JORDAN VALLEY WATER CONSERVANCY DISTRICT

5500 West 4700 South
Kearns Improvement District Meter Vault Rehabilitation

November 2023

DESCRIPTION OF WORK: This project consists of removing and replacing the flow meter in a meter vault with some related work. The project also includes some electrical work in the vault of replacing old equipment and connecting all new equipment.

PROJECT SCHEDULE: The work shall be completed before May 30, 2024. If the work is not completed within the specified time frame, the bidder herein agrees to accept liquidated damages in the amount of $100 per day.

RECEIPT OF BIDS: Bids will be received by Jordan Valley Water Conservancy District, attention Conor Tyson at 8215 South 1300 West, West Jordan, Utah 84088 until December 20, 2022, at 3:30 pm. Electronic bids may also be submitted in adobe .pdf format to ellisad@jvwcd.org. JVWCD requests that electronic bids be submitted 15 minutes prior to the bid opening deadline. A public bid opening will be held at the bid due time. Attendance is not required. Bid results will be posted to the District's website within 24 hours of the bid opening.

OBTAINING CONTRACT DOCUMENTS: All Contract Documents may be obtained on the District's website (www.jvwcd.org), under the project "4700 South 5500 West KID Meter Vault Rehabilitation". Prospective bidders must register at the District's web site under the project to receive project notifications and addenda, if any. Contractors are required to check the District's web site for any addenda prior to submitting a responsive bid. Bids determined to be non-responsive may be rejected.

JVWCD project manager/contact person: Conor Tyson, PE, conort@jvwcd.org, telephone Number: (385) 236-2510

SITE OF WORK: Vault at south side of 4700 South in Kearns Township, UT, 84118. Vault is just east of railroad tracks and by the entrance to 5485 W 4700 S.

PRE-BID SITE VISIT: A non-mandatory pre-bid site visit will be held on the afternoon of Wednesday, December 13th, 2023, at the site of the work. Due to limited parking space, please schedule with the project manager, Conor Tyson, to set up a time.

AWARD OF CONTRACT: An Award of Purchase Order, if awarded, will be made within 60 calendar days of the opening of bids, based upon the lowest cost responsive bid.

BONDS: A Bid bond, Performance Bond, and payment bond are required for any bid exceeding $50,000 as required by Utah state law.

ADDRESS AND MARKING OF BID: The envelope enclosing the bid shall be sealed and addressed to the Jordan Valley Water Conservancy District and delivered or mailed to 8215 South 1300 West, West Jordan, Utah 84088. The envelope shall be plainly marked in the upper left-hand corner with the name and address of the bidder and shall bear the words "Bid for," followed by the title of the Contract Documents for the work and the date and hour of opening of bids. Electronic bids shall be submitted to the engineering administrative assistant, ellisad@jvwcd.org as an email attachment with the words “Bid for,” followed by the title of the Contract Documents for the work and the date and hour of opening of bids in the subject line of the email.

PROJECT ADMINISTRATION: All questions relative to this project prior to the opening of bids shall be directed to the Project Manager for the project.

OWNER'S RIGHTS RESERVED: The Owner reserves the right to reject any or all bids, to waive any informality in a bid, and to make awards in the interest of the Owner.

Owner/ Engineer
Jordan Valley Water Conservancy District
Project Manager: Conor Tyson
8215 South 1300 West
West Jordan, Utah 84088
Telephone: (801) 565-4300
Email: conort@jvwcd.org

JORDAN VALLEY WATER CONSERVANCY DISTRICT

INSTRUCTIONS TO BIDDERS

WARRANTY: The successful bidder shall warrant the equipment and installation to be free of defects in materials and workmanship for a period of one (1) year following satisfactory start-up and testing of the equipment.

INSURANCE REQUIREMENTS: Prior to awarding a purchase order the bidder must furnish certificates of insurance to include the following policies. The limits of liability for the insurance required in this project shall provide for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation

   A. State: Utah — Statutory

2. Comprehensive General Liability

   A. Bodily Injury (including completed operations and products liability):

$500,000	Each Occurrence
$1,000,000	Annual Aggregate
or a combined single limit of	$1,000,000

   B. Property Damage liability insurance including Explosion, Collapse and Underground coverages where applicable.

   C. Personal Injury, with employment exclusion deleted.

$1,000,000	Annual Aggregate

3. Comprehensive Automobile Liability:

   A. Bodily Injury

$500,000	Each Person
$1,000,000	Each Occurrence

   B. Property Damage:

$500,000	Each Occurrence
or combined single limit of	$1,000,000

BID SCHEDULE

Item	Units	Quantity	Extended Price
Demolition as indicated on the drawings	LS	1	$_____
Mechanical Work as indicated on the drawings	LS	1	$_____
Coat all piping in vault with epoxy coating.	LS	1	$_____
Provide, install, and connect flow meter	LS	1	$_____
Provide, install, and connect pressure transmitter.	LS	1	$_____
Provide, install, and connect ventilation fan and switch.	LS	1	$_____
		TOTAL BID	$_____

Bidder (Company name): _____

By: _____ Dated: _____
(Signature)

Name: _____ Title: _____
(Print)

The Bidder shall furnish the following information. Failure to comply with this requirement may render the Bid non-responsive and subject to rejection. Additional sheets shall be attached as required. No bid for the work will be considered from a bidder who does not hold an active license in good standing applicable to the type of work bid upon at the time of submission of the bid.

Contractor's name: _____

Contractor's address: _____

_____

_____

Contractor's Fax: _____

Contractor's Primary Contact: _____

Email address of primary contact: _____

Telephone number of primary contact: _____

BIDDER REQUIREMENTS: The bidder shall have:

(1) a valid Utah Business license

(2) a valid Utah Contractors license appropriate for the work,

(3) have completed a minimum of three similar construction projects including working in a vault with electrical work. The Owner shall be entitled to contact each reference listed by the contractor.

1. Utah Department of Commerce Information
   Business Entity Number: _____
   Delinquent Date: _____

2. Contractor's Utah License Number:_____
   Expiration Date:_____
   Primary Classification: _____
   Supplemental Classification held, if any: _____

3. Number of years as a contractor in work of this type:

   _____

4. Qualifying Projects:

Qualifying Project 1 _____ Completion Date_____

Description of Project

_____

_____

_____

Final Cost_____Owner_____

Owner Phone #_____ Owner email _____

Qualifying Project 2 _____ Completion Date_____

Description of Project

_____

_____

_____

Final Cost_____Owner_____

Owner Phone #_____ Owner email _____

Qualifying Project 3 _____ Completion Date_____

Description of Project

_____

_____

_____

Final Cost_____Owner_____

Owner Phone #_____ Owner email _____

5. As necessary, attach to your bid technical information showing compliance with the defined scope of work and/or technical specifications.

