

# **TECHNICAL SPECIFICATIONS**

## **SECTION 01010 - SUMMARY OF WORK**

### **PART 1 - GENERAL**

#### **101.01 GENERAL**

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

#### **101.02 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The WORK of this Contract includes furnishing and installing aqueduct blowoff piping together with appurtenant items in accordance with the drawings and these specifications. Appurtenant items include but are not limited to:
1. Open trenching through an existing trail and restoring the trail to pre-existing or better condition.
  2. Supply and installation of passive intake vent piping.
  3. Install conduit and wiring for cathodic protection of pipelines.
  4. Welding of spools and fitting inside the blowoff vaults.

#### **101.03 CONTRACT METHOD**

- A. The WORK, hereunder, will be constructed based on lump sum prices.
- B. The CONTRACTOR shall include the General Conditions and Supplementary General Conditions of the Contract as a part of all of its subcontract agreements.

#### **101.04 WORK BY OTHERS**

- A. INTERFERENCE WITH WORK ON UTILITIES:

The CONTRACTOR shall cooperate fully with all utility forces of the OWNER or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the WORK, and shall schedule the WORK so as to minimize interference with said relocation, altering, or other rearranging of facilities.

#### **101.05 WORK SEQUENCE**

## **SECTION 01010 - SUMMARY OF WORK**

- A. WORK under the Contract shall be scheduled and performed in such a manner as to result in the no disruption of water service.
- B. WORK shall be scheduled and performed in roadways such that complete pavement restoration may be accomplished. No trenching will be allowed after asphalt batch plants are closed.

### **101.06 CONTRACTOR USE OF PROJECT SITE**

- A. The CONTRACTOR's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices.
- B. The CONTRACTOR shall limit construction operations to areas within the public right-of-way of the OWNER's easements described in the drawings, and shall maintain public access to driveways.

### **101.07 OWNER USE OF THE PROJECT SITE**

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

### **101.08 PROJECT MEETINGS**

- A. **PRECONSTRUCTION CONFERENCE:**

Prior to the commencement of WORK at the site, a preconstruction conference will be held at a mutually agreed time and place which shall be attended by the CONTRACTOR, its superintendent, and its subcontractors as appropriate. Other attendees will include OWNER Representative, ENGINEER and designated project representative, representatives of other utilities affected by the WORK, others as requested by CONTRACTOR, OWNER or ENGINEER.

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

## **SECTION 01010 - SUMMARY OF WORK**

2. Transmittal, review, and distribution of CONTRACTOR's submittals.
  3. Processing applications for payment.
  4. Maintaining record documents.
  5. Critical Work sequencing.
  6. Field decisions and Change Orders.
  7. Use of project site, office and storage areas, security, housekeeping, and OWNER's needs.
  8. Major equipment deliveries and priorities.
  9. CONTRACTOR's assignments for safety and first aid.
- C. The ENGINEER will conduct the preconstruction conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.
- D. **PROGRESS MEETINGS:**
- The CONTRACTOR shall schedule and hold regular on-site progress meetings at least bi-weekly and at other times as requested by ENGINEER or as required by progress of the WORK. The CONTRACTOR, ENGINEER, and OWNER shall be represented at each meeting. CONTRACTOR may at its discretion request attendance by representatives of its suppliers, manufacturers, and subcontractors.
- E. The CONTRACTOR shall conduct the meetings and provide for keeping and distribution of the minutes. The purpose of the meetings will be to review the progress of the WORK, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

**- END OF SECTION -**

## **SECTION 01025 - MEASUREMENT AND PAYMENT**

### **PART 1 - GENERAL**

#### **101.01 SCOPE**

- A. Payment for various items of the Bid Sheets, as further specified herein, shall include all compensation to be received by the CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the item of WORK being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefore shall be included in the prices named in the Bid Schedule for the various appurtenant items of WORK.

#### **101.02 APPLICATION FOR PAYMENT**

- A. Application for Progress Payment shall be submitted in accordance with Article 14 of the General Conditions of this Contract.

