

**STANDARD SPECIFICATIONS
FOR
2025 DISTRIBUTION PIPELINE REPLACEMENTS –
WOODSTOCK AREA
JANUARY 2025**



JORDAN VALLEY WATER CONSERVANCY DISTRICT

STANDARD SPECIFICATIONS AND DETAILS FOR WATER DISTRIBUTION SYSTEM

GENERAL INFORMATION

The specifications and detail drawings contained in this document have been developed by the Jordan Valley Water Conservancy District (District) as standards of construction for the District's water distribution system. Any extensions or relocations of the District's distribution system shall be constructed in accordance with this document.

The following definitions apply to terms used in the specifications or drawings:

CONTRACTOR: The organization responsible for completing the work of extending, relocating, or otherwise modifying the District's water distribution system. The CONTRACTOR must possess a general engineering contractor's license (E-100) in good standing and must possess the bonding and insurance coverages as required by law. In addition, the CONTRACTOR must have a demonstrated a record of successfully completing work of similar type and complexity. The District reserves the right to review and approve a CONTRACTOR's qualifications in meeting these requirements.

OWNER: Jordan Valley Water Conservancy District.

ENGINEER: Jordan Valley Water Conservancy District, or as designated by the District for specific projects.

WORK: The furnishing and performance of all necessary materials, equipment, labor, and services required for the subject project in accordance with the drawings, and these standard specifications and details.

The specifications included in this document have been assembled from other project contract documents in which the District acting as the OWNER enters into an agreement with a CONTRACTOR for a specified project and pays the CONTRACTOR accordingly.

The specifications may contain references to GENERAL CONDITIONS or describe requirements for the CONTRACTOR to receive payment from the OWNER. However, for purposes of this document, the CONTRACTOR will receive payment from the project developer for extensions to the District's water distribution system, or the applicable party responsible to pay for relocations of the District's water distribution system.

TABLE OF CONTENTS

<u>Specification Section</u>	<u>Description</u>
1010	Summary of Work
1020	Measurement and Payment
1060	Health and Safety
1200	Project Meetings
1300	Contractor Submittals
1400	Quality Control
1500	Construction Facilities & Environmental Control
1600	Material & Equipment
1700	Contract Closeout
1720	Record Drawings
2100	Site Preparation
2220	Excavating, Backfilling, and Compaction
2590	Protection & Restoration of Existing Improvements
2650	Water Supply Piping
2675	Disinfection of Water Distribution Systems
9900	Painting and Finishes

TECHNICAL SPECIFICATIONS

SECTION 01010 – SUMMARY OF WORK

PART 1 - GENERAL

1.01 GENERAL

The work covered under this contract will be performed at several locations in Murray, Utah as shown on the drawings.

1.02 DESCRIPTION OF OWNER'S PROJECT

- A. The Owner's project includes the replacement of existing pipelines in Murray City. The pipelines to be replaced are located in the right-of-way maintained by Murray City. The roads in which pipelines shall be replaced are listed as follows: Hemmingway Dr. from Lakeside Dr. to 1300 E, Lupine Way from Hemmingway Dr. to Hyland Lake Dr., Lillie Circle, Johnson Circle, Sandra Circle, 5935 S, 1320 E, 5985 S, 1430 E from Vine St. to Bella Vie Ct., and 6050 S.

All of the PVC pipeline work listed above includes, but is not limited to, the installation of 8" waterline using open cut installation method and the abandonment of the existing 6" waterlines. The pipeline work for each location includes, but is not limited to, all saw cutting, excavation, bedding, piping, backfill, traffic control, paving, hydrant assemblies, valves, pipe connections, plugging and abandonment of existing pipes, restoration of existing improvements, and other work to make the systems complete and operable as indicated in the plans and specifications. All excavations in these areas shall comply with the governing agency's specifications, permitting procedures, traffic control, backfilling, and paving requirements, and these plans and specifications.

- B. PIPELINE REPLACEMENT ROW JURISDICTION (BY GOVERNING AGENCY)

1. Murray City – Entire Project Area.

1.03 CONTRACT

The contract for construction of the various project elements includes all the items set forth in the bid schedule and indicated in the plans and specifications.

SECTION 01010 – SUMMARY OF WORK

The CONTRACTOR shall cooperate with the agencies, trades or contractors involved in the execution of other work in the vicinity of the various project elements.

1.04 WORK SEQUENCE

A. SUBMITTAL:

In accordance with Section 01300, the CONTRACTOR shall submit a detailed construction time schedule of operations as specified in the General Conditions and the requirements of this section.

B. The CONTRACTOR shall observe the following constraints in preparation of this construction schedule:

1. All project features included under the Bidding Schedule(s) shall be substantially complete in the time required in the Notice Inviting Bids.
2. Asphalt pavement shall be placed in accordance with Murray City requirements. No permanent asphalt paving shall be allowed between October 15 and April 15 unless a specific written variance is obtained from the appropriate governing agency.
3. No excavation will be commenced unless permanent asphalt can be placed within four (4) weeks.

C. The CONTRACTOR shall complete the listed roads during the time period specified in any sequence determined by the CONTRACTOR provided the conditions set forth by the OWNER and governing cities and agencies are followed and all roads are completed within the time period specified by the Contract Documents.

1.05 WORK SCHEDULE

A. The contract length shall be as specified in the Notice Inviting Bids.

B. The work shall be completed meeting the requirements specified below:

1. The CONTRACTOR shall complete all work within the 1300 E ROW for the pipeline installation, abandonment, and restoration between June 9th, 2025 to August 15th, 2025. One lane of traffic in

SECTION 01010 – SUMMARY OF WORK

each direction will be required between the time of 9:00 am and 3:00 pm. Two lanes of traffic will be required during 6:00 am to 9:00 am and 3:00 pm to 6:00 pm, excluding weekends.

2. Any work requiring water line shutdowns along 1300 E shall be performed while Woodstock Elementary School is not in session. This may require night or weekend work. The contractor will be responsible for coordinating with the school.
3. All other roads in a sequence the CONTRACTOR chooses.

1.06 PERMITS

- A. CONTRACTOR-Paid Permits (Reimbursable): Permit fees as listed below shall be obtained and paid for by the CONTRACTOR and included in the CONTRACTOR's Bid. To eliminate uncertainty during bidding, OWNER will reimburse these CONTRACTOR paid permit fees upon proof of payment. CONTRACTOR shall still be responsible for securing the required bonding and insurance required by each of the permits:
 1. City and County Excavation, Land Disturbance, SWPPP (required if total area disturbed is greater than 1 acre), Traffic Control Permits (excluding lane closure fees): CONTRACTOR shall obtain all required Murray City, and UDOT Permits (if required).
 2. UDOT Encroachment Permit: From Utah Department of Transportation, Region 2, Attn: Ron Forkel, 2010 South 2760 West, Salt Lake City, UT 84104. Phone: (801) 975-4809.
 3. General Permit for Storm Water Discharge: From the State of Utah, Department of Environmental Quality, Division of Water Quality, 288 North 1460 West Street. P.O. Box 144870, Salt Lake City, Utah 84114-4879. Fee varies, contact the State for a quote.
 4. Monument Permit: From Salt Lake County Surveyor, 2001 South State Street, Salt Lake City, Utah. Fee will be at least \$200.00 per monument and is based upon time of performance.
 5. Construction Water: CONTRACTOR shall obtain all permits for use

SECTION 01010 – SUMMARY OF WORK

of City water for flushing, pressure testing, and other construction purposes.

- B. **CONTRACTOR-Paid Permits (Non-reimbursable):** All other permit fees required by individual cities, Salt Lake County, the State of Utah, the United States of America, and any of their agencies, or by any private utility companies, shall be obtained and paid for by the CONTRACTOR and included in the CONTRACTOR's Bid. The following list is not exclusive and does not relieve CONTRACTOR of the responsibility of obtaining all permits necessary to complete the work:
1. Lane closure fees
 2. Private property owner permit: written permission to store product, equipment, materials and supplies outside of the Work site boundaries.

1.07 CONTRACTOR'S RESPONSIBILITIES

- A. **Inspection of Project Site:** CONTRACTOR shall inspect the entirety of the project site prior to the BID, to understand access and right-of-way limitations and to note all salient surface features including: necessary tree pruning and removal, fence/ROW locations, existing utilities, utility poles, traffic conditions, fill required for constructability, etc. For the convenience of the CONTRACTOR some site conditions and surface features have been identified in the drawings. However, this does not relieve the CONTRACTOR of the responsibility to inspect the project site. Whether surface features and site conditions are identified in the drawings or not, it is the CONTRACTOR'S responsibility to complete all work in accordance with the Contract Documents.
- B. **Public Relations Plan:** Maintaining good public relations with property owners affected by construction is an important component of this project. In order to maintain good public relations, the Contractor shall prepare and employ a public relations plan. A written copy of the plan shall be prepared and presented to the OWNER for approval at the pre-construction conference and shall address the following minimum requirements:
1. The CONTRACTOR shall provide a Public Relations Supervisor. The Public Relations Supervisor shall be responsible for interfacing with the public throughout the project and resolving complaints and concerns of property owners adjacent to the work. The name and

SECTION 01010 – SUMMARY OF WORK

resume of the proposed Public Relations Supervisor shall be presented to the OWNER at the pre-construction conference for approval. The Public Relations Supervisor shall:

- a. have a 24-hour access phone number to respond to construction inquiries, concerns, and complaints;
- b. have the authority to direct the work as required to resolve concerns and complaints;
- c. provide an updated progress schedule to the OWNER on a weekly basis;
- d. provide an updated long-term progress schedule to the OWNER with each pay request;
- e. ensure all notifications to adjacent property owners are made as described in the contract documents;
- f. within 60 minutes of being notified, contact any property owners who have called with complaints or expressed concerns;
- g. resolve all complaints and expressed concerns within 24 hours;
- h. follow-up with individuals or entities making complaints 24 hours after resolution to ensure satisfactory results were obtained;
- i. document all complaints in a public relations log, including name, address and contact information of individual or entity, date and time of initial notification, nature of complaint, actions taken to resolve the complaint, date and time of complaint resolution, and date and time of follow-up actions;
- j. provide a weekly copy of the public relations log to the OWNER of all complaints and actions taken to resolve them;
- k. be listed with name and phone number on all project flyers, notifications, and project signs; and

SECTION 01010 – SUMMARY OF WORK

- I. not be the same person as the Project Superintendent.
2. Notification – Coordination with Adjacent Property Owners:
14-days prior to beginning work in any area and once each month during construction, hand deliver a written "Construction Status Update Notice" to all residents, businesses, schools and property owners with frontage or sole access along areas disturbed by the Work. Notice shall be on CONTRACTOR's company letter head paper and be secured to doorknob should occupants not be home. Obtain OWNER's review of notice and distribution list/map prior to distribution. As a minimum the notice shall contain the following:
 - a. name and phone number of CONTRACTOR's Public Relations Supervisor;
 - b. name and phone number of OWNER's project manager
 - c. work anticipated for the next 30 days including work locations and work by subcontractors and utility companies;
 - d. rough estimate of construction schedule through the end of work affecting area;
 - e. anticipated driveway approach closures;
 - f. anticipated water, sewer or power outages;
 - g. anticipated vehicular traffic impacts, rerouting or lane closures;
 - h. anticipated pedestrian impacts and sidewalk closures;
 - i. changes to public transportation bus routes; and
 - j. any other construction or work items which will impact or restrict the normal use of streets and amenities.
3. Project Sign: The CONTRACTOR shall provide a professionally prepared, movable, temporary project sign at each end of each work location in the project. The sign shall have a minimum face area of 16 square feet and shall be readily visible and legible. A proof of the proposed sign shall be submitted to the OWNER at the

