**SECTION 4.6**

**CORROSION CONTROL TEST STATIONS**

**PART 1: GENERAL**

**1.1 Scope of Work**

Furnish all labor, materials, tools, and equipment required to install and test the required corrosion control test station components. The test station construction shall include but not be limited to, electrical connections to the pipelines and setting of test boxes.

 Specifications for test station wiring, terminal boxes, reference electrodes and electrical connections.

**PART 2: QUALITY ASSURANCE**

**2.1 Reference Standards**

Unless otherwise stated, the latest editions of the following documents are applicable for this specification:

|  |  |
| --- | --- |
| ASTM D1248 | Polyethylene Plastic Molding and Extrusion Material |
| NACE RP-0169 | Recommended Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems |
| AWWA M9 Manual | Concrete Pressure Pipe |
| UL 83 | Thermoplastic Insulated Wires |
| UL 486A | Wire Connectors for Use with Copper Conductors |

**2.2 Submittals**

Following submittals shall be provided by the contractor:

* + 1. Catalogue Cuts

Manufacturer's catalog cuts shall be submitted for each item. The catalog cuts shall include the manufacturer's name and shall provide sufficient information to show that the materials meet the requirements of the drawings and specifications. Where more than one item or catalog number appears on a catalog cut, clearly identify the item proposed.

* + 1. Drawings

As-built drawings of the corrosion control test stations shall be maintained by the Contractor during installation and construction. Drawings shall be revised to show exact locations of all wiring, connections, and terminal boxes. All items of equipment and material shall be properly identified. The original as-built drawings shall be submitted to Dallas Water Utilities or its designated representative.

**PART 3: PRODUCTS**

**3.1 Flush Mount Test Stations**

* Test stations shall consist of test wires, a terminal box and a traffic box as shown on the drawings.
* The terminal box shall be a five terminal Big Fink as manufactured by Cott Manufacturing Company or approved equal.
* The concrete traffic box shall be an 8.75-inch diameter I-RT with a cast iron cover marked "CP Test" as manufactured by Brooks Products, Inc or approved equal.

**3.2 Above-Grade Test Stations**

* At test station locations where flush mounted structures cannot be installed, an above-grade test station shall be used, and placed such that possible damage from vandalism, traffic, etc. is minimized.
* The test station shall be a five terminal Big Fink as manufactured by Cott Manufacturing or approved equal.
* Terminal boxes shall have a lockable, corrosion-proof plastic cover and shall be mounted on a 5-foot length of 3-inch diameter UV-resistant plastic conduit.
* The test station shall be installed adjacent to a permanent structure, if available, for physical protection.

* 1. **Test Station Lead Wires**
* Test station lead wires shall be No. 12 AWG, solid copper with white TW, THW or THHN insulation.
* All terminal boards shall be wired by the installer as shown on the drawings.
	1. **Thermite Weld Equipment**
* Charges and Molds- Weld charges and mold size shall be specified by the manufacturer for the specific surface configuration. Use only the correct charges for the specific application. Welding charges and molds shall be Erico, Cadweld or Continental Industries, Thermoweld.
* Weld Coating- Coating for all welds shall be Kop-Coat as manufactured by Carboline or approved equal. Cover coated weld with a plastic weld cap.

**PART 4: EXECUTION**

**4.1 Applications**

* Required applications of corrosion control test stations include locations where future testing is anticipated for the following reasons:
* Testing to determine the effectiveness of the installed cathodic protection systems and to allow for startup adjustments.
* Testing to determine interference effects from and on adjacent or crossing foreign underground structures.
* Testing to determine sources and magnitude of stray d-c currents and required mitigative measures.
* Periodic monitoring to determine status of existing cathodic protection systems, stray current, and foreign line influence.
* Install test stations at each of the locations scheduled on the drawings.

**4.2 General**

* Attach leads in manholes as shown on the drawings. If a flush mounted test station is not feasible in a particular location, then an above-grade test station may be used, subject to approval by Dallas Water Utilities or its designated representative.
* Use continuous test station lead wires without cuts or tears in the insulation.
* Attach test lead wires to the steel plate by thermite welding.
* Use color coded test wires as indicated on the drawings.
* Wire test station terminal board configurations as shown on the drawings.
	1. **Flush –Mount Test Stations**
* Install flush-mount test stations as shown on the drawings.
* Sufficient slack shall be coiled beneath the test station to allow for soil settlement and to prevent damage to the leads during backfilling. Additional slack shall be left to allow for withdrawal of the terminal board a minimum of 18 inches for test purposes.
* Set test stations installed outside areas of permanent paving materials in a Portland Cement concrete pad. The concrete pad shall be a minimum of 24 inches square and no less than 4 inches thick.
	1. **Above-Grade Test Stations**
* Install above-grade test stations where a flush mounted test station cannot be located. Use and location of above-grade test stations shall be approved by the Dallas Water Utilities or its designated representative.
* Locate test station adjacent to a permanent structure (e.g. a power pole), if available, for physical protection.
* Coil sufficient slack beneath the test station to allow for soil settlement and to prevent damage to the leads during backfilling.
* Set test stations in a Portland cement concrete anchor. The concrete anchor shall be a minimum of 12 inches in diameter and no less than 2 feet thick.
	1. **Test Lead Wire Attachment**
* Attach test leads to the pipe by thermite welding to a steel plate as shown on the drawings.
* The steel surface to which the wires are to be attached shall be clean and dry.
* The wires to be thermite welded to the pipe shall have approximately 1 inch of insulation removed from each end, exposing clean, oxide-free copper for welding.
* Using the proper size thermite weld mold as recommended by the manufacturer, place the wire between the graphite mold and the prepared metal surface. Use a copper sleeve crimped over the wire for all No. 12 AWG wires.
* Place the metal disk in the bottom of the mold.
* Pour the thermite weld charge into the mold. Squeeze the bottom of the cartridge to spread ignition powder over the charge.
* Close the mold cover and ignite the starting powder with a flint gun.
* After the exothermic reaction, remove the thermite weld mold and gently strike the weld with a hammer to remove the weld slag. Pull on the wire to assure a secure connection. If the weld is not secure or the wire breaks, repeat the procedure.
* If the weld is secure, coat all bare metal and weld metal with Kop-Coat. Cover the coated weld with a plastic weld cap.

**4.6 Post Installation Backfilling of Test Station-Lead Wires**

* Protect test station wires to prevent damage to the wire insulation and conductor integrity during backfilling.
* After completion of the test station installation, verify the connection by recording a pipe-to-soil potential.
* Replace any test wire found to have a high resistance connection.

**PART 5: METHOD OF MEASUREMENT AND PAYMENT**

Payment for Impressed Corrosion Control Test Station as specified in this section shall be incidental and inclusive in the applicable unit price bid item.

**\*\*END OF SECTION\*\***