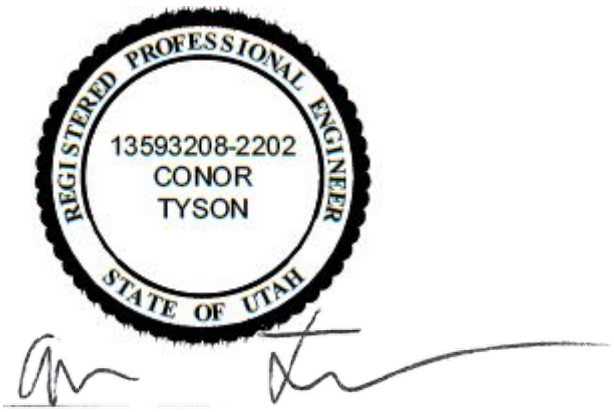
Scope of Work:

This project involved removing and disposing of the materials in the vault at 5500 West 4700 South Road marked for demolition on the plan drawings. Then obtaining and installing the required new equipment. This equipment includes:

- One gate valve
- Two blind flanges with thrust restraint spool
- One flow meter
- One Pressure Transmitter
- One Ventilation Fan and Switch

Work also includes coating all piping and valves, new and existing, in the vault with a high solids epoxy coating.

TECHNICAL SPECIFICATIONS



SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

101.01 GENERAL

A. The WORK to be performed under this Contract shall consist of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and for furnishing all transportation and services, including fuel, power, water, and essential communications, and for the performance of all labor, WORK, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents.

101.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The WORK of this Contract includes installing a 6-inch flow meter together with appurtenant items in accordance with the drawings and these specifications. Appurtenant items include but are not limited to:

1. Disinfection of the new installationg in accordance with AWWA C651 and as approved by the Engineer.

2. Supply, installation, and connection of ventilation fan and switch.

3. Paint all existing and new piping in vault.

4. Supply and installation of pressure transmitter.

101.03 CONTRACT METHOD

A. The WORK, hereunder, will be constructed based on lump sum prices.

101.04 WORK BY OTHERS

A. INTERFERENCE WITH WORK ON UTILITIES:

The CONTRACTOR shall cooperate fully with all utility forces of the 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, and shall schedule the WORK so as to minimize interference with said relocation, altering, or other rearranging of facilities.

101.05 WORK SEQUENCE

A. WORK under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption of water service. The maximum allowable down time of water service to the meter station 30 days.

B. The CONTRACTOR shall have all of his materials necessary to make a connection present at the site of WORK prior to interrupting water service, if any interruption becomes necessary.

C. The CONTRACTOR shall give notice to the OWNER of intent to disrupt water service at least five (5) days prior to disrupting water service. The OWNER will then notify the affected parties and assist by turning off any necessary valves. The CONTRACTOR shall not operate any of the OWNER's valves.

101.06 **CONTRACTOR USE OF PROJECT SITE**

A. The CONTRACTOR's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices.

B. The CONTRACTOR shall limit construction operations to areas within the public right-of-way and shall maintain public access to driveways.

101.07 **OWNER USE OF THE PROJECT SITE**

A. When the CONTRACTOR's WORK involved rehabilitation of or extension to the existing facilities, the OWNER may utilize all or part of the existing site and existing facilities during the entire period of construction for the conduct of the OWNER's normal operations. The CONTRACTOR shall cooperate with the OWNER to minimize interference with the CONTRACTOR's operations and to facilitate the OWNER's operations. In any event, the OWNER shall be allowed access to the project site during the period of construction.

101.08 **PROJECT MEETINGS**

A. PRECONSTRUCTION CONFERENCE:

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 the CONTRACTOR, its superintendent, and its subcontractors as appropriate. Other attendees will include OWNER Representative and designated project representative, representatives of other utilities affected by the WORK, others as requested by CONTRACTOR or OWNER.

B. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. This agenda will include the following:

1. CONTRACTOR'S tentative schedules.

2. Transmittal, review, and distribution of CONTRACTOR's submittals.

3. Processing applications for payment.

4. Maintaining record documents.

5. Critical Work sequencing.

6. Field decisions and Change Orders.

7. CONTRACTOR's assignments for safety and first aid.

C. The OWNER will conduct the preconstruction conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.

D. PROGRESS MEETINGS:

The CONTRACTOR shall schedule and hold regular on-site progress meetings as required by progress of the WORK. The CONTRACTOR and OWNER shall be represented at each meeting. CONTRACTOR may at its discretion request attendance by representatives of its suppliers, manufacturers, and subcontractors.

E. The CONTRACTOR shall conduct the meetings and provide for keeping and distribution of the minutes. The purpose of the meetings will be to review the progress of the WORK, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01300 - CONTRACTOR SUBMITTALS

PART 1 - GENERAL

101.01 REQUIREMENT

A. Wherever submittals are required hereunder, all such submittals by the CONTRACTOR shall be submitted to the OWNER.

B. Within 14 days after the award of Construction Contract, the CONTRACTOR shall submit the following items to the OWNER for review:

1. A preliminary construction schedule indicating the starting and completion dates of the various stages of the WORK.

2. Copies of the manufacturer's technical submittal information for the following items:

   a. New spool with blind flanges in vault.

   b. New Flow meter.

   c. New pressure transmitter.

   d. New Gate Valve

   e. Electrical conduit, wiring, and switches.

3. A list of all permits and licenses the CONTRACTOR shall obtain indicating the agency required to grant the permit and the expected date of submittal for the permit and required date for receipt of the permit.

101.02 CONTRACTOR'S SCHEDULES

A. TIME OF SUBMITTALS:

At the preconstruction conference, the CONTRACTOR shall submit for acceptance by the OWNER, a preliminary construction schedule for the WORK, showing its general plan for orderly completion of the WORK, showing its general plan for orderly completion of the WORK and showing in detail its planned mobilization of plant and equipment, sequence of early operations, and timing of procurement of materials and equipment. The construction schedule produced and submitted shall indicate a project completion date on or before the contract completion date. The OWNER within 14 days after receipt of the preliminary construction schedule, shall meet with a representative of the CONTRACTOR to review the preliminary plan and construction schedule. After review by OWNER, revise and resubmit as required.

101.03 **PROPOSED SUBSTITUTES OR EQUAL ITEMS**

A. For convenience in designation in the Contract Documents, any material, product, or equipment to be incorporated in the WORK may be designated under a brand or trade name or the name of a manufacturer and its catalog information. The use of any substitute material, product, or equipment which is equal in quality and utility and possesses the required characteristics for the purpose intended will be permitted, subject to the following requirements:

1. The burden of proof as to the quality and utility of any such substitute material, product, or equipment shall be upon the CONTRACTOR.

