on the site. Take elevations and locations of snowmaking pipe where visible above ground, especially at fittings. Provide topographic mapping as specified herein.

C. As a minimum, note preconstruction and postconstruction of the following:
   1. Finish grade above pipeline on each side of river.
   2. Location of existing fence.

D. Collect still photographs and spot elevation surveys as required to document the original condition and location of existing features and facilities.

END OF SECTION

SECTION 01 71 50
PROTECTION AND RESTORATION OF EXISTING FACILITIES

PART 1 - GENERAL

A. Protect all existing utilities and improvements not designated for removal and restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, in accordance with the Contract Documents.

B. Call Blue Stakes before commencing any digging for location of underground utility lines and cable locations. The number is 811 or (801) 208-2100.

C. Provide temporary 6-foot chain link fencing panels for protection of all open excavations and trenches within public streets, residential areas, and all other locations except for unimproved open areas where excavations and/or pipeline trenches that can be safely sloped in accordance with current OSHA standards to provide safe access without the use of shoring devices. Temporary fencing panels shall fully enclose open excavations and trenches and shall remain in place during all non-working hours.

D. Provide temporary caps over all large diameter pipe during non-working hours to prevent unauthorized access.

1.2 RIGHTS-OF-WAY

A. Do not perform any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure. Do not enter upon the rights-of-way involved until notified by Engineer that Owner has secured authority therefore from the proper party.

B. After authority has been obtained, give said party due notice of intention to begin work, if required by said party, and remove, shore, support or otherwise protect such pipeline, transmission line, ditch, fence, or structure or replace same.

C. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, Owner will determine the sequence and order of the Work. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by Owner to Contractor so desiring, to the extent, amount, in the manner, and at the times permitted and in full conformance with the conditions of the Contract Documents.

D. No such decision as to the method or time of conducting the Work or the use of territory shall be made the basis of any claim for delay or damage, except as provided for temporary suspension of the Work in the General Conditions of the Contract.

1.3 PROTECTION OF STREET OR ROADWAY MARKERS

A. Do not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. Do not begin pavement breaking or excavation until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced. Accurately replace survey markers or points disturbed after all street or roadway resurfacing has been completed.

1.4 RESTORATION OF PAVEMENT

A. General: Replace all paved areas cut or damaged during construction with similar materials of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing a permit. The pavement restoration requirement to match existing sections applies to all components of existing sections, including sub-base, base and pavement. Conform temporary and permanent pavement to the requirements of the affected jurisdictional agency. Neatly saw cut pavements, which are subject to partial removal, in straight lines. Refer to Division 02 for specific pavement restoration requirements.

B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, place temporary surfacing promptly after backfilling and maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.

C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, saw cut back and trim the edge to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement. Refer to plans for minimum dimension of T-patch replacement width over disturbed pipeline trenches in paved areas.

D. Pavement Crown: In areas where pipeline trenching impacts an existing crown of asphalt, survey, and submit to Engineer documentation showing the pre-construction location of the crown prior to trenching. Replace the crown of asphalt to its pre-construction location to the satisfaction of the governing agency and Engineer.

E. Restoration of Sidewalks or Private Driveways: Wherever sidewalks or private roads have been removed for purposes of construction, place suitable temporary sidewalks or roadways promptly after backfilling and maintain them in satisfactory condition for the period fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration. If no such period of time is so fixed, maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

F. Restoration of Curb and Gutter: Wherever curb and gutter, including driveway and sidewalk approaches, have been removed for purposes of construction, replace these improvements following construction to the specific dimension and requirements of the authority having jurisdiction. Replace improvements, including required ADA access details to the latest version of the authoritative standard regardless of their preconstruction condition.

1.5 EXISTING UTILITIES AND IMPROVEMENTS

A. General. Protect underground utilities and other improvements, which may be impaired during construction operations, regardless of whether the utilities are indicated on the Drawings. Take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

B. Except for utilities specifically located on the Drawings, be responsible for exploratory excavations (potholing) as deemed necessary to determine the exact locations and depths of utilities, which may interfere with the Work. Perform all such exploratory excavations as soon as practicable after Notice to Proceed and, in any event, a sufficient time in advance of construction to avoid possible delays to the Work's progress. When such exploratory excavations show the utility locations as shown on the Drawings to be in error, so notify Engineer. Refer to plans for minimum advance distance that potholing must be performed prior to pipeline trenching work.

C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

D. Utilities to be Moved: In case it becomes necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of Contractor, be notified by Owner to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, notify Engineer a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

E. Utilities to be Removed: Where the proper completion of the Work requires temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to Engineer and the owner of the facility. In all cases of such temporary removal or relocation, restoration to the former location shall be accomplished in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition as found prior to removal.

F. Owner's Right of Access: Owner and owners of public utilities and franchises reserve right to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.

G. Underground Utilities Indicated: Existing utility lines that are indicated or the locations of which are made known prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced unless otherwise repaired by the owner of the damaged utility. If the owner of the damaged facility performs its own repairs, reimburse said owner for the costs of repair.

H. Underground Utilities Not Indicated: In the event of damage to existing utility lines that are not indicated or the locations of which are not made known prior to excavation, make a verbal report of such damage immediately to Engineer and a written report thereof promptly thereafter. Notify the utility owner of the damage. If directed by Engineer, repairs shall be made under the provisions for changes and extra work contained in the General Conditions.

I. Damages. Costs of locating and/or repairing damage not due to failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Contract Documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the Work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such Work will be paid for as extra Work in accordance with the provisions of the General Conditions.

J. Approval of Repairs: All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement owner before being concealed by backfill or other work.

K. Fire Hydrants: Keep all fire hydrants and water control valves free from obstruction and available for use at all times.

L. Maintaining in Service: Unless indicated otherwise, all oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. Be responsible for and repair all damage due to construction operations. The provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

M. Utility Service Laterals: Utility service laterals are not shown on the plans. Anticipate that there are no less service laterals than there are homes where project trenches are located in the vicinity of a street between a home and the utility main. Protect in place, or remove and replace to the satisfaction of the utility owner, all utility service laterals encountered during construction. Duration of utility service outages and public notification procedures shall conform to the standards of the controlling agency and these Contract documents.

1.6 TREES OR SHRUBS WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

A. General: Except where trees or shrubs are indicated to be removed, exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits. Do not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or Owner. Trim or replace existing trees and shrubs which are damaged during construction using the services of a certified tree company under permit from the jurisdictional agency and/or Owner.

B. Trimming; symmetry of the tree shall be preserved; no stubs or splits or torn branches left; clean cuts shall be made close to the trunk or large branch. Do not use spikes for climbing live trees. Cuts over 1-1/2 inches in diameter shall be coated with a tree paint product that is waterproof, adhesive, and elastic, and free from kerosene, coal tar, creosote, or other material injurious to the life of the tree.

C. Replacement: Immediately notify the jurisdictional agency and/or Owner if any tree or shrub is damaged by construction operations. If, in the opinion of said agency or Owner, the damage is such that replacement is necessary, replace the tree or shrub at no additional expense to Owner. The tree or shrub shall be of a like size and variety as the one damaged, or, if of a

small size, the pay to the owner of said tree a compensatory payment acceptable to the tree or shrub owner, subject to the approval of the jurisdictional agency or Owner. The size of the tree or shrub shall not be less than 1-inch diameter nor less than 6 feet in height. Planting of replacement trees and shrubs shall be in accordance with the recommendations of the nursery furnishing the plants. Unless otherwise indicated, water and maintain the replacement trees and shrubs for 6 months after planting.

1.7 LAWN AREAS

A. Repair lawn or landscaped areas damaged during construction to match the pre-construction condition to the satisfaction of the landowner and Owner. Use high quality sod to restore all lawn areas. Location and quality of irrigation system equipment shall be confirmed prior to construction. Where lawn irrigation systems have been removed or damaged during construction, be responsible for replacement of systems in kind to the satisfaction of the landowner. Anticipate that pressurized irrigation systems are present in all maintained lawn areas that will be impacted by construction. Verify proper operation of the irrigation system with landowner as required for maintenance of newly installed sod prior to transferring of watering responsibilities.

1.8 UNIMPROVED AREAS

A. Remove and stockpile topsoil prior to construction in accordance with Division 01 specifications. Replace topsoil prior to restoration of unimproved areas.

B. Unimproved areas, including unclassified open spaces, fields, and unimproved rights-of-way, damaged during construction shall be repaired to match pre-construction conditions to the satisfaction of the land owner and Owner. At a minimum, unimproved areas shall be smoothed and finished graded with topsoil to match preconstruction topography, and reseeded using a native seed mix acceptable to the land owner and Owner.

C. All slopes greater than 2H : 1V shall be protected with erosion control matting prior to reseeding.

1.9 OTHER SURFACE IMPROVEMENTS

A. Conduct a pre-construction survey of all properties that will be impacted by construction operations. All improvements that have the potential to be impacted by construction, including but not limited to fencing, landscaping, boulders, retaining walls, irrigation systems, and other public and/or private improvements, shall be protected in place, or if necessary, removed and replaced with like kind or better quality following construction.

1.10 NOTIFICATION BY CONTRACTOR

A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, notify the owners or agencies responsible for such facilities not less than three days nor more than seven days prior to excavation so that a representative of said owner or agencies can be present during such Work if they so desire.

B. When it is necessary to temporarily deny access to property, or when any utility service connection must be interrupted, give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, shall include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.

C. Contact, cooperate with, and provide written notice (including Contractor's phone number) at least seven days prior to beginning Work on each street. The written notice shall include the approximate schedule and explanation of Work and shall be given to each homeowner, business, all emergency agencies, schools, and residents, which will be affected by the project; particularly in reference to temporary interruptions to vehicular access. At least twenty-four hours prior to initiation of Work, provide a second notice to confirm the scope of scheduled Work. Submit a copy of the notifications to Engineer, for approval, prior to the start of construction. Make verbal door-to-door communication prior to construction to remind all affected parties of the construction to take place. In addition, be responsible to answer and resolve any conflicts that may arise between a homeowner or business owner and the construction personnel.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 77 00
PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Contract closeout, including final cleaning, preparation, and submittal of closeout documents, warranties and bonds, and final completion certification.

B. Closeout submittals and submittal forms in both hard copy and electronic format.

1.2 SUBMITTALS

A. Closeout Documents: Submit the following closeout documents prior to making a written request for Final Completion.
   1. Project record drawings and documents per Section 01 78 39 – Project Record Documents.
   2. Shop drawings.
   3. Keys and keying schedule.
   4. Post construction survey record documents, where required.
   5. Quality Control reports per Section 01 45 00 – Quality Control.
   6. Final Operation and Maintenance Manuals.
   7. Maintenance stock items; spare parts and special tools.
   8. Written warranties and bonds where required.
   9. Bonds for roofing or maintenance, if indicated.
   10. Access Badges and Parking Permits.
   11. Release of liens or release of claims forms submitted by all subcontractors and suppliers, if requested by Owner

B. Evidence of Compliance With Inspections and Other Requirements of Governing Authorities: Submit the following:
   1. Special Inspection Reports.
   2. Certificate of Occupancy, if applicable.
   3. Release from each affected property owner or agency indicating final acceptance.

C. Operation and Maintenance Manuals
   1. One percent of the contract price will be withheld from any monies due as progress payments, if at the 75 percent construction completion point, the approved *Operations and Maintenance Manual* complying with Section 01 33 20 - Submittal Procedures has not been submitted. The aforementioned amount will be withheld by Owner as the agreed, estimated value of the approved *Operations and Maintenance Manuals.* Any such retention of money for failure to submit the approved *Operations and Maintenance Manuals* on or before the 75 percent construction completion point shall be in addition to the retention of any payments due under General Conditions of the Contract.

D. Final Change Order: A final Change Order shall be submitted and processed if required. Final payment and close-out procedures shall comply with requirements of the Contract Documents.

1.3 CLOSEOUT TIMETABLE

A. Establish dates for equipment testing, acceptance periods, and on-site instructional periods as required under the Contract Documents. Such dates shall be established not less than one week prior to beginning any of the required activities, to allow Owner, Engineer, and their authorized representatives sufficient time to schedule attendance at such activities.

1.4 COMPLETION PROCEDURES

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Prior to making such request, the following must be complete:
   1. Work necessary for the safe, proper, and complete use or operation of the facility as intended.
   2. Punch list of items remaining to be completed, for submission with the request for issuance of a Certificate of Substantial Completion.
   3. Submit and receive acceptance of accurate record drawings for all work completed to date.
   4. Submit and receive acceptance of all specified warranties, bonds, guarantees and operation and *Operations and Maintenance Manuals*.
   5. Complete all required vendor training, testing, and where required, start-up.
   6. Deliver all required spare parts, maintenance stock items, and special tools.
   7. Complete equipment and communications system testing successfully.

B. Upon receipt of the request, Engineer and designated representatives will review the request, the Work, and the above requirements to determine whether Substantial Completion has been achieved. If this review fails to support Substantial Completion, Engineer will notify Contractor in writing citing the reasons for rejection. If Engineer determines that Substantial Completion has been achieved, the following procedures will be followed:
   1. Engineer, his/her representative, and user representatives will review the Work and the punch list to assure all deficiencies are noted on a final punch list.
   2. Engineer will schedule and conduct a pre-final walk-through of the facility with representatives of Owner, Engineer, Contractor, and others, for the purpose of formally reviewing the Work, the final punch list, and the readiness of the Work for use. A copy of the final punch list will be furnished to all participants and any additional items noted during the walk-through will be added to the list.
   3. Upon completion of the pre-final walk-through, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion as the date of the walk-through, provided the walk-through has verified that the Work is in fact ready for use and occupancy by Owner for its intended purpose. Engineer will attach to the certificate a punch list of items to be completed or corrected before final payment. In accordance with the General Conditions of the Contract, upon approval of this request by Owner, the facility will be considered Substantially Complete.

C. When Contractor deems that the entire Work or an agreed portion thereof is complete, Contractor shall notify Engineer and Owner in writing that the entire Work is complete. Final Completion will be deemed to have occurred when Work is completed including the following:
   1. All final punch list items have been corrected, signed off by Contractor and Engineer, and demonstrated to Owner during a final walk-through.
   2. All updates to record drawings, and *Operations and Maintenance Manuals* have been made.
   3. Demobilization and site cleanup are complete.
   4. Facilities and/or equipment have been properly demonstrated to be functioning as required.
   5. Owner has received releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.
   6. New permanent cylinders and key blanks for all locks have been provided to Owner.

D. Final Inspection and Payment
   1. When all items have been completed or corrected, Engineer, Contractor, and Owner will promptly make a final inspection to verify completion. Final payment and Engineer's *Notice of Acceptability* will then be processed in accordance with the General Conditions of the Contract.

1.5 CLOSE-OUT PROCEDURE

A. Engineer and Contractor shall meet and resolve all outstanding issues including, but not limited to:
   1. Claims and adjustments for time or costs
   2. Outstanding, unused allowances
   3. Procedures for handling warranty issues.

B. A Final Change Order shall be processed if required. Final payment and close out procedures shall comply with all requirements of the Contract Documents.

1.6 MAINTENANCE AND GUARANTEE

A. Comply with the maintenance and guarantee requirements contained in General Conditions of the Contract.

B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless Contractor has obtained a statement in writing from the affected private authority or public agency releasing Owner from further responsibility in connection with such repair or resurfacing. Submit such release(s) to Engineer.

C. Make all repairs and replacements promptly upon receipt of written order from Owner. If Contractor fails to make such repairs or replacements promptly, Owner reserves the right to do the Work and Contractor, and his surety shall be liable to Owner for the cost thereof.

1.7 BOND

A. Furnish a Performance Bond as required by General Conditions of the Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. Certificate of Final Completion of the Work by Owner will be withheld until requirements for final cleanup of the Project Site are complete as follows:
   1. Perform final cleaning prior to inspections for final acceptance.
   2. Employ skilled workers who are experienced in cleaning operations.
   3. Use cleaning materials that are recommended by manufacturers of surfaces to be cleaned.
   4. Avoid scratching, discoloring, and otherwise damaging surfaces being cleaned.
   5. Clean roofs.
   6. Broom clean and power wash exterior paved surfaces and rake clean other surfaces of sitework. Police yards and grounds to keep clean.
   7. Remove dust, cobwebs, and traces of insects and dirt.
   8. Clean grease, mastic, adhesives, dust, dirt, stains, fingerprints, paint, blemishes, sealants, plaster, concrete, and other foreign materials from sight-exposed surfaces, fixtures, and Equipment.
   9. Remove nonpermanent protection and labels.
   10. Polish finish hardware.
   11. Wash and shine mirrors.
   12. Polish glossy surfaces to clear shine.
   13. Clean ducts, blowers, and coils when units were operated without filters during construction.
   14. Clean light fixtures and replace burned-out or dim lamps.

3.2 WASTE DISPOSAL

A. Remove temporary structures and facilities and arrange for and dispose of surplus materials, waste products, and debris as follows:
   1. Prior to making disposal on private property, obtain written permission from owner of such private property.
   2. Do not fill ditches, washes, or drainage ways which may create drainage problems.
   3. Do not create unsightly or unsanitary nuisances during disposal operations.
   4. Maintain disposal site in safe condition and good appearance.
   5. Complete leveling and clean-up prior to final acceptance of the Work.

3.3 TOUCH-UP AND REPAIR

A. Touch up or repair finished surfaces on structures, equipment, fixtures, and installations that have been damaged prior to inspection for final acceptance.

B. Refinish or replace entire surfaces that cannot be touched-up or repaired satisfactorily.

3.4 DEMOBILIZATION

A. Demobilization shall include moving plant and equipment, field trailers, construction materials, debris, and so forth from the Site as well as performing final cleanup.
   1. Disturbed areas shall be restored to their original state or better.
   2. Permanent improvements damaged during construction operations shall be repaired or replaced at no additional cost to Owner.
   3. Remove all equipment, materials, waste, and debris from the site and restore site to original condition upon completion of construction.
   4. The work area shall be restored to its original or better condition and shall be inspected and approved by Engineer.

END OF SECTION

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SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Maintain at the Site for Owner, one record copy of the Drawings, Specifications, Operation and Maintenance manuals, coordination drawings, and Shop Drawings that are clearly marked with a red pen to indicate all changes and or revisions resulting from, but not limited to, the following:
   1. Actual Project as constructed.
   2. Addenda.
   3. Change Orders and other modifications.
   4. Engineer's instructions.
   5. Field revisions.
   6. Requests for Information (RFI).
   7. All other changes.

B. Give special attention to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings.

C. Record drawings shall be supplemented by any detailed sketches as necessary or directed to fully indicate the Work, as actually constructed.

D. Section Includes:
   1. Maintenance of Documents and Samples
   2. Marking Devices.
   3. Recording.
   4. Close-out Submittal Delivery.

1.2 MAINTENANCE OF DOCUMENTS AND SAMPLES

B. Store documents and samples in field office apart from documents used for construction.

C. Provide files and racks for storage of documents.

D. Provide locked cabinet or secure storage space for storage of samples.

E. Maintain documents in clean, dry, legible condition and in good order. Keep record documents separate from those used for construction.

F. Always make documents and samples available for reference by Engineer and Owner.

G. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the record drawings shall be updated by indicating those portions which are superseded by change order drawings or final shop drawings, and by including appropriate reference information

describing the change orders by number and the shop drawings by manufacturer, drawing, and revision numbers.

H. During progress meetings, record documents may be reviewed to ascertain that changes have been recorded.

I. Updated Drawings, when provided by Engineer, will be substituted for the hand markups provided Contractor prints the applicable Drawings and inserts them into the record set each month.

J. Copies of the record drawings will be audited regularly by Engineer after the month in which the Notice to Proceed is given as well as on completion of the Work. Failure to properly maintain record drawings in a up-to-date condition may result in the withholding of payments due at the sole discretion of Owner.

1.3 MARKING DEVICES

A. Use a red color pen for recording all information to all documents defined herein.

1.4 RECORDING

A. Label each document "CONFORMING TO CONSTRUCTION RECORD" in neat large red printed letters.

B. Record information concurrently with construction progress, at the time the material or equipment is installed. Do not conceal any work until required information is recorded.

C. Drawings shall be legibly marked to record actual construction per the following:
   1. Record actual as-built depths, horizontal and vertical location, (at every direction change and a maximum of 100 feet intervals on straight runs), of underground pipes, duct banks, and other buried utilities. Reference horizontal location to Project coordinate system and vertical elevations to Project datum.
   2. Identify and record specific details of pipe connections, location of existing buried features and utilities located during excavation, and the final locations of piping, equipment electrical conduits, manholes, and pull boxes (horizontal coordinates and vertical elevation).
   3. Record field changes of dimension and detail.
   4. Record changes made by instruction from Engineer or by Change Order.
   5. Record details not on original Contract Drawings.

D. Specifications and Addenda shall be legibly marked to record:
   1. Manufacturer, trade name, catalog number, and supplier for each product and item of equipment installed.
   2. Changes made by instruction from Engineer or by Change Order.

E. Record potholing data and installation of marker balls.

F. All surveying for record documents shall be performed by a licensed surveyor.

1.5 CLOSEOUT SUBMITTALS

A. At Contract closeout, deliver complete record documents to Engineer as required in Section 01 77 00 - Project Closeout. Final payment will not be acted upon until the record drawings have been prepared and delivered to Engineer.

B. The information submitted will be incorporated by Engineer into final drawings to be provided to Owner. Be responsible for the accuracy of submitted construction information. Engineer will assume that the information provided by Contractor is correct and faithfully represents actual construction.

C. This submittal shall include the record paper set along with 2 CDs. Each CD shall contain .pdf files and .dwg files of each drawing.

D. Prepare submittal with transmittal letter containing:
   1. Date.
   2. Project title and number.
   3. Contractor's name and address.
   4. Title and number of each record as-built document.
   5. Signature of Contractor's authorized representative and a statement that certifies that the record documents are accurate and reflect what was installed during construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes demolition, salvage, and reconstruction of existing civil, landscaping, structural, architectural, mechanical, HVAC, electrical, and instrumentation facilities as indicated in accordance with the Contract Documents.

1.2 RELATED SECTIONS

A. Section 09 90 00 – Painting and Coating

B. Section 31 23 00 – Earthwork

1.3 REFERENCES

A. Air-Conditioning, Heating, and Refrigeration Institute (AHRI) standards, most recent editions:

Guideline K	Containers for Recovered Non-flammable Fluorocarbon Refrigerants.

B. American National Standards Institute (ANSI) standards, most recent editions:

A10.6	Safety and Health Program Requirements For Demolition Operations.

C. Environmental Protection Agency (EPA), standards and laws, most recent editions:

40 CFR 61	National Emission Standards for Hazardous Air Pollutants.
40 CFR 82	Protection of Stratospheric Ozone.
40 CFR 273	Standards for Universal Waste Management.

D. Occupational Safety and Health Administration (OSHA) standards and laws, most recent editions:

29 CFR 1926	Safety and Health Regulations for Construction.

1.4 DEFINITIONS

A. Demolition: Dismantling, razing, destroying, or wrecking of any fixed building or structure or any part thereof. Demolition also includes removal of pipes, manholes, tanks, conduit, and other underground facilities, whether as a separate activity or in conjunction with construction of new facilities.

B. Modify: Provide all necessary material and labor to modify an existing item to the condition indicated or specified in Contract Documents.

C. Relocate: Remove, protect, clean, and reinstall equipment, including electrical, instrumentation, and all ancillary components required to make the equipment fully functional, to the new location identified herein and on Contract Drawings.

D. Renovation: Altering a facility or one or more facility components in any way.

E. Salvage/Salvageable: Remove and deliver, to the specified location(s), the equipment, building materials, or other items so identified to be saved from destruction, damage, or waste; such property to remain that of Owner. Unless otherwise specified, title to items identified for demolition reverts to Contractor.

F. Universal Waste Lamp: In accordance with 40 CFR 273, the bulb or tube portion of an electric lighting device, examples of which include, but are not limited to, fluorescent, high-intensity discharge, neon, mercury vapor, high-pressure sodium, and metal halide lamps.