SECTION 01010 – SUMMARY OF WORK

pre-construction conference for approval. Each sign shall contain the following information:

- a. Project Name: Waterline Replacement Project
- b. Contractor Name
- c. Public Relations Supervisor Name
- d. Public Relations Supervisor Contact Number
- e. Owner Name: Jordan Valley Water Conservancy District
- f. Owner Contact Number: 801-565-4300

1.08 Project Clarifications

- A. Project shall follow APWA 2017 standards except as where noted in the Contract Documents.
- B. All new C-900 PVC waterline shall be installed 3' off the curb unless otherwise indicated in the project drawings.
- C. Water service lines from the water main to the water meter shall be treated as follows: galvanized water service lines and black poly service lines shall be replaced with copper from the new water main to the existing water meter and copper water service lines shall be reconnected. If any lead service lines are encountered, inform the owner immediately. These lines shall also be replaced with copper.
- D. Mainline shutdowns shall be minimized as much as possible. A minimum of 3 business days (72 hours) will be provided to the OWNER before any mainline shutdown will occur. Failure to do so may result in a delay of the mainline shutdown at no cost to the OWNER. Mainline shutdowns are typically permitted Tuesday through Thursday of a normal business week.
- E. OWNER does not guarantee water shutdowns. CONTRACTOR to devise schedule to avoid work stoppages in the event a shutdown does not go as planned.
- F. It is anticipated that the CONTRACTOR could encounter high groundwater along Hemmingway Drive or other areas. The

SECTION 01010 – SUMMARY OF WORK

CONTRACTOR shall be required dewater the trench as describe in Section 301.5 of 02220 Excavation, Backfilling and Compaction. All dewatering costs shall be included in the CONTRACTOR'S Bid.

- G. Exposed storm drains and other gravity utilities shall be backfilled using flowable fill (CLSM) 4' on both sides of the pipe and shall extend to the spring-line of the gravity utility.
- H. Concrete curb and gutters or rolled waterways which are tunneled under to install the waterline shall be backfilled using CLSM to the bottom of the asphalt layer.

- END OF SECTION -

SECTION 01020 – MEASUREMENT AND PAYMENT

PART 1 – GENERAL

101.1 GENERAL

- A. This section includes measurement and payment provisions.
- B. The purpose of the measurement and payment is to inform the CONTRACTOR how to take measurements and compute quantities for billing purposes. The ENGINEER will verify measurements and quantities.
- C. Unit Quantities: Quantities and measurements indicated in the BID are for contract purposes only. Quantities and measurements supplied or placed in the work shall determine payment.
- D. Payment includes full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services, and all incidentals; erection, application, or installation of an item of the work; overhead and profit.

101.2 MEASUREMENT AND PAYMENT – BID SCHEDULE

Bid Item #1: Mobilization Charges

- 1. Measurement: Lump Sum
- 2. Payment Covers: cost of mobilization, demobilization, installation of temporary facilities, and bringing all necessary construction equipment to the site. Payment will be made on a percentage basis as follows:

Payment	Percent of Original Contract Amount Earned	Percent of Amount Bid for Mobilization to be Paid
First	5%	40%
Second	15%	20%
Third	50%	30%
Final	90%	10%

Bid Item #2: Traffic Control

- 1. Measurement: Lump Sum
- 2. Payment Covers: Preparation of an approved Traffic Control Plan, and furnishing all labor, materials, tools, equipment, and all incidentals, and doing all work necessary to implement and maintain the traffic control as shown on the plan and as specified in the project contract documents. Payment also includes Certified

SECTION 01020 – MEASUREMENT AND PAYMENT

Flaggers and Traffic Control Technicians. Payment will be made on a percentage basis as follows:

Payment	Percent of Original Contract Amount Earned	Percent of Amount Bid for Traffic Control to be Paid
First	5%	25%
Second	Remaining portion of bid item paid as a percentage of the contract completed	

Bid Item #3: Permits

1. Measurement: Lump Sum. Bid Item #3 is to cover the anticipated permitting costs of the project. An allowance of \$15,000 has been shown. Bidders shall include this amount in their total bid price.
2. Payment Covers: All work required to obtain and pay for local, state, federal, and private permits listed in Section 1.06 of 01010 Summary of Work. Submit proof of payment for reimbursement.

Note: UDOT inspection fees are included in this Bid Item.

Bid Item #4: Fire Hydrant Assembly (including 6" Gate Valve)

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, testing, and all incidentals required for the installation of the Fire Hydrant Assembly as per the Fire Hydrant Connection Detail. Fire Hydrant Assemblies shall meet the specifications listed in the Contract Documents. Materials include but are not limited to: fire hydrant, gaskets, mechanical thrust restraints, tracer wire, C-900 PVC pipe, gate valve, valve box, valve box lid, concrete thrust blocks, protective plastic wrapping and grease, tee, backfill as specified, and concrete collar. Fire hydrant locations shall be restored to match the surrounding area using sod, concrete, stamped concrete, etc. Irrigation lines damaged shall be repaired and sprinkler watering zones impacted due to fire hydrant location may require moving of sprinkler heads to restore water coverage to an area and landscape shall be restored to the pre-construction condition in which type, style, color, and material are matched.

Bid Item #5: 8" C-900 PVC DR-18 Waterline Installation, Flushing, Disinfection, Testing

1. Measurement: Linear Feet

SECTION 01020 – MEASUREMENT AND PAYMENT

2. Payment Covers: Furnishing all labor, materials, tools, equipment, concrete and landscape removal and restoration, and all incidentals required for the installation, flushing, disinfection, and testing of the 8" C-900 PVC DR-18 waterline and abandonment of the existing waterline. The unit bid price shall include the CONTRACTOR furnishing all the cost of the pipes, gaskets, mechanical fittings, bends, tees, crosses, sleeves, reducers, transition couplings, caps, washout valve assemblies, greasing and wrapping all exposed fittings, bolts, and nuts, pipeline dewatering, trench dewatering, concrete thrust blocks, tracer wire, magnetic marking tape, excavation and removal of excess material, removal of all obstructions and appurtenances as specified, indicated, or implied on the plans, backfill as specified, and the flushing, disinfection, and testing of the waterline. Should the waterline not meet the any of the District's requirements for flushing, disinfection, and/or testing the CONTRACTOR is responsible for correcting the deficiency. Item also includes the repair of any sewer or gas pipeline disturbed by the CONTRACTOR's operation and the abandonment of the replaced waterline from the existing system by removing obsolete valve (if present), plugging or capping, and installing concrete thrust block. The CONTRACTOR shall remove all existing valve boxes on the abandoned waterline and restore landscape and pavement. Potholing 200 feet ahead of the pipeline to identify the locations of existing utilities as described in the project general notes is included in this bid item. Potholing is considered an incidental item to the waterline installation.

Bid Item #6: 8" FLxMJ Gate Valve

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, testing, and all incidentals required for the installation of the 8" FLxMJ Gate Valve as per the Typical Valve Box Detail. 8" FLxMJ Gate Valves shall meet the specifications listed in the Contract Documents. Materials include but are not limited to: 8" FLxMJ gate valve, gaskets, mechanical thrust restraints, valve box, valve box lid, concrete thrust blocks, protective plastic wrapping, backfill as specified, and concrete collar.

Bid Item #7: 8" MJxMJ Gate Valve

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, testing, and all incidentals required for the installation of the 8" MJxMJ Gate Valve as per the Typical Valve Box Detail. 8" MJxMJ Gate Valves shall meet the specifications listed in the Contract Documents. Materials include but are not limited to:

SECTION 01020 – MEASUREMENT AND PAYMENT

8" MJxMJ gate valve, gaskets, mechanical thrust restraints, valve box, valve box lid, concrete thrust blocks, protective plastic wrapping, backfill as specified, and concrete collar.

Bid Item #8: ¾" Copper Water Service Reconnect

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, testing, concrete and landscape removal and restoration, and all incidentals required for the reconnection of ¾" copper water services to the new C-900 PVC waterline. Materials include but are not limited to: fittings, type K copper tubing for service extension, and backfill as specified. A continuous piece of type K copper is required between the new corporation stop and the tie-in location of the existing water service. The connection shall be made with a compression coupler.

Bid Item #9: 1" Copper Water Service Reconnect

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, testing, concrete and landscape removal and restoration, and all incidentals required for the reconnection of 1" copper water services to the new C-900 PVC waterline. Materials include but are not limited to: fittings, type K copper tubing for service extension, and backfill as specified. A continuous piece of type K copper is required between the new corporation stop and the tie-in location of the existing water service. The connection shall be made with a compression coupler.

Bid Item #10: Hot Tap Existing 12" Waterline

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, dewatering, and all incidentals required for the hot tap of an existing 12" waterline.

Note: The gate valve is not included in this bid item.

Bid Item #11: Remove and Dispose of Existing Fire Hydrants

1. Measurement: Each

SECTION 01020 – MEASUREMENT AND PAYMENT

2. Payment Covers: Furnishing all labor, materials, tools, equipment, concrete and landscape removal and restoration, and all incidentals required for the removal and disposal of the existing fire hydrants. Fire hydrant locations shall be restored to match the surrounding area using sod, concrete, stamped concrete, etc.

Bid Item #12: Asphalt Concrete

1. Measurement:
 - a. Measured by the Ton. To receive payment for this item the CONTRACTOR shall submit copies of the asphalt tonnage tickets from the supplier.
 - b. No measurement will be made for temporary asphalt concrete pavement (hot or cold) required to facilitate construction or demolition, whether shown in the Contract Documents or not.
2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals necessary for the accepted placement and compaction of Hot-Mix Asphalt concrete paving to the governing agency's standards. This bid item covers 1/2" Asphalt APWA Mix. This item also includes the labor, material, tools, equipment, and all incidentals to restore the road paint and markings to the preconstruction condition using paint and methods as approved by the governing agency which maintains the roadway.

Bid Item #13: 3/4" Meter Setter & Meter Box Replacement

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, testing, concrete and landscape removal and restoration, and all incidentals required for the removal and replacement of a 3/4" meter setter and meter box. Materials include but are not limited to: two polymer meter boxes, box lids, fittings, type K copper tubing for service extension, and backfill as specified. Owner shall provide meter setter to be installed by the contractor. New setters are anticipated to arrive by spring 2025.

Note: Contractor shall preserve and reinstall the existing 3/4" meter and meter transmitter as directed by JWCD staff

SECTION 01020 – MEASUREMENT AND PAYMENT

Bid Item #14: 1" Meter Setter & Meter Box Replacement

1. Measurement: Each
2. Payment Covers: Furnishing all labor, materials, tools, equipment, testing, concrete and landscape removal and restoration, and all incidentals required for the removal and replacement of a 1" meter setter and meter box. Materials include but are not limited to: two polymer meter boxes, box lids, fittings, type K copper tubing for service extension, and backfill as specified. Owner shall provide meter setter to be installed by the contractor. New setters are anticipated to arrive by spring 2025.