2. The OWNER will be the sole judge as to the quality and utility of any such substitute decision shall be final.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

101.01 SITE INVESTIGATION AND CONTROL

A. The Contractor shall verify all dimensions the field and shall check field conditions continuously during construction. The Contractor shall solely be responsible for any inaccuracies built into the work due to his failure to comply with this requirement.

B. The Contractor shall inspect related and appurtenant work and shall report in writing to the OWNER any conditions which will prevent proper completion of the work. Failure to report any such condition shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at his sole cost and expense.

101.02 DESCRIPTION OF WORK

A. The work shall be conducted under the general observation and inspection by representatives of the OWNER to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop of field inspection, as required. The OWNER shall be permitted access to all parts of the WORK, including plants where materials or equipment are manufactured or fabricated.

B. The presence of the OWNER or any inspector(s), however, shall not relieve the Contractor of the responsibility for the proper execution of the WORK in accordance with all requirements of the Contract Documents. Compliance is a duty of the Contractor and said duty shall not be avoided by any act or omission on the part of the OWNER or any inspector(s).

C. All materials and articles furnished by the Contractor shall be subject to rigid inspection, and no materials or articles shall be used in the WORK until they have been inspected and accepted by the OWNER or his authorized representative. No WORK shall be backfilled, buried, cast in concrete, hidden, or otherwise covered until it has been inspected by the OWNER or is authorized representative. Any WORK so covered in the absence of inspection shall be subject to uncovering. Where uninspected WORK cannot be uncovered, such as in concrete cast over reinforcing steel, all such WORK shall be subject to demolition, removal, and reconstruction under proper inspection, and no addition payment will be allowed, therefore.

101.03 **TIME OF INSPECTION AND TESTS**

A. Except as otherwise provided in these specifications, performance of the required tests will be by the OWNER, and all costs therefore will be borne by the OWNER at no cost to the Contractor; except, that the costs of any test which shows unsatisfactory results shall be borne by the Contractor. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover any WORK under the contract, he shall notify the OWNER not less than 24 hours in advance to request inspection before beginning any such WORK of covering. Failure of the Contractor to notify the OWNER at least 24 hours in advance of any such inspection shall be reasonable cause for the OWNER to order a sufficient delay in the Contractor's schedule to allow time for such inspections and any remedial or corrective WORK required, and all costs of such delays, including its effect upon other portions of the WORK, shall be borne by the Contractor.

101.04 **RIGHT OF REJECTION**

A. The OWNER shall have the right, at all times and places, to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of these specifications, regardless of whether the defects in such articles of materials are detected at the point of manufacture or after completion of the WORK at the site. If the OWNER or inspector, through an oversight or otherwise, as accepted materials or WORK which is defective or which is contrary to the specifications, such material, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected by the OWNER.

B. The Contractor shall promptly remove rejected articles or materials from the site of the WORK after notification of rejection.

C. All costs of removal and replacement of rejected articles or materials as specified herein shall be borne by the Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01500 - CONSTRUCTION FACILITIES AND ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

101.01 GENERAL

A. The Contractor shall provide and maintain adequate construction facilities and perform the necessary work to minimize the impact and inconvenience of the construction activities.

101.02 SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures in accordance with Part 1926 of the OSHA Standards for Construction.

101.03 BARRIERS AND ENCLOSURES

A. Provide as required to prevent public entry to construction areas, and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide barricades as required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

101.04 PROTECTION OF INSTALLED WORK

A. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage. Repair or replace at OWNER's option any installed work damaged by traffic, the public, or Work operations.

101.05 DUST, WATER AND NOISE CONTROL

A. Surface Water, Erosion and Sediment Control:

1. Surface water shall be controlled so that the construction area is not allowed to become wet from runoff from adjacent areas.

B. DUST CONTROL:

1. All work shall be in compliance with the Federal, State, and local air pollution standards, and not cause a hazard or nuisance to personnel and the public in the vicinity of the work.

2. Execute work by methods to minimize raising dust from construction operations.

C. NOISE CONTROL:

1. Execute construction between the hours as allowed unless otherwise approved by OWNER.

101.06 **CONSTRUCTION CLEANING**

A. All public and private areas used as haul roads shall be continuously maintained and cleaned of all construction caused debris such as mud, sand, gravel, soils, pavement fragments, sod, etc. Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately, and the area cleaned.

B. Public roads shall be maintained in accordance with applicable ordinances and regulations.

C. Through all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and shall remove daily all refuse, dirt, damaged materials, unusable materials, and all other trash or debris that he has created from his construction activities.

D. Materials and equipment shall be removed from the site as soon as they are no longer necessary; and upon completion of the work and before final inspection, the entire work site shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory clean and neat appearance. All cleanup costs shall be included in the Contractor's Bid.

101.07 **REMOVAL**

A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of two feet; grade site as indicated. Restore existing facilities used during construction to specified, or to original, condition.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

101.01 GENERAL

A. It is the responsibility of the Contractor to provide products as specified in the Contract Documents free from manufacturer defects or damage from shipping.

101.02 PRODUCTS

A. Products include all material, equipment, and systems.

B. Components required to be supplied in quantity within a specification section shall be the same and shall be interchangeable.

C. Do not use products removed from an existing structure, pipeline, etc., except as specifically required, or allowed, by Contract Documents.

101.03 TRANSPORTATION AND HANDLING

A. Transport products by methods to avoid product damage; deliver in undamaged condition.

B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

101.04 STORAGE AND PROTECTION

A. Store products in accordance with manufacturer's instructions. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

C. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged and are maintained under required conditions.

101.05 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only; Any product meeting those standards.

B. Products Specified by Naming One or More Manufacturers with a Provision of Substitutions: Submit a request for substitution for any manufacturer not specifically named.

C. Product Specified by Naming Several Manufacturers: Products of named manufacturers meeting specifications: no options, or substitutions allowed.

D. Products Specified by Naming Only One Manufacturer: No options, no substitutions allowed.

101.06 **PRODUCTS LISTS**

A. Within 10 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number (if applicable) of each product.

101.07 **SUBSTITUTIONS**

A. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

B. Request constitutes a representation that Contractor:

1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.

2. Will provide the same warranty for substitution as for specified product.

3. Will coordinate installation and make other changes which may be required for WORK to complete in all respects.

4. Waives claims for additional costs which may subsequently become apparent.

C. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.

D. OWNER will determine acceptability of proposed substitution and will notify Contractor of acceptance or rejection in writing within a reasonable time.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

101.01 CLOSEOUT PROCEDURES

A. When Contractor considers WORK has been reached final completion, submit written certification that Contract Documents have been reviewed, WORK has been inspected, and that WORK is complete in accordance with Contract Documents and ready for OWNER's review.