#### **101.03 LUMP SUM ITEMS**

- A. No separate measurement of quantities will be made for those items of WORK performed on a lump sum basis, but the item will be constructed, complete, as required to complete the WORK shown on the Drawings and as described in the Specifications.
- B. Bid prices for lump sum items represent the total cost to the OWNER. Such price shall constitute full compensation for furnishing and placing of materials required to complete the item, and for all labor, equipment, tools, and incidentals needed to complete the WORK in conformity with the plans and specifications.

#### **101.04 UNIT PRICE ITEMS**

- A. Determination of the actual quantities and classifications of Unit Price WORK performed by CONTRACTOR will be made by the ENGINEER in accordance with individual sections of specifications. Payment will be for actual quantities and at the price stated in the Bid. Estimated quantities in the Bid are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price.

### **PART 2 - PRODUCTS (Not Used)**

**SECTION 01025 - MEASUREMENT AND PAYMENT**

**PART 3 - EXECUTION (Not Used)**

**- END OF SECTION -**

## **SECTION 01300 - CONTRACTOR SUBMITTALS**

### **PART 1 - GENERAL**

#### **101.01 REQUIREMENT**

- A. Wherever submittals are required hereunder, all such submittals by the CONTRACTOR shall be submitted to the ENGINEER.
- B. Within 14 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. The manufacturer's technical submittal information for the following items:
    - a. Steel piping
    - b. Insulating flange kits
    - c. Ventilation Head
    - d. Pipe specials, fittings, and paint system.
    - e. Electrical conduit and wiring.
  - 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. List must include Utah County and Provo River Water Users Association.

#### **101.02 CONTRACTOR'S SCHEDULES**

##### **A. TIME OF SUBMITTALS:**

At the preconstruction 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.

## **SECTION 01300 - CONTRACTOR SUBMITTALS**

### **B. CONSTRUCTION SCHEDULE REVISIONS:**

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

### **101.03 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 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 (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

**- END OF SECTION -**



## **SECTION 01400 - QUALITY CONTROL**

### **PART 1 - GENERAL**

#### **101.01 SITE INVESTIGATION AND CONTROL**

- A. The Contractor shall verify all dimensions the field and shall check field conditions continuously during construction. The Contractor shall solely 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.

#### **101.02 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 or 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 is authorized representative. Any WORK so covered in the absence of inspection shall be subject to uncovering. Where uninspected WORK cannot be uncovered, such as in concrete cast over reinforcing steel, all such WORK shall be subject to demolition, removal, and reconstruction under proper inspection, and no addition payment will be allowed therefore.

## **SECTION 01400 - QUALITY CONTROL**

### **101.03 TIME OF INSPECTION AND TESTS**

- A. Except as otherwise provided in these specifications, performance of the required tests will be by the OWNER, and all costs therefore will be borne by the OWNER at no cost to the Contractor; except, that the costs of any test which shows unsatisfactory results shall be borne by the Contractor. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover any WORK under the contract, he shall notify the 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.

### **101.04 RIGHT OF REJECTION**

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

#### **101.01 GENERAL**

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

#### **101.02 SANITARY FACILITIES**

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

#### **101.03 BARRIERS AND ENCLOSURES**

- A. Provide as required to prevent public entry to construction areas, and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barricades as required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

#### **101.04 PROTECTION OF INSTALLED WORK**

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

#### **101.05 DUST, WATER AND NOISE CONTROL**

- A. Surface Water, Erosion and Sediment Control:
  - 1. Surface water shall be controlled so that the construction area is not allowed to become wet from runoff from adjacent areas. 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. Maintain excavations free of water. Provide and operate pumping equipment.

## **SECTION 01500 - CONSTRUCTION FACILITIES AND ENVIRONMENTAL CONTROLS**

3. Prevent erosion and sedimentation.
4. Provide temporary measures such as beams, dikes, and drains, to prevent 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 atmosphere.
4. Other methods of dust control for haul and access roads may include chemical treatment, light bituminous treatment or other method 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 unless otherwise approved by OWNER.