Note: Contractor shall preserve and reinstall the existing 1" meter and meter transmitter as directed by JWWCD staff.

Bid Item #15: Asphalt Concrete Cutting

1. Measurement: Linear Feet
2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals to saw cut the existing asphalt concrete to complete the asphalt "T-patch" or standard patch. Any cutting of asphalt that is not related to preparation of the existing asphalt for a "T-patch" or standard patch such as but not limited to digging the trench for the pipe shall be included in the unit cost of the PVC waterline.

Bid Item #16: Rolled Concrete Gutter/Waterway

1. Measurement:
 - a. Each (10-foot linear sections)
 - b. Sections will be measured in 5-foot increments. A concrete section 0-5 feet will be measured as a partial section and receive one half of the bid unit price. A concrete section 5.01-10 feet will measure a complete section and be billed at the full unit price.
2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals to construct and install a rolled concrete gutter or waterway to match the existing gutter or waterway style, length, color, and finish.

Bid Item #17: APWA Type A Curb and Gutter

SECTION 01020 – MEASUREMENT AND PAYMENT

1. Measurement:
 - a. Each (10-foot linear sections)
 - b. Sections will be measured in 5-foot increments. A concrete section 0-5 feet will be measured as a partial section and receive one half of the bid unit price. A concrete section 5.01-10 feet will measure a complete section and be billed at the full unit price.
2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals to replace an APWA Type A Curb and Gutter to match the existing curb and gutter style, length, color, and finish.

Bid Item #18: Concrete Panel

1. Measurement: Each (20 square feet per panel)
2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals to construct and install a concrete panel which matches the surrounding concrete panels or sidewalk's style, length, color, and finish.

Bid Item #19: Concrete Drive Approach

1. Measurement: Each (60 square feet per approach)
2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals to construct and install a concrete drive approach to match the existing curb and gutter style, length, color, and finish.

Bid Item #20: CLSM Backfill

1. Measurement: Yards. To receive payment for this item the CONTRACTOR shall submit copies of the CLSM yardage tickets from the supplier.
2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals for the installation of CLSM backfill as specified by the Contract Documents. CLSM is the required backfill in all UDOT ROW and around all exposed storm drain lines.

SECTION 01020 – MEASUREMENT AND PAYMENT

Bid Item #21:Trench Stabilization Material

1. Measurement: Yards

Measurement of the trench stabilization material will be based upon Unit Price per in place cubic yard measured from the dimensions of the trench prior to installation of the material and will be calculated using 3.5' maximum trench width.

2. Payment Covers: Furnishing all labor, materials, tools, and equipment for the over excavation of the trench, removal and disposal of excess material, and all incidentals to install the trench stabilization material as specified or implied on the plans. The use of trench stabilization material shall be authorized in advance by the Engineer.

Bid Item #22: 8" Waterline Loop

1. Measurement: Each

2. Payment Covers: Furnishing all labor, materials, tools, equipment, and all incidentals necessary for all 8" waterline loop installations. Materials include but are not limited to: gaskets, concrete thrust blocks, mechanical fittings, pipe bends, and C-900 PVC pipe.

Note: The purpose of this bid item is to loop the 8" PVC waterline under utilities not shown in the drawings in order to resolve conflicts found in the field. Loops shown on the drawings shall be included in the bid item for the PVC waterline (Bid Item #5). The 8" Waterline Loop can only be used with written authorization from the ENGINEER.

Bid Item #23: Galvanized or Black Poly Water Service Replacement

1. Measurement: Each

2. Payment Covers: Furnishing all labor, materials, tools, equipment, concrete and landscape removal and restoration, and all incidentals required for the installation of the Galvanized or Black Poly Water Service Replacement. When the existing water service between the meter setter and the ball valve of the existing service is galvanized or black poly the line shall be replaced with a new continuous piece of type K copper water service line of the same diameter from the existing meter setter (hot side) to the ball valve (corporation stop) on the new C-900 PVC waterline.

SECTION 01020 – MEASUREMENT AND PAYMENT

- END OF SECTION -

SECTION 01060 – SAFETY AND HEALTH

PART 1 - GENERAL (Not Used)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

301.1 GENERAL

- A. The CONTRACTOR, by entering into a contract with the Owner for performance of this work, certifies that he is experienced and qualified to anticipate and meet the safety and health requirements of this project, and is skilled and regularly engaged in the general class and type of work called for in the Contract Documents. The CONTRACTOR acknowledges that there are certain peculiar and inherent conditions existent in the construction of the particular facilities, which may create, during the construction program, unusual or peculiar unsafe conditions hazardous to persons, property and the environment. The CONTRACTOR expressly acknowledges that they are aware of such peculiar risks and that they have the skill and experience to foresee and to adopt protective measures to perform the work adequately and safely with respect to such hazards.
- B. The CONTRACTOR shall be solely responsible for project site safety and shall conform to all applicable occupational, safety and health standards, rules and regulations, and orders established by the State of Utah. The CONTRACTOR shall observe the provisions of the Workman's Compensation and Safety Laws of the State of Utah and shall use all of the accepted and best safety practices for the public and/or CONTRACTOR's employees.
- C. Where a trench or excavation exceeds five (5) feet in depth, the CONTRACTOR shall submit a detailed plan or method for shoring to preclude collapse.

301.2 SAFETY AND HEALTH REGULATIONS

- A. The CONTRACTOR shall comply with Safety and Health Regulations for Construction, promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Act, as set forth in title 29, C.F.R. Copies of these

SECTION 01060 – SAFETY AND HEALTH

regulations may be obtained from Labor Building, 14th and Constitution Avenue NW, Washington, DC 20013.

The CONTRACTOR shall also comply with the provisions of the Federal Occupational Safety and Health Act, as amended.

301.3 INSURANCE

- A. The successful bidder, prior to entering into a contract for the work covered herein shall take out and maintain in full force and effect Worker's Compensations Insurance with an insurance carrier authorized to transact business in the State of Utah, covering their full liability for compensation to any persons employed who may be injured in the carrying out of said contract or the dependents thereof. Evidence of such Worker's Compensation Insurance shall be furnished to the Owner in conformance with the Contract Documents.

- END OF SECTION -

SECTION 01200 – PROJECT MEETINGS

PART 1 - GENERAL

101.1 PROJECT MEETINGS

- A. Project meetings will be held as often as deemed necessary by the Project Representative. Meetings will normally be held weekly. The CONTRACTOR's superintendent and pertinent representatives shall attend.

The purpose of the meetings will be to discuss project schedule, progress, coordination, submittals, and job-related problems. The time and place of these project meetings shall be coordinated in the pre-construction meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01300 – CONTRACTOR SUBMITTALS

PART 1 - GENERAL

101.1 REQUIREMENT

- A. Wherever submittals are required hereunder, all such submittals by the CONTRACTOR shall be submitted to the ENGINEER.
- B. Within 10 days after the award of Construction Contract, the CONTRACTOR shall submit the following items to the ENGINEER for review:
 - 1. A preliminary construction schedule indicating the starting and completion dates of the various stages of the WORK.
 - 2. Copies of manufacturer's technical submittal information for materials to be incorporated into the WORK.
 - 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.

101.2 CONTRACTOR'S SCHEDULES

- A. TIME OF SUBMITTALS:

At the pre-construction conference, the CONTRACTOR shall submit for acceptance by the ENGINEER, 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 ENGINEER 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 ENGINEER, revise and resubmit as required.

- B. CONSTRUCTION SCHEDULE REVISIONS:

Submit revised schedules with each Application of Payment, reflecting changes since previous submittal.

101.3 PROPOSED SUBSTITUTES OR "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

SECTION 01300 – CONTRACTOR SUBMITTALS

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

PART 2 - PRODUCTS

A. USED MATERIALS:

Materials which have been previously installed as part of any project shall not be reused on this project unless written approval is obtained from the ENGINEER. In the event that used materials are allowed to be installed on the project, the OWNER reserves the right to renegotiate the unit cost of the bid item that the material falls under with the CONTRACTOR.

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01400 – QUALITY CONTROL

PART 1 - GENERAL

101.1 SITE INVESTIGATION AND CONTROL

- A. The CONTRACTOR shall verify all dimensions in the field and shall check field conditions continuously during construction. The CONTRACTOR shall be solely 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 ENGINEER 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.

101.2 DESCRIPTION OF WORK

- A. The WORK shall be conducted under the general observation of the ENGINEER and shall be subject to inspection by representatives of the OWNER to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, and in field inspection, as required. The ENGINEER 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 ENGINEER 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 ENGINEER 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 ENGINEER or his authorized representative. No WORK shall be backfilled, buried, cast in concrete, hidden, or otherwise covered until it has been inspected by the ENGINEER or his authorized representative. Any WORK so covered in the absence of inspection shall be subject to uncovering at the CONTRACTOR'S sole cost and expense. 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.

SECTION 01400 – QUALITY CONTROL

101.3 TIME OF INSPECTION AND TESTS

- A. Whenever the CONTRACTOR is ready to backfill, bury, cast in concrete, hide, or otherwise cover any WORK under the contract, he shall notify the ENGINEER not less than 24 hours in advance to request inspection before beginning any such WORK of covering. Failure of the CONTRACTOR to notify the ENGINEER at least 24 hours in advance of any such inspection shall be reasonable cause for the ENGINEER 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.

101.4 RIGHT OF REJECTION

- A. The ENGINEER 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 or materials are detected at the point of manufacture or after completion of the WORK at the site. If the ENGINEER or inspector, through an oversight or otherwise, has 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 ENGINEER for 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

101.1 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.

101.2 SANITARY FACILITIES

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

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

101.4 PROTECTION OF INSTALLED WORK

- A. Provide temporary protection for installed products. Control traffic in the immediate area to minimize damage. Repair or replace at OWNER's option any installed WORK damaged by traffic, the public, or WORK operations.
- B. Prohibit traffic on restored lawn and landscaped areas.

101.5 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. Surface water shall be directed away from these areas but not directed toward adjacent property, buildings, or any improvement that may be damaged by water. Surface water shall not be allowed to enter sanitary sewers.
 - 2. Provide and operate pumping equipment as necessary to maintain excavations free of water.
 - 3. Prevent erosion and sedimentation.

SECTION 01500 – CONSTRUCTION FACILITIES AND ENVIRONMENTAL CONTROLS

4. Provide temporary measures such as berms, dikes, and drains, to control surface water flow.

B. DUST CONTROL:

1. Dust control measures shall be implemented by application of water to all WORK areas, storage areas, haul and access roads, or other areas affected by construction.
2. 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.
3. Provide and operate at least one mobile tank sprinkling unit or other positive means to prevent air-borne dust from dispersing into the atmosphere. The CONTRACTOR shall secure a suitable source of water used during construction. The use of fire hydrants on the OWNER's water system to supply temporary construction water will not be allowed. Any connections made to the OWNER's system to supply temporary construction water shall include backflow and metering devices approved by the ENGINEER.
4. Other methods of dust control for haul and access roads may include chemical treatment, light bituminous treatment, or other methods as approved by the ENGINEER.
5. Execute WORK by methods to minimize raising dust from construction operations.