B. In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.

C. OWNER will issue a final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order.

101.02 FINAL CLEANING

A. Execute prior to final inspection.

B. Clean and flush drainage systems.

C. Clean site; sweep paved areas, rake clean other surfaces.

D. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site.

101.03 PROJECT RECORD DOCUMENTS

A. Provide completed record drawings and other required closeout documents prior to requesting final payment.

B. Store record documents separate from those used for construction.

C. Keep documents current; do not permanently conceal any WORK until required information has been recorded.

D. At Contract closeout, submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

101.01 MAINTENANCE AND GUARANTEE

A. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the OWNER. If the Contractor fails to make such repairs or

replacements promptly, the OWNER reserves the right to do the WORK and the Contractor and his surety shall be liable to the OWNER for the cost thereof.

B. Comply with ordinances of local jurisdictions having authority.

C. Make periodic inspections during guarantee period and correct defective work or correct defective work as directed by the OWNER or appropriate governing authority.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01720 - RECORD DRAWINGS

PART 1 - GENERAL

101.01 RECORD DRAWINGS

A. The CONTRACTOR shall keep and maintain, at the job site, one record set of drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. These master record drawings of the CONTRACTOR's representation of as-built conditions, including all revisions made necessary by addenda, change orders, and the like shall be maintained up-to-date during the progress of the WORK.

B. 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.

C. Record drawings shall be accessible to the OWNER at all times during the construction period and shall be delivered to the OWNER upon completion of the WORK.

D. Final payment will not be approved until the CONTRACTOR-prepared record drawings have been delivered to the OWNER. Said up-to-date, record drawings may be in the form of a set of prints with carefully plotted information overlaid in pencil.

E. Upon substantial completion of the WORK and prior to final acceptance, the CONTRACTOR shall complete and deliver a complete set of record drawings to the OWNER, conforming to the construction records of the CONTRACTOR. This set of drawings shall consist of corrected plans showing the reported location of the WORK. The information submitted by the CONTRACTOR and incorporated by the OWNER into the Record Drawings will be assumed to be reliable, and the OWNER will not be responsible for the accuracy of such information, nor for any error or omissions which may appear on the Record Drawings as a result.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 02100 - SITE PREPARATION

PART 1 - GENERAL

101.01 DESCRIPTION

This section specifies site preparation which consists of clearing, grubbing and demolition.

101.02 JOB CONDITIONS

A. EXISTING CONDITIONS:

The Contractor shall determine the actual condition of the site as it affects this portion of WORK. Contractor shall coordinate site preparation with OWNER's administration and operation staff.

B. PROTECTION:

Site preparation shall not damage structures, landscaping, or vegetation adjacent to the site. The Contractor shall repair or replace any damaged property.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

303.01 GENERAL

The Contractor shall notify the Project Representative when site preparation is complete.

303.02 PERFORMANCE

A. DEMOLITION AND REMOVAL:

1. Piping:

Piping shall be removed where indicated on the drawings and disposed of as directed by the Project Representative.

- END OF SECTION -

SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS

PART 1 - GENERAL

101.01 GENERAL

A. The WORK of this section includes the restoration of all existing improvements damaged or altered by the construction of the project.

B. Existing improvements shall include but are not limited to permanent surfacing, curbs, gutters, sidewalks, planted areas, ditches, driveways, culverts, fences, walls, signs, mailboxes, and sprinkling appurtenances. All improvements shall be reconstructed to equal or better, in all respects, the existing improvements removed. Said existing improvements shall be reconstructed in accordance with the notes and details shown on the drawings and/or the applicable provision of these Specifications.

101.02 **QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are trained and experienced in the type of construction required.

B. The quality of the finished restored improvement, as determined by the OWNER, shall be of equal or better quality than was said improvement prior to being damaged or removed.

101.01 **REFERENCES**

A. State of Utah Standard Specifications for Road and Bridge Construction, latest edition including all addendums.

PART 2 - PRODUCTS

202.01 MATERIALS - GENERAL

A. As required to complete the restoration of existing improvements and shall be at least equal to original improvement at the time of damage or removal, as determined by the OWNER of said improvement, and shall match original construction in finish and dimension.

B. Shall be in accordance with requirements of local jurisdiction having authority. Obtain approval of all materials from local jurisdiction having authority prior to ordering or delivering.

PART 3 - EXECUTION

SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS

303.01 PREPARATION

A. Obtain all permits necessary for the restoration of existing surface improvements.

B. Protect all public and private property adjacent to the WORK. Exercise due caution to avoid damage to such property.

303.02 GENERAL RESTORATION REQUIREMENTS

A. All improvements damaged or removed shall be restored in accordance with local jurisdiction having authority. In case of conflict between these specifications and local authority specifications, the local authority shall govern.

B. Repair or replace all existing surface improvements, which were damaged or removed as a result of operations of WORK under this contract. Restoration shall be of at least equal quality and identical in dimension to original improvement unless specifically specified otherwise.

303.08 NOTIFICATION BY THE 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 pipeline; all buried electric power, communications or television cables; all traffic signal and street lighting facilities; and all roadway and state highway right-of-way the Contractor shall notify the respective authorities representing the OWNERS or agencies responsible for such facilities not less than three working days nor more than five working days prior to excavation so that a representative of said OWNERS or agencies can be present during such work if they so desire.

- END OF SECTION -

SECTION 09900 - PAINTING AND FINISHES

PART 1 - GENERAL

101.01 DESCRIPTION

A. The WORK included in this section includes surface preparation, furnishing and applying paints and coatings to the exterior surfaces of piping, valves, and fittings located in vaults, or as indicated on the drawings.

101.02 REFERENCES AND STANDARDS

A. Work covered by this specification shall meet or exceed the provisions of the latest editions of the following codes and standards in effect at the time of award of the contract:

1. OSHA Occupation Safety and Health Act: State of Utah and Federal

101.03 SUBMITTALS

A. CONTRACTOR shall supply shop drawings for approval on all paint materials prior to installation.

PART 2 - PRODUCTS

201.01 PAINT, SEALERS AND SURFACE FINISH MATERIALS

A. Paint for Exposed Piping: Exposed metal piping, fittings and valves shall be coated with a high solids two component epoxy coating system. The epoxy coating shall be Ameron, Amerlock 400, Safety Blue or approved equal.

PART 3 - EXECUTION

301.01 SURFACE PREPARATION

A. All surfaces which receive paint or other coatings shall be prepared in accordance with the recommendations of the manufacturer of the material being used. Any loose coating, or corrosion scale on existing piping shall be completely removed with wire brushing, sand blasting, water blasting or other approved methods.