G. Universal Waste Thermostat: A temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of 40 CFR 273.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination

1. Coordinate the Work in in areas where existing facilities are interconnected with new facilities and where existing facilities remain operational. The Work as indicated is not all inclusive. Be responsible for performing the reconstruction indicated plus that which can be reasonably inferred from the Contract Documents as necessary to complete the Project. The Specifications and Drawings identify the major facilities to be demolished and reconstructed, but auxiliary utilities such as water, air, chemicals, drainage, lubrication, fluid power, electrical wiring, controls, and instrumentation are not necessarily shown.
2. Drawings used to indicate demolition and reconstruction are based on drawings conforming to construction records for the existing facilities. These drawings have been reproduced to show existing conditions and to clarify the scope of Work as much as possible. Prior to bidding, conduct a comprehensive survey at the Site to verify the correctness and exactness of the Drawings, the scope of Work, and the extent of auxiliary utilities. A complete set of available drawings conforming to construction records is available for review at the Project site.
3. While demolition and reconstruction are being performed, provide adequate access for the continued operation and maintenance of equipment and treatment processes. Erect and maintain fences, warning signs, barricades, and other devices around the reconstruction as required for the protection of the Contractor employees and the Owner's personnel at the Site. Remove such protection when reconstruction activities are complete, or as work progresses, or when directed by Engineer.

1.6 SUBMITTALS

A. Submit in accordance with Section 01 33 20 – Submittal Procedures.

B. Informational Submittals
   1. Submit proposed Demolition/Renovation Plan, in accordance with requirements specified herein, for approval before such Work is started.
   2. Submit copies of any notifications, authorizations and permits required to perform the Work.
   3. Copies of reports and other documentation required for abandoning wells.
   4. Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped.
   5. Submit a shipping receipt or bill of lading for all universal waste shipped.

1.7 REGULATORY AND SAFETY REQUIREMENTS

A. When applicable, accomplish demolition Work in strict accordance with 29 CFR 1926 Subpart T.

B. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the General Conditions, conform to ANSI A10.6.

C. Furnish timely notification of this demolition/renovation project to applicable federal, state, regional, and local authorities in accordance with 40 CFR 61 Subpart M.

1.8 DEMOLITION/RENOVATION PLAN

A. Prepare Demolition/Renovation Plan to provide for safe conduct of the Work, including the following:
   1. Detailed description of methods and equipment to be used for each operation.
   2. Planned sequence of operations, including coordination with other work in progress.
   3. Procedures for removal and disposition of materials specified to be salvaged.
   4. Disconnection schedule of utility services.

B. Include statements affirming Contractor inspection of the existing roof deck, floors, walls, and framing members, and their suitability to perform as a safe working platform or, if inspection reveals a safety hazard to workers, state provisions for securing the safety of the workers throughout the performance of the Work if applicable for Project Work.

1.9 SEQUENCING AND SCHEDULING

A. Do not commence demolition work until the Demolition/Renovation Plan has been accepted by Engineer.

B. Include the Work of this Section in the progress schedule, as specified in Section 01 32 16 – Construction Progress Schedule.

C. Comply with sequencing requirements in Section 01 14 40 - Construction and Schedule Constraints.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

A. Coordinate demolition and reconstruction Work with Engineer. Unless otherwise indicated, be responsible for the sequence of activities and perform Work in accordance with applicable safety rules and regulations.

B. Verify that any utilities connected to structures, equipment, and facilities to be removed, relocated, salvaged, replaced, or abandoned are rendered inoperable, replaced with new utilities, or adequately bypassed with temporary utilities before proceeding with demolition and reconstruction.

C. Avoid damage to adjacent facilities and limit Work activities to the extent indicated. If reconstruction beyond the scope indicated is required, obtain approval from Engineer prior to commencing.

3.2 PROTECTION OF EXISTING FACILITIES

A. Before beginning any reconstruction, survey the existing facilities and examine the Contract Documents to determine the extent of demolition and/or reconstruction and coordination with the Work. Protect existing facilities not subject to the Work of this Section and maintain in accordance with Section 01 71 50 – Protection and Restoration of Existing Facilities. Repair or replace damaged existing facilities to the previous condition.

B. Provide safe passage for pedestrians and drivers around areas of demolition. Where pedestrian and driver safety is endangered in the area of Work, use traffic barricades with flashing lights.

C. Do not overload structural elements. Be responsible for shoring, bracing, or adding new supports as may be required for adequate structural support as a result of Work performed under this Section. Remove temporary protection when the Work is complete or when so authorized by Engineer.

D. Dust and Debris Control
   1. Prevent the spread of dust and debris to occupied portions of existing facilities and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.
   2. Vacuum and sweep the Work area daily.
   3. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to vehicular traffic.

E. Weather Protection:
   1. For portions of the facility scheduled to remain, protect interior materials and equipment from weather at all times. Where removal of existing roofing is necessary

to accomplish the Work, have materials and workers ready to provide adequate and temporary covering of exposed areas to ensure effectiveness and to prevent loss.

F. Facilities:
1. Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.
2. Floors, roofs, walls, columns, pilasters, and other structural elements that are designed and constructed to stand without lateral support or shoring and are determined by Contractor to be in stable condition, may remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by Engineer.
3. Protect all facility elements not scheduled for demolition.
4. Provide interior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities.

G. Protection of Personnel:
1. During demolition, continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site.
2. Provide temporary barricades and other forms of protection to protect Owner's personnel and the general public from injury due to demolition Work.
3. Provide protective measures as required to provide free and safe passage of Owner's personnel and the general public to occupied portions of the structure.

3.3 EXISTING FACILITIES TO BE DEMOLISHED AND ABANDONED

A. Facilities:
1. Buildings and adjacent designated areas scheduled for complete demolition are as shown on the Contract Drawings.
2. Portions of buildings and other areas scheduled for selective demolition, partial demolition, and renovation Work are as shown on the Contract Drawings.

B. Structures:
1. Remove existing above grade structures indicated to 3 feet minimum below grade unless otherwise indicated.
2. Remove interior walls, other than retaining walls and partitions, as shown on Contract Drawings.
3. Remove partition walls as shown on Contract Drawings.
4. Core drill concrete slabs and other concrete improvements scheduled to remain in place below ground, or break holes at the structure's lowest point to allow water to freely migrate through.
5. Remove sidewalks, curbs, gutters, and street light bases as indicated on Contract Drawings.
6. Where existing railing is removed, remove post embedments and anchors and fill post holes with non-shrink grout flush to the floor surface. At the point of continuation of existing handrailing, install a new post with rail connections matching the existing railing system. Install new posts in existing concrete floors in core-drilled socket holes and the annular space between the post and hole filled with non-shrink grout

C. Substructure: Where applicable, extract conflicting existing pilings prior to driving new piles.

D. Utilities and Related Equipment:
   1. Notify Owner or appropriate utilities to turn off affected services at least 48 hours before starting demolition or renovation activities.
   2. Remove existing utilities as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by Engineer.
   3. When utility lines are encountered that are not indicated on Contract Drawings, notify Owner prior to further work in that area.
   4. Remove meters and related equipment and deliver to a location as determined by Owner.
   5. Excavate and remove utility lines serving buildings to be demolished to 5 feet beyond the outside perimeter of the demolition.
   6. Provide a permanent leak-proof closure for water and gas lines.
   7. Plug other utility lines with concrete to a minimum plug length of 2 feet to prevent groundwater infiltration.
   8. When existing pipe is removed, plug the resulting open ends whether or not so indicated. When removed piping is exposed, blind flange the remaining piping or fit with a removable cap or plug.
   9. When existing piping is removed from existing structures, fill resulting openings in the structures and repair any damage such that the finished rehabilitated structure appears as a new homogeneous unit with little or no indication of where the new and old materials join. Fill openings in water-bearing structures with non-shrink grout to be watertight and reinforced as required or indicated. In locations where the surface of the grout will be exposed to view, recess the grout approximately 1/2-inch and fill the recessed area with cement mortar grout.

E. Paving and Slabs:
   1. Remove concrete and asphaltic concrete paving and slabs including aggregate base as indicated.
   2. Provide neat sawcuts at limits of pavement removal as indicated.

F. Concrete:
   1. Core drill corners of new opening to avoid overcutting adjacent reinforcing in existing concrete to remain. Saw concrete along straight lines to a depth of not less than 2 inches. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished Work, and the remaining concrete is sound.
   2. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.
   3. Where new concrete adjoins existing concrete, thoroughly clean and mechanically roughen existing concrete surfaces to roughness profile of 1/4 inch. Rebar and small embeds at existing concrete may be required to be left to engage new concrete. Saturate surface with water for 24 hours prior to placing new concrete. Tie new Work into the existing construction as shown on Contract Drawings.
   4. At locations not to receive new concrete, paint exposed rebar or metal embed ends with System No. 18a per Section 09 90 00 - Painting and Coating.

G. Patching:

1. Where removals leave holes and damaged surfaces exposed in the finished Work, patch and repair to match adjacent finished surfaces as to texture and finish.
2. Where new Work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new Work.
3. Patching as specified and indicated, includes:
    a. Fill holes and depressions caused by previous physical damage or left because of removals in existing exposed elements like walls with an approved patching material, applied in accordance with the manufacturer's printed instructions.

H. Cylinders and Canisters: Remove all fire suppression system cylinders and canisters and dispose as specified in 40 CFR 82.

I. Door Locksets: Remove all locksets from doors indicated to be removed and disposed of. Turn locksets over to Owner immediately after removal.

J. Electrical:
1. Cut off concealed or embedded conduit, boxes, or other materials a minimum of 3/4 inch below final finished surface.
2. When removing designated equipment, conduit and wiring may require rework to maintain service to other equipment.
3. Rework existing circuits or provide temporary circuits as necessary during renovation to maintain service to existing lighting and equipment not scheduled to be renovated. Existing equipment and circuiting shown are based on limited field surveys and drawings conforming to construction records. Verify existing conditions and make necessary adjustments. Record the Work on the Project's construction record drawings. This includes, but is not limited to, swapping and other adjustments to branch circuits and relocation of branch circuit breakers within panelboards as required to accomplish the finished work.
4. Reuse of existing luminaires, devices, conduits, boxes, or equipment will be permitted only where specifically indicated.
5. Remove raceways and cabling not scheduled for reuse.
6. For inaccessibly concealed items, cut off and abandon in place.
7. Remove items exposed or concealed above accessible ceilings.
8. Cap/seal or tab raceways and cabling scheduled for future use.
9. When relocating existing equipment, extend existing wiring or run new wiring from the source.
10. Where the existing raceway is concealed, clean the outlet box and install a blank cover plate.
11. Where the concealed raceway is uncovered, remove raceway (or extend to new location if appropriate).
12. Provide new typewritten panelboard circuit directory cards.

K. Universal Waste Lamps and Thermostats: Manage, contain, package, and label in strict accordance with 40 CFR 273.

3.4 EXISTING ITEMS TO BE SALVAGED

A. Remove items of existing equipment, piping, valves, electrical gear, instrumentation, utilities, and appurtenances indicated to be salvaged without any degradation in condition from that

prior to removal. Stockpile salvaged items and protect on Site at a location directed by Engineer. Be responsible to properly safeguard the salvaged items against damage and loss during removal and handling.

3.5 EXISTING ITEMS TO BE RELOCATED

A. Remove items of existing equipment, piping, valves, electrical gear, instrumentation, utilities, and appurtenances required to be relocated without any degradation in condition from that prior to removal. Be responsible to properly safeguard the relocated items against damage and loss during removal, handling, storage, and installation in the new location.

B. Perform a functional test of existing equipment that is relocated and reinstalled to ensure the equipment functions in the manner documented during the initial inspection. Inform Engineer in writing a minimum of 5 Days prior to the functional testing for Owner and Engineer to witness the test. If, in the opinion of Engineer, the relocated equipment does not function in a satisfactory manner, make repairs and modifications necessary to restore the equipment to its original operating condition at no additional cost to Owner.

3.6 REHABILITATION

A. Repair and rehabilitate existing civil, landscaping, structural, architectural, mechanical, HVAC, electrical, and instrumentation Work disturbed or damaged by reconstruction activities to satisfaction of Engineer.

B. Repair or replace damaged items to restore items or surfaces to a condition equal to and matching that existing prior to damage.

C. When performing reconstruction Work in existing buildings, do not use any Owner equipment (e.g., bridge cranes and monorails) unless authorized in advance in writing by Engineer. Such authorization will be subject to documentation by Contractor of the load proposed to place on the equipment and be subject to Owner requirements for crane use for operating and maintenance needs. Repair damage to a crane or monorail, or replace to Engineer's satisfaction.

3.7 BURNING

A. The use of burning as the Site for disposal of refuse and debris will not be permitted.

3.8 BACKFILL

A. Do not use demolition debris as backfill material.

B. Fill excavation, open basements, and other hazardous openings to existing ground level or foundation level of new construction in accordance with Section 31 23 00 – Earthwork.

3.9 TITLE TO MATERIALS

A. Except for items listed herein to be salvaged, all items designated to be removed become the property of Contractor.

3.10 DISPOSITION OF MATERIAL

A. Do not remove equipment and materials until acceptance of Contractor's Demolition/Renovation Plan by Engineer.

B. Salvage equipment and material to the maximum extent possible.

C. Remove salvaged items designated as the property of Owner in a manner to prevent damage and pack or crate to protect the items from damage while in storage or during shipment. Properly identify containers as to contents.

D. Repair or replace, at the discretion of Engineer, items designated as the property of the Owner damaged during removal or storage.

E. Deliver salvaged items that are designated as the property of Owner to a storage site as directed by Engineer.

F. Owner will not be responsible for the condition or loss of, or damage to, property scheduled to become Contractor's property after Engineer's authorization to begin demolition or renovation. Materials and equipment may not be viewed by prospective purchasers or sold on the Site.

G. Store Contractor owned salvaged items where approved by Owner and remove them from Owner's property before completion of the Contract.

3.11 REUSE OF MATERIALS AND EQUIPMENT

A. Store equipment and material designated to be reused in a location designated by Engineer.

B. Equipment and material designated to be reused must be cleaned, serviced, and checked for proper operability before being put back into service.

C. Engineer will determine condition of equipment and materials prior to removal. Properly store and maintain equipment and materials in same condition as when removed.

3.12 UNSALVAGEABLE MATERIAL

A. Dispose of concrete, masonry, and other noncombustible material, except concrete permitted to remain in place, off Site unless indicated otherwise.

B. Dispose of combustible material in a sanitary fill.

C. Dispose of universal waste lamps and thermostats in strict accordance with 40 CFR 273.

3.13 CLEANUP

A. Remove debris and rubbish from basement and similar excavations. Remove and transport debris and rubbish in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal apply.

END OF SECTION

SECTION 03 30 53
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including forms, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 REFERENCES

A. American Concrete Institute (ACI) standards, most recent editions:

ACI 117	Specifications for Tolerances for Concrete Construction and Materials
ACI 301	Specifications for Structural Concrete
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 315	Details of Concrete Reinforcement
ACI 318	Building Code Requirements for Reinforced Concrete
ACI 347	Formwork For Concrete

B. American Welding Society (AWS):

D1.4	Structural Welding Code – Reinforcing Steel

C. ASTM International (ASTM) standards, most recent editions:

ASTM A82	Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
ASTM A185	Standard Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
ASTM A497	Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete
ASTM A615	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A706	Standard Specification for Low Alloy Steel Deformed Bars for Concrete Reinforcement

ASTM A775	Standard Specification for Epoxy-Coated Reinforcing Steel Bars
ASTM C31	Standard Specification Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specifications for Concrete Aggregates
ASTM C39	Test for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C143	Standard Test Method for Slump of Hydraulic Cement Concrete
ASTM C156	Standard Test Method for Water Loss [from a Mortar Specimen] Through Liquid Membrane-Forming Curing Compounds for Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C920	Standard Specification for Elastomeric Joint Sealants
ASTM C1064	Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

ASTM D1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 4397	Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E1745	Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

D. Concrete Reinforcing Steel Institute (CRSI) standards, most recent editions:

Manual of Standard Practice

E. Federal Specifications, most recent editions:

UU-B-790A	Building Paper, Vegetable (Kraft, Waterproofed, Water Repellent and Fire Resistant)

F. U. S. Army Corps of Engineers standards, most recent editions:

CRD-C 572	PVC Waterstops

1.3 SYSTEM DESCRIPTION

A. The Contractor shall be responsible for the design, engineering, construction, maintenance, and safety of all falsework, including staging, walkways, forms, ladders, and similar appurtenances, which shall equal or exceed the applicable requirements of the provisions of the OSHA Safety and Health Standards for Construction, and the requirements specified herein.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 20 – Submittal Procedures.

B. Submit details of the concrete reinforcement steel and concrete inserts as soon as possible after receipt of the Notice to Proceed.

C. Include, but not limit to, the following:
1. Complete bar schedule, bar details and erection drawings to conform to ACI 315.
2. Each type of bar marked with identification corresponding to identification tag on bar.
3. Length, type, and location of all splices.
4. Erection drawings shall be clear, easily legible and to a minimum scale of:
   a. 1/4 inch = 1 foot.
   b. 1/8 inch = 1 foot if bars in each face are shown in separate views.
5. Size and location of openings.

D. Do not use Contract Documents as erection drawings.

1.5 QUALITY ASSURANCE

A. Ready mix concrete manufacturer qualifications: Concrete producer shall be a firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

B. Perform work in accordance with ACI 301 and the applicable referenced documents.

C. Welders' Certificates: When welding of reinforcing steel is proposed, submit welders' certificates certifying welders employed on the Work and verifying AWS qualification within the previous 12 months. All welding to be performed in accordance with AWS D1.4.

D. Conform to ACI 305R and/or ACI 306R when concreting during hot or cold weather as appropriate.

PART 2 - PRODUCTS

2.1 FORMWORK

A. Conform to ACI 301, ACI 318, and ACI 347, using plywood or metal forms.

B. Plywood forms: Douglas Fir or Southern Yellow Pine species; solid one side or high density overlaid one side; sound, undamaged sheets designed to support weight of concrete with minimum deflection.

C. Steel forms: Stiffened to support weight of concrete with minimum deflection.

D. Glass fiber reinforced resin type: Preformed shape, stiffened to support weight of concrete with minimum deflection.

E. Tubular column type: Round, spirally wound, laminated fiber material, surface treated with release agent; non-reusable, of sizes indicated.

F. Form ties: Removable or snap-off metal of fixed length, leaving no metal within 1 inch of finished surface.

G. Form release agent: Colorless mineral oil that will not stain concrete or absorb moisture.

2.2 STEEL REINFORCEMENT

A. Reinforcing steel: ASTM A615, Grade 60, deformed billet steel bars, uncoated finish.
   1. When shown on Drawings, supply epoxy coated bars in accordance with ASTM A775.
   2. Plain-steel wire: ASTM A82 as drawn.
   3. Plain steel welded wire reinforcement: ASTM A185, fabricated from as-drawn steel wire into flat sheets.
   4. Deformed-steel welded wire reinforcement: ASTM A497, flat sheet.
   5. Tie wire: Minimum 16 gage annealed type.

6. Chairs, bolsters, bar supports and spacers: Sized and shaped for strength and support of reinforcement during concrete placement.

B. Welding reinforcing steel: When welded reinforcing steel is called for on the Drawings or in these Specifications, provide per ASTM A706.

2.3 CONCRETE MATERIALS

A. Blended Hydraulic Cement: Comply with ASTM C595, Type IL (10) (MS), grey color.
1. Cement shall not contain more than 0.60 percent equivalent alkalis.
2. Limestone content is limited to 10 percent.
3. Single brand of cement used throughout Work; brand approved by Engineer.

B. Fly ash: ASTM C618, Class F including supplementary optional requirements relating to reactive aggregates and alkalis, and loss on ignition (LOI) not to exceed 5 percent.
1. Maximum of 25 percent replacement at 1.0 pounds of fly ash per pound of cement replaced.

C. Coarse aggregate: ASTM C33,
1. Graded Size No. 67.
2. Obtain coarse aggregates from sources approved by Engineer.

D. Fine aggregate: ASTM C33
1. Fineness Modulus: Not over 3.00.
2. Obtain fine aggregates from sources approved by Engineer.

E. Lightweight aggregates: Not permitted unless specifically allowed by Engineer.

F. Water
1. Clean and not detrimental to concrete; potable.
2. Conform to ASTM C94.

2.4 ADMIXTURES

A. Air entrainment: ASTM C260.

B. Water reducing: ASTM C494, Type A.

C. Water reducing and retarding: ASTM C494, Type D.

D. Water reducing and accelerating: ASTM C494, Type E.

E. Water reducing, high range plasticizer: ASTM C494, Type F.

F. Do not use calcium chloride.

G. Pigments for underground conduit banks: Pigment shall be added to concrete encasing electrical duct banks as required by Rocky Mountain Power Company.

2.5 RELATED MATERIALS

A. Waterstops, plastic serrated type.
   1. Extruded elastomeric polyvinyl chloride compound: containing plasticizers, resins, stabilizers, and other materials necessary to meet requirements of Specifications.
      a. Provide manufacturer's factory fabrications for intersections, transitions, and changes of direction.
      a. In accordance with Specification CRD-C572.
      b. Style:
         1) Centerbulb, 7/8-inch OD, 6 inches long.
         2) Flat Strip, 6 inches long unless noted otherwise.
         3) Split Rib, as shown on Drawings, used only when specifically approved for application.

B. Waterstops, plastic adhesive type.
   1. Non expansive plastic adhesive strip type manufactured solely for the purpose of preventing water from passing through construction joints.
      a. Synko Flex, as manufactured by Henry Co. or Engineer approved equal.

C. Bonding agent: Polymer resin emulsion acceptable to Engineer.

D. Bond breaker: VOC compliant, water or solvent based membrane forming, reactive bond breaker.

E. Vapor barrier: Multi-ply reinforced polyethylene sheet, ASTM E1745, Class C, not less than 7.8 mils thick or polyethylene sheet, ASTM D4397, not less than 15 mils thick.

F. Grout: Premixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents, capable of minimum compressive strength of 2500 psi in 3 days and 6000 psi in 28 days.

G. Construction joints: Locate and install construction joints that are not shown on Drawings so as not to impair strength of concrete, and as acceptable to the Engineer.

H. Premolded joint filler:
   1. Provide expansion joints in concrete construction in locations shown on Contract Drawings.
   2. Expansion Joint Filler: Preformed, non-extruding, resilient type, constructed of cellular neoprene sponge rubber, extending full thickness of slab, in accordance with ASTM D1751 or ASTM D1752, Type I.

I. Expansion joints: Locate and install where shown on the Drawings.

J. Joint sealant: 2-component polyurethane conforming to ASTM C920.

2.6 CURING MATERIALS

A. Water: Clean and potable.

B. Polyethylene sheet for use as concrete curing blanket shall be white and shall have a nominal thickness of 6 mils. The loss of moisture when determined in accordance with the requirements of ASTM C156 shall not exceed 0.055 grams per square centimeter of surface.

C. Polyethylene-coated waterproof paper sheeting for use as concrete curing blanket shall consist of white polyethylene sheeting free of visible defects, uniform in appearance, having a nominal thickness of 2 mils and permanently bonded to waterproof paper conforming to the requirements of Federal Specification UU-B-790A (1) (2). The loss of moisture, when determined in accordance with the requirements of ASTM C156, shall not exceed 0.055 gram per square centimeter of surface.

D. Polyethylene-coated burlap for use as concrete curing blanket shall be 4 mils thick, white opaque polyethylene film impregnated or extruded into one side of the burlap. Burlap shall weigh not less than 9 ounces per square yard. The loss of moisture, when determined in accordance with the requirements of ASTM C156, shall not exceed 0.055 gram per square centimeter of surface.

E. Evaporation retardant to provide thin continuous film over freshly placed flatwork concrete to prevent rapid moisture loss before finishing.
   1. Membrane Curing Compound: ASTM C309, Type 1, Class B. Sodium silicate compounds shall not be allowed.

2.7 CONCRETE MIXTURES

A. Normal-weight concrete: Select proportions for normal-weight concrete in accordance with ACI 301 using either the "statistical method" or the "trial batch method".
   1. "Statistical method" is preferred with a minimum of 30 tests acceptable to the Engineer.
   2. If "trial batches" are used to verify the mix design strength, the proposed mix design shall achieve an average compressive strength of 1200 psi more than strengths given in table below.