C. NOISE CONTROL:

1. Execute construction between the hours as allowed by the Salt Lake County Health Department unless a written variance has been obtained.
2. Properly maintain all equipment to minimize noise generation.

101.6 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

SECTION 01500 – CONSTRUCTION FACILITIES AND ENVIRONMENTAL CONTROLS

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.

101.7 PROJECT IDENTIFICATION

- A. NOT USED

101.8 TRAFFIC REGULATION

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and OWNER's operations.
- B. Monitor parking of construction personnel's vehicles. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.
- D. Provide trained and equipped flagmen to regulate traffic when construction operations or traffic encroach on public traffic lanes. Provide control in accordance with local authority having jurisdiction.
- E. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- F. Consult with authorities; establish public thoroughfares to be used for haul routes and site access.
- G. Confine construction traffic to haul routes and designated construction limits.
- H. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
- I. At approaches to site and on site, install signage at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
- J. Relocate as WORK progresses, to maintain effective traffic control.
- K. Maintain traffic flow to private driveways during entire contract period.
- L. Provide "business access" signage indicating locations of business entrances which have been disturbed by construction activities.

SECTION 01500 – CONSTRUCTION FACILITIES AND ENVIRONMENTAL CONTROLS

- M. Post-mounted traffic control and informational signs, traffic cones and drums, flagman equipment: as approved by local jurisdictions.
- N. Where local jurisdictions have no requirements, construct and erect devices and signs according to "Manual on Uniform Traffic Control Devices for streets and Highway" (MUTCD).
- O. Remove equipment and devices when no longer required. Repair damage caused by installation. Remove post settings to a depth of three feet.

101.9 FIELD OFFICE

- A. NOT USED

101.10 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 three feet; grade site as indicated. Restore existing facilities used during construction to as 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

101.1 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.

101.2 PRODUCTS

- A. Products include all material, equipment, and systems.
- B. Comply with specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a specification section shall be the same and shall be interchangeable.
- D. Do not use products removed from an existing structure, pipeline, etc., except as specifically required, or allowed, by Contract Documents.

101.3 TRANSPORTATION AND HANDLING

- A. Transport products by methods to avoid product damage; deliver in undamaged condition.
- B. Provide equipment and personnel to handle products by methods to prevent damage.
- C. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

101.4 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturer's instructions. Store sensitive products in weathertight 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. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for inspection. Periodically inspect to ensure products are undamaged and are maintained under required conditions.

SECTION 01600 – MATERIAL AND EQUIPMENT

101.5 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.

101.6 PRODUCTS LISTS

- A. Within 10 days after the 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.

101.7 SUBSTITUTIONS

- A. Only within 15 days after the date of the Notice to Proceed will ENGINEER consider requests from CONTRACTOR for substitutions. Subsequently, substitutions will be considered only when a product becomes unavailable due to no fault of CONTRACTOR.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- C. 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.
- D. 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.

SECTION 01600 – MATERIAL AND EQUIPMENT

- E. ENGINEER will determine acceptability of proposed substitution and will notify CONTRACTOR of acceptance or rejection in writing within a reasonable time.
- F. Only one request for substitution will be considered for each product. When substitution is not accepted, CONTRACTOR must provide specified product.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 01700 – CONTRACT CLOSEOUT

PART 1 - GENERAL

101.1 CLOSEOUT PROCEDURES

- A. Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.
- B. 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 ENGINEER's review.
- C. 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.
- D. ENGINEER will issue a final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order.

101.2 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.

101.3 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.

101.4 OPERATION AND MAINTENANCE DATA

- A. Provide data for:
 - 1. Mechanical equipment and controls.

SECTION 01700 – CONTRACT CLOSEOUT

- B. Submit one hard copy prior to final inspection, bound in 8-1/2 X 11-inch three-ring side binder with durable plastic covers and one digital copy.

101.5 MAINTENANCE AND GUARANTEE

- A. The CONTRACTOR shall comply with the maintenance and guarantee requirements contained in Article 13.01 of the General Conditions.
- 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 constructed by the CONTRACTOR which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair WORK unless the CONTRACTOR shall have obtained a statement in writing from the affected private OWNER or public agency releasing the OWNER from further responsibility in connection with such repair or resurfacing.
- C. 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.
- D. Comply with General Conditions and ordinances of local jurisdictions having authority.
- E. 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

101.1 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 construction. Special attention shall be given 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, said record drawings shall be supplemented by any detailed sketches as necessary or directed to indicate, fully, the WORK as actually constructed. 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 ENGINEER at all times during the construction period and shall be delivered to the ENGINEER upon completion of the WORK.
- D. Requests for partial payments will not be approved if the record drawings are not kept current, and not until the completed record drawings, showing all variations between the WORK as actually constructed and as originally shown on the Contract Drawings or other Contract Documents, have been inspected by the ENGINEER.
- E. Final payment will not be approved until the CONTRACTOR-prepared record drawings have been delivered to the ENGINEER. Said up-to-date, record drawings may be in the form of a set of prints with carefully plotted information overlaid in pencil.
- F. 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 ENGINEER for transmittal 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 ENGINEER into the Record Drawings will be assumed to be reliable, and the ENGINEER will not be responsible for the accuracy of such

SECTION 01720 – RECORD DRAWINGS

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

101.1 DESCRIPTION

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

101.2 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

301.01 GENERAL

The CONTRACTOR shall notify the Project Representative when site preparation is complete. Further WORK shall not be started until the conditions of paragraph 02100-301.02 are satisfied.

301.02 PERFORMANCE

A. CLEARING AND GRUBBING:

Unless otherwise specified, the CONTRACTOR shall remove obstructions such as brush, trees, logs, stumps, roots, heavy sod, vegetation, rock, stones larger than 6 inches in any dimension, broken or old concrete and pavement, debris, structures, and piping where the completion of the WORK requires their removal.

Material that is removed and is not to be incorporated in the WORK shall be disposed of off the site, or as directed by the OWNER.

B. DEMOLITION AND REMOVAL:

1. Structures:

Demolition and removal of structures consist of removal of manholes and any other structures interfering with construction of

SECTION 02100 – SITE PREPARATION

this contract as shown on the Contract Drawings or as directed by the Project Representative. Excavations caused by structure removal shall be cleared of waste, debris, and loose soil and refilled as specified.

2. Pavement:

When portions of concrete pads are to be removed and replaced, edges shall be saw cut, on a neat line at right angles to the curb face.

3. Piping:

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

4. Salvage:

The OWNER has the right to salvage any items scheduled for removal. The CONTRACTOR shall notify the Project Representative 5 days prior to any salvage or demolition WORK to determine the disposition of items to be salvaged. Such items shall be properly disconnected, removed from their foundations, cleaned, and stored at a location on the plant site as specified.

C. UTILITY INTERFERENCE:

Where existing utilities interference with the prosecution of the WORK, the CONTRACTOR shall relocate them in accordance with the General Conditions of the contract.

- END OF SECTION -

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

PART 1 - GENERAL

101.1 GENERAL

- A. The WORK of this section includes all earthwork required for construction of the WORK including preparation, excavation, backfilling, compaction, dewatering, field quality control, and cleaning up.

101.2 REFERENCES

- A. Utah Occupational Safety and Health Division (UOSHD).
- B. American Association of State Highway and Transportation Official (AASHTO):
 - 1. Designation T-99.
 - 2. Designation T-180.

101.3 SUBMITTALS

- A. Submit for approval drawings and structural calculations for trench shoring to be utilized.

101.4 QUALITY ASSURANCE

- A. Comply with federal, state, and local codes and regulations.
- B. All working conditions shall comply with the "Utah Occupational Safety and Health Division", Safe Practices for excavation and Trenching Operations, latest edition.
- C. All WORK performed in the public right of way shall conform to the standards, regulations, and requirements of the applicable governmental agency responsible for the maintenance of the public right of way.
- D. All necessary permits and bonds shall be paid for and provided by the CONTRACTOR.

PART 2 - PRODUCTS

201.01 BACKFILL MATERIALS

- A. STABILIZATION MATERIAL:

Stabilization material shall consist of hard, durable particles of stone or gravel, screened or crushed to the required size and gradation. The material shall be free from vegetation matter, lumps or balls of clay, or other deleterious matter and shall conform to the following gradation when tested in accordance with AASHTO T 27 or ASTM C 136.

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

1. Coarse material shall be crushed or washed, and fine material shall be wasted to meet the grading requirements set forth below. Note that if stabilization material is required, an 8 oz. non-woven filter fabric shall be placed between the stabilization material and the pipe zone material. Install fabric per to APWA Section 31 05 19.
2. Coarse aggregate, retained on the No. 4 sieve, shall have a percentage of wear not greater than 40 percent when tested by the Los Angeles Test, AASHTO T-96 or ASTM C 131.
3. Graded within the following limits:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
2-inch	100
1-1/2-inch	10-50
3/4-inch	0-25
#4	0-10
#200	0-3

B. PIPE ZONE BACKFILL: TYPE A

The pipe zone extends from six inches below the pipe to 12 inches above the top of the pipe.

1. Shall be free from alkali, salt, and petroleum products, roots, sod, limbs, and other vegetative matter, lumps or balls of clay, slag, cinders, ashes and rubbish, or other materials that in the opinion of the ENGINEER may be objectionable or deleterious. Material shall be screened to the required size and gradation and shall conform to the following gradation when tested in accordance with AASHTO T 27 or ASTM C 136.
2. Graded within the following limits:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
3/8-inch	100
#4	80-85
#10	30-50
#40	10-30
#200	0-15

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

C. GRANULAR BACKFILL: TYPE B

1. Shall be free from alkali, salt, and petroleum products, roots, sod, limbs, and other vegetative matter, lumps or balls of clay, slag, cinders, ashes and rubbish, or other materials that in the opinion of the ENGINEER may be objectionable or deleterious. Material shall be screened to the required size and gradation and shall conform to the following gradation when tested in accordance with AASHTO T 27 or ASTM C 136.
2. Graded within the following limits:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
1-inch	100
#4	70-85
#10	20-50
#40	10-30
#200	0-15

D. STRUCTURAL BACKFILL: TYPE F

1. Shall consist of hard durable particles of stone or gravel, screened or crushed to the required size and grading. The material shall be free from vegetation, or clay and shall conform to the following grading:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
2-inch	100
1-1/2-inch	95-100
3/4-inch	50-100
3/8-inch	15-55
#4	0-25
#8	0-5
#200	0-3

E. PERVIOUS BACKFILL: TYPE G

1. Shall be pervious backfill material (sand) and be free from petroleum products, roots, sod, limbs, and other vegetative matter, slag, cinders, ashes and rubbish, or other material that in the opinion of the ENGINEER may be objectionable or deleterious.