## **101.06 CONSTRUCTION CLEANING**

- A. All public and private areas used as haul roads shall be continuously maintained and cleaned of all construction caused debris such as mud, sand, gravel, soils, pavement fragments, sod, etc. Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.
- B. Public roads shall be maintained in accordance with applicable ordinances and regulations.
- C. Through all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and shall remove daily all refuse, dirt, damaged materials, unusable materials, and all other trash or debris that he has created from his construction activities.

**SECTION 01500 - CONSTRUCTION FACILITIES AND  
ENVIRONMENTAL CONTROLS**

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

**101.07 PROJECT IDENTIFICATION**

- A. NOT USED

**101.08 TRAFFIC REGULATION**

- A. Comply with all requirements of the applicable governmental organization responsible for regulating trail traffic including creating, submitting for review approval, and maintaining an appropriate trail traffic control plan.

**101.09 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 two feet; grade site as indicated. Restore existing facilities used during construction to specified, or to original, condition.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**- END OF SECTION -**

## **SECTION 01600 - MATERIAL AND EQUIPMENT**

### **PART 1 - GENERAL**

#### **101.01 GENERAL**

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

#### **101.02 PRODUCTS**

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

#### **101.03 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 assure that products comply with requirements, quantities are correct, and products are undamaged.

#### **101.04 STORAGE AND PROTECTION**

- A. Store products in accordance with manufacturer's instructions. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- C. 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 assure products are undamaged, and are maintained under required conditions.

## **SECTION 01600 - MATERIAL AND EQUIPMENT**

### **101.05 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only; Any product meeting those standards.
- B. Products Specified by Naming One or More Manufacturers with a Provision of Substitutions: Submit a request for substitution for any manufacturer not specifically named.
- C. Product Specified by Naming Several Manufacturers: Products of named manufacturers meeting specifications: no options, or substitutions allowed.
- D. Products Specified by Naming Only One Manufacturer: No options, no substitutions allowed.

### **101.06 PRODUCTS LISTS**

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

### **101.07 SUBSTITUTIONS**

- A. Only within 15 days after date established in 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.

## **SECTION 01600 - MATERIAL AND EQUIPMENT**

- 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.
- 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**

#### **101.01 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.

#### **101.02 FINAL CLEANING**

- A. Execute prior to final inspection.
- B. Clean and flush drainage systems.
- C. Clean site; sweep paved areas, rake clean other surfaces.
- D. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site.

#### **101.03 PROJECT RECORD DOCUMENTS**

- A. Provide completed record drawings and other required closeout documents prior to requesting final payment.
- B. Store record documents separate from those used for construction.
- C. Keep documents current; do not permanently conceal any WORK until required information has been recorded.

## **SECTION 01700 - CONTRACT CLOSEOUT**

- 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.

### **101.04 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

#### 101.01 RECORD DRAWINGS

- A. The CONTRACTOR shall keep and maintain, at the job site, one record set of drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. 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

## **SECTION 01720 - RECORD DRAWINGS**

accuracy of such information, nor for any error or omissions which may appear on the Record Drawings as a result.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

**- END OF SECTION -**

## **SECTION 02100 - SITE PREPARATION**

### **PART 1 - GENERAL**

#### **101.01 DESCRIPTION**

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

#### **101.02 JOB CONDITIONS**

A. **EXISTING CONDITIONS:**

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

B. **PROTECTION:**

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

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### **303.01 GENERAL**

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

#### **303.02 PERFORMANCE**

A. **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. **Piping:**

## **SECTION 02100 - SITE PREPARATION**

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

2. 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 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**

#### **101.01 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.

#### **101.02 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.

#### **101.03 SUBMITTALS**

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

#### **101.04 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. Utah County requirements shall govern for all work in Utah County right-of-ways:
  - 1. All work shall conform to the applicable standards, regulations, and requirements of the Utah County Public Works Department.
  - 2. Permits shall be obtained and paid for by the Contractor.
  - 3. An Application for Right of Use on Provo River Aqueduct Lands must be obtained and paid for by the Contractor.
- D. Provo River Water Users Association policies and guidelines shall govern for work in PRA easements.
  - 1. An Application for Right of Use on Provo River Aqueduct Lands must be obtained and paid for by the Contractor.