B. Concrete strength, cement content and slump per the following table:

Type of Construction	Compressive Strength (psi)	Aggregate Gradation (ASTM C33)	Slump in Inches (Max.)	Max W/C Ratio (by Weight)
Structure walls and top slabs.	4,500	#57 (1")	4	0.42
Structure footings; foundations and bottom slabs.	4,500	#467 (1-1/2")	4	0.42
Reinforced concrete encasements; thrust blocks	4,000	#467 (1-1/2")	4	0.50
Site Slabs; Curb and gutter	4,000	#57 (1")	4	0.50
Lean Concrete	3,000	#467 (1-1/2")	5	0.60
Site underground conduit banks: Min. 3 lbs. red pigment/sack cement	3,000	#8 (3/8")	5	0.60

1. Slump as shown above shall be plus or minus 1 inch.
2. Minimum cement content:
    a. Reinforced Concrete: Six sacks of Portland Cement per cubic yard.
    b. Unreinforced Concrete: Five sacks of Portland Cement per cubic yard.
3. Air content: Provide air entrainment resulting in a total air content of 5 to 7 percent for all types of construction.
    a. Air content to be measured in accordance with ASTM C231, ASTM C173, or ASTM C138.
    b. Air may be omitted from interior slabs to be trowel finished.

2.8 CONCRETE MIXING

A. Measure, batch, mix, and deliver concrete according to ASTM C94 and furnish batch ticket for each truck delivered.
    1. Deliver and place concrete within 90 minutes from the time the water is added to the mix.
    2. When ambient air temperature is above 90 degrees F, reduce delivery and placement time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL

A. Earth surfaces shall be thoroughly wetted by sprinkling, prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. Surface shall be free from standing water, mud and debris at the time of placing concrete.

B. Provide slabs and beams of minimum indicated depth when sloping foundation base slabs or elevated floor slabs to drains.
    1. For slabs on grade, slope top of subgrade to provide floor slabs of minimum uniform indicated depth.
    2. Do not place floor drains through beams.

C. Unless otherwise indicated, provide exterior corners in concrete members with 3/4-inch chamfers. Re-entrant corners in concrete members shall not have fillets unless otherwise indicated.

3.2 FORMWORK

A. Verify lines, levels, and measurement before proceeding with formwork.

B. Hand trim sides and bottom of earth forms. Remove all loose soil.

C. Align form joints.

D. Do not apply form release agent where concrete surfaces will receive special finishes or applied coatings that may be affected by the agent.

E. Coordinate work of other trades in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

3.3 WATERSTOPS

A. Preparation
1. Uncoil waterstop minimum of 24 hours prior to installation for ease of handling and fabrication.
2. Position waterstop to ensure proper distance from steel reinforcing bars and to prevent rock pockets and honeycomb.
3. Clean concrete joint and waterstop after first pour to remove debris and dirt.

B. Installation
1. Position waterstop across joints as specified herein and as indicated on Drawings.
2. Center waterstops on joint unless shown otherwise.
3. When centerbulb is present at moving joints, ensure that it is not embedded.
4. All waterstops fully continuous for the extent of the joint.
5. Secure plastic serrated waterstop in correct position before concrete placement with hog rings and wire to adjacent reinforcing steel at 12-inch maximum spacing. Center-to-center spacing may be increased upon written request and approval of Engineer.
6. Take suitable precautions and means to support and protect waterstops during the progress of the work.
7. Carefully place concrete without displacing waterstop from proper position.

3.4 VAPOR BARRIER

A. Except where membrane waterproofing is required, place interior concrete slabs on a continuous vapor barrier

B. Place 2” of fine granular fill over the vapor barrier to act as a blotter for the concrete slab.

C. Lap joints minimum of 6 inches and seal with a compatible pressure-sensitive tape

D. Patch punctures and tears before placing sand blotter or concrete.

3.5 STEEL REINFORCEMENT

A. Comply with CRSI’s “Manual of Standard Practice” for fabricating, placing, and supporting reinforcement.
1. Do not cut or puncture vapor barrier if used.

3.6 CONCRETE PLACEMENT

A. Notify Engineer a minimum of 24 hours prior to commencement of concreting operations.

B. Before placing new concrete on or against concrete which has set, existing surfaces shall be roughened and cleaned free from all laitance, foreign matter, and loose particles.

C. Place concrete in accordance with ACI 301.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301. In no case shall water be added to exceed the specified water-cement ratio of the mix.

E. Conform to ACI 305R when concreting during hot weather.

F. Conform to ACI 306R when concreting during cold weather.

3.7 FLOOR SLABS

A. Install control joints in slab by forming or cutting within 4 hours of placement using an early entry saw.

B. Separate slabs-on-grade from vertical surfaces using full-depth joint filler. Apply joint sealant when shown on Drawings.

3.8 FINISHING FORMED SURFACES

A. Rough-formed finish: As-cast concrete texture imparted by form facing material with tie holes and defective areas repaired and patched.
   1. Remove fins and other projections exceeding 1/2 inch.
   2. Apply to concrete surfaces not exposed to view after final grading.

B. Smooth-formed finish: As-cast concrete texture imparted by form facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
   1. Repair and patch tie holes and defective areas.
   2. Remove fins and other projections exceeding 1/8 inch.
   3. Apply to concrete surfaces exposed to view or to be covered with a coating or covering material applied directly to concrete.

3.9 FINISHING UNFORMED SURFACES

A. Steel trowel surfaces at interior floor slabs which are to be exposed.

B. Steel trowel surfaces that are to receive carpeting, resilient flooring, seamless flooring, thin-set marble, quarry, or ceramic tile.

C. Wood float surfaces that are scheduled to receive quarry, ceramic tile, or terrazzo tile, with full bed setting system.

D. Broom finish at exterior concrete slabs, paving, and steps.

E. Broom or wood float finish at exposed concrete filled pan stair treads.

F. Floor densifier/sealer:
   1. Apply to all exposed concrete floor surfaces.
   2. Apply after concrete has cured minimum 7 days.
   3. Apply in accordance with manufacturer's recommendations.
   4. Keep floors covered and free of traffic and loads for a minimum of 10 days after completion.

3.10 CONCRETE CURING AND PROTECTION

A. Evaporation retarder.
   1. Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. per hour before and during finishing operations.
   2. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

B. Cure concrete for not less than 14 days after placing.

C. Leave forms in place at least 14 days, or until concrete has attained specified 28-day strength, unless otherwise approved by Engineer. If forms are allowed to be removed within 14 days of placing concrete, continue curing in accordance with other methods specified herein or as directed by Engineer.

D. Strictly follow careful procedures for the removal of forms and perform with care so as to avoid injury to the concrete. No heavy loading on green concrete will be permitted.

E. Keep encasement concrete, concrete cradles and anchor blocks moist until covered. The surface shall be covered with moist earth not less than 4 hours, or more than 24 hours, after the concrete is placed. Earthwork operations that may damage the concrete shall not begin until at least 7 days after placement of concrete.

F. Concrete slabs may be cured by either of the following two methods:
   1. Method 1:
      a. After finishing slab, wet surface with a fine spray of water and cover with polyethylene-bonded waterproof paper sheeting.
      b. Lap sheets 4 inches at sides and ends and seal with adhesive tape to form a continuous watertight joint.
      c. Weigh sheeting down with wood planks to keep sheeting in contact with concrete.
      d. Repair or replace sheets immediately if damage occurs.
   2. Method 2:
      a. Cover concrete with water-saturated polyethylene-coated burlap curing mats and keep continuously wet for curing period.
      b. Lap sheets 4 inches at sides and ends and seal with adhesive tape to form a continuous watertight joint.
      c. Weigh sheeting down with wood planks to keep sheeting in contact with concrete.
      d. Repair or replace sheets immediately if damage occurs.

G. As an alternate to above referenced curing methods for formed and slab concrete, spray surface with liquid curing compound that does not affect bond of paint to concrete surface.
   1. Apply curing compound in accordance with manufacturer's instructions as soon as the concrete has hardened enough to prevent marring on unformed surfaces, and within 2 hours after completion of finish or stripping of forms, if stripped in less than 14 days.
      a. Maximum coverage rate of 200 square feet per gallon, applied in such a manner as to cover surface with a uniform film to seal thoroughly.

2. Curing vertical surfaces with a curing compound:
    a. Cover vertical surfaces with a minimum of two coats of the curing compound.
    b. Apply the first coat of curing compound immediately after form removal. Vertical surface at the time of receiving the first coat shall be damp with no free water on the surface.
    c. Allow the preceding coat to completely dry prior to applying the next coat.
    d. Vertical surface is defined as any surface steeper than 1 vertical to 4 horizontal.
3. Curing Compound: As specified herein.
4. Take care to avoid damage to seal during curing period.
5. Repair broken or damaged seals occurring before expiration of curing period by application of additional curing compound over damaged portion.
6. Do not use curing film method where construction joints are to be made.
7. In hot weather, follow curing procedures outlined in ACI 305R.
8. In Cold Weather, following curing procedures outlined in ACI 306R.

3.11 TOLERANCES

A. Construction Tolerances: Set and maintain concrete forms and perform finishing operations so as to ensure that the completed Work is within the tolerances specified in ACI 117. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown.

3.12 FIELD QUALITY CONTROL

A. General
1. Tests on component materials and for slump, temperature, air content, and compressive strength will be performed as specified herein.
2. The cost of all laboratory tests for qualification of mix designs on cement, aggregates, and concrete, including strength testing will be borne by the Contractor. The cost of all field-testing during construction, including slump, temperature, air, and strength will also be borne by the Contractor. Contractor's testing laboratory shall meet or exceed the requirements of ASTM C1077.
3. Concrete for testing shall be supplied by the Contractor at no additional cost to the Owner, and the Contractor shall assist Engineer in obtaining samples, and disposal and cleanup of excess material.
4. Composite samples of concrete placed in the Work shall be taken in accordance with ASTM C172 from the first placement of each class of concrete and at the following minimum frequency for each class:
    a. Not less than one sample per day on which concrete it placed.
    b. Not less than one sample for each 50 cubic yards of concrete placed.
    c. Not less than one sample for each 5,000 square feet of surface area for slabs or walls.
    d. Not less than 5 samples from randomly selected batches for the Work.

B. Slump Tests
1. Perform in accordance with requirements of ASTM C143 at frequency indicated for sampling above.

C. Temperature Tests

1. Test concrete temperature per ASTM C1064 at frequency indicated for sampling above.

D. Air Content Tests
   1. Test air content per ASTM C231 at frequency indicated for sampling above.

E. Field Compression Tests
   1. Field compression test specimens will be made at the frequency indicated for sampling above.
   2. Each set of test specimens will be a minimum of five cylinders.
   3. Compression test specimens for concrete shall be made in accordance with ASTM C31. Specimens shall be 6-inch diameter by 12-inch high cylinders.
   4. Compression tests shall be performed in accordance with ASTM C 39. One test cylinder will be tested at 7 days and two at 28 days. The remaining cylinders will be held to verify test results, if needed.

F. Evaluation and Acceptance of Concrete
   1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 318 and as specified herein.
   2. All concrete which fails to meet the ACI requirements and these Specifications, is subject to removal and replacement at no increase in cost to the Owner.

3.13 APPLICATION OF LOADS

A. Do not allow traffic, construction equipment, or materials of any kind to be placed on elevated concrete slabs until the concrete has attained a minimum age of 7 days and 80% of the minimum specified 28-day strength as proven by concrete strength tests.

B. Do not place backfill against cantilevered walls until the concrete has attained a minimum age of 7 days and 100% of the minimum specified 28-day concrete strength as proven by concrete strength tests.

C. Do not place backfill against walls that are tied to elevated slabs or decks until the both the slabs and walls have attained a minimum age of 7 days and 80% of the minimum specified 28-day strength as proven by concrete strength tests.

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SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish, fabricate, and install metal fabrications in accordance with Contract Documents.

1.2 REFERENCES

A. ASTM International (ASTM) standards, most recent editions:

ASTM A123	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
ASTM A307	Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A325	Specification for Structural Bolts, Steel Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A563	Specification for Carbon and Alloy Steel Nuts
ASTM A653	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTMA668	Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use
ASTM A780	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM F593	Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F594	Standard Specification for Stainless Steel Nuts
ASTM F1554	Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

B. American Welding Society (AWS) Standards, most recent editions:

AWS D1.1	Structural Welding Code – Steel
AWS D1.6	Structural Welding Code – Stainless Steel
AWS QC1	Specification for AWS Certification of Welding Inspectors

AWS Welding Handbook

C. American Water Works Association (AWWA) standards, most recent editions:

AWWA C217	Petrolatum and Petroleum Wax Tape Coatings for the Exterior of Connections and Fittings for Steel Water Pipelines

D. Federal Specifications:

MIL-A-907E	Anti-seize Thread Compound, High Temperature

E. Society for Protective Coatings (SSPC):

SSPC-PA 1	Shop, Field, and Maintenance Painting of Steel

1.3 DEFINITIONS

A. Metal Fabrications: Defined as items to be fabricated from metal shapes, plates, or bars and their products.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 20 – Submittal Procedures.

B. Shop Drawings: Submit shop drawings of all metal fabrications to the Engineer for review.
   1. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other Sections.
   2. Submit layout drawings for grating showing the direction of span, type and depth of grating, size and shape of grating panels, seat angle details, and details of grating hold down fasteners. Submit load and deflection tables for each style and depth of grating used.

C. Submit ICC-ES report listing the ultimate load capacity in tension and shear for each size and type of concrete anchor submitted. Submit manufacturer's recommended installation instructions and procedures for adhesive anchors. Upon review, by Engineer, these instructions shall be followed specifically.

D. No substitution for the indicated adhesive anchors will be considered unless accompanied by an ICC-ES report verifying strength and material equivalency, including temperature at which load capacity is reduced to 90 percent of that determined at 75 degrees F.

1.5 QUALITY ASSURANCE

A. All weld procedures and welder qualifications shall be available in the Contractor's field office for review.

B. Qualification of Welders: Use welders with current certifications (previous 12 months) for the material, type, and position of welding used. Certify in accordance with AWS Specifications according to the following:

1. AWS D1.1, Structural Welding Code – Steel.

C. Furnish a welding inspector who is qualified in accordance with AWS requirements and approved by Engineer. Inspector to inspect all welding.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01 25 10 - Products, Materials, Equipment and Substitutions.

B. Metal fabrications shall be loaded for transport in such a manner that they may be transported and unloaded without being excessively stressed, deformed, or otherwise damaged.

C. Protect metal fabrications from corrosion and deterioration.

D. Store material in a dry area and do not place in direct contact with the ground.
1. Do not place materials on the structure in a manner that might cause distortion or damage to the members or supporting structures.
2. Repair or replace damaged materials or structures as directed.

1.7 PROJECT CONDITIONS

A. Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
1. Concrete and masonry anchors:
   a. Hilti, Inc.
   b. ITW Ramset/Redhead.
   c. Simpson Strong Tie Company, Inc.
   d. Engineer approved equal.
2. Drill-in anchors:
   a. Epoxy anchors (Concrete):
      1) HIT-HY 200.
      2) Set 3G, Simpson Strong-Tie.
      3) Pure110+, DeWalt
      4) Red Head C6+, ITW Ramset/Redhead.
      5) Engineer approved equal.

2.2 MATERIALS

A. Steel Forgings: ASTM A668.

B. Bolts and Anchors:
   1. Standard Service (non-corrosive applications): Unless otherwise indicated, provide steel bolts, anchor bolts, washers, and nuts as indicated herein. Form threads on galvanized bolts and nuts with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing. Except as otherwise indicated, provide steel for bolt material, anchor bolts, and cap screws in accordance with the following:
      a. Anchor bolts: ASTM F1554, Grade 36, of dimensions indicated, with nuts conforming to ASTM A563 and flat washers where indicated.
      b. Install high-strength structural connections using ASTM A325 bolts and nuts per ASTM A563, coated to match material being connected.
   2. Corrosive Service: Provide stainless steel for bolts, nuts, and washers in the locations listed below.
      a. All buried locations except as noted below for pipe flange, fitting, and coupling connections.
      b. All submerged locations.
      c. Inside hydraulic structures, below the top of the structure.
      d. Inside buried vaults, manholes, and structures that do not have a forced-air ventilation system and either a gravity drain or a sump with a sump pump.
      e. All chemical handling areas.
      f. Other locations indicated by the Contract Documents or designated by the Engineer to be provided with stainless steel bolts.
   3. Stainless steel bolts, anchor bolts, nuts, and washers shall be Type 316 stainless steel, conforming to ASTM F593 for bolts and to ASTM F594 for nuts. Protect all threads on stainless steel bolts with an anti-seize lubricant suitable for submerged stainless-steel bolts, to meet government specification MIL-A-907E and classified as acceptable for potable water use by NSF. Coat buried bolts in poorly drained soil the same as the buried pipe.
   4. Pipe Flange, Fitting and Coupling Connection Applications: Unless otherwise noted, all pipe flange, fitting and coupling connection bolts for welded steel pipe shall be carbon steel per ASTM A193, Grade B7 hex bolts, with nuts per ASTM A194, Grade 2H and all pipe flange, fitting and coupling connection bolts for ductile iron pipe shall be carbon steel per ASTM A307, Grade A hex bolts and ASTM A563, Grade A hex nuts. All bolts, nuts and washers shall be zinc plated. Protect all threads on bolts and nuts with anti-seize lubricant.
      a. Exposed Connections: For exposed pipe connections in buried vaults, manholes, and structures with forced-air ventilation and which drain through a gravity sewer or to a sump with a pump, prepare and coat bolts and nuts after installation with the same system as the adjacent flanged piping, in accordance with Section 09 90 00 – Painting and Coating.
      b. Buried Connections: Coat all buried connections in accordance with Section 09 97 01 – Pipeline Coatings and Linings. Provide wax tape coating per AWWA C217 for steel pipe connections, including sleeve couplings and restrained sleeve couplings. For other pipe materials, grease and wrap connections per AWWA C105.

c. Submerged Connections: Bolts for submerged flanges and pipe connections shall be Type 316 stainless steel, ASTM A193/A193M, Grade B8M hex head bolts, and ASTM A194/A194M Grade 8M hex head nuts. Fabricate in accordance with ASME B18.2.2.

d. Provide two washers for each bolt and nut with a washer installed on each side of the flange. Washers shall be of the same material as the nuts.

e. Provide bolts of the proper length to accommodate flange, washer, and gasket thickness to accommodate bolt minimum length per AWWA C207.

5. Bolt Requirements:

a. The bolt and nut material shall be free-cutting steel.

b. The nuts shall be capable of developing the full strength of the bolts.

c. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads.

d. Provide bolts with hexagon heads. Provide nuts conforming to Heavy Hexagon Series.

e. Install all bolts and nuts with washers fabricated of material matching the base material of bolts, except that hardened washers for high strength bolts shall conform to the requirements of the AISC Specification.

f. Install lock washers with washers where indicated and fabricated of material matching the bolts.

C. Provide bolts of length such that after joints are made up, each bolt extends through the entire nut, but in no case more than 1/2-inch beyond the nut.

D. Drill-in anchors:

1. Epoxy anchors: Unless otherwise indicated, all drilled concrete and masonry anchors shall be epoxy anchors. No substitutions will be considered unless accompanied by ICC-ES reports verifying strength and material equivalency.

a. Epoxy anchors are required for drilled anchors exposed to weather, in submerged, wet, splash, and corrosive conditions, and for anchoring handrails, pumps, and mechanical equipment. Provide threaded stainless steel rod, Type 316.

b. Unless otherwise indicated, epoxy anchors will also be permitted in locations not indicated above.

2. Expansion Anchors: Expansion anchors will only be permitted when specifically approved by the Engineer. Expansion anchors that are to be fully encased in grout may be carbon steel. For non-encased buried or submerged anchors, provide stainless steel anchors.

3. Screw Anchors: Screw anchors will only be permitted when specifically approved by the Engineer. Screw anchors that are to be fully encased in grout may be carbon steel. For non-encased buried or submerged anchors, provide stainless steel anchors.

E. Corrosion Protection:

1. Hot dip galvanize all miscellaneous steel metalwork after fabrication.

a. Galvanizing: ASTM A123 or A653 with minimum coating of 1.5 ounce per square foot.

2.3 MANUFACTURED UNITS

A. All Purpose Metal Framing:
   1. Material: Carbon Steel.
   2. Channels and inserts:
      a. Minimum 12 gage.
      b. Channels to have one side with a continuous slot and inturned lips.
   3. Fittings: Hot-rolled steel strip and plate.
   4. Nuts: Steel, ASTM A563, with toothed grooves in top of nuts to engage the inturned lips of channels.
   5. Finish: Epoxy coated. Galvanize items which cannot be epoxy coated.

2.4 FABRICATION

A. Verify field conditions and dimensions prior to fabrication.

B. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

C. Form exposed work true to line and level with accurate angles and surfaces straight and sharp edges.

D. Drill and punch holes with smooth edges.

E. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
   1. Temperature Range: 0 degrees F minimum to 110 degrees F maximum ambient temperature.

F. Shear and punch metals cleanly and accurately. Remove burrs.

G. Ease exposed edges to a radius of approximately 1/32 inch unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

H. Remove sharp or rough areas on exposed traffic surfaces.

I. Welding
   1. Welding shall be by the metal-arc method or gas-shielded arc method as described in the American Welding Society's "Welding Handbook" as supplemented by other pertinent standards of the AWS. Qualification of welders shall be in accordance with the AWS Standards governing same.
   2. In assembly and during welding, the component parts shall be adequately clamped, supported and restrained to minimize distortion and for control of dimensions. Weld reinforcement shall be as indicated by the AWS Code. Upon completion of welding, all weld splatter, flux, slag, and burrs left by attachments shall be removed. Welds

shall be repaired to produce a workmanlike appearance, with uniform weld contours and dimensions. All sharp corners of material that are to be painted or coated shall be ground to a minimum of 1/32-inch on the flat.

3. Weld corners and seams continuously to comply with the following:
   a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   b. Obtain fusion without undercutting or overlap.
   c. Remove welding flux immediately.
   d. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.

J. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners whenever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

K. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

L. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

M. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

N. Fabricate joints that will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

2.5 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Hot dip galvanize after fabrication.

2.6 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel studs for embedding into concrete.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

A. Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.

B. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports.

C. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection.

D. Cut, drill, and tap units to receive hardware, hangers, and similar items.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

B. Inspect and verify condition of substrate. Correct any surface defects or conditions which might interfere with or prevent a satisfactory installation.

C. Set sleeves in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entry.

3.2 INSTALLATION

A. Set metal work level, true to line, plumb.

B. In fabrication and erection of structural steel, conform to the requirements of the American Institute of Steel Construction "Manual of Steel Construction."

C. To the maximum extent possible, use bolted field connections. Where practicable, conceal the fastenings. When field welding is warranted, comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercutting or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish/grind exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.

D. Unless notes or specified otherwise:
   1. Connect steel members to steel members with 3/4-inch diameter high strength bolts.
   2. Connect aluminum to aluminum with 3/4-inch diameter aluminum bolts.
   3. Connect aluminum to structural steel using 3/4-inch diameter stainless steel bolts.
   4. Connect aluminum and steel members to concrete and masonry using 3/4-inch stainless steel epoxy anchors. Provide a minimum of 5 1/2 inches of embedment into concrete or masonry.

E. Do not field splice fabricated items unless said items exceed standard shipping length or change of direction requires splicing. Provide fully welded splices where continuity is required.

F. Provide each fabricated item complete with attachment devices as indicated or required to install.

G. Anchor metal items so that items will not be distorted, nor fasteners overstressed from expansion and contraction.

3.3 DRILLED ANCHORS

A. Drilled-in anchors and reinforcing bars shall be installed in strict accordance with the manufacturer's instructions. Holes shall be roughened with a brush on a power drill, cleaned and dried. Drilled anchors shall not be installed until the concrete has reached the specified 28-day compressive strength. Epoxy anchors shall not be loaded until the adhesive has reached its indicated strength in accordance with the manufacturer's instructions.

3.4 SETTING LOOSE PLATES

A. Clean concrete bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.

B. Set loose level and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout.
   1. Use non-shrink grout in concealed locations where not exposed to moisture.
   2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780

END OF SECTION

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SECTION 31 10 00
SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section includes all those measures required during the Contractor's initial move onto the site to protect existing fences, structures and associated improvements, streets, and utilities downslope of construction areas from damage due to boulders, trees or other objects dislodged during the construction process: clearing, grubbing and stripping; and regrading of areas to receive embankment fill.