301.02 APPLICATION

A. Exposed metal piping, fittings and valves shall be painted in accordance with the manufacturer's recommendation and the resulting coating dry film thickness shall be not less than 7 mils.

B. Each coat shall be free of runs, skips or "holidays". All excess paint and/or drips on floors, walls, and other surfaces which are not designated for paint shall be removed.

C. All work shall be done in accordance with the manufacturer's recommendation.

- END OF SECTION -

SECTION 15061 - STEEL PIPING, FABRICATED SPECIALS

PART 1 - GENERAL

101.01 THE REQUIREMENT

A. When required, the Contractor shall fabricate, install, and test all bends, reducers, wyes, tees, crosses, outlets, manifolds, and other steel plate specials, complete in place all in accordance with the requirements of the Contract Documents.

101.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these specifications, all work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following documents to the extent that the requirements therein are not in conflict with the provisions of this Section.

1. Commercial Standards:

ANSI/AWWA C200-80	Steel Water Pipe 6 inches and larger
ANSI/AWWA C208-83	Fabricated Steel Water Pipe Fittings, Dimensions for.
ASTM A234/A234M-84a	Specification for Piping Fittings of Wrought Carbon Steel and Allow Steel for Moderate and Elevated Temperatures
AWWA M-11	Steel Water Pipe-A Guide for Design and Installation.

101.03 CONTRACTOR SUBMITTALS

A. Shop Drawings

1. The Contractor shall submit shop drawings and laying diagrams of all pipes, joints, bends, reducers, wyes, tees crosses, outlets, manifolds, and other steel plate specials in accordance with the requirements in Section entitled Contractor Submittals, 01300.

B. Design calculations shall be submitted to the Engineer for review prior to manufacture of pipe specials.

C. Certifications

1. A certified affidavit of compliance shall be furnished for all steel plate specials and other products or materials furnished under this section of the specifications.

SECTION 15061 - STEEL PIPING, FABRICATED SPECIALS

101.04 QUALITY ASSURANCE

A. Shop Testing of Steel Plate Specials

1. Upon completion of the welding, but prior to lining and coating, each steel plate special shall be bulkheaded and tested under a hydrostatic pressure of 1.5 times the design pressure; provided, that if straight pipe used in fabricating the specials has been previously tested and meets the requirements of the applicable piping Section, no further hydrostatic testing will be required; or provided, that all other welded seams are tested by the liquid penetrant inspection procedure conforming to ASTM 3 165, under Method B and Leak Testing or where applicable by the soap and compressed air method at an air pressure of 25 psi. Any pin holes or porous welds which may be revealed by the test shall be chipped out and rewelded and the pipe or fitting retested.

B. No outside mortar shall be applied over a seam prior to testing; however, mortar lining may be applied over a seam prior to hydrostatic testing, but under such conditions said pressure test shall be held on the pipe or fitting for a period of not less than 30 minutes.

PART 2 - PRODUCTS

201.01 GENERAL

A. Specials are defined as fittings, closure pieces, bends, reducers, wyes, tees, crosses, outlets, manifolds, and other steel plate specials located above ground or in structures.

201.02 DESIGN

A. Except as otherwise provided herein, materials, fabrication and shop testing of striahgt pipe shall conform to the requirements of ANSI/AWWA C200 and shall conform to the dimensions of ANSI/AWWA C208. The minimum thickness of plate for pipe from which specials are to be fabricated shall be the greater of that determined by the following 2 formulas:

(1) $T = \frac{P_w D/2}{Y/S_W}$ (2) $T = \frac{P_t D/2}{Y/S_t}$

where T =Plate thickness in inches

D = Outside diameter of steel cylinder in inches

P_w = Design working pressure = 115 psi

P_t = Design transient pressure for piping = (275 psi)

Y = Yield point of steel in psi

S_w = Safety factor of 2.5 at design working pressure

S_t = Safety factor of 1.875 at design transient pressure

B. In no case shall the design stress at design work pressure (Y/S_w) for steel pipe exceed 16,500 psi or 22,000 psi at design transient pressure (Y/S_t), nor shall plate thickness be less than the thickness of adjacent mainline pipe or the following:

Nominal Pipe Diameter (inches)	Piping above Ground Piping in Structures
16	0.206 inch

C. Pipe installed on saddle support shall be designed to limit the longitudinal bending stress to a maximum of 10,000 psi. Design shall be in accordance with the provisions of Chapter 7 of AWWA M-11.

201.04 FABRICATION AND MATERIALS

A. General

1. Reinforcement for wyes, tees, outlets, and nozzles shall be designed in accordance with AWWA Manual M-11. Reinforcement shall be designed for the design pressure specified or shown and shall be in accordance with the details shown on the Drawings. Specials and fittings shall be equal in pressure design strength and shall have the same coating as the adjoining pipe. Unless otherwise shown on the Drawings, the minimum radius of elbows shall be 2.5 times the pipe diameter and the maximum miter angle on each section of the elbow shall not exceed 11 1/4 degrees.

B. Specials and fittings that cannot be mechanically lined and coated shall be lined and coated by hand-application, using the same materials as are used for the pipe and in accordance with the applicable AWWA or ASTM Standards. Coating and lining applied in this manner shall provide protection equal to that specified for the pipe. Fittings may be fabricated from pipe that has been mechanically lined and/or coated. Areas of lining and coating that have been damaged by such fabrication shall be repaired by hand-applications in accordance with applicable AWWA or ASTM Standards.

C. Access manholes with covers shall be as detailed on the Drawings. All threaded outlets shall be forged steel suitable for 3000 psi service, manufactured by Vogt or as equal.

D. Moderate deflections and long radius curves may be made by means of beveled joint rings, by pulling standard joints, by using short lengths of pipe, or a combinations of these methods; provided that pulled joints shall not be used in combination with bevels. The maximum total allowable angle for beveled joints shall be 5 degrees per pipe joint. The maximum allowable angle for recommendations or the angle which results from a 3/4-inch pull out from normal joint closure, whichever is less. All horizontal deflections or fabricated angles shall fall on the alignment. All vertical deflections shall fall on the alignment and at locations adjacent to underground obstructions, points of minimum earth cover, and pipeline outlets and structures, the pipe angle points shall meet the angle points shown on the Drawings.

E. Outlets, Tees, Wyes, and Crosses

1. Outlets 12-inch and smaller may be fabricated from Schedule 30 or heavier steel pipe in the standard outside diameters, i.e., 12-3/4 inch, 10-3/4 inch, 8-5/8 inch, 6-5/8 inch, and 4-1/2 inch.

F. The design of outlet reinforcement shall be in accordance with the procedures given in Chapter 13 of AWWA Manual M-11, except that the design pressure P, used in the M-11 procedure shall equal the greater of 1.25 P_w or 0.9375 P_t. Unless otherwise shown on the Drawings, outlets 2 inches in diameter and smaller need not be reinforced.