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

2. Graded within the following limits:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
#50	100
#100	0-8
#200	0-4

F. **CONTROLLED LOW STRENGTH MATERIAL (CLSM)**

1. Refer to specification 03575 – Flowable Fill of the UDOT Standard Specifications Manual

PART 3 - EXECUTION

301.01 PREPARATION

- A. It shall be the CONTRACTOR's responsibility to locate existing water, sanitary sewer, storm drain, and gas lines, electrical and telephone conduit and other underground utilities with their existing house service connections, and all other underground structures in order that no damage or loss or service will result from interference with existing lines.
- B. The location of underground utilities shown on the plans have been determined by plans furnished by various municipalities, public utilities, and field surveys. No guarantee is made as to the completeness or accuracy of the locations shown on the plans. The CONTRACTOR shall verify the locations and elevations of existing utilities before WORK begins concerning that utility.
- C. It shall be the responsibility of the CONTRACTOR to maintain trenching operations a sufficient distance ahead of pipe laying operations so that grade and alignment changes may be made to avoid existing underground utilities and structures. Where pipes are to be laid within two (2) feet of other utilities, the CONTRACTOR shall notify the OWNER of the utility. No extra compensation shall be due the CONTRACTOR for delays, or additional WORK created by is failure to comply with the above requirements.
- D. Blue Stakes Location Center shall be contacted 48 hours before any excavation is commenced. Phone 1-800-662-4111 for assistance.

301.02 EXCAVATION

- A. All gas, sanitary sewer, storm drain, water and other pipelines, flumes and ditches of metal, wood or concrete, underground electrical conduits and telephone cable, and all walks, curbs, and other improvements

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

encountered in excavating trenches carefully shall be supported, maintained, and protected from injury or interruption of service until backfill is complete and settlement has taken place.

- B. If any existing facility is damaged or interrupted, promptly after becoming aware thereof and before performing any WORK affected thereby (except in an emergency as permitted by the General Conditions of the construction contract), identify the OWNER of such existing facility, and give written notice thereof to that OWNER and the District and ENGINEER. Comply with other applicable requirements of the General Conditions of the construction contract and indemnify the District from any and all damages resulting from damaged facilities.
- C. Excavation for pipe lines, concrete valve boxes, manholes and appurtenant structures shall include the WORK of removing all earth, sand, gravel, quicksand, stone, loose rock, solid rock, clay, shale, cement, hardpan, boulders, and all other materials necessary to be moved in excavating the trench for the pipe; maintaining the excavation by shoring, bracing, and sheeting or well pointing as necessary to prevent the sides of the trench from caving in while pipe laying is in progress; and removing sheeting from the trench after pipe has been laid.
- D. Bottom of Trench Preparation
 - 1. Where rock, hard pan, boulders or other material which might damage the pipe are encountered, the bottom of the trench shall be over excavated 4 inches below the required grade and replaced with Stabilization Material. Otherwise, the bottom of the trench shall be over excavated 6 inches or 1/12 the outside diameter of the pipe, whichever is greater, below the required grade and replaced with Pipe Zone Backfill.
 - 2. The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 1 inch or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.
- A. Minimum cover over the top of the pipe, including any paving, shall be as follows:
 - 1. Water supply piping: 4 feet minimum from finish grade.
- B. Grading of trenches shall be performed to avoid interference of water and sewer lines with other underground utilities and structures:

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

1. Water supply piping: Unless otherwise indicated, trenches shall be graded to avoid high points in the waterline.
- C. The width of trench, measured at the top of the pipe, shall be as narrow as possible; not to be wider than 12 inches on each side of water pipe.
- D. Excavation manholes, concrete valve boxes, and similar structures shall be sufficient to leave at least 12 inches in the clear between the outer surfaces and the embankment or timber that may be used to hold and protect the banks.
- E. Excess materials shall be hauled away from the construction site or otherwise disposed of by the CONTRACTOR as approved by the ENGINEER.

301.03 BACKFILLING

- A. The trenches shall not be backfilled until the utilities systems as installed conform to the requirements of the Drawings and Specifications.
- B. Trenches shall be backfilled to the proper surface with material as shown or specified. Trenches improperly backfilled shall be reopened to the depth required for correction, then refilled and compacted as specified, or the condition shall be otherwise corrected as approved.
- C. PIPE ZONE BACKFILL:
 1. Prepare an acceptable pipe bedding consisting of six inches of compacted material meeting requirements of 201.01 A in the bottom of the trench or on a built-up foundation if conditions warrant. All piping shall be protected from lateral displacement and possible damage resulting from pact or unbalanced loading during backfilling operations by being adequately bedded.
 2. Place and compact bedding material from pipe foundation to 12 inches above top of pipe. Deposition and compaction of bedding materials shall be done simultaneously and uniformly on both sides of the pipe. All pipe zone materials shall be placed carefully in the trench to avoid any damage to the pipe.
- D. GRANULAR BACKFILL:
 1. The pipe trench outside of the pipe zone shall be backfilled with granular backfill.
 2. Material shall be placed and compacted in layers not exceeding 12 inches.
- E. Each lift shall be evenly spread and moistened or dried by disk harrowing or other means so that the required density will be produced.
- F. Backfill around valves with sand bedding material.

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

- G. Care shall be exercised so that when backfilling is complete and settlement has taken place, all existing pipes, flumes, ditches, conduits, cables, walks, curbs, and other improvements will be on the same alignment and grade as they were before WORK commenced.

301.04 COMPACTION

- A. Compaction shall be the responsibility of the CONTRACTOR. He shall select the methods to be used and carefully perform the WORK of backfilling and compaction so as to prevent damage to new or existing piping. Any new or existing piping damaged during the CONTRACTOR's WORK shall be replaced as directed by the ENGINEER with new piping.
- B. **BACKFILL COMPACTION REQUIREMENTS:**
 - 1. Under pavements, or other surface improvements, the road base shall be compacted to 96% of the modified proctor density as determined by ASTM 1557.
 - 2. In shoulders and other unimproved areas, the average density shall be 90 per cent of laboratory maximum density with no individual test lower than 86 per cent of the laboratory maximum density, as determined by AASHTO Designation T-180.
- C. Methods of compaction include mechanical compaction only. Authorization by the ENGINEER to use any method does not relieve the CONTRACTOR of his responsibility to meet the specified density requirements. Compaction shall be performed in strict accordance with the manufacturer's recommendations for each type of pipe.
- D. **MECHANICAL COMPACTION:**

Shall be accomplished by the use of sheep's-foot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers of a size and type necessary to achieve the required degree of compaction.
- E. Water jetting shall not be allowed.

301.05 DEWATERING

- A. The CONTRACTOR shall do all pumping, shall build all drains, and do all the WORK necessary to keep the trench and pipes free from water during the progress of the WORK.
- B. In wet trenches, a channel shall be kept open along the side of the pipe for conducting the water to a sump hole, from which it shall be pumped out of the trench. No water shall be allowed to enter the pipe.
- C. All dewatering costs shall be included in the CONTRACTOR'S Bid.

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

301.06 FIELD QUALITY CONTROL

- A. The OWNER, at its expense, shall employ an independent testing laboratory to perform field and laboratory density tests. The CONTRACTOR shall coordinate with the ENGINEER in directing testing laboratory personnel in performing field density tests or taking samples for laboratory tests. In general, tests and samples shall be made as the WORK proceeds. The CONTRACTOR shall promptly report the results of the density tests to the ENGINEER.
- B. The ENGINEER will direct testing laboratory to perform field density tests of compacted backfill materials. The approximate location and number of such tests shall be as shown on the drawings, or as selected by the ENGINEER. Field density tests shall be performed at frequencies and locations satisfactory to the organization which granted the permit to excavate in a public right-of-way or generally outlined below:
 - 1. In planted or unimproved areas:
 - a. 18 inches above the top of the pipe
 - b. Finished grade
 - 2. In streets, roads, parking lots or other paved areas:
 - a. 18 inches above the top of the pipe
 - b. 24 inches to 36 inches below the gravel road base
 - c. Gravel road base sub-grade
 - d. Top of gravel road base
 - e. Top of bituminous surface course
- C. Copies of test results prepared by the testing laboratory will be transmitted to the ENGINEER at the same time they are transmitted to the CONTRACTOR.
- D. Successful performance of field density tests by the testing laboratory shall not relieve the CONTRACTOR of his responsibility to meet the specified density requirements for the complete project.

301.07 FINAL GRADING

- A. The roadway including shoulders, slopes, ditches, and borrow pits shall be smoothly trimmed, and shaped by machinery, or other satisfactory methods, to the lines, grades, and cross-sections, as established, and shall be so maintained until accepted. Any surplus material not suitable for spreading along the road to widen the existing shoulder or raise the grade shall be hauled away or disposed of near the site as directed by the ENGINEER.

SECTION 02220 – EXCAVATING, BACKFILLING AND COMPACTION

- END OF SECTION -

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

PART 1 - GENERAL

101.1 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, than the existing improvements which were 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.

101.2 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.
- C. All WORK performed in the public right of way shall conform to the standards, regulations, and requirements of the applicable governmental agency responsible for the maintenance of the public right of way.

101.3 REFERENCES

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

101.4 SUBMITTALS

- A. Submit to ENGINEER written evidence of approval of base course and surface coarse aggregate gradation approval by the State of Utah or by Salt Lake County, as applicable, for WORK in public rights-of-way.

PART 2 - PRODUCTS

201.01 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.

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

- 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.

201.02 CLEAN GRAVEL FOR ROADWAY SHOULDER (Not Used)

201.03 UNTREATED BASE COURSE

- A. Shall be in accordance with State of Utah Standard Specifications for Road and Bridge Construction, paragraphs 301.02 and 301.13, one-inch gradation:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
1-inch	100
1/2-inch	79-91
#4	49-61
#16	27-35
#200	7-11

201.04 BITUMINOUS PRIME COAT

- A. Shall be MC 70-250 asphalt, unless otherwise required by local jurisdiction having authority.

201.05 BITUMINOUS SURFACE COURSE

- A. Shall be plant mix in accordance with State of Utah Standard Specifications for Road and Bridge Construction, Section 402, in accordance with the following gradation. Actual mix design to be used shall be as approved by local jurisdiction having authority. No more than 15 percent reclaimed asphalt pavement is allowed.

3/4-INCH GRADATION

SIEVE SIZE	PERCENT PASSING BY WEIGHT
3/4-inch	100
3/8-inch	75-91
#4	46-62
#50	11-23
#200	5-9

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

1/2-INCH GRADATION

SIEVE SIZE	PERCENT PASSING BY WEIGHT
1/2-inch	100
#4	60-80
#16	28-42
#50	11-23
#200	5-9

201.06 CONCRETE

- A. Concrete for curbs, gutters, sidewalks, and driveways shall be Class AA(AE) conforming to the requirements of paragraph 505.04 of the State of Utah Standard Specification for Road and Bridge Construction, including the following requirements:
1. Coarse aggregate size: $\frac{3}{4}$ " to No. 4
 2. Maximum water/cement: 5.0 gallons/sack
 3. Minimum cement content: 6.5 sacks/cubic yard
 4. Required mix design compressive strength: 5,210 psi
 5. Minimum 28-day compressive strength: 4,000 psi

201.07 SOD AND VEGETATION

- A. All materials shall be from sources approved by the ENGINEER; however, such approval does not relieve the CONTRACTOR from responsibilities for growth, maintenance, and replacement as specified herein.
- B. TOPSOIL:
1. Topsoil shall be fertile, friable, natural loam, surface soil, reasonably free of clay lumps, brush weeds, and other litter, and free of rocks, stumps, stones larger than 2 inches in any dimension, and other extraneous or toxic matter harmful to plant growth. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than four inches.
 2. Do not obtain from bogs or marshes.

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

PART 3 - EXECUTION

301.01 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.

301.02 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.