B. The Contractor is required to protect and preserve all things designated to remain. Where Contractor's operation causes damage or injury to trees and plants designated to remain, an arborist or other qualified professional shall be employed by the Contractor, at no additional cost to the Owner, to repair the damage or provide adequate replacement to the Owner's satisfaction where damage is beyond repair.

1.2 SITE INSPECTION

A. Prior to moving onto the Project site, the Contractor shall inspect the site conditions and review maps of the existing plant site and off-site pipeline routes and facilities delineating the Owner's property and right-of-way lines.

B. Contractor shall submit photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site preparation.

C. The Contractor shall identify and accurately locate utilities and other subsurface structural, electrical, and mechanical conditions. Existing conditions shall be incorporated into the record drawings for the project.

1.3 DEFINITIONS

A. The following definitions apply to the Work of this Section:
   1. Clearing is defined as cutting trees, removing fences and posts, removing curbs and other improvements to prepare the site for grubbing and stripping.
   2. Grubbing is defined as the below grade part of clearing to remove roots, small piping, irrigation systems, etc., to prepare the site for stripping.
   3. Stripping is defined as removing a surface layer of soil and organic material, sod, topsoil, and other unsuitable material as defined in Section 31 23 00 – Earthwork, to a depth that earthwork can proceed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Locate and clearly flag trees and vegetation to remain or to be relocated.

D. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TREE PROTECTION

A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
   1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
   2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
   1. Cover exposed roots with burlap and water regularly.
   2. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
   3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
   4. Cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Engineer.
   1. Employ a qualified arborist, licensed in jurisdiction where project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
   2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.

3.3 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Engineer not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's written permission.

C. Excavate for and remove underground utilities indicated to be removed.

3.4 PRIMARY SITE ACCESS

A. Develop any necessary access to the site, including barrier facilities to be installed at the beginning of construction in order to prohibit entry of unauthorized persons.

B. Utility Interference: Where existing utilities interfere with the Work of this Section, notify the Engineer and work around the interferences until a directive is issued.

3.5 CLEARING, GRUBBING, AND STRIPPING

A. All construction areas shall be cleared of grass and weeds to at least a depth of six inches and cleared of structures, concrete or masonry debris, trees, logs, upturned stumps, loose boulders, and any other objectionable material of any kind which would interfere with the performance or completion of the Work, create a hazard to safety, or impair the Work's subsequent usefulness or obstruct its operation. Loose boulders within 10 feet of the top of cut lines shall be incorporated in landscaping or removed from the site. Trees and other natural vegetation outside the actual lines of construction shall be protected from damage during construction, as directed by the Engineer.

B. Within the limits of clearing, the areas below the natural ground surface shall be grubbed to a depth necessary to remove all stumps, roots, buried logs, and all other objectionable material. Debris or waste shall be totally removed if they are found on the site. All objectionable material from the clearing and grubbing process shall be removed from the site and wasted in approved safe locations in compliance with state and federal regulations.

C. The area to be affected by construction that have not been pre-excavated to the subgrade elevation shall be removed and placed in the designated stockpile areas, and/or incorporated into landscaped areas or other nonstructural embankments.

D. For all areas that have not been previously disturbed, including staging areas and temporary construction easements, topsoil-salvaging operation shall immediately follow clearing operations. The area shall be stripped of topsoil to a depth of 8 inches. Unsuitable materials, specified in Section 31 23 00, shall not be considered topsoil. The Contractor shall strip to the depth indicated regardless of the material encountered. All stripped topsoil shall be stockpiled within stripped areas in stockpiles not to exceed 15 feet in height. Vegetation shall be ground or chipped to a mulching consistency and mixed with the stripped soil. Stockpiles shall be placed away from high construction traffic areas and shall be fenced and signed to prevent accidental use as fill prior to topsoil replacement.

E. Upon completion of Work within the construction areas stripped of topsoil, the stored topsoil shall be respread over the disturbed areas. Topsoil shall be spread in about a 6-inch layer. Respread topsoil shall match the existing terrain as much as possible. Interfaces between restored disturbed areas and undisturbed areas shall be chain dragged to eliminate obvious edges. All tracks and equipment marks shall be chain dragged or hand raked away. Replaced topsoil shall be thoroughly watered for dust control upon completion of the respreading operations. Once topsoil replacement has been completed, no vehicles or other motorized equipment shall be allowed to travel on the finished surface.

F. Unless otherwise indicated, native trees larger than three inches in diameter at the base shall not be removed without the Engineer's approval. The removal of any trees, shrubs, fences, or other improvements outside of rights-of-way, if not necessary for the Contractor's choice of means and methods, shall be arranged with the property owner and be removed and replaced at no increased cost to the Owner.

G. Except in areas to be excavated, holes and other holes resulting from Work of this section shall be backfilled with suitable material in accordance with Section 31 23 00 – Earthwork.

3.6 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
   1. Unless existing full-depth joints coincides with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

3.7 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 33 05 01
HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. The Contractor shall provide high density polyethylene pipe and appurtenances, complete in place, in accordance with the Contract Documents.

1.2 RELATED SECTION

A. Section 31 23 00 – Earthwork

1.3 REFERENCES

A. The Materials and Work furnished shall be, as a minimum, in accordance with the latest editions of the following standards except as such Standard are modified and supplemented in this section.

AWWA C906	Standard for Polyethylene (PE) Pressure Pipe & Fittings, 4 inch (100 mm) through 63 inch (1,575 mm) for Water Distribution and Transmission
ASTM D1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1248	Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
ASTM D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D2837	Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
ASTM D3035	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
ASTM D3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM D3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

ASTM D256	Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
ASTM D2683	Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
ASTM F1055	Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
ASTM D2657	Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
ASTM F2164	Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
ASTM F1417	Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
PPI TR-33	Generic Butt Fusion Joining Procedure for Field Joining of PE Pipe

1.4 SUBMITTALS

A. The Contractor shall submit the following information and data. See Section 01 33 20 – Submittal Procedures.
   1. Product Data: Provide data indicating pipe, pipe accessories and fittings.
   2. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
   3. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   4. Certified Resin Test Reports covering the physical, stress, regression, thermal and impact tests of resin material to be used for the pipe. Submit this information prior to manufacturing or fabricating any pipe.
   5. Proposed butt fusion procedures including training and qualification requirements and joint repair procedures shall be submitted to the Engineer for review and approval.
   6. Qualifications of Butt Fusion Welders and Welding Operators
      a. All butt fusion welders and welding operators shall be qualified and certified for all portions of the work specified in this section. Welder qualification requires that during the past 12 months all welders and welding operators have successfully completed certified butt-fusion joints using the pipe and welding machine proposed for this project.
      b. Current welder and welding operator performance qualification test records shall be submitted to the Engineer for review and approval prior to commencing field operations.
      c. Personnel that will be operating the butt fusion welder shall be certified by either 1 and 3, or 2 and 3 of the following criteria:

1) Previous demonstrated experience during the past 12 months, in the use of the procedure on similar projects using the same welding machines and type of pipe proposed.
2) Appropriate training and apprenticeship
3) All operators shall make a specimen joint from the pipe to be used on the project. This joint shall then be subjected to the test requirements specified herein.

7. Fusion parameters including the recommended limits of all criteria recorded by the data logger.
8. Fusion report for each joint, which shall include the following information.
   a. Pipe size and dimensions
   b. Machine size
   c. Operator identification
   d. Job identification number
   e. Weld number
   f. Fusion, heating and drag resistance settings
   g. Heater plate temperature
   h. Time Stamp
   i. Heating and curing time of weld
   j. Curing temperature readings and time stamps of readings
   k. Ambient air temperature and humidity
   l. Error message and warnings for out of range temperature or pressure settings.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable codes for materials and installation of the Work in this Section.

1.6 PROJECT CONDITIONS

A. Coordinate the Work on sewer lines and connections to existing sewer lines with the Owner.

1.7 QUALITY CONTROL

A. Any pipe manufactured prior to review and approval of all required prefabrication submittals will be at the Contractor's own risk.

B. Review of the Contractor's shop drawings shall not relieve the Contractor of any responsibility for accuracy of dimensions and details, nor shall mutual Agreement of dimensions or details relieve the Contractor of responsibility for Agreement and conformity of its Shop Drawings with the Contract.

1.8 QUALITY ASSURANCE

A. Fabrication, processing, testing and inspection operations affecting the pipe and associated accessories shall, at any time, be subject to quality assurance surveillance by Owner, or Engineer. Such surveillance shall be at the discretion of the Owner. Such surveillance does not relieve the Contractor from responsibility for the Work.

B. All deviations from this specification section must be documented and referred to Engineer for resolution.

C. The Contractor shall submit to the Engineer an affidavit from the manufacturer that the pipe, specials, fittings, and other products of material furnished under this Contract comply with all applicable provisions of AWWA C906 standards and this specification.

D. DOCUMENTATION: The following items shall be documented and stored as part of the manufacturer's permanent records. Copies of all documentation shall be provided to the Engineer.

1. Documentation from the resin's manufacturer showing results of the following tests for resin identification:
    a. Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer, ASTM D1238
    b. Standard Test Method for Density of Plastics by the Density - Gradient Technique, ASTM D1505
2. The polyethylene pipe manufacturer shall provide certification that stress regression testing has been performed on the specific polyethylene resin being utilized in the manufacture of this product. This stress regression testing shall have been done in accordance with ASTM D2837 and the manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis (HDB) of 1,600 psi as determined in accordance with ASTM D2837.
3. Production staff shall check each length of pipe produced for the items listed below. The results of all measurements shall be recorded on production sheets, which becomes part of the manufacturer's permanent records.
    a. Pipe in process shall be checked visually, inside and out for cosmetic defects (grooves, pits, hollows, etc.)
    b. Pipe outside diameter shall be measured using a suitable periphery tape to ensure conformance with ASTM D3035.
    c. Pipe wall thickness shall be measured at 12 equally spaced locations around the circumference at both ends of the pipe to ensure conformance with ASTM D3035.
    d. Pipe length shall be measured.
    e. Pipe marking shall be examined and checked for accuracy.
    f. Pipe ends shall be checked to ensure they are cut square and clean.
    g. Subject inside surface to a "reverse bend test" to ensure the pipe is free of oxidation (brittleness).
    h. Copies of all manufacturer documentation shall be submitted to the Engineer for review and approval upon completion of manufacturing.

E. In addition to those tests specifically required, the Engineer may request additional samples of any material for testing by the Owner. The additional samples shall be furnished as a part of the Work.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Contractor shall comply with the following minimum requirements:
   1. Referenced standards for all materials, processes, methods, tests, etc to be used in completion of the Work.
   2. Delivery of all pipe and materials, all aspects of which shall be conducted in such a manner as to minimize handling, provide proper weather protection and storage, and to meet schedule requirements.
   3. Furnish and use load rated nylon-type slings for securing, lifting, and unloading pipe sections; or, the use of acceptable protective wraps to minimize damage from the alternate rigging equipment.
   4. Internal timber bracing shall be provided to maintain pipe shape and integrity throughout plant storage, transportation, and site storage operations through installation and backfill placement. Internal bracing shall not be removed until a minimum of 2 feet of compacted trench zone material is placed above the top of the pipe.

2.2 MANUFACTURER

A. All HDPE pipe and HDPE fittings shall be from a single manufacturer, who is fully experienced, reputable and qualified in the manufacture of the HDPE pipe to be furnished. The pipe shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications. Qualified manufacturers shall be: PLEXCO Division of Chevron Phillips Chemical Company, DRISCOPIPE as manufactured by Chevron Phillips Co., Inc., WL Plastics or equal as approved by the Engineer.

2.3 PIPE IDENTIFICATION

A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5-feet:
   1. Name and/or trademark of the pipe manufacturer.
   2. Nominal pipe size.
   3. Dimension ratio.
   4. The letters PE followed by the polyethylene grade in accordance with ASTM
   5. D1248 followed by the hydrostatic design basis of 1600 psi, e.g., PE 4710.
   6. Manufacturing standard reference, e.g., ASTM D-3035, as required.
   7. A production code from which the date and place of manufacture can be determined.
   8. Color Identification, either striped by co-extruding longitudinal identifiable color markings or shall be solid in color and as follows:
      a. BLUE – Potable Water
      b. GREEN – Sanitary Sewer
      c. LAVENDER – IQ cover all

B. Marking Tape: Marking tape shall be provided and installed as shown in Drawings and per Engineer approval.

2.4 COMPATIBILITY

A. Contractor is responsible for compatibility between pipe materials, fittings and appurtenances.

2.5 WARRANTY

A. The pipe Manufacturer shall provide a warranty against manufacturing defects of material and workmanship for a period of ten years after the final acceptance of the project by the Owner. The Manufacturer shall replace at no expense to the Owner any defective pipe/fitting material including labor within the warranty period.

2.6 MATERIALS

A. Materials used for the manufacture of polyethylene pipe and fittings shall be made from a PE 4710 high density polyethylene resin compound meeting a minimum cell classification 445574C per ASTM D3350 and ASTM F714.

B. High Density Polyethylene (HDPE) pipe shall be manufactured in accordance with AWWA C901-96 for sizes ½-inch through 3-inch diameters and to the requirements of ASTM D 3035. Pipe 4-inches and above shall be manufactured to the requirements of ASTM F714 and AWWA C906-99.

C. Unless otherwise noted, diameters shown in the Contract Documents shall refer to Iron Pipe Size (IPS) system conforming to the requirements of AWWA C906.

D. If rework compounds are required, only those generated in the Manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used. Clean rework material of the same type grade, and cell classification generated from the manufacturers own pipe and fitting production may be used by the same manufacturer as long as the pipe, tubing and fittings produced meet all requirements of AWWA C906.

E. Dimensions and workmanship shall be as specified by ASTM F714. HDPE fittings and transitions shall meet ASTM D3261. HDPE pipe shall have a range of density 0.956-0.964 grams per cubic centimeter. All HDPE pipe and fittings shall have a Hydrostatic Design Basis (HDB) of 1,600 psi at 73.0°F in accordance with ASTM D2837.

F. The extruded pipe shall have impact strengths greater than 42 in-lb/in in accordance with ASTM D256 Method A, with a material thickness representative of the cross-section in which the material is to be used.

G. The pipe Manufacturer shall certify compliance with the above requirements.

2.7 FABRICATION

A. Pipe shall be homogenous throughout and uniform in color, opacity, density and other properties as prescribed in the Resin Manufacturers Specifications. The inside and outside surfaces shall be semi-matte to glossy in appearance and free from sticky or tacky material. The pipe walls shall be free from cuts, cracks, holes, blisters, voids, foreign inclusions, or other defects that are visible to the naked eye that may affect wall integrity.

B. Pipe dimensions and wall thickness variations shall be in conformance with requirements of AWWA C906.

C. Pipe shall be finished smooth throughout all inside surfaces and true to all specified tolerances circumference and diameter such that: The difference between maximum and minimum diameters, at any cross-section along the length of the pipe does not exceed 1% of the nominal diameter.

D. Special pipe sections, fittings, and special pieces shall be completely fabricated in the shop. All pipe fittings shall be fabricated or molded to correct dimensions throughout the entire length. Ends cuts shall be clean, squarely-made, and suitable for field welding, without drawn, ragged, gouged, or split ends.

E. All HDPE fittings, unless noted otherwise on the drawings shall be fabricated in conformance with the requirements of AWWA C906. Molded fittings shall meet the requirements of ASTM D3261 for butt-type fittings and this specification.

2.8 FITTINGS

A. All molded fittings and fabricated fittings shall be fully pressure rated to match the pipe SDR pressure rating to which they are made. All fittings shall be molded or fabricated by the manufacturer. No Contractor fabricated fittings shall be used unless approved by the Engineer.

B. Polyethylene fittings furnished under this specification shall be manufactured using compounds complying with the requirements of HDPE pipe above and all appropriate requirements of AWWA C906. Socket fittings shall comply with ASTM D2683, Butt Fusion fittings shall comply with ASTM D3261. Electrofusion fittings shall comply with ASTM F1055. Mechanical fittings (e.g. back-up rings, etc.) shall be of stainless steel, including stainless steel hardware, as indicated in the drawings and shall be approved only after submission of appropriate test data and service histories indicating their acceptability for intended service. In all cases, the specification and requirements for the fittings supplied shall comply with the appropriate sections of AWWA C906 and must be approved by the Engineer. NO size on size wet taps shall be permitted.

C. The manufacturer of the HDPE pipe shall supply all HDPE fittings and accessories as well as any adapters and/or specials required to perform the work as shown on the Drawings and specified herein.

2.9 SHIPPING, STORAGE & HANDLING

A. All materials shall be properly loaded so that they will not bear on each other, and shall be braced to prevent damage to material during shipping. Pipe shall be stacked on level ground and per the manufacturer's recommendations to prevent pipe from becoming out of round.

B. All loose parts shall be crated or boxed for shipping, appropriately identified and shipped with the associated pipe sections.

C. Contractor shall protect pipeline sections stored at the site from damage, including weather and vandalism.

D. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects, which could damage the pipe OR on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. The Contractor shall abide by the required handling techniques specified by the Supplier.

E. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects

F. All piping products shall be kept free from dirt, grease, all petroleum based products, and other foreign matter.

G. The Contractor shall provide suitable lifting equipment, slings, spreader bars, rigging etc needed to handle the pipe. In no case shall any equipment be used that is not rated to handle the intended loading or conditions of use to which it is subjected. The use of cables and chains is prohibited.

H. The Contractor shall be responsible for the pipe until such time as it is installed and accepted by the Engineer.

I. The Contractor shall remove any temporary attachments to special components for installation by the Supplier for transportation purposes.

2.10 BEDDING AND COVER MATERIALS

A. Pipe bedding Material: As specified in Section 31 23 00 – Earthwork and in Drawings

PART 3 - EXECUTION

3.1 INSTALLATION – HDPE PIPING

A. High Density Polyethylene (HDPE) Pipe shall be installed in accordance with the instructions of the manufacturer, as shown on the Drawings and as specified herein. A factory qualified joining technician as designated by the pipe manufacturer shall perform all heat fusion joints.

B. Under no circumstances shall the pipe or accessories be dropped into the trench or forced through a directional bore upon “pull-back”.

C. The maximum allowable depth of cuts, scratches or gouges on the exterior of the pipe is 5 percent of wall thickness. The interior pipe surface shall be free of cuts, gouges or scratches. Sections of pipe with cuts, scratches or gouges exceeding 5 percent of the pipe wall thickness shall be removed completely and the ends of the pipeline rejoined. Repair of damaged pipe during or after installation shall conform to the fabricator’s repair procedures or by an Engineer approved repair method.

D. When laying pipe is not in progress, the open ends of the pipe shall be closed by fabricated plugs, or by other approved means.

E. The interior of the pipe shall be cleaned of any foreign matter before being lowered in the trench and kept clean during placement, joint welding, bedding and backfilling operations by plugging or other approved method. Groundwater shall not be permitted to enter the pipe. The full length of each pipe section and each bend shall rest solidly on the compacted bedding material.

F. All HDPE pipe must be at the temperature of the surrounding soil at the time of backfilling and compaction.

G. If a 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.

H. Contractor shall install HDPE pipe when the ambient air temperature conforms to manufacturer's specifications. The Contractor will be responsible for verifying the temperature by maintaining a log listing dates, times, length of pipe installed and ambient temperature during installation.

I. Trench bottoms shall be graded such that each section of pipe shall be placed to the specified depth or elevation with uniform support. When the bottom of the trench has been excavated below the specified depth or elevation it shall be brought to the specified depth or elevation by backfilling with approved pipe zone material. When material at the bottom of the trench is determined to be unsuitable by the Engineer, it shall be removed and the trench backfilled with approved subgrade material or bedding material to the specified depth of excavation.

J. During pipe installation, the trench bottom shall be kept free of frost, frozen earth, or standing water. The Contractor shall maintain the trench in good, stable condition at all times to prevent caving.

K. Precautions shall be taken to prevent flotation of the pipe in the trench.

L. The pipeline may be buried as it is installed, provided all inspection, testing and backfill requirements are met.

M. All areas disturbed by installation of the pipeline shall be restored in accordance with the specification and drawings.

3.2 JOINING METHOD

A. HDPE pipe shall be joined with butt, heat fusion joints as outlined in ASTM D3261 and conform to the Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe, Technical Report TR-33, published by the Plastic Pipe Institute (PPI). All joints shall be made in strict compliance with the manufacturer's recommendations. A factory qualified joining technician as designated by pipe manufacturer or experienced, trained technician shall perform all heat fusion joints in the presence of the Inspector. The Contractor shall install the HDPE pipeline complete, including bends, couplings, valves, and other associated fittings and appurtenances as shown on the drawings or specified herein and make all necessary connections to the lines and grades shown on the Drawings and in accordance with these specifications.

B. The Contractor shall furnish all welding equipment and all construction materials and equipment required for lugs, railings, templates, spiders or other supports and internal bracing as may be required to hold the components firmly within the specified tolerances during welding, concrete placement or backfill placement. The contractor shall also furnish and install all necessary positioning devices, ties, pedestals and supports required for installation. Details of such equipment shall be included in the proposed installation procedure to be submitted to the engineer prior to the start of work.

C. Lengths of pipe shall be assembled into suitable installation lengths by the butt-fusion process. All pipes so joined shall be made from the same class and type of raw material made by the same raw material supplier. Pipe shall be furnished in standard laying lengths not to exceed 50 feet and no shorter than 20 feet. Installation shall be in accordance with the requirements of AWWA C906 unless otherwise noted, and the Manufacturer's instructions. Contractor shall be responsible for correct fitting of all pipeline members and components.

D. The polyethylene flange adapters shall be used at pipe material transitions and other locations as indicated in the drawings. The adapters shall be connected together or to other flanges by using a stainless steel "back-up" ring conforming to ANSI B16.1 and shaped as necessary to suit the outside dimensions of the pipe. Ensure that back up rings are in place prior to joining flange adapter to piping or other components. The flange adapter assemblies shall be connected with corrosion resistant bolts and nuts of Type 316 Stainless Steel as specified in ASTM A726 and ASTM A307. All bolts shall be tightened to the manufacturer's specified torques. Bolts shall be tightened alternatively and evenly. After installation apply a non-oxide grease coating to bolts and nuts.

E. Where indicated, sleeve couplings shall be used to make HDPE joints. When sleeve couplings are used, stainless steel (Type 316), pipe stiffeners shall be inserted inside of each HDPE pipe end as recommended by the manufacture to prevent the pipe from going out of round and to ensure a leak free joint. Sleeve couplings shall be specifically rated for service with HDPE pipe and shall be as specified in the Contract Documents. Sleeve coupling shall only be used where indicated in the plans and in conjunction with an HDPE Pipe Anchor Block.

3.3 PREPARATION

A. Butt-fusion welded joints: Refer to Manufacturers recommended procedures. All joints formed by butt fusion processes shall be completed in strict accordance with the Manufacturers specified procedures, except where specifically called out in the specifications or drawings. Minimum requirements for butt-fusion welded joints are as follows:
   1. Pipe ends shall be made clean and square prior to fitting and alignment
   2. Care shall be taken to assure a clean work area, free from airborne dust, moisture, or other foreign matter which may contaminate the finished weld.
   3. All internal surfaces of the pipe shall be maintained clean following completion of a weld and prior to starting the next joint.
   4. All butt-fusion joints shall be water tight under the maximum internal pressure.

3.4 BACKFILL PLACEMENT

A. Pipe zone material shall be placed in accordance with Section 31 23 00 - Earthwork. Care shall be taken to ensure that the material is carefully worked and compacted into the area

beneath and around the pipe to provide continuous support to the pipe. Material shall be properly haunched to provide support. Care shall be taken to avoid movement of the pipe during placement and compaction of the bedding material. Pipe bedding shall be placed to the limits shown on the drawings.

B. Trench backfill shall be placed in accordance with Section 31 23 00 - Earthwork.

C. No construction vehicles or ride-on mechanical compaction equipment shall be permitted to travel over the pipe until a minimum of 2 feet of trench backfill is placed above the top of the pipe.

3.5 CONNECTION TO EXISTING

A. Mechanical connections of the polyethylene pipe to auxiliary equipment such as valves, pumps and tanks shall be through flanged connections which shall consists of the following:
   1. A polyethylene flange adapter shall be thermally butt-fused to the stub end of the pipe.
   2. A Type 316 stainless steel back up ring shall mate with the polyethylene flange adapter.
   3. Type 316 stainless steel bolts and nuts shall be used to complete the connection.
   4. Flange connections shall be provided with a full-face neoprene gasket.