G. In lieu of saddle or wrapper reinforcement as proved by the design procedure in Manual M-11, pipe or specials with outlets may be fabricated in their entirety of steel plate having a thickness equal to the sum of the pipe wall plus the required reinforcement.

H. Where required by the M-11 design procedure, crotch plate reinforcement shall be furnished.

I. Steel Welding Fittings

1. Steel welding fittings shall conform to ASTM A 234.

J. Flanges

1. Flanges shall conform to AWWA C207 Class D flange.

K. Lining

1. Fusion Bonded Epoxy Lining

   a. All interior fittings/specials shall be lined with a Polyamide Epoxy system, fusion bonded epoxy system, or cement mortar in accordance with AWWA C205.

L. Coating

1. All requirements pertaining to thickness, application and curing of coating specified for straight pipe shall apply to specials. Coating system shall be in accordance with Section 09900.

M. A mark indicating the true vertical axis of the special shall be placed in the top and bottom of the special.

PART 3 - EXECUTION

301.01 GENERAL

A. Unless otherwise provided, the Contractor shall furnish and install all fittings, closure pieces, bends, reducers, wyes, tees, crosses, outlets, manifolds, and other steel plate specials, bolts, nuts, gaskets, jointing materials, and all other appurtenances as shown and as required to provide a complete and workable installation. Where pipe support details are shown, the supports shall conform thereto and shall be placed as indicated; provided, that the support for all exposed piping shall be complete and adequate regardless of whether or not supporting devices are specifically shown. Where shown, concrete thrust blocks and welded joints shall be provided. At all times when the Work of installing pipe is not in progress, all openings into the pipe and at the ends of the pipe in trenches or structures shall be kept tightly closed to prevent entrance of animals and foreign materials. The Contractor shall maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by the Owner.

- END OF SECTION -

SECTION 15085 - PIPING SYSTEMS AND CONNECTIONS

PART 1 - GENERAL

101.01 SECTION INCLUDES

This section includes the pipe materials, connection methods and related work.

101.02 REFERENCES

This section contains references to the following documents. Al work specified herein shall conform to or exceed the applicable requirements of the referenced portions. In case of conflict between the requirements of this section and the listed documents, the requirements for this section shall prevail.

Reference	Title
ANSI BI.1	Unified Inch Screw Threads (UN and UNR Thread Form)
ANSI BI.20.1	Pipe Threads, General Purpose (Inch)
ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250, and 800
ANSI B18.2.1	Square and Hex Bolts and Screws Inch Series including Hex Cap Screws and Lag Screws
ANSI B18.2.2	Square and Hex Nuts
ANSI/AWWA C110/A21.10	Ductile Iron and Gray Iron Fittings
ANSI/AWWA C104/A21.4	Cement Mortar Lining for Ductile Iron Pipe and Fittings
ANSI/AWWA C115/A21.15	Flanged Ductile Iron Pipe

PART 2 - PRODUCTS

201.01 FLANGED ASSEMBLIES

A. STEEL PIPE AND FITTINGS

1. When pipe and fittings are designated on the drawings as steel, it shall be in accordance with section 15061 - Steel Piping, Fabricated Specials.

B. GASKETS:

1. Gasket material shall be as specified in paragraph 15085-2.03.

2. Gaskets for plain faced flanges shall be the full-face type. Thickness shall be 1/16-inch for pipe 10 inches and less in diameter and 1/8-inch for pipe 12 inches and larger in diameter. Unless otherwise specified, gaskets for raised face flanges shall match the raised face and shall be 1/16-inch thick for pipe 3-1/2 inches and less in diameter and 1/8-inch thick for pipe 4 inches and larger.

C. BOLTS AND NUTS

Flange assembly bolts shall be ANSI B18.2.1 standard square or hexagon head carbon steel machine bolts with ANSI B18.2.2 standard hot pressed hexagon nuts. Threads shall be ANSI BI.1, standard coarse thread series; bolts shall be Class 2A, nuts shall be Class 2B. Bolt length shall conform to ANSI B16.5. Bolts and nuts shall be cadmium plated.

201.02 GASKETS

A. Gaskets shall be as follows:

1. EPDM: ethylene-propylene-diene-monomer.

2. Neoprene: neoprene.

3. Nitrile: nitrile (Buna-N)

4. Neoprene, CI.I.: Neoprene with cloth inserts.

5. Neoprene, oil resistant: neoprene with oil-resisting characteristics.

6. TFE: non-creeping tetrafluoroethylene (TFE) with insert filler.

7. Compressed gasketing consisting of organic fibers (Kevlar), rillers and styrene butadiene rubber (SBR) binder.

8. TFE bonded EPDM: TFE bonded to EPDM in full-face gasket having concentric convex molded rings.

201.03 THREAD

A. All pipe thread dimensions, and size limits shall conform to ANSI BI.20.1.

201.04 COATINGS

A. Flange assemblies and fittings shall be coated in accordance with Section 09900.

- END OF SECTION -

SECTION 16000 - ELECTRICAL PROVISIONS

PART 1 - GENERAL

101.01 WORK INCLUDED

A. Furnish all labor, materials, and equipment as required by the plans and specifications to provide a complete and workable electrical system. This specification describes the types of materials, methods, and management to be utilized. This includes the work listed in this division as well as equipment furnished under other divisions not specifically mentioned herein.

101.02 CODES AND STANDARDS

A. All equipment, materials, and methods of design and installation are to comply with the National Electrical Code, the basic Electrical Regulations of the State of Utah, the Occupational Safety and Health Act (OSHA), and the requirements of any local codes at the site. Codes and standards of the following organizations may be referred to in this section and shall be considered as the minimum acceptable. A reference herein to any portion of the standard or code is not to be considered as negating any other portion of the standard or code.

1. American National Standards Institute, Inc. (ANSI)
2. Institute of Electrical & Electronic Engineers (IEEE)
3. American Society for Testing & Materials (ASTM)
4. Underwriters Laboratories, Inc. (UL)
5. National Electrical Manufacturers Association (NEMA)
6. Insulated Cable Engineers Association (ICEA)
7. National Electrical Code (NEC)
8. Illuminating Engineering Society (IES)
9. International Society for Measurement and Control (ISA)

B. Where the plans or these specifications require a higher degree of workmanship or quality of material than the above codes and standards imply, then these plans and specifications will prevail.

101.03 EQUIPMENT, MATERIAL AND WORKMANSHIP

A. All equipment and material are to be new, free from defects, of current manufacture, and listed by Underwriters Laboratories, Inc., (UL) where UL

requirements apply. All materials are to be products of reputable and experienced manufacturers. Similar items in the project are to be of the same manufacturer. Use only equipment and materials of industrial quality and durability, and capable of long, reliable, trouble free service.