301.03 ASPHALTIC CONCRETE SURFACED AREAS

- A. PROJECT SPECIFIC ASPHALT REQUIREMENTS:
 - 1. Murray Roads
 - a. ½" HMA asphalt mix, PG 64-22 or better.
 - b. 1' "T-patch" required on both sides of trench or extend to curb if patch is within 2'.
 - c. Provide full tack coat coverage on all vertical surfaces.
 - d. All roads to match existing asphalt thickness plus 1", with 4" minimum thickness, with the exception of 1300 E with a minimum thickness of 6".
 - e. Install in lifts no greater than 3" after compaction.
 - f. Place asphalt at a temperature of 50 degrees and rising.
 - g. Follow APWA 2017 requirements for trenching and asphalt placement except as noted here
- B. Where trenches are excavated through asphaltic concrete surfaced areas such as roads, driveways or parking areas, the surface shall be restored by preparing the subgrade, placing base course(s), placing tack and prime coats, and placing the asphaltic concrete surface course(s).

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

- C. Subgrade preparation shall conform to applicable parts of paragraphs 208.02 and 209.01 through 209.03 of the State of Utah Standard Specifications for Road and Bridge Construction:
1. Average of field density determination shall be 95 percent of the maximum dry density, with no determination lower than 92 percent.
 2. The maximum dry densities shall be determined in accordance with the following:
 - a. A-1 soils: AASHTO Designation T-180, Method D.
 - b. All other soils: AASHTO Designation T-99, Method D.
- D. Thickness of base course shall be eight inches minimum and surface course shall be three inches minimum.
- E. Placing and compaction of base course shall conform to applicable parts of Section 301 of the State of Utah Standard Specifications for Road and Bridge Construction, excluding pay factor allowances.
- F. PRIME COAT:
1. Base course shall be primed, unless otherwise required by local jurisdiction having authority.
 2. Ensure base course is dry and free of loose or foreign material before priming.
 3. Apply primer over prepared base course at a uniform rate of 0.25 gallon per square yard, unless otherwise required by manufacturer. Ensure primer is at temperature recommended by manufacturer.
 4. Allow to cure and dry as long as required to attain penetration and evaporation of the volatiles but in no case less than one hour.
 5. Where a surface is over primed, resulting in a film of free liquid asphalt, it shall be blotted by spreading a light, uniform layer of blotter materials.
 6. An under primed surface shall immediately receive another application of prime coat.
 7. The temperature range of the prime coat at the time of application shall be such that the viscosity will be between 50 and 100 centistokes as determined in accordance with ASTM Designation D-2170.
 8. Maintain the primed surface until the next course is placed. Maintenance shall include spreading any necessary additional blotter material, replacing all portions of prime coat that have been

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

destroyed, and patching any breaks in the primed surface. Any primed area that has become fouled by traffic, or otherwise, shall be cleaned before the next course is placed.

9. Under no circumstances shall traffic be permitted to travel over freshly primed surface. If detours cannot be provided, restrict operation to a width that will permit at least one-way traffic over the remaining portion of the roadbed. If one-way traffic is provided, the traffic shall be controlled in accordance with local jurisdiction having authority.

G. TACK COAT:

1. Tack coat shall be applied at the rate of 0.05 to 0.15 gal/SY. A hand sprayer or brush shall be used to apply tack coat to vertical faces of previously constructed bituminous pavement (over ½ hour hence) prior to placing an adjacent or parallel pass, curbs, gutters, slab edges, and all structures to be in actual contact with the bituminous pavement. Tack coat shall also be applied uniformly at the same rate to the horizontal top surface of each lift of bituminous pavement prior to placing the next lift of bituminous pavement to promote a bond between the two courses of pavement. None of the material shall penetrate into the pavement and for this reason the application should be limited.
2. Prior to applying the material, the surface to be treated shall be swept or flushed free of dust or other foreign material.
3. Protect all surfaces not required to receive tack coat from any inadvertent application.
4. The temperature range of the tack coat at the time of application shall be such that the viscosity will be between 50 and 100 centistokes as determined in accordance with ASTM Designation D-2170.
5. Under no circumstances shall traffic be permitted to travel over the tacked surface. If detours cannot be provided, restrict operation to a width that will permit at least one-way traffic over the remaining portion of the roadbed. If one-way traffic is provided, the traffic shall be controlled in accordance with governing authority.
6. After application of tack coat, sufficient time shall be given to allow for complete separation of asphalt and water before paving operations begin. The tack coat shall be applied on only as many surfaces as will be paved against in the same day.

- H. Mixing, placing, spreading and compaction of bituminous surface course shall conform to applicable parts of Section 402 of the State of Utah

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

Standard Specifications for Road and Bridge Construction, excluding pay factor allowances.

- I. Any painted traffic lanes, markings, and parking lot striping disturbed during construction shall be repainted in the same location with materials meeting the standards of the local jurisdiction having authority.

301.04 CONCRETE CURBS, GUTTER, SIDEWALKS AND DRIVEWAYS

- A. Shall be removed and replaced to the next joint or scoring lining beyond the actually damaged or broken sections; or in the event that joints or scoring lines do not exist or are three or more feet from the removed or damaged section, the damaged portions shall be removed by saw cutting full depth.
- B. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements. Where necessary, lampblack or other pigments shall be added to the new concrete to obtain the desired results.
- C. Concrete forms shall be true to line and of sufficient strength to ensure against bulging or displacement.
- D. Contraction and expansion joints shall match original construction in placement and size, unless otherwise required by local jurisdiction having authority.
- E. Reinforcement shall be replaced as in original construction, and doweled into edges of existing concrete, unless otherwise required by local jurisdiction having authority, and shall be installed in accordance with applicable CRSI and ACI Standards.
- F. Finishing and curing shall be in accordance with local jurisdiction having authority.
- G. Concrete shall be placed over at least six inches of compacted untreated base course and shall match the depth of existing concrete.

301.05 PLANTED AREAS

- A. Prior to placing topsoil, examine and repair the subgrade as necessary to assure a smooth and even surface, which will match grade and contours of surrounding undisturbed ground. Finish grade construction areas to match grade prior to construction activities. Assure that a positive slope away from all building walls is maintained for at least ten feet to prevent runoff from approaching walls.
- B. **SPRINKLING SYSTEMS:**
 - 1. Restore all sprinkling systems disturbed, removed, or damaged by construction operations in a condition at least equal to that prior to construction.

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

301.06 MISCELLANEOUS IMPROVEMENTS

- A. All other improvements interrupted or removed to permit the construction specified herein shall be restored. Miscellaneous improvements to be restored shall include, but shall not be limited to, the following:

Culverts

Canals and Canal Structures

Bridges and Bridge Abutments

Fences

301.07 EXISTING UTILITIES AND IMPROVEMENTS

- A. GENERAL:

The CONTRACTOR shall protect all utilities and other improvements, which may be impaired during construction operations. It shall be the CONTRACTOR's responsibility to ascertain the actual location of all existing utilities and other improvements indicated by utility owners that will be encountered in his construction operations at least 100 feet ahead of the construction activity, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The CONTRACTOR shall 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 directed by the ENGINEER. The OWNER anticipates being able to modify its designated test station or other excavation location in the case that such location is found to conflict with existing utilities.

- B. UTILITIES TO BE MOVED:

In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon proper application by the CONTRACTOR, be notified by the ENGINEER to move such property within a specified reasonable time, and the CONTRACTOR shall not interfere with said property until after the expiration of the time stipulated.

- C. OWNER'S RIGHT OF ACCESS:

The right is reserved to the OWNER and to the OWNERS of public utilities and franchises 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.

- D. KNOWN UTILITIES:

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

Existing utility lines, the locations of which are made known to the CONTRACTOR prior to excavation 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 by the CONTRACTOR at his expense.

E. UNKNOWN UTILITIES:

In the event that the CONTRACTOR damages any existing utility lines, the locations of which are not made known to the CONTRACTOR prior to excavation, a written report thereof shall be made immediately to the ENGINEER. If directed by the ENGINEER, repairs shall be made by the CONTRACTOR under the provision for changes and extra WORK contained in Article 10 of the General Conditions.

F. COSTS BORNE BY OTHERS:

All costs of locating, repairing damage not due to failure of the CONTRACTOR to exercise reasonable care, and removing or relocating such utility facilities not indicated by the utility OWNER with reasonable accuracy, will be paid for as extra WORK in accordance with the provisions of Article 10 of the General Conditions if the OWNER requires the CONTRACTOR to man such costs; or such repair WORK may be performed by the utility OWNER.

G. UTILITIES TO BE REMOVED:

When utility lines that are to be removed are encountered within the area of operations, the CONTRACTOR shall notify the ENGINEER a sufficient time in advance for the necessary measures to be taken to prevent interruption of the service.

H. APPROVAL OF REPAIRS:

All repairs to a damaged improvement shall be inspected and approved by an authorized representative of the improvement OWNER before being concealed by backfill or other WORK.

I. RELOCATION OF UTILITIES:

Where the proper completion of the WORK requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is shown on the drawings, the CONTRACTOR shall at his own expense, remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the ENGINEER and the OWNER of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the CONTRACTOR 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 than found prior to removal.

**SECTION 02590 – PROTECTION AND RESTORATION
OF EXISTING IMPROVEMENTS**

J. MAINTENANCE IN SERVICE:

All oil and gasoline pipelines, power and telephone or other 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 be maintained 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. The CONTRACTOR shall be responsible for and shall make good all damage due to his operations, and 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.

301.08 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 (3) working days nor more than five (5) 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 02650 – WATER SUPPLY PIPING

PART 1 - GENERAL

101.1 GENERAL

- A. The WORK of this section includes installing the new water pipeline with all the necessary valves and fittings and performing the pressure test of the new water main.

101.2 QUALITY ASSURANCE

- A. Comply with federal, state, and local codes and regulations. Underground piping pressure testing shall be witnessed by Fire Marshall, if required.
- B. Pipe, valve, and appurtenance materials and workmanship shall be in accordance with AWWA Standards or other standards as specified herein.
- C. All materials, linings, and coatings which come into direct contact with potable water shall meet NSF-61 and other applicable industry standard requirements.

101.3 DELIVERY, STORAGE AND HANDLING

- A. Load and unload pipes, fittings, specials, valves, and accessories by lifting with hoists or skidding so as to avoid shock or damage. Do not skid or roll pipe on skidways against pipe already on the ground. Any unit of pipe that, in the opinion of the ENGINEER, is damaged beyond repair by the CONTRACTOR shall be removed from the site of the WORK and replaced with another unit. No payment will be made for damaged pipe or for repairs to such damaged pipe. The use of chains or cables for handling pipe is not permitted.
- B. Each length of pipe shall be unloaded opposite or near the place where it is to be laid in the trench.
- C. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or other means approved by the ENGINEER.