## SECTION 02220 - EXCAVATING, BACKFILLING AND COMPACTION

### PART 2 - PRODUCTS

#### 202.01 BACKFILL MATERIALS

##### A. PIPE ZONE BACKFILL:

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, slag, cinders, ashes and rubbish, or other materials that in the opinion of the Engineer may be objectional or deleterious.
2. Graded within the following limits:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
#4	100
#10	30-50
#40	10-30
#200	0-15

##### B. GRANULAR BACKFILL:

1. Shall be readily compactible and shall be free from alkali, salt, and 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 objectional or deleterious.
2. Graded within the following limits:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
2 inch	100
No. 10	50 max.
No. 40	30 max.
No. 200	15 max.

##### C. STRUCTURAL BACKFILL:

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



## SECTION 02220 - EXCAVATING, BACKFILLING AND COMPACTION

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
2-inch	100
1-1/2-inch	95-100
3/4-inch	50-100
3/8-inch	15-55
No. 4	0-25
No. 8	0-5
No. 200	0-3

### **PART 3 - EXECUTION**

#### **303.01 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 plats 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.

## SECTION 02220 - EXCAVATING, BACKFILLING AND COMPACTION

### 303.02 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 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. Minimum cover over the top of the pipe, including any paving, shall be as shown in the drawings.
- E. Grading of trenches shall be performed to avoid interference of water and sewer lines with other underground utilities and structures:
  - 1. Water supply piping: Unless otherwise indicated, trenches shall be graded to avoid high points in the waterline.
- F. The width of trench, measured at the top of the pipe, shall be as narrow as possible but not wider than 12 inches on each side of sewer or water pipe.
- G. Excess materials shall be hauled away from the construction site or otherwise disposed of by the Contractor as approved by the Engineer.

### 303.03 BACKFILLING

- A. The trenches shall not be backfilled until the utilities systems as installed conform to the requirements of the Drawings and Specifications.

## **SECTION 02220 - EXCAVATING, BACKFILLING AND COMPACTION**

- B. Trenches shall be back filled 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 imported sand in the bottom of the trench or on a built up foundation if conditions so 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 sand 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.
- 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.

### **303.04 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:**

## **SECTION 02220 - EXCAVATING, BACKFILLING AND COMPACTION**

1. Under pavements, or other surface improvements, the average density shall be 96 per cent of laboratory maximum density with no individual test lower than 92 per cent of the laboratory maximum density, as determined by AASHTO Designation T-180.
  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 sheeps-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.

### **303.05 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.

### **303.06 FIELD QUALITY CONTROL**

- A. The Owner will employ a testing laboratory to perform field and laboratory density tests as directed by the Engineer. The Contractor shall fully cooperate with the 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 cooperate with the Engineer to schedule and perform tests.
- B. The Engineer will direct testing laboratory to perform maximum density tests on materials to be compacted from samples submitted by Contractor taken from locations selected by the Engineer.

## **SECTION 02220 - EXCAVATING, BACKFILLING AND COMPACTION**

- C. 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 taken as follows, or as otherwise selected by the Engineer.
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
- D. Copies of test results prepared by the testing laboratory will be transmitted to the Contractor at the same time they are transmitted to the Engineer.
- E. 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.

### **303.07 CLEANING UP**

- 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.

**- END OF SECTION -**

## **SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**

### **PART 1 - GENERAL**

#### **101.01 GENERAL**

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

#### **101.02 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen who are trained and experienced in the type of construction required.
- B. The quality of the finished restored improvement, as determined by the OWNER, shall be of equal or better quality than was said improvement prior to being damaged or removed.
- C. Utah County requirements shall govern for all work in Utah County road right-of-way:
  - 1. All work shall conform to the applicable standards, regulations, and requirements of the Utah County Public Works Department.