B. The Owner reserves the right to operate defective equipment or that equipment which fails to conform to detailed specifications or does not operate satisfactorily until the defects are corrected or the equipment is repaired or replaced, without cost for depreciation, use or wear. Rejected equipment will be removed from operation only at times approved by the Owner. All equipment furnished under this section will be guaranteed for a minimum period of one (1) year from date of acceptance against defective materials, design, and workmanship.

C. Provide protection for materials and equipment against loss or damage throughout the contract. Protect everything from the effect of weather prior to installation. Store items to be installed in indoor location.

D. Any item subject to corrosion under damp conditions and items containing insulation such as transformers and motors are to be kept in heated locations.

E. Following installation, protect materials and equipment from corrosion, physical damage, and effects of moisture on insulation.

F. Cap all conduit runs during construction with manufactured seals. Keep openings in boxes or equipment closed.

G. Lay out work carefully in advance.

H. Do not cut or notch any structural member or building surface without specific approval of the Engineer. Carefully carry out any cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, pavings, or other surfaces required for the installation, support, or anchorage of conduit, raceways, or other electrical equipment. Following such work, restore surfaces neatly to new conditions using skilled craftsmen of the trades involved at no additional cost to the Owner.

I. All work will be performed by accomplished, qualified and experienced personnel working under continuous competent supervision.

101.04 PERMITS

A. Obtain and pay for all permits and inspections pertinent to the electrical installation and obtain such permits from the proper governing body before any progress payment will be certified for electrical work.

SECTION 16000 - ELECTRICAL PROVISIONS

101.05 SITE INSPECTION

A. Prior to submitting a bid, visit the project site and ascertain conditions affecting the proposed work and all existing electrical facilities.

101.06 TEMPORARY INSTALLATION

A. Temporary installation is to conform to the requirements of the National Electrical Code and the State and local governing bodies.

101.07 RECORD DRAWINGS

A. Maintain a neatly marked set of record drawings showing installation location, and/or routing of conduits, junction boxes, and outlets. Mark this set to show current job progress and any deviation from the contract drawings. These drawings will be available upon demand of the Engineer. After final inspection, transfer all record information to the Engineer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

103.01 CLEAN-UP

A. Continuously remove debris, cuttings, crates, cartons, etc.

B. Before acceptance, carefully clean all cabinets, panels, boxes, wiring devices, cover plates, etc. Replace all damaged or blemished fixtures.

- END OF SECTION -

SECTION 16111 - CONDUIT

PART 1 - GENERAL

101.01 SECTION INCLUDES

A. Metal conduit.

B. Liquid tight flexible metal conduit.

C. Electrical metallic tubing.

D. Nonmetallic conduit.

E. Fittings and conduit bodies.

101.02 RELATED SECTIONS

A. Section 16130 - Boxes.

B. Section 16170 - Grounding and Bonding.

C. Section 16190 - Supporting Devices.

101.03 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

D. ANSI/NFPA 70 - National Electrical Code.

E. NECA "Standard of Installation."

F. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.

G. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

H. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

101.04 DESIGN REQUIREMENTS

A. Conduit Size: ANSI/NFPA 70.

101.05 REGULATORY REQUIREMENTS

SECTION 16111 - CONDUIT

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

101.06 DELIVERY, STORAGE, AND HANDLING

A. Accept conduit on site. Inspect for damage.

B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

C. Protect PVC conduit from sunlight.

101.07 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 - PRODUCTS

201.01 CONDUIT REQUIREMENTS

A. Minimum Size: 2 inch unless otherwise specified.

201.02 METAL CONDUIT

A. Rigid Steel Conduit: ANSI C80.1.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.

201.03 LIQUID TIGHT FLEXIBLE METAL CONDUIT

A. Description: Interlocked steel construction with PVC jacket.

B. Fittings: ANSI/NEMA FB 1.

201.04 ELECTRICAL METALLIC TUBING (EMT)

A. Description: ANSI C80.3; galvanized tubing.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, compression type.

201.05 NONMETALLIC CONDUIT

A. Description: NEMA TC 2; Schedule 40 PVC.

B. Fittings and Conduit Bodies: NEMA TC 3.

PART 3 - EXECUTION

301.01 INSTALLATION

A. Install conduit in accordance with NECA "Standard of Installation."

B. Install nonmetallic conduit in accordance with manufacturer's instructions.

C. Arrange supports to prevent misalignment during wiring installation.

D. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

E. Group related conduits; support using conduit rack. Construct rack using steel channel.

F. Fasten conduit supports to building structure and surfaces under provisions of Section 16190.

G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports

H. Do not attach conduit to ceiling support wires.

I. Arrange conduit to maintain headroom and present neat appearance.

J. Route exposed conduit parallel and perpendicular to walls.

K. Route conduit in and under slab from point-to-point.

L. Do not cross conduits in slab.

M. Maintain adequate clearance between conduit and piping.

N. Cut conduit square using saw or pipe cutter; de-burr cut ends.

O. Bring conduit to shoulder of fittings; fasten securely.

P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

Q. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations.

R. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender or factory elbows for bends in metal conduit larger than 2-inch size.

S. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

T. Provide suitable fittings to accommodate expansion and deflection where conduit crosses expansion joints.

U. Provide suitable pull string in each empty conduit except sleeves and nipples.

V. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

W. Ground and bond conduit under provisions of Section 16170.

X. All fittings and boxes for use with galvanized steel conduit shall be of malleable iron or gray-iron alloy with zinc plating.

301.02 INTERFACE WITH OTHER PRODUCTS

A. Route conduit through roof openings with a suitable roof jack.

B. Provide a water tight seal around conduits which penetrate concrete walls where one side of wall is below grade.

- END OF SECTION -

SECTION 16123 - WIRE AND CABLE

PART 1 - GENERAL

101.01 SECTION INCLUDES

A. Wire and cable.

B. Wiring connectors and connections.

101.02 RELATED SECTIONS

A. Section 16111 - Conduit.

B. Section 16130 - Boxes.

101.03 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

PART 2 - PRODUCTS

201.01 GENERAL

A. All conductors, include grounding conductors, shall be copper. Aluminum conductor wire and cable will not be permitted. Insulation shall bear UL label, the manufacturer's trademark, and identify the type, voltage, and conductor size. All conductors except flexible cords and cables, fixture wires, and conductors that form an integral part of equipment such as motors and controllers shall conform to the requirements of Article 310 of the National Electrical Code, latest edition, for current carrying capacity. Flexible cords and cables shall conform to Article 400 and fixture wires shall conform to Article 402. All wiring shall have wire markers at each end.