B. All transitions from HDPE pipe to ductile iron or PVC shall be made per the approval of Engineer and per the HDPE pipe manufacturer's recommendations and specifications. A molded flange connector adapter with a back-up ring assembly shall be used for pipe type transitions. Ductile iron back-up rings shall mate with cast iron flanges per ANSI B16.1. A type 316 stainless steel back-up ring shall mate with a type 316 stainless steel flange per ANSI B16.1 and shall be used in all buried applications.
   1. Transition from HDPE to ductile iron fittings and valves shall be approved by Engineer before installation.
   2. No solid sleeves couplings shall be allowed between such material transitions.
   3. The pipe supplier must certify compliance with the above requirements

C. Prior to making connections to any existing structure or pipe, ensure that new pipe has had the time required to acclimate to the buried conditions. Make the appropriate adjustments required by the thermal expansion and contraction properties of HDPE materials before connecting to any dissimilar material or structure.

3.6 FIELD QUALITY CONTROL

A. On days butt fusions are to be made, the first fusion shall be a trial fusion in the presence of the Inspector. The following shall apply:
   1. Heating plates shall be inspected for cuts and scrapes. The plate temperature shall be measured at various locations to ensure proper heating/melting per manufacturer's recommendations and as approved by the Inspector.
   2. The fusion or test section shall be cut out after cooling completely for inspection.
   3. The test section shall be 12" or 30 times (minimum) the wall thickness in length and 1" or 1.5 times the wall thickness in width (minimum).

4. The joint shall be visually inspected as to continuity of “beads” from the melted material, and for assurance of “cold joint” prevention (i.e. – joint shall have visible molded material between walls of (pipe). Joint spacing between the walls of the two ends shall be a minimum of 1/16” to a maximum 3/16”.

3.7 TOLERANCES

A. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-in per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed. Good alignment shall be preserved during installation. Deflection of the pipe shall occur only at those places on design drawings and as approved by the Engineer. Fittings, in addition to those shown on the Drawings, shall be used only if necessary or required by the Engineer.

3.8 CLEANING

A. Do not allow dirt, grease, mud, groundwater, tools, equipment and all other foreign matter to enter the pipe at any point during construction.

B. All pipes shall be completely flushed at a rate with water velocities no less than 4.0 feet per second for pipes up to 12 inches in diameter and 3.0 feet per second for all other pipes. For large diameter pipes, alternate methods, including pigging, of cleaning the pipe may be proposed by the Contractor, subject to the approval of the Engineer, provided proposed method will provide a clean pipe equivalent to flushing as determined by the Engineer.

C. No debris, rubbish, dirt, rocks, or other foreign material shall be permitted to enter downstream sections of the pipeline or system.

D. Furnish, install and permanently remove all cross-connections, piping, valving, ports, etc required to complete the cleaning process. Obtain approval of the Engineer prior to adding any components to the pipeline.

3.9 HYDROSTATIC PRESSURE TESTING

A. Hydrostatic pressure testing shall be conducted per the requirements of ASTM F 2164 and these specifications.

B. All HDPE mains shall be field-tested. Contractor shall supply all labor, equipment, material, gages, pumps, plugs, meters and incidentals required for testing. Each main shall be pressure tested upon completion of the pipe laying and backfilling operations, including placement of any required temporary roadway surfacing.

C. Submit a plan for testing, including schedule, method for water conveyance, control, and disposal, to the Engineer for review at least 10 days before starting the test and notify the Engineer a minimum of 48 hours prior to test

D. The maximum test pressure shall be as indicated in the Drawings but shall not exceed 150 percent of the maximum working pressure of the pipe or the design pressure of any component on the pipe, whichever is less..

E. The test temperature of the piping and the test liquid (water) shall not exceed 73 degrees F. or the temperature related to the pressure rating of the pipe as reported by the manufacturer.

F. Test equipment, preparations and procedures shall implicitly follow the requirements of ASTM F 2164 and the Manufacturer's recommendations.

G. In preparing for test, fill line slowly with water. Maintain flow velocity less than 2 feet per second or less than the capacity of any air release devices use to expel trapped air, whichever is less.

H. Expel air completely from the line during filling and again before applying test pressure. Air shall be expelled by means of taps at points of highest elevation. Any taps installed solely for the purpose of releasing trapped air shall be permanently capped at the conclusion of the test.

I. Once all air is expelled and all testing equipment and pipeline components are adequately braced, gradually increase the pressure in the pipeline to the required maximum test pressure. Hold test pressure for four hours adding make-up water as required to maintain the noted maximum test pressure.

J. After the four hour equalization period, reduce pressure in the pipeline by 10 psi to the test pressure and monitor the pressure for 1 hour. Do not increase the pressure or add make-up water during this time.

K. During and after the one-hour test period, observe all components, joints, fittings, and appurtenances of the pipeline for visible signs of leakage. Any visible signs of leakage indicate a failed test, all such leaks shall be repaired and pipeline retested before pipeline will be accepted. If any visible signs of leakage in any butt-fusion joints in the pipe are noted, immediately stop the test and carefully release the test pressure. Repair the noted leaks and restart test procedure from beginning.

L. A successful hydrostatic pressure test will be indicated by no visible signs of leakage and a steady pipeline pressure within 5 psi of the test pressure throughout the one hour test period without increasing the pressure or the addition of make-up water.

M. Upon completion of the test, the pressure shall be bled off from a location other than the point where the pressure is monitored. The pressure drop shall be witnessed by the Engineer at the point where the pressure is being monitored and shall show on the recorded pressure read-out submitted to the Engineer.

N. Repair and/or replace any failed pipeline sections, components, fittings, valves or other appurtenances to the satisfaction of the Engineer and at no additional expense to the Owner.

3.10 LOW PRESSURE AIR TESTING

A. HDPE pipelines intended for use as air ducts shall be tested for leakage prior to placing the pipe in service. Air test shall not be used for acceptance of any HDPE pipeline except those indicated herein or in the Drawings. Furnish, install and completely remove all fittings, branches, plugs, valves and other appurtenances required to complete the testing process.

B. Prior to beginning air test, HDPE pipeline shall be isolated from pipeline components not rated for the air pressures called for in the test.

C. Low pressure air testing shall be completed per the requirements of ASTM F1417 as given in Section 33 08 00 – Gravity Piping Testing and Inspection.

D. Pipeline shall be inspected for all visible infiltration leaks as evidenced by infiltrating groundwater. Leaks shall be located and repaired at no additional cost to the Owner and to the satisfaction of the Engineer.

3.11 MANDREL TESTING

A. After successful completion of hydrostatic test, mandrel test all buried HDPE piping.

B. Mandrel configuration: Rigid with circular cross-section with a diameter of not less than 95% of the average inside diameter of the pipeline with a length of circular proportion equal to the nominal diameter of the pipeline.

C. Mandrel pulling method shall be by hand, rope or as directed by the Engineer.

END OF SECTION

SECTION 33 13 00
WATER PIPELINE TESTING AND DISINFECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The Contractor shall perform flushing and testing of all pressure pipelines and appurtenant piping and disinfection of all pipelines and appurtenant piping for potable and fire water, complete.

B. This specification applies to all pipelines requiring hydrostatic tests (water medium) regardless of the pipeline service medium.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards

ANSI/AWWA B300	Hypochlorites
ANSI/AWWA B301	Liquid Chlorine
ANSI/AWWA C206	Field Welding of Steel Water Pipe
ANSI/AWWA C651	Disinfecting Water Mains

1.3 CONTRACTOR SUBMITTALS

A. A testing schedule, including proposed plans for water conveyance, control, disposal, and disinfection shall be submitted in writing for approval a minimum of 7 days before testing is to start.

B. A copy of the Utah Pollutant Discharge Elimination System (UPDES) permit application shall be submitted a minimum of 30 days prior to the proposed date to start testing. A copy of the approved UPDES permit shall be submitted prior to the start of testing.

C. Chlorine residual test data and bacteriological test data shall be submitted to document the results of the pipeline disinfection. Tests shall be conducted 24 hours after the start of disinfection.

PART 2 - PRODUCTS

2.1 MATERIALS REQUIREMENTS

A. All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor subject to the Engineer's review. No materials shall be used which would be injurious to the construction or its future function.

B. Used pressure gauges shall be recertified prior to testing.

C. Chlorine for disinfection shall be in the form of liquid chlorine, sodium hypochlorite solution, or calcium hypochlorite granules or tablets.

D. Liquid chlorine shall be in accordance with the requirements of ANSI/AWWA B301. Liquid chlorine shall be used only:
   1. In combination with appropriate gas flow chlorinators and ejectors;
   2. Under the direct supervision of an experienced technician;
   3. When appropriate safety practices are observed.

E. Sodium hypochlorite and calcium hypochlorite shall be in accordance with the requirements of ANSI/AWWA B300 - Hypochlorite.

PART 3 - EXECUTION

3.1 GENERAL

A. Water for testing and disinfecting water pipelines shall be furnished by the Contractor. The Contractor shall make all necessary provisions for conveying the water from the source to the points of use, and disposal of the water (and dechlorinating - where applicable).

B. All pressure pipelines shall be tested. Disinfection shall be accomplished by chlorination for all pipelines providing potable water or connected to a potable water system. All chlorinating and testing operations shall be performed in the presence of the Engineer.

C. Disinfection operations shall be scheduled as late as possible during the contract time period so as to assure the maximum degree of sterility of the facilities at the time the Work is accepted by the Owner. Samples for bacteriological testing shall be collected by the Contractor, and testing shall be performed by the Owner laboratory and at the expense of the Contractor. Results of the bacteriological testing shall be satisfactory with the State Department of Health or other appropriate regulatory agency.

D. Pipeline pressure tests will include the following tests:
   1. Air test of double welded lap joints.
   2. Hydrostatic pressure test of the complete pipeline, in segments as required to match pipe pressure class.
   3. Contractor shall conduct the discharge in accordance with the Utah Pollutant Discharge Elimination System (UPDES) permit from the Utah Division of Environmental Quality (UDEQ). The Contractor shall apply a reducing agent to the discharged water to neutralize the chlorine residual and meet the chlorine residual limit required under the permit. The Owner shall conduct the water quality sampling of the discharge as required by the permit. The Contractor shall notify local agencies, secure appropriate other permits and approvals, and provide erosion control measures for any releases as appropriate. Release of water after pipeline testing and disinfection have been completed shall be only if acceptable to the Engineer.

E. Notification: Notify the Engineer at each of the following stages:
   1. Three working days prior to the start of filling the pipeline with water.

2. Three working days prior to the start of chlorination.
3. Twenty-four hours before withdrawing samples for bacteriological testing.
4. Three working days prior to the start of flushing.

3.2 VISUAL INSPECTION

A. All welds shall be 100% visually inspected in accordance with ANSI/AWS D1.1, Table 6.1; Visual Inspection Acceptance Criteria for Statically Loaded Non-Tubular Connections.

3.3 AIR TEST

A. All double welded lap joint or double gasket Carnegie joint shall be pressure tested to a minimum of 40-psi air pressure for a period of 10 minutes per AWWA C206. No air leakage will be allowed.

B. If the test pressure drops below 40 psi, paint the welds with a soap solution. Mark any leaks indicated by the escaping gas bubbles.

C. Any joints which leak shall be repaired and retested.

3.4 HYDROSTATIC TESTING OF PIPELINES

A. Prior to hydrostatic testing, all pipelines shall be flushed or blown out as appropriate. Test all pipelines either in sections or as a unit. No section of the pipeline shall be tested until all field-placed concrete or mortar has attained an age of 14 days. The test shall be made by closing valves when available, or by placing temporary bulkheads in the pipe and filling the line slowly with water. The Contractor shall be responsible for ascertaining that all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to or movement of the adjacent pipe. Any unharnessed sleeve-type couplings, expansion joints, or other sliding joints shall be restrained or suitably anchored prior to the test, to avoid movement and damage to piping and equipment. Provide sufficient temporary air tappings in the pipelines to allow for evacuation of all entrapped air in each pipe segment to be tested. After completion of the tests, such taps shall be permanently plugged. Care shall be taken to see that all air vents are open prior to and during filling.

B. The pipeline shall be filled at a rate not to exceed 2-feet per second as calculated by using the cross-sectional area based on the inside diameter of the pipe and which will not cause any surges or exceed the rate at which the air can be released through the air valves at a reasonable velocity and all the air within the pipeline shall be properly purged. After the pipeline or section thereof has been filled, it shall be allowed to stand under a slight pressure for at least 24 hours to allow the concrete or mortar lining, as applicable, to absorb what water it will and to allow the escape of air from any air pocket. No personnel shall be within or enter any vault or confined space subject to flooding during the initial filling and for a 24 hour period. After the 24 hour period bulkheads, valves, and connections shall be examined for leaks. If leaks are found, corrective measures satisfactory to the Engineer shall be taken.

C. The hydrostatic test shall consist of holding the test pressure on the pipeline for a period of 4 hours. The test pressure for distribution and transmission pipelines shall be 150 percent of the working pressure in the pipeline measured at the lowest point of the pipeline section being tested. The test pressure for yard piping shall be as indicated on the Piping Schedule

measured at the lowest point of the pipeline section being tested. No pressure test will be required for a reservoir overflow line. All visible leaks shall be repaired in a manner acceptable to the Engineer.

D. The maximum allowable leakage for distribution and transmission pipelines shall be 10 U.S. gallons per inch of diameter per mile of pipe per 24 hours for pipe with 40-foot or greater lengths between joints and with rubber-gasketed joints and 20 U.S. gallons per inch of diameter per mile of pipe per 24 hours for pipe with 20-foot or less lengths between joints and with rubber-gasketed joints. The maximum leakage for yard piping shall be as shown on the Piping Schedule. Pipe with welded joints shall have no leakage.

E. In the case of pipelines that fail to pass the prescribed leakage test, determine the cause of the leakage, take corrective measures necessary to repair the leaks, and again test the pipelines at no additional cost to the Owner.

F. The pipeline shall be drained after successful completion of the hydrostatic test.

3.5 DISINFECTING PIPELINES

A. General: All potable water pipelines shall be disinfected in accordance with the requirements of ANSI/AWWA C651 - Disinfecting Water Mains as modified herein.

B. Prior to disinfecting the pipeline for potable water services and before placing into service for other water pipelines, flush the pipeline to remove any debris, rocks, or other foreign material that may have entered the pipe. Flushing shall be carried out such that the velocities in the pipe exceed 2.5 feet per second. Provide all required material, labor and equipment to complete flushing. Contractor shall provide the water for flushing. Make appropriate provision and preparations for disposal of flushing water, satisfying all local, state and federal rules, laws, regulations and ordinances.

C. Continuous Feed Method: Disinfect in accordance with ANSI/AWWA C651 except that:
   1. The water in the pipe shall contain 50 mg/l free chlorine.
   2. After 24 hours of disinfection, the residual free chlorine shall be at least 25 mg/l at the pipeline extremities.

D. Slug Feed Method: Disinfect in accordance with ANSI/AWWA C651.

E. Chlorinating Valves: During the process of chlorinating the pipelines, all valves and other appurtenances shall be operated while the pipeline is filled with the heavily chlorinated water.

F. Final Flushing: After the applicable retention period, the heavily chlorinated water shall be flushed from the pipeline until chlorine measurements show that the concentration in the water leaving the pipeline is no higher than that generally prevailing in the system or is acceptable for domestic use. If there is any question that the chlorinated discharge will cause damage to the environment, a reducing agent shall be applied to the water to neutralize thoroughly the chlorine residual remaining in the water. See the appendix of AWWA C651 for acceptable neutralization methods for heavily chlorinated water.

G. Sampling Ports: The Contractor shall provide sampling ports along the pipeline as defined in AWWA C651. Taps may be made at manways and air valves to help facilitate the spacing requirement.

H. Bacteriological Testing: After final flushing and before the pipeline is placed in service, two consecutive sets of samples shall be collected at least 24 hours apart by the Contractor from the end of the line and at other locations as designated by the Engineer, and shall be tested by the Owner for bacteriological quality in accordance with the requirements of AWWA C651. For this purpose, the pipe shall be refilled with fresh potable water and left for a period of 24 hours before any samples are collected. If the initial disinfection fails to produce satisfactory bacteriological results or if other water quality is affected, the new main may be reflushed and shall be resampled. If check samples also fail to produce acceptable results, the main shall be rechlorinated by the continuous-feed or slug method until satisfactory results are obtained – that being two consecutive sets of acceptable samples taken 24 hours apart.

3.6 CONNECTIONS TO EXISTING SYSTEM

A. Where connections are to be made to an existing potable water system, the interior surfaces of all pipe and fittings used in making the connections shall be swabbed or sprayed with a one percent hypochlorite solution before they are installed. Thorough flushing shall be started as soon as the connection is completed and shall be continued until discolored water is eliminated.

END OF SECTION

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SECTION 33 41 05
DUCTILE IRON PIPE (AWWA C151, MODIFIED)

PART 1 - GENERAL

1.1 SUMMARY

A. The Contractor shall furnish and install ductile iron pipe and all appurtenant Work, including tape wrap, complete in place, all in accordance with the requirements of the Contract Documents.

1.2 REFERENCE STANDARDS

A. Commercial Standards:

ANSI/AWWA C104/A21.4	Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water
ANSI/AWWA C105/A21.5	Polyethylene Encasement for Ductile Iron Piping and Fittings for Water
ANSI/AWWA C110/A21.10	Ductile Iron and Gray Iron Fittings, 3-in. through 48-in. for Water and Other Liquids
ANSI/AWWA C111/A21.11	Rubber-Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
ANSI/AWWA C115/A21.15	Flanged Ductile Iron and Gray-Iron Pipe with Threaded Flanges
ANSI/AWWA C150/A21.50	Thickness Design of Ductile Iron Pipe
ANSI/AWWA C151/A21.51	Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
ANSI/AWWA C153/A21.53	Ductile Iron Compact Fittings, 3-in. through 12-in. for Water and Other Liquids
AWWA C209	Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines
AWWA C214	Tape Coating Systems for the Exterior of Steel Water Pipelines
ANSI/AWWA C600	Installation of Ductile Iron Water Mains and their Appurtenances
ASTM C150	Specification for Portland Cement

AWWA C217	Cold-Applied Petrolatum Tape and Petroleum Wax Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.

1.3 CONTRACTOR SUBMITTALS

A. Shop Drawings: The Contractor shall submit shop drawings of pipe and fittings in accordance with the requirements of Section 01 33 20 – Contractor Submittals, the requirements of the referenced standards and the following supplemental requirements as applicable and specified herein.
   1. Marking plan and details of standard pipe section showing dimensions, pipe joints, fitting and special fitting pressure rating and thickness, size, coating and lining data.
   2. Pipeline layout drawings showing the location of each pipe section, each special length, closure sections, location and angle of bends, outlets, location of valves, and other special fittings.

B. Certifications: The Contractor shall furnish a certified affidavit of compliance for all pipe and other products or materials furnished under this Section, as specified in the referenced standards and the following supplemental requirements:
   1. Physical and chemical properties.
      a. Hydrostatic Test Reports

C. Sample Costs: All expenses incurred in making samples for certification of tests shall be borne by the Contractor.

D. Shop Drawings: Catalog cuts and other information for wax tape.

1.4 QUALITY ASSURANCE

A. Inspection: All pipe shall be subject to inspection at the place of manufacture, in accordance with the provisions of the referenced standards, as supplemented by the requirements herein. The Contractor shall notify the Engineer in writing of the manufacturing starting date not less than 14 calendar days prior to the start of any phase of the pipe manufacture.

B. During the manufacture of the pipe, the Engineer shall be given access to all areas where manufacturing is in process and shall be permitted to make all inspections necessary to confirm compliance with the Specifications.

C. Test: Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of the referenced standards as applicable.

D. The Contractor shall perform said material tests at no additional cost to the Owner. The Engineer shall have the right to witness all testing conducted by the Contractor; provided, that the Contractor's schedule is not delayed for the convenience of the Engineer.

E. In addition to those tests specifically required, the Engineer may request additional samples of any material including lining and coating samples for testing by the Owner. The additional samples shall be furnished at no additional cost to the Owner

PART 2 - PRODUCTS

2.1 GENERAL

A. Standards: Mortar-lined and polyethylene-wrapped ductile iron pipe shall conform to ANSI/AWWA C151, C104, and C105, subject to the following supplemental requirements. The pipe shall be of the diameter and class shown, shall be furnished complete with rubber gaskets as indicated in the Contract Documents, and all flanges, specials and fittings shall be provided as required under the Contract Documents.

B. Handling and Storage: The pipe shall be handled by devices acceptable to the Engineer, designed and constructed to prevent damage to the pipe coating/exterior. The use of equipment which might injure the pipe coating/exterior will not be permitted. Stockpiled pipe shall be suitably supported and shall be secured to prevent accidental rolling. All other pipe handling equipment and methods shall be acceptable to the Engineer.

C. Laying Lengths: Maximum pipe laying lengths shall be 20 feet with shorter lengths provided as required by the Drawings.

D. Finish: The pipe shall have smooth and dense interior surfaces, and shall be free from fractures, excessive interior surface crazing, and roughness.

E. Closures and Correction Pieces: Closures and correction pieces shall be provided as required so that closures may be made due to different headings in the pipe laying operation and so that correction may be made to adjust the pipe laying to conform to pipe stationing shown on the Drawings. The locations of correction pieces and closure assemblies are shown on the Drawings. Any change in location or number of said items shall be acceptable to the Engineer.

F. Pipe shall be new and recently manufactured. Refurbished pipe shall not be provided.

2.2 PIPE DESIGN CRITERIA

A. General: Ductile iron pipe shall be designed in accordance with the requirements of ANSI/AWWA C150 as applicable and as modified in this Section.

B. Pipe Wall Thickness for Internal Pressure: The pipe shall be designed with a net thickness to withstand the design pressure in accordance with the hoop stress formula.

C. Pipe Wall Thickness for External Load: The pipe shall also be designed with a net thickness to withstand internal loads using ANSI/AWWA C150 Design Equation (2) with the appropriate bending moment and deflection coefficients for Laying Condition Types 4 and 5 as applicable.

D. The pipe deflection shall be checked using ANSI/AWWA C150 Design Equation (3) and the coefficients stated above. The allowable deflection shall not exceed 0.0225 times the nominal diameter.

E. In lieu of ANSI/AWWA C150 Design Equation (4), the earth loads will be computed using the following two equations for trench or embankment loading as applicable:
   1. Trench Condition:

a. $W_d = C_d w B_d 2$,
b. Where:
c. W_d = Earth load in pounds per linear foot
d. C_d = Calculation Coefficient
e. Ku1 = 0.13
f. w = 120 lb/ft3
g. B_d = Trench width at top of pipe, feet

2. Positive Projecting Embankment Condition:
   a. Wc = CcwBc2
   b. Where:
   c. Wc = Earth load in pounds per linear foot
   d. Cc = Calculation Coefficient (based on rsdP of 0.25)
   e. Ku1 = 0.13
   f. w = 120 lb/ft3
   g. Bc = Trench width at top of pipe, feet

F. The above two formulas are based on a depth of cover of 10 feet or greater. For depths of cover of less than 10 feet, HS-20 live load shall be included. For depths of cover of three feet or less, HS-20 live load plus impact shall be included. The determination of live load and impact factors shall be as recommend by AASHTO in "Standard Specifications for Highway Bridges."

G. If the calculated deflection, $Defl_x$, exceeds 0.0225 times the nominal diameter, the pipe class shall be increased.

H. Minimum Pipe Wall Thickness: In addition to the requirements of this Section, the minimum wall thickness shall be in accordance with Table 50.5 of ANSI/AWWA C150.

2.3 MATERIALS

A. Ductile Iron Pipe: Pipe materials shall conform to the requirements of ANSI/AWWA C151.

B. Cement: Cement for mortar lining shall conform to the requirements of ANSI/AWWA C104, provided that cement for mortar lining shall be Type V. A fly ash or pozzolan shall not be used as a cement replacement.

