

SECTION 15300 – TRACER WIRE FOR NONMETALLIC PIPE

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The CONTRACTOR shall furnish and install a conductive tracer wire with all buried plastic water mains, services and appurtenances in accordance with the Water Utilities Manual, standard specifications, and approved drawings.
- B. All materials and installation shall be in accordance with the standards and specifications of the Water Utilities Department.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. The Work of the following Sections applies to the Work of this Section. Work of other Sections of the Specification, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 01010, Summary of Work
 - 2. Section 01300, Record Drawings and Submittals
 - 3. City of Oceanside Water, Wastewater, Recycled Water and Design Construction Manual (Water Utilities Manual) Approved Materials List

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Uniform Mechanical Code
- B. Uniform Plumbing Code
- C. Uniform Fire Code
- D. Commercial Standards: All equipment, products, and their installation shall be in accordance with the following standards, as applicable, and as indicated in each Section:
 - 1. American Society for Testing and Materials (ASTM)
 - 2. American National Standards Institute (ANSI)
 - 3. American Society of Mechanical Engineers (ASME)
 - 4. American Water Works Association (AWWA)
 - 5. American Welding Society (AWS)
 - 6. American Iron and Steel Institute (AISI)
 - 7. National Fire Protection Association (NFPA)

SECTION 15300 – TRACER WIRE FOR NONMETALLIC PIPE

E. The following standards have been referenced in this Section:

ANSI B910/B190M	Standard Specifications for Annealed Copper-Clad Steel Wire
ANSI B170	Standard Specifications for Oxygen-Free Electrolytic Copper
ASTM D1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

1.4 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall submit manufacturer's data on materials furnished by the AGENCY in accordance with the requirements in the standard specifications, and as indicated in the individual sections.
- B. The CONTRACTOR shall submit information containing the following:
1. Manufacturer's product data.
 2. Manufacturer's installation instructions.
 3. Manufacturer's certification of compliance.

1.5 QUALITY ASSURANCE

- A. Inspection: All tracer wire shall be subject to inspection at the place of manufacture. Defective, damaged or unsound tracer wire will be rejected.
- B. Tests: Except where otherwise indicated, all materials used in the manufacture tracer wire shall be tested in accordance with the applicable specifications and standards. The CONTRACTOR shall perform all tests at no additional cost to the AGENCY. Copies of all test reports shall be submitted to the AGENCY.

1.6 MANUFACTURER'S SERVICE REPRESENTATIVE

- A. Where the assistance of a manufacturer's service representative is advisable in order to obtain proper wire placement and connections, the CONTRACTOR shall furnish such assistance at no additional cost to the AGENCY.

1.7 CLEANUP

- A. After completion of the work, all remaining tracer wire materials, and other scattered debris, shall be removed from the site by the CONTRACTOR.

SECTION 15300 – TRACER WIRE FOR NONMETALLIC PIPE

PART 2 – MATERIALS

2.1 GENERAL

- A. Open-Trench Installation: direct burial #12 AWG Solid (0.0808" diameter), steel core soft drawn tracer wire, 250# average tensile break load, 30 mil high molecular-high density polyethylene jacket complying with ASTM-D-1248, 30 volt rating.

Color shall be "blue" for domestic water (potable) pipelines, "green" for sewer pipelines and "purple" for raw and recycled water (non-potable) pipelines. Manufactured by Copperhead Industries part number 1230-SF, or approved equal.

- B. Directional Bore or Jacked Installation: direct burial #12 AWG Solid (0.0808" diameter), steel core hard drawn extra high strength horizontal directional drill tracer wire, 1150# average tensile break load, 45 mil high molecular-high density polyethylene jacket complying with ASTM-D-1248, 30 volt rating. Color shall be "blue" for domestic water (potable) pipelines, "green" for sewer pipelines and "purple" for raw and recycled water (non-potable) pipelines. Manufactured by Copperhead Industries part number 1245-EHS, or approved equal.

2.2 CONNECTORS

- A. Splices along the continuous run of tracer wire for repair of a wire break or replacement of failed segment of wire shall use 3M Brand DBR Direct Bury Splice Kit or approved equal. Approved alternatives must securely connect two or more wires, effectively moisture seal by means of a dielectric non-hardening silicone sealant, manufacturer approved for direct burial and rated for a minimum of 50V.
- B. Branch connections for laterals, turnouts, services and appurtenances shall use DryConn Direct Bury Lug Aqua, or approved equal. Approved alternatives must securely connect one or two wires to the main tracer wire without cutting the main tracer wire, effectively moisture seal by means of a dielectric non-hardening silicone sealant, manufacturer approved for direct burial and rated for a minimum of 50V.

2.3 GROUNDING

- A. Tracer wire shall be properly grounded at all dead ends and stubs. Grounding of tracer wire shall be achieved by use of a drive-in magnesium grounding anode rod with a minimum of 20 feet of #14 HDPE copper clad wire connected to anode (minimum weight of 1.0 pound) specifically manufactured for this purpose and buried at the same elevation as the utility. The grounding rod shall be Copperhead 1 Lb., Drive-In Magnesium anode (Part #ANO-1005 with Part #SCB-01SR Connector), or equal.