201.02 LOW VOLTAGE WIRE AND CABLE

A. Power and Lighting Wire

1. All wire rated for 600 Volts in duct or conduit for all power and lighting circuits shall be Class B stranded Type XHHW or THHW.

2. Wiring for 600-volt class power and lighting shall be as manufactured by BICC Cables, Okonite, or equal.

B. Control Wire

1. Control wire in duct or conduit shall be the same type as power and lighting wire indicated above, or as indicated on the drawings.

2. Control wiring shall be No. 14 AWG, or as indicated on the drawings.

3. Control wires at panels and cabinets shall be machine tool grade type MTW, UL approved, rated for 90 degrees C at dry locations, and be as manufactured by American, Carol Cable, or equal.

4. Control wires shall be type SIS when indicated on the drawings.

C. Instrumentation Cable

1. Instrumentation cable shall be rated at 300 volts.

2. Individual conductors shall be No. 18 AWG stranded, tinned copper, unless otherwise indicated. Insulation shall be color coded PVC with nylon overcoat: black-white for two-conductor cable and black-red-white for three-conductor cable.

3. Instrumentation cables shall be composed of the individual conductors, an aluminum polyester foil shield, a No. 20 AWG stranded tinned copper drawn wire, and a PVC outer jacket.

4. Two conductor shielded cable shall be Belden Type 9318.

5. Three conductor shielded cable shall be Belden Type 9366.

6. Instrumentation cable shall not be larger size than what is specified.

D. Serial Communication Cable

1. Cable shall be two twisted pair.

2. Individual conductors shall be No. 22 AWG stranded tinned copper, twisted pair with a tinned copper drain wire, foil aluminum-polyester shield. Insulation shall be color coded polyethylene. Cable shall have a chrome PVC outer jacket.

3. Cable shall be Belden Type 8723, or equal.

PART 3 - EXECUTION

301.01 GENERAL

A. The Contractor shall provide and terminate all power, control, and instrumentation conductors except where indicated.

301.02 INSTALLATION

A. Conductors shall not be pulled into raceway until raceway has been cleared of moisture and debris.

B. Pulling tensions on raceway cables shall be within the limits recommended by the cable manufacturer. Wire pulling lubricant, where needed, shall be UL approved.

C. Instrumentation wire shall not be run in the same raceway with power and control wiring except where specifically indicated.

D. Wire in panels, cabinets, and wireways shall be neatly grouped using nylon tie straps and shall be fanned out to terminals.

301.03 SPLICES AND TERMINATIONS

A. General

1. All wire taps and splices shall be properly taped and insulated according to their respective classes.

2. Stranded conductors shall be terminated directly on equipment box lugs making sure that all conductor strands are confined within lug. Use forked-tongue lugs where equipment box lugs have not been provided.

3. Excess control and instrumentation wire shall be properly taped and terminated as spares.

B. Control Wire and Cable

1. Control conductors shall be spliced or terminated only at the locations indicated and only on terminal strips or terminal lugs of vendor furnished equipment.

2. In junction boxes, motor control centers, and control panels, all control wire and spare wire shall be terminated to terminal strips.

C. Instrumentation Wire and Cable

1. Shielded instrumentation cables shall be grounded at one end only, preferably the receiving end on a 4-20 mA system.

D. Power Wire and Cable

1. All 120/208-volt branch circuit conductors shall not be spliced.

2. Splices to motor leads in motor terminal boxes shall be wrapped with mastic material to form a mold and then shall be taped with a minimum of two layers of varnished cambric tape overtaped with a minimum of six layers of high temperature tape.

3. All medium voltage shielded power cable shall have stress cone terminations. Terminations shall be installed per manufacturer's instructions.

- END OF SECTION

SECTION 16130 - BOXES

PART 1 - GENERAL

101.01 SECTION INCLUDES

A. Pull and junction boxes.

101.02 REFERENCES

A. ANSI/NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.

B. ANSI/NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

C. ANSI/NFPA 70 - National Electrical Code.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

101.03 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

101.04 PROJECT CONDITIONS

A. Verify field measurements are as shown on Drawings.

B. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose.

PART 2 PRODUCTS (Not Used)

PART 3 - EXECUTION

303.01 INSTALLATION

A. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.

C. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.

D. Support boxes independently of conduit.

E. Use gang box where more than one device is mounted together. Do not use sectional box.

F. Use cast outlet or switch box in exterior and exposed interior locations and wet locations.

303.02 ADJUSTING

A. Install knockout closure in unused box opening.

- END OF SECTION -

SECTION 16190 – SUPPORTING DEVICES

PART 1 - GENERAL

101.01 SECTION INCLUDES

A. Conduit and equipment support.

B. Anchors and fasteners.

101.02 REFERENCES

A. NECA - National Electrical Contractors Association.

B. ANSI/NFPA 70 - National Electrical Code.

101.03 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

PART 2 - PRODUCTS

201.01 PRODUCT REQUIREMENTS

A. Materials and Finishes: Provide adequate corrosion resistance.

B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

C. Anchors and Fasteners:

1. Concrete Structural Elements: Use expansion anchors.

2. Steel Structural Elements: Use beam clamps.

3. Concrete Surfaces: Use expansion anchors.

4. Hollow Masonry, Plaster, and Gypsum Board Partitions:

5. Use hollow wall fasteners.

6. Solid Masonry Walls: Use expansion anchors.

7. Sheet Metal: Use sheet metal screws.

8. Wood Elements: Use wood screws.

201.02 STEEL CHANNEL

A. Description: Galvanized steel.

PART 3 - EXECUTION

301.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".

C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

D. Do not use spring steel clips and clamps.

E. Do not use powder-actuated anchors.

F. Obtain permission from Engineer before drilling or cutting structural members.

G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

H. Install surface-mounted cabinets and panelboards with minimum of four anchors.

- END OF SECTION -

AWARD OF PURCHASE ORDER

To: Contractor's Name and Address

Re: 5500 West 4700 South Meter Vault Rehabilitation

The Jordan Valley Water Conservancy District (Owner) hereby accepts your Bid dated _____. In accordance with your Bid and the Owner's Documents dated _____, the Owner has created a purchase order in the amount of $_____ for the project entitled "5500 West 4700 South Meter Vault Rehabilitation". **The completion date is May 30, 2024.**

You should sign and return this Award of Purchase Order within 10 calendar days from the date of this notice to you.

Sincerely,

_____

Shane K. Swensen, PE
Chief Engineer

_____
Award Date

ACCEPTANCE OF AWARD

_____, a corporation qualified to do business in the State of Utah, hereby agrees to perform as specified in its Bid, the Owner's Contract Documents, and this Award of Purchase Order.

_____

_____
Signature

_____
Title

_____
Acceptance Date

Attachments: Bid