C. Polyethylene Sleeve: Material for the polyethylene sleeve shall conform to the requirements of ANSI/AWWA C105.

2.4 SPECIALS AND FITTINGS

A. Fittings for ductile iron pipe shall conform to the requirements of ANSI/AWWA C153/A21.53 or ANSI/AWWA C110/A21.10 for diameters 3-inch through 48-inch and shall have a minimum pressure rating of 250 psi. Ductile iron fittings larger than 48-inch shall conform to the above-referenced standard with the necessary modifications for the larger size.

2.5 DESIGN OF PIPE

A. General: The pipe furnished shall be ductile iron pipe, mortar-lined and polyethylene-wrapped with rubber-gasketed joints as shown.

B. Manufacturing Requirements: The pipe shall be designed, manufactured, tested, inspected, and marked according to applicable requirements previously stated and, except as hereinafter modified, shall conform to ANSI/AWWA C151.

C. Pipe Dimensions**:** The pipe shall be of the diameter and class shown. The minimum wall thickness for each pipe size shall be as specified or shown.

D. Fitting Dimensions: The fittings shall be of the diameter and class shown.

E. Joint Design: Ductile iron pipe and fittings shall be furnished with mechanical joints, push-on joints, flanged joints, and restrained joints as required.
   1. Mechanical and push-on joints shall conform to ANSI/AWWA C111/A21.11.
   2. Restrained Joint:
      a. Manufactured proprietary joint that mechanically restrains pipe to adjoining pipe without setscrews or devices with shoes or wedges activated by setscrews.
      b. The use of devices utilizing setscrews or with shoes or wedges activated by setscrews or bolts shall not be allowed. Except where allowed by governing agencies as temporary thrust restraint.
      c. Rated at minimum working pressure equal to or greater than that of the pipe class.
      d. The use of field-lock, gripper ring type restraining devices shall not be allowed.
      e. Field welding of ductile iron pipe and fitting shall not be allowed.
   3. Flanged joints shall conform to ANSI/AWWA C115/A21.15.

F. Joint Clearances: For bell-and-spigot ends with rubber gaskets, the clearance between the bells and spigots shall be such that when combined with the gasket groove configuration and the gasket itself, will provide watertight joints under all operating conditions when properly installed. The Contractor shall require the pipe manufacturer to submit details complete with significant dimensions and tolerances and also to submit performance data indicating that the proposed joint has performed satisfactorily under similar conditions. In the absence of a history of field performance, the results of a test program shall be submitted.

G. Coating and Linings Held Back: Shop-applied interior linings and exterior coatings shall be held back from the ends of the pipe as shown, or as otherwise acceptable to the Engineer.

2.6 CEMENT-MORTAR LINING

A. Cement-Mortar Lining for Shop Application: Except as otherwise provided herein, interior surfaces of all ductile iron pipe, fittings and specials shall be cleaned and lined in the shop with cement-mortar lining applied centrifugally in conformity with ANSI/AWWA C104. During the lining operation and thereafter, the pipe shall be maintained in a round condition by suitable bracing or strutting. The lining machines shall be of a type that has been used successfully for similar work. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at the delivery site, the damaged or unsatisfactory portions shall be replaced with lining conforming to these Specifications.

B. Lining Thickness: The minimum lining thickness shall be as follows:

Nominal Pipe Diameter (in)	Minimum Lining Thickness (in)
3-12	1/8
14-24	3/16
30-54	1/4

C. Protection of Pipe Lining/Interior: All shop-applied cement mortar lining shall be given a water based (no-VOC) seal coat fully compliant with NSF61 standards and in conformance with ANSI/AWWA C104.

2.7 EXTERIOR COATING OF PIPE

A. Exterior Coating of Piping: The exterior coating shall be an asphaltic coating approximately one mil thick.

2.8 PETROLEUM OR WAX TAPE WRAP

A. MANUFACTURERS
   1. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
      a. Petroleum or Wax Tape Coatings
         1) Denso North American
         2) Trenton
         3) Engineer approved equal.

B. Coating:
   1. Coating System:
      a. Primer: petroleum or petrolatum wax
      b. Filler Material:
         1) Filler materials shall be petroleum or petrolatum wax sealer/filler with closed cell plastic filler
         2) Provide filler material to fill and smooth all irregular surfaces, such that no tenting or voids remain under the applied wax tape.
      c. Inner Tape: Petroleum or petrolatum wax impregnated fabric, 6-inch width maximum, 40 mils thick
      d. Outer Wrap: PVC or tape suitable for application to inner tape.
   2. Application:
      a. Coating shall be in accordance with AWWA C217, except as modified herein.

2.9 SOURCE QUALITY CONTROL

A. Factory Tests: In accordance with AWWA C104, C105, C110, C111, C115, C150, C151, C153, and C606.

PART 3 - EXECUTION

3.1 GENERAL

A. Laying, jointing, testing for defects and for leakage shall be performed in the presence of the Engineer, and shall be subject to approval before acceptance. Material found to have defects will be rejected and the Contractor shall promptly remove such defective materials from the Site.

B. Installation shall conform to the requirements of AWWA C600, instructions furnished by the pipe manufacturer, and to the supplementary requirements herein. Wherever the provisions of this Section and the aforementioned requirements are in conflict, the more stringent provision shall apply.

3.2 INSTALLATION OF PIPE

A. Handling and Storage: All pipe, fittings, etc., shall be carefully handled and protected against damage, impact shocks, and free fall. All pipe handling equipment shall be acceptable to the Engineer. Pipe shall not be placed directly on rough ground but shall be supported in a manner that will protect the pipe coating against injury whenever stored at the trench site or elsewhere. No pipe shall be installed where the lining or coating show defects that may be harmful as determined by the Engineer. Such damaged lining or coating shall be repaired, or a new undamaged pipe shall be furnished and installed.

B. Damaged Pipe: All pipe damaged prior to Substantial Completion shall be repaired or replaced by the Contractor.

C. Contractor to Inspect Pipe: The Contractor shall inspect each pipe and fitting prior to installation to insure that there are no damaged portions of the pipe.

D. Trench excavation and backfill shall conform to the requirements of Section 31 23 00 – Earthwork. Care shall be taken to ensure that pipe zone material is compacted and in full contact with the haunches of the pipe and that the pipe is fully supported.

E. Clean Pipe: Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance, which may have collected thereon, and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the Work.
   1. Remove lumps, blisters, and excess asphaltic type coating from bell and spigot ends of each pipe. Wire brush outside of spigot and inside of bell and wipe clean, dry, and free from oil and grease before pipe is laid.
   2. Wipe ends of mechanical joint pipe and fittings and of rubber gasket joint pipe and fittings clean of dirt, grease, and foreign matter.

F. Pipe Laying: The pipe shall be installed in accordance with ANSI/AWWA C600.
   1. Direction of Laying: Lay pipe with bell end facing in direction of laying. For lines on an appreciable slope, face bells upgrade at discretion of Engineer.
   2. Mechanical Joint, Push-On Joint, and Restrained Joint Pipe: After first length of pipe is installed in trench, secure pipe in place with approved backfill material tamped under and along sides to prevent movement. Keep ends clear of backfill. After each section

is jointed, place backfill as specified to prevent movement. For restrained joint pipe and fittings, after each section is jointed and restraining devices are completely installed, fully extend the completed joint and place backfill as specified to prevent movement before installation of the next section of pipe or fitting.

3. Take precautions necessary to prevent floating of pipe prior to completion of backfill operation.
4. When using movable trench shield, take necessary precautions to prevent pipe joints from pulling apart when moving shield ahead.
5. Do not allow foreign material to enter pipe while it is being placed in trench.
6. Close and block open end of last laid section of pipe to prevent entry of foreign material or creep of gasketed joints when laying operations are not in progress, at close of day's work, or whenever workers are absent from job.

G. Joining Push-On Joint Pipe and Mechanical Joint Fittings:

1. Join pipe with push-on joints and mechanical joint fittings in strict accordance with manufacturer's recommendations.
2. Provide special tools and devices, such as, special jacks, chokers, and similar items required for installation.
3. Lubricate pipe gaskets using lubricant furnished by pipe manufacturer. No substitutes will be permitted.
4. Clean ends of fittings of dirt, mud, and foreign matter by washing with water and scrubbing with a wire brush, after which, slip gland and gasket on plain end of pipe. If necessary, lubricate end of pipe to facilitate sliding gasket in place, then guide fitting onto spigot of pipe previously laid.

H. Founding Pipe: Pipe shall be laid directly on the Pipe Zone material. No blocking will be permitted, and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Excavations shall be made as needed to facilitate removal of handling devices after the pipe is laid. Bell holes shall be formed at the ends of the pipe to prevent point loading at the bells or couplings. Excavation shall be made as needed outside the normal trench section at field joints to permit adequate access to the joints for field connection operations and for application of coating on field joints.

I. Unforeseen Obstructions: Where necessary to raise or lower the pipe due to unforeseen obstructions or other causes, the Engineer may change the alignment and/or the grades. Such change shall be made by the deflection of joints, or by the use of additional fittings. However, in no case shall the deflection in the joint exceed the maximum designed deflection recommended by the pipe manufacturer. No joint shall be misfit any amount that will be detrimental to the strength and water tightness of the finished joint.

J. Except for short runs which may be permitted by the Engineer, pipes shall be laid uphill on grades exceeding 10 percent. Pipe which is laid on a downhill grade shall be blocked and held in place until sufficient support is furnished by the following pipe to prevent movement. All bends shall be properly installed as shown.

K. Cold Weather Protection: No pipe shall be installed upon a foundation into which frost has penetrated or at any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.

L. Pipe and Specials Protection: The openings of all pipe and specials shall be protected with suitable bulkheads to prevent unauthorized access by persons, animals, water or any undesirable substance. At all times, means shall be provided to prevent the pipe from floating.

M. Pipe Cleanup: As pipe laying progresses, the Contractor shall keep the pipe interior free of all debris. The Contractor shall completely clean the interior of the pipe of all sand, dirt, mortar splatter and any other debris following completion of pipe laying, pointing of joints and any necessary interior repairs prior to testing and disinfecting the completed pipeline.

N. Cutting Pipe: General: Cut pipe for inserting closure pieces in a neat and workmanlike manner without damaging pipe or lining and so as to leave a smooth end, at right angles to axis of pipe.
   1. Pipe: Cut pipe with milling type cutter or saw. Do not flame cut.
   2. Dressing Cut Ends: Dress cut ends of push-on joint pipe by beveling, as recommended by manufacturer.

O. Field Welding:
   1. Field welding of ductile iron pipe shall not be allowed.
   2. Field welding of bars for restrained joint systems will not be allowed. All welding shall be performed in pipe manufacturer's shop.

P. Field Installed Outlets: Field outlets may be installed with a saddle; however, the maximum nominal diameter of outlet for saddle shall be 2-inch. Opening in pipe shall be machine cut. Flame cut openings shall not be allowed.

3.3 RUBBER GASKETED JOINTS

A. Rubber Gasketed Joints: Immediately before jointing pipe, the bell end of the pipe shall be thoroughly cleaned, and a clean rubber gasket, lubricated with an approved vegetable-based lubricant, shall be placed in the bell groove. The spigot end of the pipe shall be carefully cleaned and lubricated with a vegetable-based lubricant. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and telescoped into its proper position. Tilting of the pipe to insert the spigot into the bell will not be permitted.

3.4 CORROSION PROTECTION

A. Wax Tape: All ductile iron pipe installed, buried and above ground, shall be wrapped with wax tape per 09 97 10 Pipeline Coatings and Lining.

3.5 INSTALLATION OF PIPE APPURTENANCES

A. Protection of Appurtenances: Where the joining pipe is tape-coated, buried appurtenances shall be coated with cold-applied tape in accordance with ANSI/AWWA C209, Type II. Where pipe is encased in polyethylene sleeves, buried appurtenances shall also be encased in polyethylene.

B. Installation of Valves: All valves shall be handled in a manner to prevent any injury or damage to any part of the valve. All joints shall be thoroughly cleaned and prepared prior to

installation. The Contractor shall adjust all stem packing and operate each valve prior to installation to insure proper operation.

C. Valve Installation: All valves shall be installed so that the valve stems are plumb and in the location shown on the Drawings.

3.6 INSTALLATION OF METALLIC LOCATING TAPE

A. Buried pipelines shall be provided with a metallic locating tape laid along the centerline of the pipe trench at a depth of 18 inches below finished grade OR above top of pipe. The Contractor shall furnish manufacturer's literature, completely describing the tape proposed to be furnished. No tape shall be used prior to receipt of written approval of the Engineer.

3.7 FIELD TESTING AND DISINFECTION

A. Field testing shall conform to the requirements of Section 33 13 00 – Water Pipeline Testing and Disinfection as applicable.

END OF SECTION

CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

SNOWMAKING PIPE REPLACEMENT

Volume 2 of 2
Drawings

Jordanelle

Jordanelle Special Service District

For Information Regarding this Project Contact:
Brandon Ashcroft, P.E.
154 East 14075 South
Draper, Utah 84020
(801) 495-2224

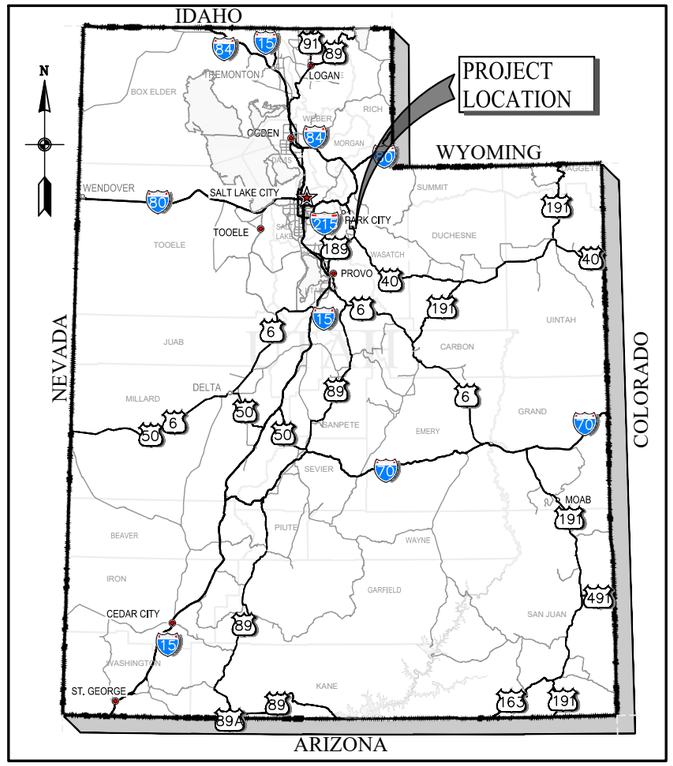
BOWEN COLLINS & ASSOCIATES

December 2025

DRAWINGS FOR CONSTRUCTION OF THE

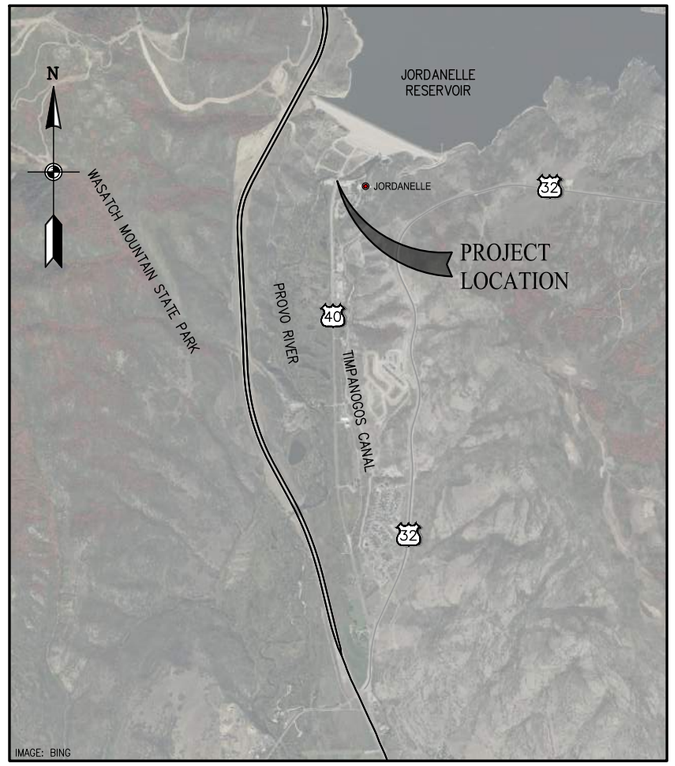
SNOWMAKING PIPE REPLACEMENT

JORDANELLE, UTAH



PROJECT LOCATION MAP

INDEX OF DRAWINGS		
SHT NO.	DWG NO.	DESCRIPTION
GENERAL		
01	G-01	INDEX OF DRAWINGS, PROJECT LOCATION AND VICINITY MAPS
02	G-02	ABBREVIATIONS AND SYMBOLS
CIVIL		
03	C-01	PLAN AND PROFILE
GENERAL CIVIL DETAILS		
04	GC-01	GENERAL CIVIL DETAILS - 01
05	GC-02	GENERAL CIVIL DETAILS - 02
06	GC-03	GENERAL CIVIL DETAILS - 03



PROJECT VICINITY MAP

REGISTERED PROFESSIONAL ENGINEER
BRANDON CHARLES ASHCROFT
NO. 11775360
STATE OF UTAH
12/12/2025
CIVIL

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
BRANDON CHARLES ASHCROFT
NO. 11775360
STATE OF UTAH
12/12/2025

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

JORDANELLE SPECIAL SERVICE DISTRICT
SNOWMAKING PIPE REPLACEMENT
JORDANELLE, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN B. ASHCROFT
DRAWN T. ANDERSON
REVIEW
CHECKED J. DIETRICH
APPROVED B. ASHCROFT

GENERAL
INDEX OF DRAWINGS, PROJECT LOCATION AND VICINITY MAPS
DATE: DECEMBER 2025
PROJECT NUMBER 056-25-02

DRAWING NO. G-01
SHEET 01 OF 06

P:\Jordanelle SSD\056-25-02 Snowmaking Pipe Replacement\2.0 Design Phase\2.7 Drawings\sht\0562502_G-01.dwg Plotted: 12/11/2025 11:24 AM By: Logan Anderson

SECTION IDENTIFICATION

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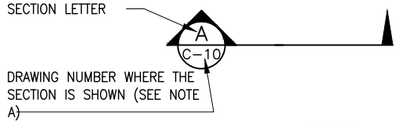

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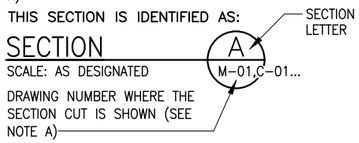

DETAIL IDENTIFICATION

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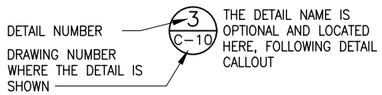

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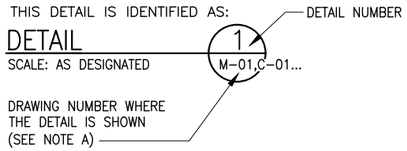

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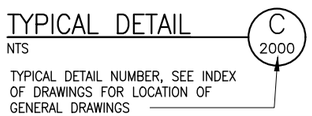


DRAWING IDENTIFICATION SYSTEM

LETTER	DISCIPLINE
G	GENERAL
C	CIVIL
CP	CORROSION PROTECTION
GC	GENERAL CIVIL DETAILS

G-02
- INDIVIDUAL DRAWING NUMBER
- DISCIPLINE

NOTES:

A. IF PLAN AND SECTION (OR DETAIL CALL-OUT AND DETAIL) ARE SHOWN ON SAME DRAWING, DRAWING NUMBER IS REPLACED BY A HORIZONTAL LINE.

B. ELECTRICAL SYMBOLS SHOWN ON ELECTRICAL DRAWINGS. FOR WELDING SYMBOLS USE AMERICAN WELDING SOCIETY STANDARD SYMBOLS. SEE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL.

- COORDINATE IDENTIFICATION
- ELEVATION INDICATOR
- SECTION CORNER
- BENCH MARK
- MONUMENT INDICATOR
- POTHOLE
- TEST HOLE
- BORING HOLE
- SECTION LINE
- PROPERTY LINE
- EASEMENT
- PARCEL
- R/W — RIGHT-OF-WAY
- NEW ASPHALT
- EXISTING ASPHALT
- CENTERLINE
- 4500 — CONTOUR LINE, FINISHED GRADE
- 4500 — CONTOUR LINE, EXISTING GRADE
- 4500.20 — FINISHED ELEVATION
- (4500.20) — EXISTING ELEVATION
- TOP / TOE — CUT OR FILL SLOPE TO BE CONSTRUCTED
- SILT FENCE
- X — X — FENCE
- RAILING
- DITCH
- CULVERT
- RIPRAP
- TREE LINE/VEGETATION
- EXISTING STRUCTURE OR FACILITY
- NEW STRUCTURE OR FACILITY
- FUTURE STRUCTURE OR FACILITY
- NEW PIPELINE (CIVIL SHEETS)
- NEW PIPELINE 10" DIA AND SMALLER (CIVIL SHEETS)
- EXISTING UTILITY PIPELINE
- ATMS — ATMS
- CTV — CABLE
- C(ug) — COMMUNICATION BURIED
- COMM — COMMUNICATION OVERHEAD
- P(ug) — ELECTRICAL BURIED
- OHP — ELECTRICAL OVERHEAD
- FO — FIBER OPTICS OVERHEAD
- FO(ug) — FIBER OPTICS UNDERGROUND
- G — GAS
- IRR — IRRIGATION
- PETRO — PETROLEUM LINE
- SS — SANITARY SEWER
- SD — STORM DRAIN
- T(ug) — TELEPHONE BURIED
- TEL — TELEPHONE OVERHEAD
- W — WATERLINE
- TV — CABLE BOX
- CATCH BASIN
- EB — ELECTRICAL BOX
- HYDRANT
- G — GAS MANHOLE
- S — SEWER MANHOLE
- D — STORM DRAIN MANHOLE
- T — TELEPHONE MANHOLE
- W — WATER MANHOLE
- WM — WATER METER

- POWER POLE
- TB — TELEPHONE BOX
- LIGHT POLE
- TO BE REMOVED OR ABANDONED
- GRAVEL
- CONCRETE
- EARTH
- SAND
- GATE VALVE
- REDUCER OR INCREASER
- LIQUID SURFACE EL
- 1 — REVISION WORK
- 3 — REFERENCE TO NOTE

ABBREVIATIONS

APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIAL
CFS	CUBIC FEET PER SECOND
DEG	DEGREE
DEMO	DEMOLITION, DEMOLISH
DEQ	DEPARTMENT OF ENVIRONMENTAL QUALITY
DI	DUCTILE IRON, DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
ELEV	ELEVATION
FG	FINISH GRADE, FLOW GLASS
FLG	FLANGE
GIS	GEOGRAPHIC INFORMATION SYSTEM
PVC	POLYVINYL CHLORIDE
R/W	RIGHT OF WAY
RW	RAW WATER
SIM	SIMILAR
SQ FT	SQUARE FOOT
TYP	TYPICAL