#### **101.01 REFERENCES**

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

#### **101.02 SUBMITTALS**

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

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

**PART 2 - PRODUCTS**

**202.01 MATERIALS - GENERAL**

- A. As required to complete the restoration of existing improvements and shall be at least equal to original improvement at the time of damage or removal, as determined by the OWNER of said improvement, and shall match original construction in finish and dimension.
- B. Shall be in accordance with requirements of local jurisdiction having authority. Obtain approval of all materials from local jurisdiction having authority prior to ordering or delivering.

**202.02 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:

<u>Sieve Size</u>	<u>Percent Passing</u>
1"	100
2"	79-91
No. 4	49-61
No. 16	27-35
No. 200	7-11

**202.03 BITUMINOUS PRIME COAT**

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

**202.04 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 gradation to be used shall be as approved by local jurisdiction having authority.

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

<b>3/4-INCH GRADATION</b>	
<u>Sieve Size</u>	<u>Percent Passing</u>
3/4"	100
3/8"	75/91
No. 4	46-62
No. 50	11-23
No. 200	5-9

<b>2-INCH GRADATION</b>	
<u>Sieve Size</u>	<u>Percent Passing</u>
2"	100
No. 4	60-80
No. 16	28-42
No. 50	11-23
No. 200	5-9

**202.05 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: 3/4" to No.
  2. Maximum water/cement: 5.0 gallons/sack
  3. Minimum cement content: 6.5 sacks/cubic yard
  4. Required mix design compressive strength: 5210 psi
  5. Minimum 28-day compressive strength: 4,000 psi



## **SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**

### **202.06 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.

### **PART 3 - EXECUTION**

#### **303.01 PREPARATION**

- A. Obtain all permits necessary for the restoration of existing surface improvements.
- B. Protect all public and private property adjacent to the WORK. Exercise due caution to avoid damage to such property.

#### **303.02 GENERAL RESTORATION REQUIREMENTS**

- A. All improvements damaged or removed shall be restored in accordance with local jurisdiction having authority. In case of conflict between these specifications and local authority specifications, the local authority shall govern.
- B. Repair or replace all existing surface improvements, which were damaged or removed as a result of operations of WORK under this contract. Restoration shall be of at least equal quality and identical in dimension to original improvement unless specifically specified otherwise.

#### **303.03 ASPHALTIC CONCRETE SURFACED AREAS**

- A. 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**

- B. 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 96 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.
- C. Thickness of base course shall be eight inches minimum and surface course shall be three inches minimum.
- D. 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.
- E. 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.

## **SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**

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 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.

### **F. 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 2 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

## **SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**

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.
- G. Mixing, placing, spreading and compaction of bituminous surface course shall conform to applicable parts of Section 402 of the State of Utah Standard Specifications for Road and Bridge Construction, excluding pay factor allowances.

### **303.04 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 doveled 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.

## **SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**

### **303.05 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.

### **303.06 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:
1. Culverts
  2. Canals and Canal Structures
  3. Bridges and Bridge Abutments
  4. Fences

### **303.07 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, 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

## **SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**

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:**

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.

## **SECTION 02590 - PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**

### **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.

### **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.

## **303.08 NOTIFICATION BY THE CONTRACTOR**

- A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipeline; all buried electric power, communications or television cables; all traffic signal and street lighting facilities; and all roadway and state highway right-of-way the Contractor shall notify the respective authorities representing the OWNERS or agencies responsible for such facilities not less than three working days nor more than five working days prior to excavation so that a representative of said OWNERS or agencies can be present during such work if they so desire.

**- END OF SECTION -**

## **SECTION 09900 - PAINTING AND FINISHES**

### **PART 1 - GENERAL**

#### **101.01 DESCRIPTION**

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

#### **101.02 REFERENCES AND STANDARDS**

- A. Work covered by this specification shall meet or exceed the provisions of the latest editions of the following codes and standards in effect at the time of award of the contract:
  - 1. OSHA Occupation Safety and Health Act: State of Utah and Federal

#### **101.03 SUBMITTALS**

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

### **PART 2 - PRODUCTS**

#### **201.01 PAINT, SEALERS AND SURFACE FINISH MATERIALS**

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

### **PART 3 - EXECUTION**

#### **301.01 SURFACE PREPARATION**

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

#### **301.02 APPLICATION**

- A. Exposed metal piping, fittings and valves shall be painted in accordance with the manufacturer's recommendation.