PART 2 - PRODUCTS

201.01 WATER MAINS

- A. Water Supply Piping shall be as shown on the drawings and in accordance with Table 1 shown below:

SECTION 02650 – WATER SUPPLY PIPING

PIPE				PIPE JOINTS		FITTINGS	
SERVICE	MATERIAL	SPEC.	CLASS	TYPE	SPEC.	MATERIALS	SPEC.
Water Distribution Main (8"-12")	PVC	AWWA C-900	DR 18 (235 psi) Or as designed on drawings	Push-on-rubber gasket	AWWA C-900	Ductile Iron	AWWA C-110 or C-153
Water Distribution Main (14"-24")	Ductile Iron	AWWA C-151	As designed on drawings	Push-on-rubber gasket	AWWA C-151	Ductile Iron	AWWA C-110 or C-153

B. FITTINGS:

All fittings and accessories shall be manufactured in accordance with AWWA standards applicable to mechanical joint, flanged joint, or push-on joint, as called for in the drawings or specifications. The pipe fittings shall be manufactured from ductile iron, in accordance with AWWA C-104 cement lined, with mechanical joints, or flange joints as shown on the drawings, and shall have equal or greater strength as the pipe to which they attach. Fittings shall be installed as specified by the manufacturer. All buried bolts and T-bolts shall be made from low alloy corrosion resistant steel and shall be coated with FM Food Quality Grease. All bolts are to specification ANSI/ASME B18.21 ASTM A307 Steel Hex Bolt. ANSI/ASME B1.1 Class 2A thread fit. All hex nuts are to specification ANSI/ASME B18.2.2 ASTM F594 A307 plain hex nut. ANSI/ASME B1.1 Class 2B thread fit.

All mechanical joints shall utilize MEGALUG®, or approved equal, mechanical joint restraints.

C. ACCESSORIES:

1. Polyethylene Encasement:

Polyethylene encasement shall be provided and installed in accordance with ANSI/AWWA C105/A21.5 for all ductile iron pipe and fittings.

2. Locator Wire:

The CONTRACTOR shall provide and install locating wire which shall be solid copper 12-gauge wire, 600-volt with PVC insulation, and manufactured for underground service. Locating wire shall be

SECTION 02650 – WATER SUPPLY PIPING

installed along the entire length of the pipe on the top of the pipe and held in place with ties or hitches not more than 12-feet apart. Sections of wire shall be spliced together using approved splice caps with waterproof seals. Along with the pressure testing of the waterline, the locating wire shall be tested for continuity. Any breaks in the wire shall be excavated and repaired at no additional cost to the OWNER.

3. Tracer Tape:

The CONTRACTOR shall provide tracer tape, 3 inches wide and made of inert plastic material suitable for direct burial. Tape shall be capable of stretching to twice its original length. Color shall be in accordance with applicable standards. The tape shall say "Caution – Buried JWCD Waterline – Call (801) 256-4401"

Tracer tape is available through Christy's or other manufacturers.

201.02 VALVES

A. GATE VALVES:

1. Gate valves shall conform to the requirements of AWWA C-509 or AWWA C-515 and shall be NSF-61 Certified. Valves shall be of the resilient-seat type with non-rising stem, opening to the left, and provided with a 2-inch square operating nut for buried valves or handwheel for valves located in structures. Buried valves shall be of flange or mechanical joint design to match pipe joint system.
2. The valve shall have a 250-psig working pressure.
3. Valves, valve-operating units, stem extensions and other accessories shall be installed by CONTRACTOR where shown, or where required in the opinion of ENGINEER, to provide convenience in operation. Where buried valves are indicated, CONTRACTOR shall furnish and install valve boxes to 1-inch above grade in unimproved areas or at grade with concrete collar in improved areas. All valves and gates shall be new and of current manufacture.
4. The valve shall have an FDA, EPA, AWWA C550 and ASTM D1763 approved two part thermosetting epoxy protective coating (10 mil minimum inside and out) system that is non-toxic and imparts no taste to water and complies to ANSI/NSF 61 & 372.
5. All mechanical joints shall utilize MEGALUG®, or approved equal, mechanical joint restraints.
6. Valves shall be Mueller A2361 Series, Clow Valve Model 2638, or approved equal.

SECTION 02650 – WATER SUPPLY PIPING

B. BRASS SERVICE SADDLES

1. Brass service saddles shall incorporate stainless steel bands in place of the standard bronze straps to conform to AWWA standards for use on C900 PVC pipe.
2. IP threads, EPDM gasket, and NSF 61 certified.
3. Rated for 200 psi working pressure.
4. Brass service saddles shall be Ford Style 202BS, Ford Style 202BSD, Mueller BR 2 S Series, or Mueller BR 2 W series.

C. TAPPING VALVES AND SLEEVES:

1. Tapping valves shall have large diameter seat rings to permit entry of tapping machine cutters. Inlet shall be flanged. Outlet shall suit branch piping and shall include the required flange for tapping machine adapter connection. In other details, tapping valves shall conform to the requirements outlined for gate valves in Paragraph 201.02 A.
2. Tapping sleeves shall be suitable for assembly around the existing main. Tapping sleeves shall have a stainless-steel body with a stainless-steel flange.
3. Tapping sleeves shall be Romac SSTIII, Ford FTSS, or approved equal.

D. AIR VALVES

1. Air valves shall provide air and vacuum, and air release features in a single body, double orifice assembly. The air valves shall be manufactured by Val-Matic or approved equal.

201.03 VALVE BOXES AND LIDS

- A. Shall be suitable for HS-20 (AASHTO) traffic loading.
- B. Shall be furnished and installed over each line valve and over each auxiliary hydrant valve. Valve boxes shall be of the adjustable extension type and shall be carefully and securely set over the valves. Lids shall be marked "**JVWCD**". The valve boxes shall be D&L Series M-8040 or approved equal.
- C. Concrete Collars shall be 10" thick x 2'- 6" in diameter centered on the valve box. Concrete shall be 4000 psi.

SECTION 02650 – WATER SUPPLY PIPING

201.04 FIRE HYDRANTS

- A. Shall be manufactured to meet the requirements of AWWA C502 standard for dry barrel fire hydrants.
- B. Fire hydrants shall be Mueller Super Centurion A-423 or Clow Medallion, no equal.
- C. Fire hydrants that are located more than 20' feet from water main shall have a second gate valve flanged to the foot of the hydrant.

PART 3 - EXECUTION

301.01 INSPECTION

- A. All pipe fittings, valves and other appurtenances shall be examined by CONTRACTOR carefully for damage and other defects immediately before installation.
- B. Defective materials shall be marked and held for inspection by the District, who may prescribe corrective repairs or reject the materials.
- C. Prior to installation, valves shall be inspected for direction of opening, freedom of operation, tightness of pressure-containing bolting, cleanliness of valve ports and especially seating surfaces, handling damage, and cracks. Defective valves shall be corrected or held for inspection by the OWNER.

301.02 PREPARATION

- A. Furnish temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, and other obstructions encountered in the progress of the WORK.
- B. The trench bottom and pipe-bedding surface shall be prepared in accordance with the plans and Section 02220-EXCAVATING, BACKFILLING AND COMPACTION prior to pipe installation.
- C. All lumps, blisters, and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign material before the pipe is laid. Bevel and file plain end of pipe to prevent gasket damage during joint assembly.
- D. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the WORK. All pipe, fittings, and valves shall be lowered carefully into the trench by means of a derrick,

SECTION 02650 – WATER SUPPLY PIPING

ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water-main materials and protective coatings and linings. Under no circumstances shall water system materials be dropped or dumped into the trench.

301.03 WATER PIPE INSTALLATION

- A. The water pipe shall be laid and maintained to lines and grades established by the drawings and specifications with fittings and valves at the required locations unless otherwise approved by the District. Unless otherwise shown, all water lines shall have 4 feet minimum cover to final finish grade.
- B. When crossing existing pipelines or other structures, alignment and grade shall be adjusted as necessary, with the approval of the ENGINEER to provide clearance as required by federal, state, or local regulations or as deemed necessary by the ENGINEER to prevent future damage or contamination of either structure.
- C. Lay all water lines on a continuous grade to avoid low points.
- D. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe. If the pipe-laying crew cannot put the pipe into the trench and in place without getting earth into it, the ENGINEER may require that, before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is to be made to the adjacent pipe.
- E. As each length of pipe is placed in the trench, the joint shall be assembled in accordance with manufacturer's recommendations.
- F. The pipe shall be brought to correct line and grade and shall be secured in place with approved backfill material in accordance with section 02220-EXCAVATING, BACKFILLING AND COMPACTING.
- G. Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions or plumb stems or where long-radius curves are permitted, the amount of deflection allowed at pipe joints shall not exceed one half of the amount allowed by pipe manufacturer and shall be approved by the ENGINEER. For PVC pipe, any required deflections must be made in the pipe barrel with no deflection allowed at the joint. The minimum radius of the bending curve is 500 x pipe outside diameter. The CONTRACTOR's installation procedure for deflecting pipe shall be approved by the ENGINEER prior to performing the WORK.
- H. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the

SECTION 02650 – WATER SUPPLY PIPING

ENGINEER. Care must be taken to prevent pipe flotation should the trench fill with water.

- I. Cutting pipe for the insertion of valves, fittings, or closure pieces shall be done in a neat, workmanlike manner without creating damage to the pipe or lining.
- J. Cut ends and rough edges shall be ground smooth, and for push-on joint connections, the cut end shall be beveled.

K. SEPARATION OF WATER MAINS FROM SANITARY SEWERS

- 1. Water mains crossing above a sanitary sewer line or lateral shall meet separation standards listed in the Utah Administrative Code (R309-550-7).
- 2. Where local conditions make it impossible for water mains to cross above a sanitary sewer line or lateral while maintaining the required cover, the conditions below shall be met and approved by the ENGINEER:
 - a. Install water main providing minimum 18" edge to edge vertical separation from the sewer lateral,
 - b. When a sanitary sewer line is crossed the 20' stick of PVC shall be centered beneath the lateral to provide approximately 10' of separation from the sewer line and the water main joint. This will require additional cutting and waste on an extra stick of PVC with each sewer line crossing. The Work shall not proceed until written authorization has been received from the ENGINEER.

301.04 VALVE AND FITTING INSTALLATION

- A. Valves shall be as located on the Drawings.
- B. Valve-operating stems shall be oriented in a manner to allow proper operation.
- C. A valve box shall be provided for every valve that has no gearing or operating mechanism or in which the gearing or operating mechanism is fully protected with a gear case. The valve box shall not transmit shock or stress to the valve and shall be centered over the operating nut of the valve, with the box cover flush with the surface of the finished area or such other level as may be directed by the OWNER.
- D. In no case shall valves be used to bring misaligned pipe into alignment during installation. Valves shall be supported in such a manner as to prevent stress on the piping.

301.05 THRUST BLOCK INSTALLATION

SECTION 02650 – WATER SUPPLY PIPING

- A. Thrust blocks shall be provided at reducers and valves where shown on the Drawings, at all tees, plugs, and caps, and at bends deflecting 11-1/4 degrees or more.
- B. Thrust block shall be placed between solid ground and the fitting to be anchored; the area of bearing on the pipe and on the ground in each instance shall be that shown on the drawings. The block shall, unless otherwise shown or directed, be so located as to contain the resultant thrust force and so that the pipe and fitting joints will be accessible for repair.
- C. Concrete for thrust blocks shall have a compressive strength of not less than 4000 psi in 28 days.
- D. Thrust blocks shall be allowed to cure for five (5) days before any pipe pressure testing is conducted.