GENERAL NOTES

1. SYMBOLS FOR STRUCTURES, PIPE, ETC. USED FOR IDENTIFICATION ARE SHOWN IN LEGENDS AND SHALL BE FOLLOWED THROUGHOUT THE PLANS WHENEVER APPLICABLE. NOT ALL OF THE VARIOUS COMPONENTS SHOWN IN THESE LEGENDS ARE NECESSARILY USED IN THE PROJECT.
2. SCALE OF THE DRAWINGS OR DETAILS ARE SHOWN IN TITLE BLOCK OR DIRECTLY UNDER THE PLAN OR DETAIL. THE SIZE OF THE ORIGINAL PLOTTED DRAWINGS IS 22"X34". CARE SHOULD BE TAKEN TO VERIFY THE SCALE BAR IN THE TITLE BLOCK AREA TO DETERMINE THE SCALE OF REDUCED REPRODUCTIONS.
3. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PERFORM CONSTRUCTION ACTIVITIES PER THE CONTRACT DOCUMENTS. ANY ADDITIONS, DELETIONS, OR MODIFICATIONS SHALL FIRST MEET WITH THE WRITTEN APPROVAL OF THE ENGINEER AND THE OWNER.
4. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMIT(S) AND COMPLY WITH ALL REQUIREMENTS OF GOVERNING AGENCIES.
5. THE CONTRACTOR SHALL PREPARE AND SUBMIT TRAFFIC CONTROL PLANS FOR REVIEW AND APPROVAL BY WASATCH COUNTY. WORK WILL NOT BEGIN UNTIL THE PLANS HAVE BEEN APPROVED.
6. THE CONTRACTOR SHALL KEEP ALL CONSTRUCTION ACTIVITIES WITHIN THE ESTABLISHED RIGHTS-OF-WAY. THIS SHALL INCLUDE BUT NOT BE LIMITED TO, VEHICLES AND EQUIPMENT, LIMITS OF TRENCH EXCAVATION, AND EXCAVATED MATERIAL AND BACKFILL STORAGE. IF THE CONTRACTOR REQUIRES ADDITIONAL CONSTRUCTION EASEMENTS, IT SHALL BE SOLELY THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN SUCH EASEMENTS FROM INDIVIDUAL PROPERTY OWNERS.
7. UTILITY LOCATIONS:
   - CONTRACTOR SHALL CONTACT BLUE STAKES TO LOCATE EXISTING UTILITIES.
   - ALL UTILITY LOCATIONS, SHOWN ON DRAWINGS, ARE APPROXIMATE AND ARE NOT INCLUSIVE OF ALL EXISTING UTILITIES.
   - CONTRACTOR TO VERIFY DEPTHS OF UTILITIES IN THE FIELD BY POT HOLING A MINIMUM OF TWO WEEKS TIME AHEAD OF PIPELINE CONSTRUCTION TO AVOID CONFLICTS WITH DESIGNED PIPELINE GRADE AND ALIGNMENT. IF A CONFLICT ARISES RESULTING FROM THE CONTRACTOR NEGLECTING TO POT HOLE UTILITIES, THE CONTRACTOR TO RESOLVE THE CONFLICT WITHOUT ADDITIONAL COST OR CLAIM TO THE OWNER.
   - CONTRACTOR SHALL POT HOLE CRITICAL LOCATIONS AND OBTAIN ALL EXISTING PIPE O.D. PRIOR TO ORDERING OR OBTAINING MATERIALS REQUIRED FOR CONNECTIONS TO EXISTING PIPING. UTILITY SHUT-DOWNS AND OTHER WORK WILL NOT BE SCHEDULED OR ALLOWED UNTIL THIS IS ACCOMPLISHED AND MATERIALS ARE ON SITE AND APPROVED FOR USE BY JORDANELLE SPECIAL SERVICE DISTRICT (JSSD).
8. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS FROM DAMAGE WHICH ARE TO REMAIN IN PLACE. ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTORS OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO ORIGINAL OR BETTER CONDITION TO THE SATISFACTION OF THE OWNER AT THE EXPENSE OF THE CONTRACTOR.
9. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING SERVICE LINES FOR GAS, SEWER, WATER, AND OTHER UTILITIES AND REPAIRING DAMAGE TO SUCH LINES AS A RESULT OF THE CONTRACTOR'S OPERATIONS. SERVICE CONNECTIONS FOR UTILITIES ARE NOT SHOWN ON THE DRAWINGS.
10. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFORMANCE WITH LOCAL AND FEDERAL CODES GOVERNING SHORING AND BRACING OF EXCAVATIONS AND TRENCHES. CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF THE PUBLIC AND PROTECTION OF PERSONNEL AND WORKERS.
11. CONTRACTOR SHALL NOT DESTROY, REMOVE, OR DISTURB ANY EXISTING SURVEY MONUMENTS WITHOUT AUTHORIZATION OF CONTROLLING AGENCY. NO PAVEMENT CUTTING OR REMOVAL SHALL BEGIN UNTIL ALL SURVEY MARKERS OR MONUMENT POINTS THAT HAVE THE POTENTIAL OF BEING DISTURBED BY THE CONSTRUCTION OPERATIONS HAVE BEEN PROPERLY REFERENCED BY A REGISTERED LAND SURVEYOR. ALL SURVEY MONUMENTS OR POINTS DISTURBED BY THE CONTRACTOR SHALL BE ACCURATELY RESET BY A REGISTERED LAND SURVEYOR AFTER ALL RESTORATION AND RESURFACING HAS BEEN COMPLETED.
12. TRENCH SUPPORTS AND DEWATERING (NOTE 14) SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR. MAXIMUM OPEN TRENCH DURING WORKING HOURS SHALL BE 300 FEET. ALL TRENCHES SHALL BE BACKFILLED AND/OR PLATED DURING NON-WORKING HOURS, PER EXCAVATION PERMIT REQUIREMENTS.
13. DEWATERING: GROUND WATER AND SURFACE WATER CONTROL SHALL BE PERFORMED AND RESPONSIBLY HANDLED BY THE CONTRACTOR ACCORDING TO, AND IN COMPLIANCE WITH, ALL LOCAL GOVERNING AUTHORITIES. HEAVY GROUND WATER AND/OR SURFACE WATER PUMPING MAY BE REQUIRED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE POTENTIAL PUMPING NEEDS. THE CONTRACTOR SHALL NOT RELY ON OWNER SUPPLIED PROCTOR, GROUND WATER AND/OR SURFACE WATER DATA. CONTRACTOR SHALL OBTAIN DEWATERING PERMIT AS NECESSARY.
14. AERIAL PHOTOS IN DRAWINGS:
    THE AERIAL PHOTOS PROVIDED AS BACKGROUND IN THESE DRAWINGS ARE PROVIDED TO HELP CLARIFY THE WORK SITE. HOWEVER, THE PHOTOS DEPICT CONDITIONS AS THEY EXISTED IN 2021. PRESENT DAY CONDITIONS MAY VARY FROM THOSE SHOWN. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO BIDDING. BID SHALL INCLUDE ALL WORK REQUIRED TO COMPLETE THE PROJECT.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY SETTLEMENT OF EXCAVATIONS, AND ANY DAMAGE OF UTILITIES RESULTING FROM SETTLEMENT.
16. CONTRACTOR SHALL PREVENT ANY GROUND WATER OR DEBRIS FROM ENTERING NEW PIPES DURING CONSTRUCTION. THE ENDS OF THE PIPES SHALL BE SEALED AT THE END OF EACH WORKDAY.
17. PROFILE DRAWINGS ARE HORIZONTAL PROJECTIONS OF THE PIPELINE CENTERLINE, UNLESS OTHERWISE NOTED.
18. LAY PIPE TO DEPTH AND ALONG HORIZONTAL ALIGNMENT AS DEFINED IN THESE DRAWINGS. CONTRACTOR SHALL NOT DEVIATE FROM PROPOSED ALIGNMENT OR GRADE WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. AVOID HIGH AND LOW POINTS EXCEPT WHERE DESIGNED.
19. ALL BURIED REBAR, FITTINGS, COUPLINGS, VALVES AND MECHANICAL JOINT NUTS AND BOLTS ARE TO BE COATED WITH NON OXIDE GREASE CHEVRON FM 2 OR APPROVED EQUAL, COVERED WITH 8 MIL POLYETHYLENE SHEETING, AND TAPE WRAPPED.
20. UNLESS NOTED OTHERWISE, ALL WATER MAIN SHALL BE 24-INCH DUCTILE IRON PRESSURE CLASS 350. SIZE OF FITTINGS SHOWN ON THE PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, AND SHALL BE DUCTILE IRON FITTINGS.
21. CONTRACTOR SHALL PROTECT ADJACENT PRESSURE PIPELINES AND PROVIDE TEMPORARY THRUST RESTRAINT AS NECESSARY DURING CONSTRUCTION INCLUDING EXISTING VALVES, TEES, BENDS, ETC.. ALL NEW PRESSURE PIPE AND FITTINGS SHALL HAVE THRUST RESTRAINED JOINTS, THRUST BLOCKS, THRUST TIES OR OTHER APPROVED THRUST RESTRAINT. THRUST PROTECTION SHALL BE ADEQUATE FOR THE TEST PRESSURE SPECIFIED.
22. ALL FITTINGS REQUIRED FOR THE COMPLETION OF THE WORK ARE NOT SHOWN IN THE DRAWINGS. MAXIMUM PIPE JOINT DEFLECTION SHALL BE 1-DEGREE. ADDITIONAL FITTINGS REQUIRED TO MAINTAIN THE ALIGNMENT SHOWN IN THE PLANS SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
23. MINIMUM DEPTH OF NEW PIPE: 5 FEET TO TOP OF PIPE AND XXX FEET TO TOP OF PIPE UNDER CANAL UNLESS OTHERWISE NOTED.
24. COORDINATE CONNECTION OF EXISTING WATER MAINS WITH JORDANELLE SPECIAL SERVICE DISTRICT (JSSD).
    - OPERATION OF ALL EXISTING MAIN LINE VALVES TO BE COORDINATED THROUGH JSSD 48-HOURS IN ADVANCE OF SHUTDOWN. CONNECTIONS TO SOME WATERLINES SERVING COMMERCIAL AREAS MAY REQUIRE NIGHT OR WEEKEND SHUTDOWNS. CONTRACTOR TO PERFORM NIGHT OR WEEKEND WORK IN THESE AREAS AT NO ADDITIONAL COST TO OWNER.
    - XXXX DOES NOT GUARANTEE WATER SHUT-DOWNS. CONTRACTOR TO DEVISE PLANS TO AVOID WORK STOPPAGES IN THE EVENT A SHUT-DOWN DOES NOT GO AS PLANNED
    - CONTRACTOR SHALL SUBMIT FOR REVIEW A SEQUENTIAL PLAN FOR CONNECTION, TESTING, AND FLUSHING OF ALL NEW WATER MAINS, HYDRANTS, AND SERVICE CONNECTIONS.
30. CONTRACTOR SHALL PERFORM PRESSURE TEST.
31. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN A WORKMANLIKE AND SAFE MANNER AND IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND JOB-SITE RELATED CONSTRUCTION CONDITIONS AND REQUIREMENTS. OBTAIN PERMITS, INSPECTIONS AND APPROVALS AS REQUIRED BY JURISDICTIONAL AGENCIES AND PAY ALL ASSOCIATED FEES. CONTRACTOR AND INSTALLERS SHALL BE LICENSED AS REQUIRED BY STATE AND LOCAL JURISDICTIONS, AND BONDED AS DETERMINED BY PROJECT REQUIREMENTS.
32. PRESSURE TEST ALL PIPELINES TO 350 PSI MINIMUM FOR TWO HOURS WITH ZERO LEAKAGE. IN THE CASE OF PIPELINES THAT FAIL TO PASS THE LEAKAGE TEST, THE CONTRACTOR SHALL DETERMINE THE CAUSE OF THE EXCESSIVE LEAKAGE, SHALL TAKE CORRECTIVE MEASURES NECESSARY TO REPAIR THE LEAKS, AND SHALL AGAIN TEST THE PIPELINES, ALL AT NO COST TO THE OWNER.
33. WORKING PRESSURE FOR THE SYSTEM IS 275 PSI AT THE BRIDGE WITH TEST PRESSURE OF 350 PSI. ALL FLANGES, VALVES, FITTINGS, THRUST BLOCKS, ETC. SHALL BE RATED APPROPRIATELY.
34. CONTRACTOR TO PROVIDE AND DISTRIBUTE APPROVED WRITTEN NOTICE OF CONSTRUCTION ACTIVITIES TO ALL RESIDENTS AND BUSINESSES LOCATED IN THE CONSTRUCTION AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. WRITTEN NOTICE SHALL BE APPROVED BY THE ENGINEER PRIOR TO DISTRIBUTION.
35. CONTRACTOR SHALL PROVIDE AND UPDATE A CONSTRUCTION SCHEDULE FOR WORKING IN THE PUBLIC RIGHT-OF-WAY PRIOR TO CONSTRUCTION.
36. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTROL OF DRAINAGE AND EROSION DURING CONSTRUCTION AT CONSTRUCTION SITE, STAGING, AND SPOILS AREA. CONTRACTOR SHALL SUBMIT STORM RUNOFF CONTROL PLAN FOR APPROVAL BY ENGINEER AND OBTAIN A SWPPP PERMIT FROM THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY.
37. WORKING HOURS SHALL BE 7:00 AM TO 7:00 PM. ENGINEER TO APPROVE ANY EXCEPTIONS.
38. INSTALL ALL MATERIALS ACCORDING TO MANUFACTURER RECOMMENDATIONS AND STATE AND LOCAL REQUIREMENTS. USE ONLY NEW AND UNUSED MATERIALS. ALL MATERIALS SHALL BE PROVIDED BY MANUFACTURERS REGULARLY ENGAGED IN PRODUCING SAID ITEMS, AND WHICH SHALL BE FIRST QUALITY, HEAVY DUTY, COMMERCIAL/INDUSTRIAL GRADE, SUITABLE FOR THE INTENDED USE.
39. ALL DUCTILE IRON FITTINGS SHALL BE TR FLEX OR FLANGED AS CALLED OUT ON PLANS. NO FRICTION TYPE RESTRAINTS ARE ALLOWED.

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — BRANDON C. HARPER — NO. 11775360 — STATE OF UTAH — REGISTERED — 12/12/2025

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

JORDANELLE SPECIAL SERVICE DISTRICT

SNOWMAKING PIPE REPLACEMENT

JORDANELLE, UTAH

VERIFY SCALE — BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW — CHECKED J. DIETRICH — APPROVED B. ASHCROFT

DESIGN — DESIGN B. ASHCROFT — DRAWN T. ANDERSON

GENERAL

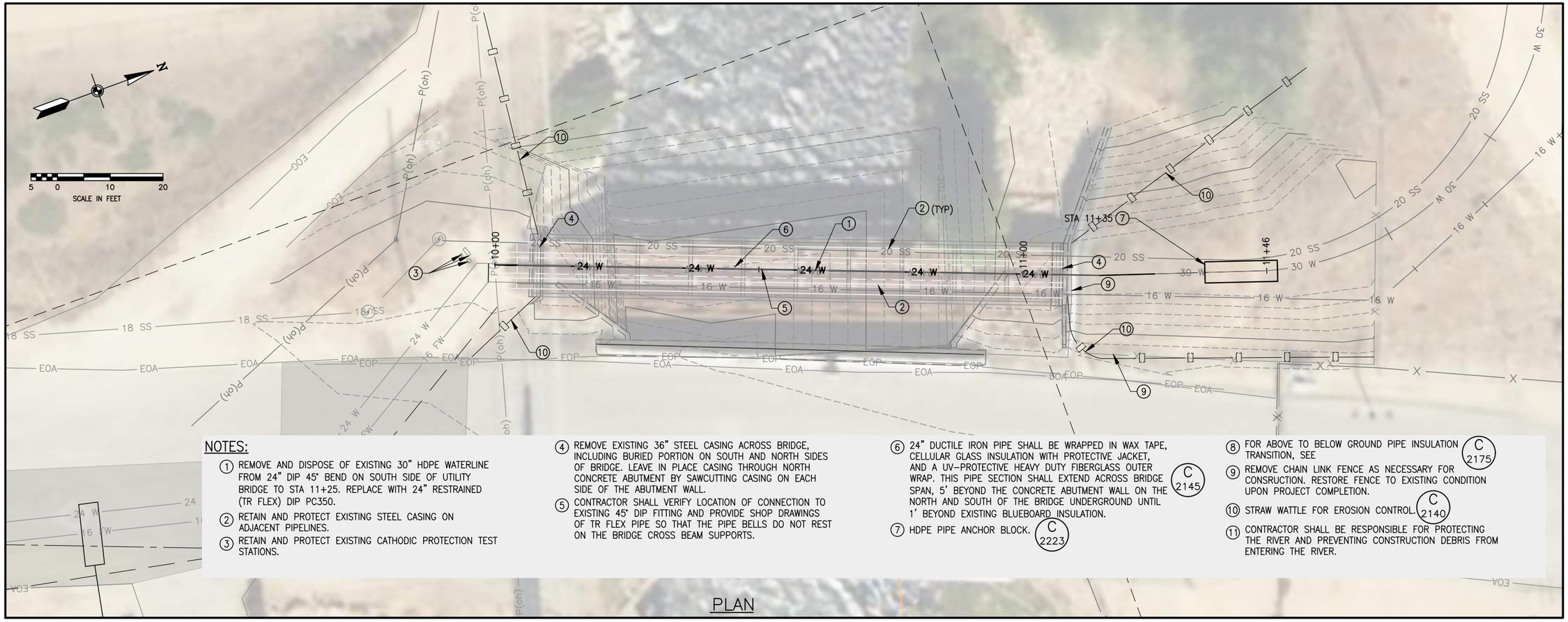
ABBREVIATIONS AND SYMBOLS

DATE: DECEMBER 2025 — PROJECT NUMBER 056-25-02

DRAWING NO. G-02

SHEET 02 OF 06

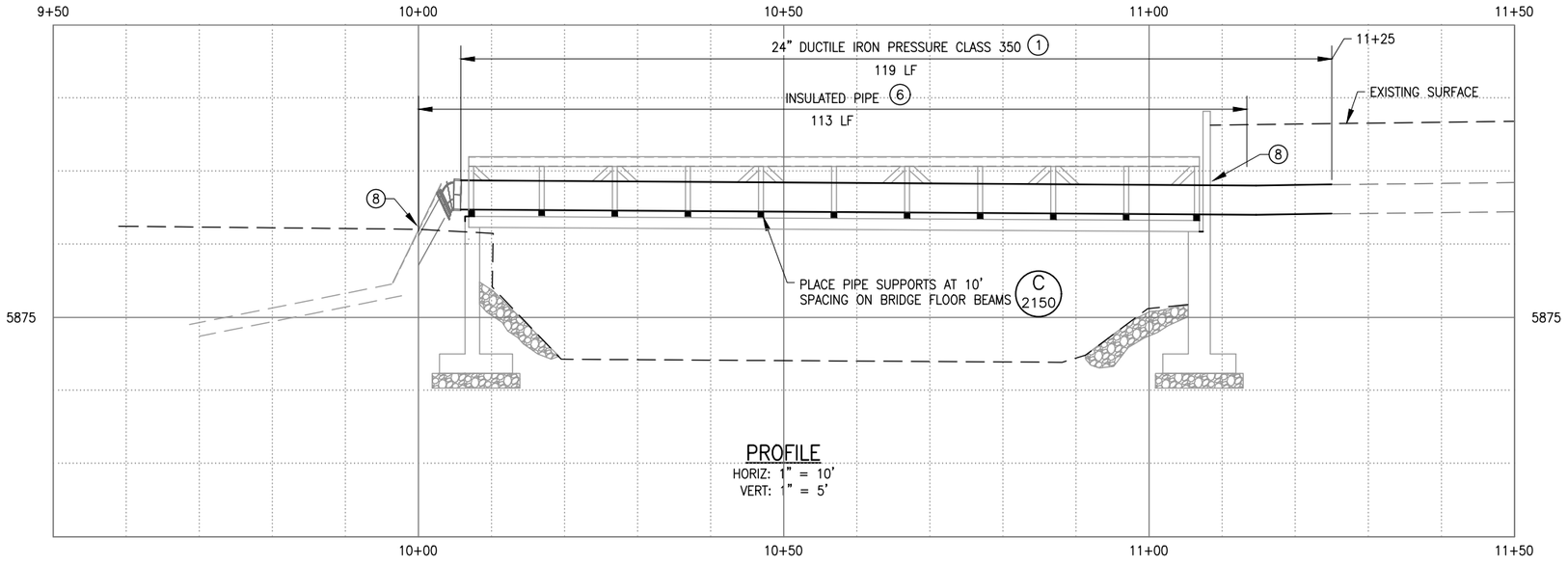
P:\Jordanelle SSD\056-25-02 Snowmaking Pipe Replacement\2.0 Design Phase\2.7 Drawings\sht\0562502_G-02.dwg Plotted: 12/11/2025 11:19 AM By: Logan Anderson



NOTES:

1. REMOVE AND DISPOSE OF EXISTING 30" HDPE WATERLINE FROM 24" DIP 45° BEND ON SOUTH SIDE OF UTILITY BRIDGE TO STA 11+25. REPLACE WITH 24" RESTRAINED (TR FLEX) DIP PC350.
2. RETAIN AND PROTECT EXISTING STEEL CASING ON ADJACENT PIPELINES.
3. RETAIN AND PROTECT EXISTING CATHODIC PROTECTION TEST STATIONS.
4. REMOVE EXISTING 36" STEEL CASING ACROSS BRIDGE, INCLUDING BURIED PORTION ON SOUTH AND NORTH SIDES OF BRIDGE. LEAVE IN PLACE CASING THROUGH NORTH CONCRETE ABUTMENT BY SAWCUTTING CASING ON EACH SIDE OF THE ABUTMENT WALL.
5. CONTRACTOR SHALL VERIFY LOCATION OF CONNECTION TO EXISTING 45° DIP FITTING AND PROVIDE SHOP DRAWINGS OF TR FLEX PIPE SO THAT THE PIPE BELLS DO NOT REST ON THE BRIDGE CROSS BEAM SUPPORTS.
6. 24" DUCTILE IRON PIPE SHALL BE WRAPPED IN WAX TAPE, CELLULAR GLASS INSULATION WITH PROTECTIVE JACKET, AND A UV-PROTECTIVE HEAVY DUTY FIBERGLASS OUTER WRAP. THIS PIPE SECTION SHALL EXTEND ACROSS BRIDGE SPAN, 5' BEYOND THE CONCRETE ABUTMENT WALL ON THE NORTH AND SOUTH OF THE BRIDGE UNDERGROUND UNTIL 1' BEYOND EXISTING BLUEBOARD INSULATION. (C 2145)
7. HDPE PIPE ANCHOR BLOCK. (C 2223)
8. FOR ABOVE TO BELOW GROUND PIPE INSULATION TRANSITION, SEE (C 2175)
9. REMOVE CHAIN LINK FENCE AS NECESSARY FOR CONSRUCTION. RESTORE FENCE TO EXISTING CONDITION UPON PROJECT COMPLETION.
10. STRAW WATTLE FOR EROSION CONTROL. (C 2140)
11. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE RIVER AND PREVENTING CONSTRUCTION DEBRIS FROM ENTERING THE RIVER.

PLAN



PROFILE
HORIZ: 1" = 10'
VERT: 1" = 5'

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
BRANDON C. HARDY
NO. 11775360
STATE OF UTAH
12/12/2025

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

JORDANELLE SPECIAL SERVICE DISTRICT
SNOWMAKING PIPE REPLACEMENT
JORDANELLE, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

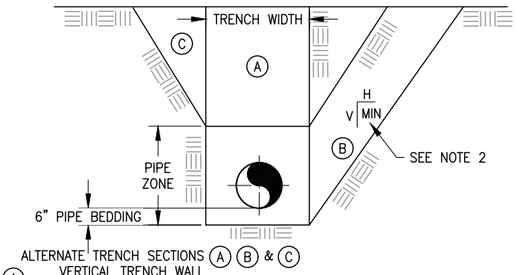
DESIGN B. ASHCROFT
DRAWN T. ANDERSON
REVIEW
CHECKED J. DIETRICH
APPROVED B. ASHCROFT

CIVIL
PLAN AND PROFILE

DATE: DECEMBER 2025
PROJECT NUMBER 056-25-02

DRAWING NO.
C-01
SHEET 03 OF 06

P:\Jordanelle SSD\056-25-02 Snowmaking Pipe Replacement\2.0 Design Phase\2.7 Drawings\sht\0562502_C-01.dwg Plotted: 12/11/2025 11:20 AM By: Logan Anderson



ALTERNATE TRENCH SECTIONS (A) (B) & (C)

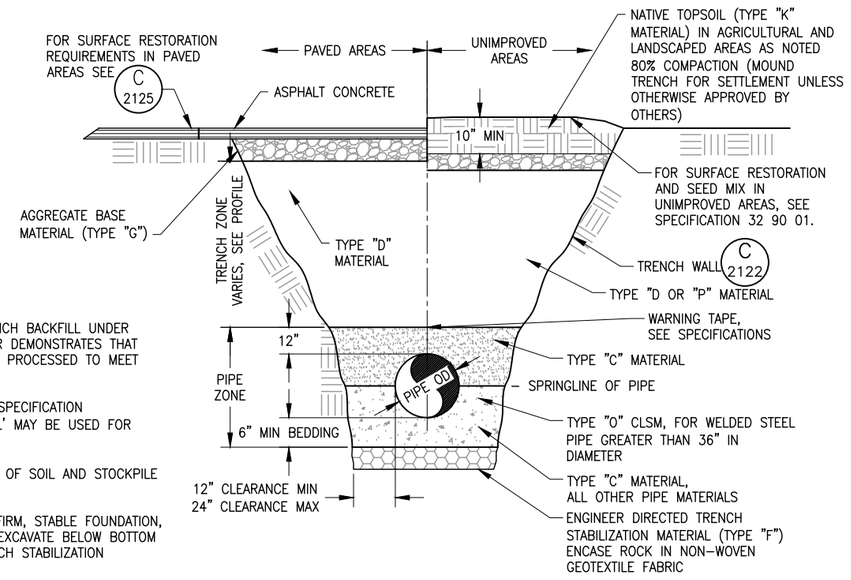
(A) VERTICAL TRENCH WALL
1. MAX UNSUPPORTED HEIGHT = 3.5 FT.
2. FOR DEPTH OVER 3.5 FT SHORING OR SHEATHING REQUIRED.