## **SECTION 09900 - PAINTING AND FINISHES**

### **1. Priming**

- a) Minimum drying time: 16 hours at 70°F or 30 hours at 50°F.
- b) Thickness: 7.0 mils wet and 5.0 mils after drying.

### **2. Topcoat**

- a) Minimum drying time: 20 hours at 70°F or 40 hours at 50°F.
- b) Thickness: 7.0 mils wet and 5.0 mils after drying.
- c) Final Thickness: 10 mils minimum.

- 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.

**- END OF SECTION -**

## SECTION 15061 - STEEL PIPING, FABRICATED SPECIALS

### PART 1 - GENERAL

#### 101.01 THE REQUIREMENT

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

#### 101.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

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

1. Commercial Standards:

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

#### 101.03 CONTRACTOR SUBMITTALS

- A. Shop Drawings
1. The Contractor shall submit shop drawings and laying diagrams of all pipe, joints, bends, reducers, wyes, tees crosses, outlets, manifolds, and other steel plate specials in accordance with the requirements in Section entitled Contractor Submittals, 01300.
- B. Design calculations shall be submitted to the Engineer for review prior to manufacture of pipe specials.
- C. Certifications
1. A certified affidavit of compliance shall be furnished for all steel plate specials and other products or materials furnished under this section of the specifications.

## SECTION 15061 - STEEL PIPING, FABRICATED SPECIALS

### 101.04 QUALITY ASSURANCE

- A. Shop Testing of Steel Plate Specials
1. Upon completion of the welding, but prior to lining and coating, each steel plate special shall be bulkheaded and tested under a hydrostatic pressure of 1 2 times the design pressure; provided, that if straight pipe used in fabricating the specials has been previously tested and meets the requirements of the applicable piping Section, no further hydrostatic testing will be required; or provided, that all other welded seams are tested by the liquid penetrant inspection procedure conforming to ASTM 3 165, under Method B and Leak Testing or where applicable by the soap and compressed air method at an air pressure of 25 psi. Any pin holes or porous welds which may be revealed by the test shall be chipped out and rewelded and the pipe or fitting retested.
- B. Not outside mortar shall be applied over a seam prior to testing; however, mortar lining may be applied over a seam prior to hydrostatic testing, but under such conditions said pressure test shall be held on the pipe or fitting for a period of not less than 30 minutes.