301.06 FIELD QUALITY CONTROL

- A. Comply with all inspection and testing procedures as may be required by State Fire Marshall.
- B. Temporary connections for pressure testing shall be made by the CONTRACTOR at his expense and removed by him after the satisfactory completion of the testing WORK.
- C. PRESSURE TEST:
 - 1. After completion of the installation of the system, including disinfection, pressure tests shall be made. The system to be tested shall be subjected to a hydrostatic pressure of 200 pounds per square inch, measured at the low point between valves, unless otherwise noted on the drawings or specified by the ENGINEER, for a period of not less than one hour duration.
 - 2. The portion to be tested shall be filled with water slowly and the specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the ENGINEER. The CONTRACTOR shall make the temporary connection for pressure testing.
 - 3. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the CONTRACTOR shall install corporation stops at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged by the CONTRACTOR.

SECTION 02650 – WATER SUPPLY PIPING

4. All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, or hydrants that are discovered following the pressure test shall be repaired or replaced with sound materials and the test shall be repeated until it is satisfactory to the ENGINEER.

D. LEAKAGE TEST:

1. A leakage test shall be conducted concurrently with the pressure test.
2. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within five psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.
3. Maximum leakage during the pressure test shall not exceed 0.25 gallon per inch diameter per 1,000 feet of pipe.
4. Acceptance of installation shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified above, the CONTRACTOR shall, at his own expense, locate and repair the defective material until the leakage is within the specified allowance.
5. All visible leaks, other than a minor amount of sweating, shall require immediate stoppage of the test and tightening of the joints so that, when pressure is again put on the system, there will be no leakage.

301.07 PIPING IDENTIFICATION

A. TRACER TAPE

A single line of tape as specified in paragraph 201.01 C 3. shall be provided 2.5 feet above the centerline of all buried piping. Tape shall be spread flat with message side up before backfilling.

- END OF SECTION -

**SECTION 02675 – DISINFECTION OF WATER
DISTRIBUTION SYSTEMS**

PART 1 - GENERAL

101.1 GENERAL

- A. The WORK included in this section consists of disinfecting the new water main.

101.2 QUALITY ASSURANCE

- A. All disinfection and testing procedures shall be in accordance with applicable Federal, State, and local standards, and in accordance with applicable provisions of AWWA C651.

101.3 REFERENCES

- A. American Water Works Association (AWWA).
 - 1. B300 - Standard for Hypochlorites
 - 2. B301 - Standard for Liquid Chlorine
 - 3. C651 - Disinfecting Water mains
 - 4. C655 - Filed Dichlorination

PART 2 - PRODUCTS

201.01 CHLORINE

- A. SODIUM HYPOCHLORITE:
 - 1. Shall be in accordance with AWWA B300.
 - 2. Shall be stored as recommended by manufacturer.
- B. CALCIUM HYPOCHLORITE:
 - 1. Shall be in accordance with AWWA B300.
 - 2. Shall be in granular or tablet (5 gram) form.
 - 3. Shall be stored in a cool, dry, and dark environment or as recommended by manufacturer.

PART 3 - EXECUTION

301.01 PREPARATION

- A. Notify ENGINEER at least 72 hours prior to any flushing or disinfecting.

**SECTION 02675 – DISINFECTION OF WATER
DISTRIBUTION SYSTEMS**

- B. Temporary connections for flushing water lines after disinfection shall be made by the CONTRACTOR at his expense and removed by him, after the satisfactory completion of the flushing WORK.

301.02 DISINFECTING PIPES

The procedure for sterilizing the pipes shall be as described in AWWA Specification C-651. The tablet method (placing calcium hypochlorite granules in pipe as it is laid) may only be used after receiving specific approval of the CONTRACTOR's disinfection plan from the ENGINEER. The preferred method is the continuous-feed method, which is briefly outlined below.

- A. Pipe shall be kept clean while laying. If foreign matter should get into the pipe, it shall be removed and the pipe scrubbed before proceeding with laying.
- B. Pipe shall be capped or plugged at the end of a day's WORK or other times when left unattended. The plug or cap shall be watertight.
- C. Trench water shall be kept out of the pipe.
- D. Pipes shall be flushed at a rate in excess of 4.0 feet per second if the pipe is under 12-inch diameter and 3.0 feet per second if the pipe is 12-inch diameter and larger.
- E. Slurry shall be made from Sodium Hypochlorite to create a 10,000-ppm concentration of chlorine solution.
- F. The slurry shall be mixed with water as it enters the pipe to provide a concentration of 25 ppm of residual chlorine after 24 hours. Normally, an initial concentration of 50 ppm will accomplish this result. This would be a mixture of one gallon of slurry to 200 gallons water.
- G. During the application of chlorine, valves shall be positioned so that the strong chlorine solution in the main being treated will not flow into water mains in active service. Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24 hours, during which time all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances. At the end of this 24-hour period, the treated water in all portions of the main shall have a residual of not less than 25 ppm free chlorine.
- H. Chlorination with gaseous chlorine is not allowed.
- I. Hypochlorite solutions may be applied to the water main with a gasoline or electrically powered chemical-feed pump designed for feeding chlorine solutions. Feed lines shall be of such material and strength as to safely withstand the corrosion caused by the concentrated chlorine solutions and the maximum pressures that may be created by the pumps. All

SECTION 02675 – DISINFECTION OF WATER DISTRIBUTION SYSTEMS

connections shall be checked for tightness before the solution is applied to the main.

- J. If the chlorine residual is not 25 ppm after 24 hours, the source of contamination shall be removed, and the disinfecting process shall be repeated until the residual meets the requirements.

301.03 FINAL FLUSHING

A. CLEARING THE MAIN OF HEAVILY CHLORINATED WATER:

- 1. After the applicable retention period, the chlorinated disinfection water shall be flushed from the line.
- 2. Flushing shall continue until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.

B. DISPOSING OF HEAVILY CHLORINATED WATER:

- 1. In accordance with the Utah Department of Environmental Quality, Division of Water Quality Rule R317-8, chlorinated water is considered to be a pollutant and is illegal to discharge into Utah's waters.
 - a. The CONTRACTOR is responsible for ensuring that a temporary discharge permit from the Utah Division of Water Quality is in place prior to any flushing activities.
 - b. A copy of the temporary discharge permit shall be kept on the work site at all times. A copy of the permit shall also be provided to the OWNER.
- 2. A reducing agent such as Sodium Bisulfite shall be applied to the water to be wasted to neutralize thoroughly the chlorine residual in the flushing water. The discharged flushing water should be tested using Free Chlorine Test Kit every minute until the chlorine residual in the water stabilizes. The neutralizing agent shall be applied to the flushing water until the source of flushing water is shutoff and shall be dosed to neutralize the chlorine residual but not to create an excess of the neutralizing agent in the flushing water. In other words, the neutralizing agent dose will need to decrease or increase as the chlorine residual of the flushing water changes.
 - a. The chlorine residual in the water and the dose of neutralizing agent applied to the flushing water along with the location, date, time, and tester's name shall be recorded and given to the OWNER.
 - b. The chart below is an example of the information required for the testing:

SECTION 02675 – DISINFECTION OF WATER DISTRIBUTION SYSTEMS

Distribution Main Line Flushing Log

Date:

Name of Tester:

Test Start Time:

Location:

Test End Time:

Distance to Receiving SD inlet:

Time Elapsed (min)	Flow Rate	Cl Residual	Reducing Agent Dose
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Time Elapsed (min)	Flow Rate	Cl Residual	Reducing Agent Dose
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

3. The OWNER shall be notified 2 days prior to any flushing of water lines.

301.04 BACTERIOLOGICAL SAMPLING AND TESTING

A. STANDARD CONDITIONS:

1. After final flushing and before the water main is placed in service, samples shall be collected by the OWNER from the end of the line, shall be tested for bacteriological quality. Two sets of samples, taken at least 16 hours apart shall be collected from each section of the water main prior to being placed into service.
2. At least one sample shall be collected from the new main and one from each branch.
3. In case of extremely long mains, samples may be collected along the length of the line as well as its end.

B. SPECIAL CONDITIONS:

1. If, during construction, trench water has entered the main, or if in the opinion of the OWNER, excessive quantities of dirt or debris have entered the main, bacteriological samples may be taken at more frequent intervals than under standard conditions.

**SECTION 02675 – DISINFECTION OF WATER
DISTRIBUTION SYSTEMS**

2. Samples may be taken of water that has stood in the main for at least 16 hours after final flushing has been completed.

C. **SAMPLING PROCEDURE:**

1. The OWNER will conduct sampling; CONTRACTOR shall cooperate fully with OWNER's sampling procedures.
2. The results of the bacteriological testing will be available within 48 hours after the sample is taken.

301.05 REDISINFECTION

- A. If the initial disinfection fails to produce satisfactory bacteriological samples, the main shall be reflashed and shall be resampled.
- B. If samples do not indicate satisfactory bacteriologic water quality, then the main shall be rechlorinated by the continuous-feed or slug method of chlorination until satisfactory results are obtained.
- C. High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, water entering the new main shall also be sampled.

301.06 DISINFECTION PROCEDURES WHEN CUTTING INTO OR REPAIRING EXISTING MAINS

- A. The following procedures apply primarily when mains are wholly or partially dewatered. After the appropriate procedures have been completed, the main may be returned to service prior to completion of bacteriological testing in order to minimize the time customers are out of water. Leaks or breaks that are repaired with clamping devices while the mains remain full of pressurized water present little danger of contamination and require no disinfection.
 1. Trench Treatment: When an old main is opened, either by accident or by design, liberal quantities of hypochlorite shall be applied to open trench areas.
 2. Swabbing with Hypochlorite Solution: The interiors of all pipe and fittings (particularly couplings and sleeves) used in making the repair shall be swabbed or sprayed with a one-percent hypochlorite solution before they are installed.
 3. Flushing: Thorough flushing is the most practical means of removing contamination introduced during repairs. If valve and hydrant locations permit, flushing toward the WORK location from both directions is recommended. Flushing shall be started as soon as the repairs are completed and shall be continued until discolored water is eliminated.

**SECTION 02675 – DISINFECTION OF WATER
DISTRIBUTION SYSTEMS**

4. Sampling: Bacteriological samples will be taken by the OWNER after repairs are completed to provide a record for determining the procedure's effectiveness. If the direction of flow is unknown, samples shall be taken on each side of the main break. If positive bacteriological samples are recorded, the situation shall be evaluated by the OWNER, and daily sampling shall be continued until two consecutive negative samples are recorded.

301.07 SPECIAL PROCEDURE FOR TAPPING SLEEVES

- A. Before a tapping sleeve is installed, the exterior of the main to be tapped shall be thoroughly cleaned, and the interior surface of the sleeve shall be dusted with calcium hypochlorite powder, at the rate of 100 mg per square foot. Alternatively, the interior of the sleeve may be swabbed as explained in paragraph 301.03 A 2 of this section.

- END OF SECTION -

SECTION 09900 – PAINTING AND FINISHES

PART 1 - GENERAL

101.1 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.

101.2 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

101.3 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, BL-4 Safety Blue or approved equal.

PART 3 - EXECUTION

301.01 SURFACE PREPARATION

- A. All surfaces which receive paints, 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 recommendations, and the resulting coating dry film thickness shall be not less than 7 mils.

SECTION 09900 – PAINTING AND FINISHES

- 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 recommendations.

END OF SECTION