SECTION 15300 – TRACER WIRE FOR NONMETALLIC PIPE

PART 3 - EXECUTION

3.1 GENERAL

- A. Tracer wire shall be installed on all plastic pipes, laterals, services and appurtenances. The wire shall be installed in such a manner as to be able to properly trace all pipelines and services without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.

3.2 INSTALLATION

- A. Tracer wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be secured to the pipe as required to insure that the wire remains adjacent to the pipe. The tracer wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all tracer wire access points.
- B. Except for approved spliced-in repair or replacement connections, tracer wire shall be continuous and without splices from each tracer wire access point.
- C. The tracer wire system shall be installed as a continuous single wire. No looping or coiling of wire is allowed.
- D. Prior to backfill, install tracer wire on top of pipe and secure in place with ties or hitches at maximum 10-foot intervals in accordance with the Water Utilities Manual. Run tracer wire continuously along pipe and terminate in access points. Only adjacent valve boxes are acceptable access points. Where buried splices occur, use an electrical splicing kit 3M Brand DBR Direct Bury Splice Kit, or AGENCY approved equal. Provide no less than 24 inches of coiled wire at access points for attachment of pipe locating equipment. Each installed run of pipe shall be capable of being located using the tracer wire. Protect wire insulation from damage during installation and backfilling. Wire insulation that is broken, cut, or damaged shall be replaced.
- E. At the point of connection between existing conductive pipes, the tracer wire shall not be connected to the iron pipe. This circumstance shall be treated as a mainline dead-end grounded using an approved waterproof connection to a grounding anode, buried at the same depth as the tracer wire. All such connection points shall be grounded.
- F. Where existing tracer wire is encountered on an existing utility that is being extended or tied into, the new and existing tracer wire shall be connected using approved splice connectors, shall be properly grounded at the splice location as specified, and shall be completely waterproof to prohibit corrosion and loss of conductivity.
- G. Tracer wire shall be laid flat and securely affixed to the pipe at the three o'clock position. The wire shall be protected from damage during the execution of the

SECTION 15300 – TRACER WIRE FOR NONMETALLIC PIPE

works. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted. At service saddles, the tracer wire shall not be allowed to be placed between the saddle and the main.

- H. At all main end caps, a minimum of 6 feet of tracer wire shall be extended beyond the end of the pipe, coiled and secured to the cap for future connections. The end of the tracer wire shall be spliced to the wire of a six pound zinc anode and is to be buried at the same elevations as the main. The tracer wire from the end cap shall be brought to a surface into test station box within the public right-of-way for future access.
- I. Access valve boxes shall be placed within two feet of fire hydrants when fire hydrants are available or at 600 feet or less on center. Where no fire hydrants are available, a two inch diameter hot-dipped galvanized marker post shall be placed within two feet of the valve box. The marker post shall be set in concrete 24-inches deep into the ground and 36-inches exposed and painted. The marker post shall be filled with concrete and crowned on top prior to painting. Two feet of tracer wire shall be looped in access valve box.
- J. If the pipeline requiring tracer wire is over eight (8) feet deep, special circumstances exist and the installation method must be submitted to the AGENCY for approval.
- K. Provide as-built stations and offsets from the main line for all tracer wire valve box locations.

3.3 BRANCHED CONNECTION

- A. Connections between the main line tracer wire and branch connection tracer wire shall only be allowed at services, ARVs, blowoffs, irrigation turnouts and laterals.
- B. The branch connection tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. DryConn Direct Bury Lug Aqua water tight connectors, or approved equal, shall be used to provide electrical continuity.

3.4 DIRECTIONAL BORING

- A. For directional boring installations, two #12 tracer wires, listed above, shall be installed with the pipe and connected to the tracer wire at both ends, or cad welded to the existing iron pipe at both ends.
- B. The two tracer wires shall be laid flat and securely affixed to the top and three o'clock side of the pipeline at five foot (5') intervals to insure its placement during the boring operation.

3.5 TESTING REQUIREMENTS

- A. After all of the trench backfill operations are successfully completed, and prior to the final paving, the CONTRACTOR shall perform continuity and trace tests on

SECTION 15300 – TRACER WIRE FOR NONMETALLIC PIPE

all tracer wire in the presence of the AGENCY. If the tracer wire is found to be not continuous after testing, the CONTRACTOR shall repair or replace the failed segment of the wire. The CONTRACTOR shall be responsible for all costs to confirm, locate, and repair any breaks in the tracer wire identified in the continuity test. In addition, the CONTRACTOR shall reimburse the AGENCY for all costs incurred by the AGENCY in relation to retesting the tracer wire continuity including, but not limited to, inspection and observation. The CONTRACTOR is advised to

use care in the installation and backfilling operations to prevent damage to the wire. The CONTRACTOR shall notify the AGENCY a minimum of two (2) working days in writing prior to installation of paving over the pipelines.

3.6 REPAIR AND RESTORATION

- A. At all repair locations where there is existing tracer wire, the tracer wire shall be properly reconnected and spliced as outlined above.

****END OF SECTION****