## **PART 2 - PRODUCTS**

### **201.01 GENERAL**

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

### **201.02 DESIGN**

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

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

where T = Plate thickness in inches

D = Outside diameter of steel cylinder in inches

P<sub>w</sub> = Design working pressure = 115 psi

## SECTION 15061 - STEEL PIPING, FABRICATED SPECIALS

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

$Y =$  Yield point of steel in psi

$S_w =$  Safety factor of 2.5 at design working pressure

$S_t =$  Safety factor of 1.875 at design transient pressure

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

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

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

### 201.04 FABRICATION AND MATERIALS

A. General

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

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

## SECTION 15061 - STEEL PIPING, FABRICATED SPECIALS

- C. Access manholes with covers shall be as detailed on the Drawings. All threaded outlets shall be forged steel suitable for 3000 psi service, Vogt or equal.
- D. Moderate deflections and long radius curves may be made by means of beveled joint rings, by pulling standard joints, by using short lengths of pipe, or a combinations of these methods; provided that pulled joints shall not be used in combination with bevels. The maximum total allowable angle for beveled joints shall be 5 degrees per pipe joint. The maximum allowable angle for recommendations or the angle which results from a 3/4-inch pull out from normal joint closure, whichever is less. All horizontal deflections or fabricated angles shall fall on the alignment. All vertical deflections shall fall on the alignment and at locations adjacent to underground obstructions, points of minimum earth cover, and pipeline outlets and structures, the pipe angle points shall meet the angle points shown on the Drawings.
- E. Outlets, Tees, Wyes, and Crosses
  - 1. Outlets 12-inch and smaller may be fabricated from Schedule 30 or heavier steel pipe in the standard outside diameters, i.e., 12-3/4 inch, 10-3/4 inch, 8-5/8 inch, 6-5/8 inch, and 4-1/2 inch.
- F. The design of outlet reinforcement shall be in accordance with the procedures given in Chapter 13 of AWWA Manual M-11, except that the design pressure P, used in the M-11 procedure shall equal the greater of  $1.25 P_w$  or  $0.9375 P_t$ . Unless otherwise shown on the Drawings, outlets 2 inches in diameter and smaller need not be reinforced.
- G. In lieu of saddle or wrapper reinforcement as proved by the design procedure in Manual M-11, pipe or specials with outlets may be fabricated in their entirety of steel plate having a thickness equal to the sum of the pipe wall plus the required reinforcement.
- H. Where required by the M-11 design procedure, crotch plate reinforcement shall be furnished.
- I. Steel Welding Fittings
  - 1. Steel welding fittings shall conform to ASTM A 234.
- J. Flanges
  - 1. Flanges shall conform to AWWA C207 Class D flange.
- K. Lining
  - 1. Fusion Bonded Epoxy Lining

## **SECTION 15061 - STEEL PIPING, FABRICATED SPECIALS**

- a. All interior fittings/specials shall be lined with a Polyamide Epoxy system, fusion bonded epoxy system, or cement mortar in accordance with AWWA C205.
- L. Coating
  - 1. All requirements pertaining to thickness, application and curing of coating specified for straight pipe shall apply to specials. Coating system shall be in accordance with Section 09900.
- M. A mark indicating the true vertical axis of the special shall be placed in the top and bottom of the special.

### **PART 3 - EXECUTION**

#### **301.01 GENERAL**

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

**- END OF SECTION -**

## **SECTION 15085 - PIPING SYSTEMS AND CONNECTIONS**

### **PART 1 - GENERAL**

#### **101.01 SECTION INCLUDES**

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

#### **101.02 REFERENCES**

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

<u>Reference</u>	<u>Title</u>
ANSI B1.1	Unified Inch Screw Threads (UN and UNR Thread Form)
ANSI B1.20.1	Pipe Threads, General Purpose (Inch)
ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250, and 800
ANSI B18.2.1	Square and Hex Bolts and Screws Inch Series including Hex Cap Screws and Lag Screws
ANSI B18.2.2	Square and Hex Nuts
ANSI/AWWA C110/A21.10	Ductile Iron and Gray Iron Fittings
ANSI/AWWA C104/A21.4	Cement Mortar Lining for Ductile Iron Pipe and Fittings
ANSI/AWWA C115/A21.15	Flanged Ductile Iron Pipe

### **PART 2 - PRODUCTS**

#### **201.01 FLANGED ASSEMBLIES**

##### **A. STEEL PIPE AND FITTINGS**

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

##### **B. GASKETS:**

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

## **SECTION 15085 - PIPING SYSTEMS AND CONNECTIONS**

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

### **C. BOLTS AND NUTS**

Flange assembly bolts shall be ANSI B18.2.1 standard square or hexagon head carbon steel machine bolts with ANSI B18.2.2 standard hot pressed hexagon nuts. Threads shall be ANSI B1.1, standard coarse thread series; bolts shall be Class 2A, nuts shall be Class 2B. Bolt length shall conform to ANSI B16.5. Bolts and nuts shall be cadmium plated.