(B) SLOPING TRENCH WALL
1. NOT TO BE USED WITHOUT APPROVAL OF ENGINEER.
2. REQUIRES IMPROVED PIPE ZONE BACKFILL OR INCREASE IN PIPE CLASS

(C) COMBINATION VERTICAL/SLOPING TRENCH
1. TRENCH IN PIPE ZONE SHALL HAVE VERTICAL WALLS WHERE STABLE SOIL EXISTS

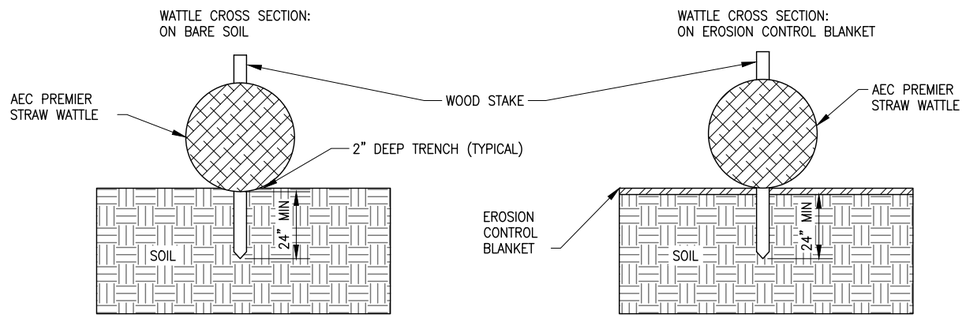
NOTES:
1. TRENCH EXCAVATIONS TO BE IN ACCORDANCE WITH OSHA SAFETY AND HEALTH STANDARDS FOR CONSTRUCTION. (29 CFR 1926).
2. CONTRACTOR TO PROVIDE SHORING OR TRENCH BOX IN ROADWAY AREAS TO MINIMIZE TRENCH WIDTH.
3. CONTRACTOR TO PROVIDE ALL DEWATERING MEASURES AS REQUIRED. GROUNDWATER ELEVATION SHALL BE MAINTAINED AT LEAST 2' BELOW BOTTOM OF TRENCH UNTIL BACKFILL IS COMPLETE.
4. SLIDE SLOPES SHALL MEET MINIMUM REQUIREMENTS OF THE GEOTECHNICAL INVESTIGATION.

TYPICAL TRENCH EXCAVATION SECTION (C 2122)
NTS



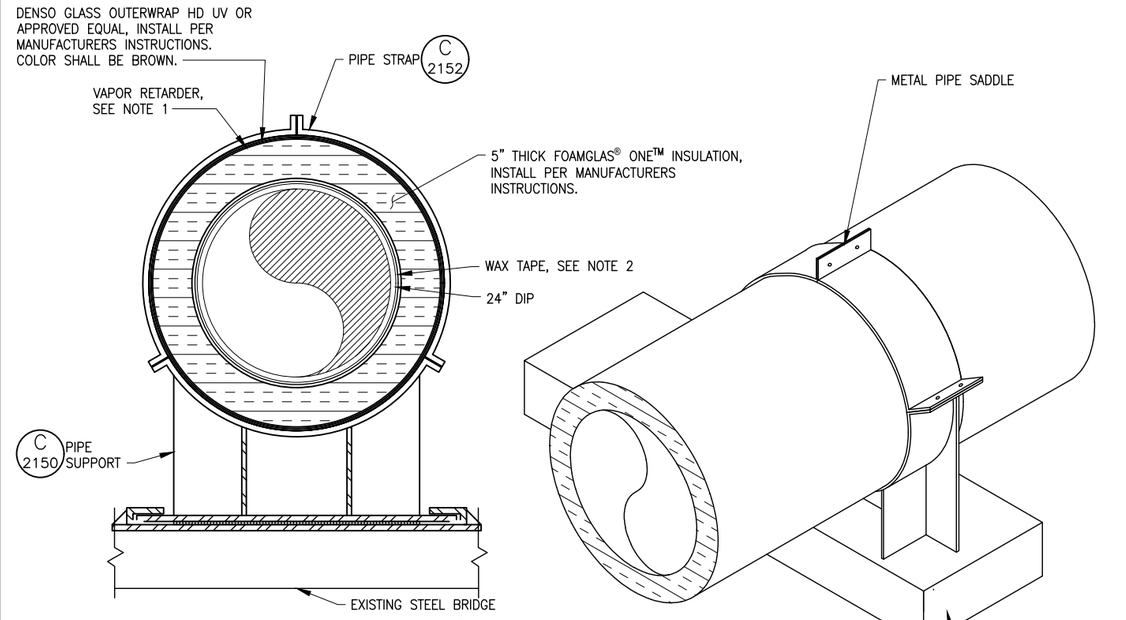
NOTES:
1. IMPORT BACKFILL REQUIRED FOR TRENCH BACKFILL UNDER ROADWAY AREAS, UNLESS CONTRACTOR DEMONSTRATES THAT SUITABLE ON-SITE MATERIAL CAN BE PROCESSED TO MEET SPECIFIED BACKFILL REQUIREMENTS.
2. SCREENED NATIVE MATERIAL MEETING SPECIFICATION REQUIREMENT FOR 'SUITABLE MATERIAL' MAY BE USED FOR TRENCH ZONE BACKFILL.
3. IN UNIMPROVED AREAS, STRIP TOP 8" OF SOIL AND STOCKPILE PRIOR TO TRENCH EXCAVATION.
4. IF NATIVE SOILS DO NOT PROVIDE A FIRM, STABLE FOUNDATION, AS DETERMINED BY ENGINEER, OVER EXCAVATE BELOW BOTTOM OF TRENCH AND BACKFILL WITH TRENCH STABILIZATION MATERIAL AS SHOWN.
5. TOP 6" OF TRENCH BACKFILL BENEATH THE TOPSOIL LAYER SHOULD BE INSTALLED, SMOOTHED, BUT LEFT UN-COMPACTED.

TYPICAL TRENCH BACKFILL SECTION (C 2124)
NTS



NOTES:
1. DRAWINGS ARE NOT TO SCALE
2. ENDS OF WATTLES SHALL BE TURNED SLIGHTLY UP SLOPE
3. RECOMMENDED STAKES ARE 1⅛" WIDE X 1⅛" THICK X 30" LONG. STAKES SHALL NOT EXTEND ABOVE THE STRAW WATTLE MORE THAN 2".

STRAW WATTLE DETAIL (C 2140)
SCALE: NTS



1. VAPOR RETARDER SHALL BE FACTORY APPLIED TO FOAMGLAS® ONE™ INSULATION AND SHALL BE PITTWRAPONE® B100.
2. WAX TAPE SHALL BE TRENTON TYPE II, DENSYL, OR APPROVED EQUAL AND INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

EXPOSED DUCTILE IRON PIPE (C 2145)
SCALE: NTS

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — BRANDON CHARLES ASHCROFT — NO. 11775360 — STATE OF UTAH — REGISTERED — 12/12/2025

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

JORDANELLE SPECIAL SERVICE DISTRICT
SNOWMAKING PIPE REPLACEMENT
JORDANELLE, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW — CHECKED J. DIETRICH — APPROVED B. ASHCROFT

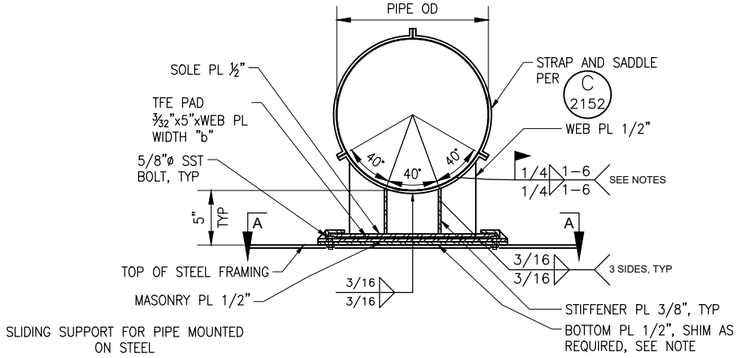
DESIGN — DESIGN B. ASHCROFT — DRAWN T. ANDERSON

CIVIL

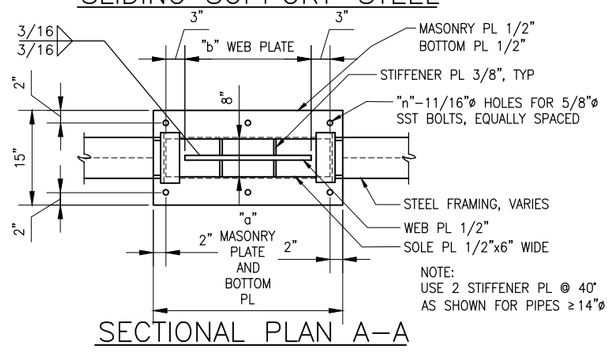
GENERAL CIVIL DETAILS - 01

PROJECT NUMBER 056-25-02
DATE: DECEMBER 2025

DRAWING NO. GC-01
SHEET 04 OF 06



SLIDING SUPPORT–STEEL



SECTIONAL PLAN A–A

PIPE SUPPORT NOTES:

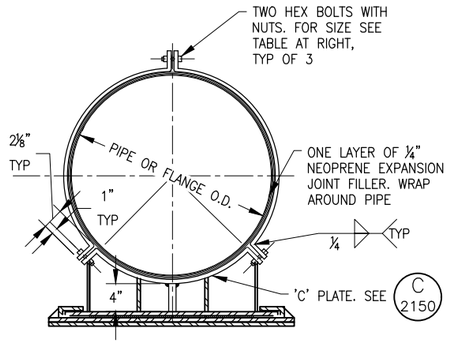
PIPE DIA	"a"	"b"	"n"
36"	36"	29"	6

1. MATERIAL OF BOTTOM PLATE, SUPPORT FROM SOLE PLATE AND ABOVE SHALL MATCH MATERIAL OF STEEL FRAME BELOW AND SHALL BE HOT DIP GALVANIZED.
2. SHIM PLATE SHALL BE LOCATED ON TOP OF BOTTOM PLATE AND SHALL HAVE THE SAME DIMENSIONS AS BOTTOM PLATE.
3. DISSIMILAR METALS SHALL BE ISOLATED PER D–110.
4. AIR PIPE SHALL BE FULLY INSTALLED PRIOR TO FIELD WELDING SADDLE PLATES TO PIPE.
5. ALL WORK INCLUDING FIELD WELDS SHALL BE APPROVED BY ENGINEER PRIOR TO TESTING OF PIPE.
6. SOLE PLATE SHALL BE CENTERED ON MASONRY PLATE ON INITIAL INSTALLATION.
7. FOR INSULATION AT PIPE SUPPORTS, SEE DETAIL C/2173.

SLIDING SUPPORT DETAIL FOR 6"–24" PIPE

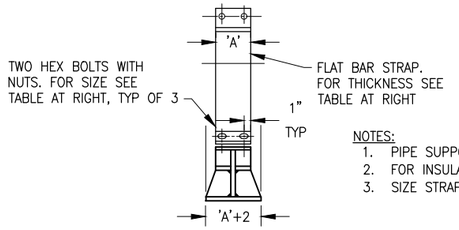
SCALE: NTS

C 2150



DIMENSIONS IN INCHES

NOMINAL PIPE SIZE	STRAP 'A'	STRAP 'C'	BOLT SIZE	FLAT BAR
6	4	⅜	½	¼
8	4	⅜	½	¼
10	4	⅜	½	¼
12	4	⅜	½	¼
14	4	⅜	½	¼
16	4	⅜	½	¼
18	4	⅜	½	¼
20	5	⅜	⅝	⅜
22	5	⅜	⅝	⅜
24	5	⅜	⅝	⅜
26	5	⅜	⅝	⅜
30	5	⅜	⅝	⅜
34	5	⅜	⅝	⅜
36	6	⅜	¾	⅜
42	6	½	¾	⅜
48	6	½	¾	⅜
54	6	½	¾	⅜
60	6	½	¾	⅜
66	6	½	¾	⅜
72	6	½	¾	⅜

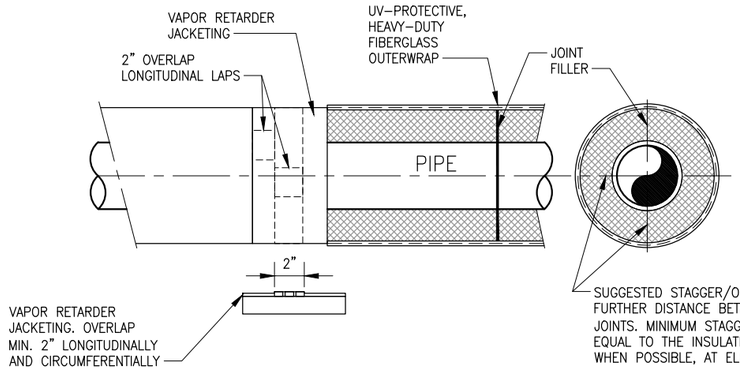


NOTES:
1. PIPE SUPPORTS SHOWN IN PROFILE ON DRAWING C–01 AT EACH BRIDGE FLOOR BEAM.
2. FOR INSULATION AT PIPE SUPPORTS, SEE DETAIL C/2173.
3. SIZE STRAP FOR SECTION SHOWN IN DETAIL C/2145.

PIPE SUPPORT WITH STRAP

SCALE: NTS

C 2152



PIPE INSULATION

SCALE: NTS

C 2170

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
BRANDON CHARLES ASHCROFT
NO. 11775360
STATE OF UTAH
12/12/2025

REVISIONS

NO.	DESCRIPTION	REV. BY	DATE

JORDANELLE SPECIAL SERVICE DISTRICT
JORDANELLE, UTAH

SNOWMAKING PIPE REPLACEMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

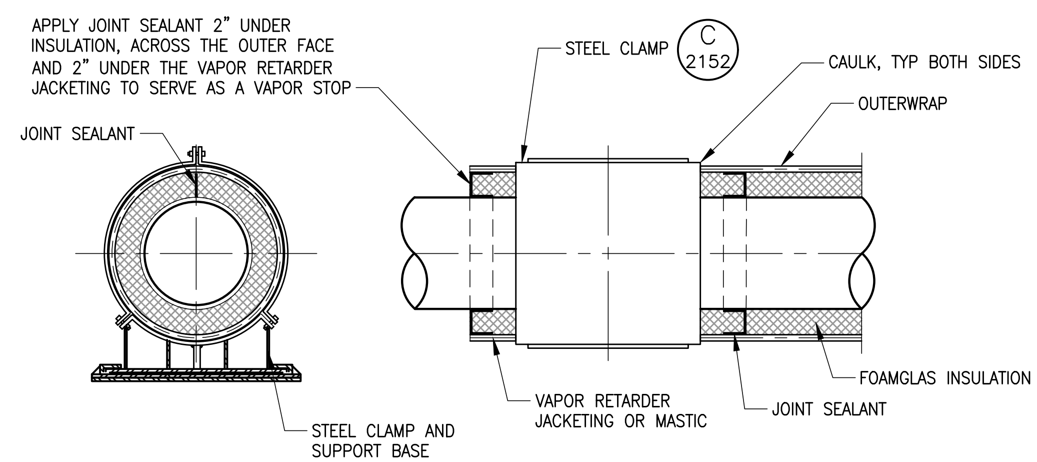
DESIGN B. ASHCROFT
DRAWN T. ANDERSON
REVIEW
CHECKED J. DIETRICH
APPROVED B. ASHCROFT

CIVIL

GENERAL CIVIL DETAILS - 02

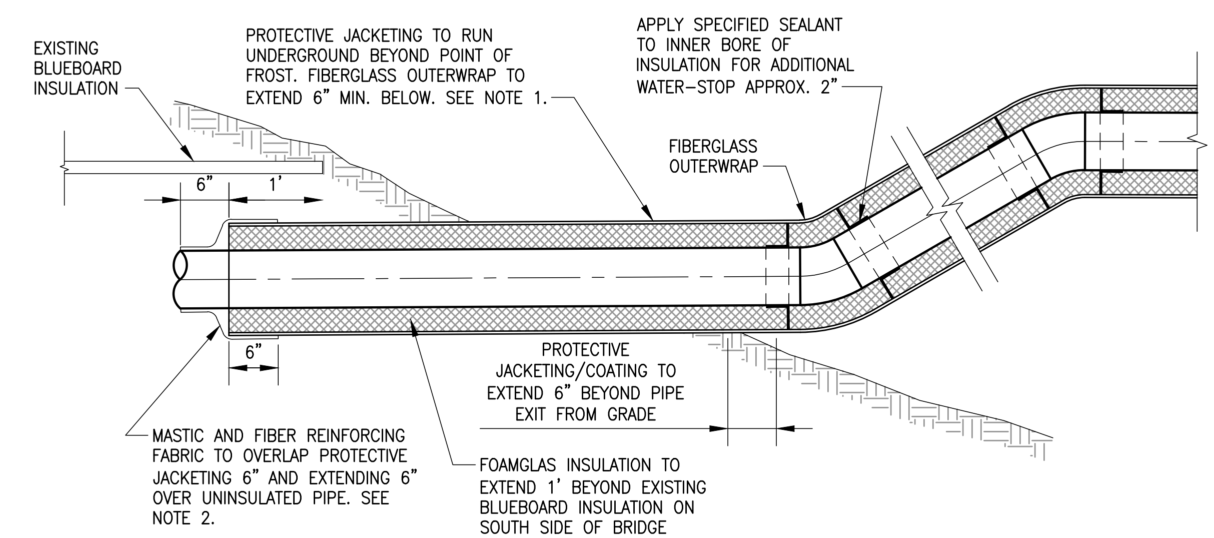
DATE: DECEMBER 2025
PROJECT NUMBER 056-25-02

DRAWING NO.
GC-02
SHEET 05 OF 06



PIPE SUPPORT INSULATION (C 2173)

SCALE: NTS



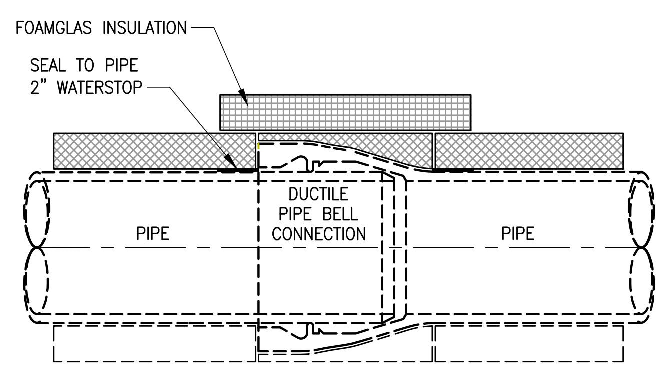
NOTES:

1. PITTWRAP® B100 JACKETING TO BE USED ABOVE GROUND. TRANSITION TO PITTWRAP SS JACKETING BELOW GROUND.
2. USE PITTCOTE® 300E WITH FABRIC REINFORCEMENT.

ABOVE TO BELOW GROUND INSULATION TRANSITION (C 2175)

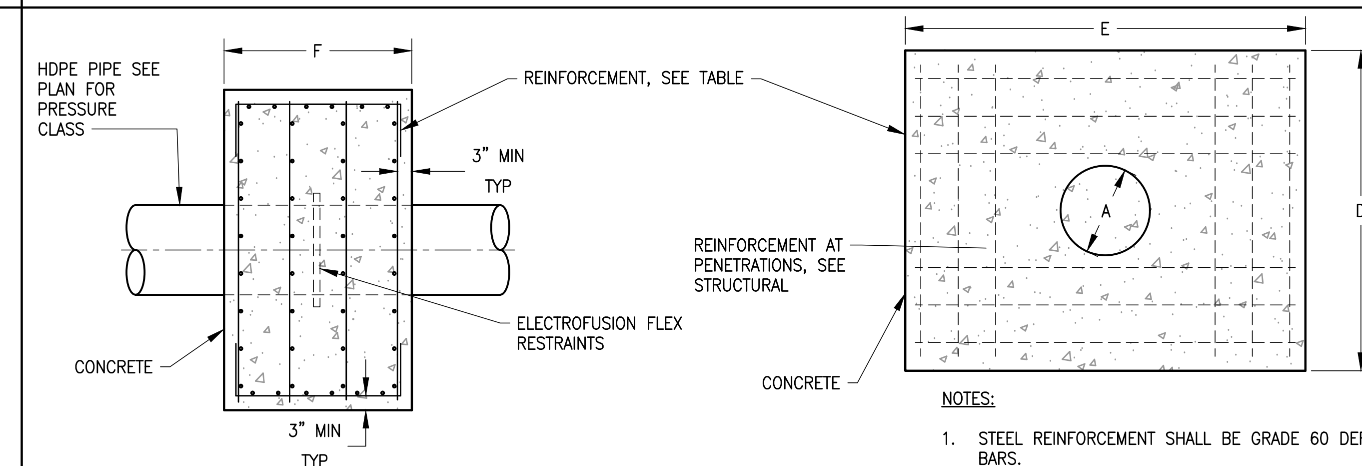
SCALE: NTS

NOTE:
ALL JOINTS OF INSULATION SHALL BE STAGGERED AND TIGHTLY ASSEMBLED, WITH OUTERMOST LAYER COMPLETELY SEALED FOR BELOW AMBIENT APPLICATIONS. INSULATION AND VAPOR RETARDERS TO BE INSTALLED IN A WATERSHED POSITION WHEN POSSIBLE. PROTECT FROM WATER INTRUSION BY SEALING THE INNER BORE AND JOINTS AT ALL STOPPING POINTS. INSTALLATION DETAILS TO BE PERFORMED IN CONJUNCTION WITH CLIENT SPECIFICATIONS. FABRICATED ITEMS MAY VARY DEPENDENT ON SUPPLIER.



DUCTILE IRON PIPE BELL CONNECTION INSULATION (C 2177)

SCALE: NTS



DIMENSIONS					
PIPE DIAMETER				REINFORCEMENT	RESTRAINTS
A	D	E	F		PIPE A
30"	6'-0"	4'-0"	13'-9"	#4 BARS @ 12" EW EF	15

NOTES:

1. STEEL REINFORCEMENT SHALL BE GRADE 60 DEFORMED BARS.
2. CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 4000 PSI.
3. ANCHOR BLOCKS SHALL BE FORMED AND POURED PRIOR TO BACKFILL BEING PLACED. CONCRETE SHALL HAVE 90% OF DESIGN STRENGTH PRIOR TO PLACING BACKFILL. BACKFILL SHALL BE PLACED EVENLY ON EACH SIDE OF BLOCK COMPACTED TO 97% MAX DENSITY.
4. NUMBER OF ELECTROFUSION FLEX RESTRAINTS IS BASED ON AN AXIAL RESISTANCE OF 7000 LBS.

HDPE PIPE ANCHOR BLOCK (C 2223)

SCALE: NTS

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER BRANDON CHARLES ASHCROFT NO. 11775360 STATE OF UTAH
12/12/2025

NO.	DATE	REV. BY	DESCRIPTION

REVISIONS

JORDANELLE SPECIAL SERVICE DISTRICT
SNOWMAKING PIPE REPLACEMENT
JORDANELLE, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED J. DIETRICH
APPROVED B. ASHCROFT

DESIGN
DESIGN B. ASHCROFT
DRAWN M. WASHBURN

CIVIL
GENERAL CIVIL DETAILS - 03
PROJECT NUMBER 056-25-02
DATE: DECEMBER 2025

DRAWING NO.
GC-03
SHEET 06 OF 06