### **201.02 GASKETS**

#### **A. Gaskets shall be as follows:**

1. EPDM: ethylene-propylene-diene-terpolymer.
2. Neoprene: neoprene.
3. Nitrile: nitrile (Buna-N)
4. Neoprene, C.I.I.: Neoprene with cloth inserts.
5. Neoprene, oil resistant: neoprene with oil-resisting characteristics.
6. TFE: noncreeping tetrafluoroethylenet (TFE) with insert filler.
7. Compressed gasketing consisting of organic fibers (kevlar), fillers and styrene butadiene rubber (SBR) binder.
8. TFE bonded EPDM: TFE bonded to EPDM in full-face gasket having concentric convex molded rings.

### **201.03 THREAD**

- #### **A. A pipe thread dimensions and size limits shall conform to ANSI B1.20.1.**

### **201.04 COATINGS**

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

**- END OF SECTION**



## SECTION 16111 - CONDUIT

### **PART 1 - GENERAL**

#### **101.01 SECTION INCLUDES**

- A. Metal conduit.
- B. Nonmetallic conduit.
- C. Fittings and conduit bodies.

#### **101.02 REFERENCES**

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- D. ANSI/NFPA 70 - National Electrical Code.
- E. NECA "Standard of Installation."
- F. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- G. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
- H. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

#### **101.03 DESIGN REQUIREMENTS**

- A. Conduit Size: ANSI/NFPA 70.

#### **101.04 REGULATORY REQUIREMENTS**

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

#### **101.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept conduit on site. Inspect for damage.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

## SECTION 16111 - CONDUIT

- C. Protect PVC conduit from sunlight.

### 101.06 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of conduit prior to rough-in.
- C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

## PART 2 - PRODUCTS

### 201.01 CONDUIT REQUIREMENTS

- A. Minimum Size: 2 inch unless otherwise specified.
- B. Underground Installations:
  - 1. Use nonmetallic conduit.
- C. Indoor Locations, exposed above grade:
  - 1. Use rigid steel conduit or nonmetallic conduit.

### 201.02 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.

### 201.03 NONMETALLIC CONDUIT

- A. Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

## PART 3 - EXECUTION

### 301.01 INSTALLATION

- A. Install conduit in accordance with NECA "Standard of Installation."
- B. Install nonmetallic conduit in accordance with manufacturer's instructions.
- C. Arrange supports to prevent misalignment during wiring installation.

## SECTION 16111 - CONDUIT

- D. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related conduits; support using conduit rack. Construct rack using steel channel.
- F. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach conduit to ceiling support wires.
- H. Arrange conduit to maintain headroom and present neat appearance.
- I. Route exposed conduit parallel and perpendicular to walls.
- J. Route conduit in and under slab from point-to-point.
- K. Do not cross conduits in slab.
- L. Maintain adequate clearance between conduit and piping.
- M. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- N. Bring conduit to shoulder of fittings; fasten securely.
- O. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- P. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations.
- Q. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender or factory elbows for bends in metal conduit larger than 2 inch size.
- R. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- S. Provide suitable fittings to accommodate expansion and deflection where conduit crosses expansion joints.
- T. Provide suitable pull string in each empty conduit except sleeves and nipples.

## **SECTION 16111 - CONDUIT**

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

### **301.02 INTERFACE WITH OTHER PRODUCTS**

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

**- END OF SECTION -**

## SECTION 16421 – INSULATING FLANGES

### **PART 1 - GENERAL**

#### **101.01 INSULATING FLANGE JOINTS**

- A. Complete assembly shall have an ANSI rating of 150 pounds, minimum, or equal to or higher than that of the joint and pipeline.
- B. Gasket materials shall be resistant to intended chemical exposure, operating temperatures, and pressures in the pipeline.
- C. Gaskets: Full-face Type E with O-ring seal.
- D. Insulating Sleeves: Full-length fiberglass reinforced epoxy (NEMA G 10 grade).
- E. Insulating Washers: Fiberglass reinforced epoxy (NEMA G 10 grade).
- F. Steel Washers: Plated, hot-rolled steel, 1/8 inch thick.
- G. Manufacturers:
  - 1. Pacific Seal, Inc., Burbank, CA.
  - 2. Central Plastics Co., Shawnee, OK.
  - 3. Approved Equal.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

- END OF SECTION -