

Item No. 512
Conductive Trace Wire for Non-Metallic Pipe Installation

512.1 Description

Install electrically continuous trace wire with access points as described herein to be used for locating non-metallic pipe with an electronic pipe locator after installation.

512.2 Materials**A. Trace Wire**

Trace wire for direct bury applications shall be twelve (12) gauge minimum solid copper or high-strength copper-clad steel (HS-CCS) with HDPE or HMWPE insulation recommended for direct burial.

Trace wire for trenchless applications shall be twelve (12) gauge minimum extra-high-strength copper-clad steel (EHS-CCS) with HDPE or HMWPE insulation recommended for direct burial.

Trace wire for all applications shall have insulation color per the APWA Uniform Color Code for the specific utility being marked.

B. Wire Connectors

Wire connectors must be watertight, provide electrical continuity, and be filled with dielectric moisture resistant grease. Connectors shall be 3M Direct Bury Splice Kits, Copperhead Snakebite Locking Connectors, or approved equal.

C. Access Points

Access Points shall meet the requirements of NBU SPL 18.1.0.

512.3 Construction Methods

Tracer wire shall be installed on all non-metallic water mains and force mains. The wire shall be installed in such a manner as to be able to properly trace all water mains or force mains without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.

Tracer wire shall be installed in the same trench and inside bored holes and casing with non-metallic pipe during pipe installation. It shall be secured to the pipe as required to ensure that the wire remains adjacent to the pipe. The trace 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 tracer wire access points installed per NBU standard details. Sections of wire shall be spliced together using approved splice caps and waterproof seals. Twisting the wires together is not acceptable. No bare tracer wire shall be accepted. Detection tape shall not be used in lieu of tracer wire.

A. Wastewater – Force Mains

For access points along force mains, tracer wire access points shall be placed at intervals of no greater than 500 feet including one at the pump station and one at the discharge point.

B. Water

Tracer wire access points are to be placed at intervals no greater than 600' and adjacent to isolation valves or fire hydrants.

C. Pipe Application

At the point of connection between cast or ductile iron water mains, with any non-iron water main, the tracer wire shall be properly connected to the iron pipe with a cad weld or approved equivalent. Tracer wire welds shall be completely sealed with the use of an approved mastic type sealer specifically manufactured for underground use. Mastic shall be applied in a thick coat a minimum of 2 inches thick and shall be protected from contamination by the backfill material with the use of a plastic membrane.

Tracer wire shall be laid flat and securely affixed to the top of the pipe at 10-foot intervals. The wire shall be protected from damage during the execution of the works. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted. At water service saddles, the tracer wire shall not be allowed to be placed between the saddle and the water main.

The tracer wire will be allowed some slack to allow for bends in laying and for future installation of joints, splices, tapping saddles, etc. The slack should also be sufficient to allow for small earth movements occurring in compacting trench fill or through natural subsidence.

At all water main end caps, a minimum, of 6 feet of tracer wire shall be extended beyond the end of the pipe, coiled and secured 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 water main.

D. Boring

For directional drilling, auguring or boring installations, four #12 tracer wires 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.

E. Splicing

Except for approved spliced-in connections, tracer wire shall be continuous and without splices from valve chamber to valve chamber.

Spliced connections between the main line tracer wire and branch connection tracer wire shall only be allowed at water main tees, crosses or at water services where a portion of the branch connection water main or water service is replaced with a non-iron or non-copper material. The branch connection tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. Where the existing branch connection is neither iron nor copper, then the new branch connection tracer wire shall be properly spliced to the existing tracer wire on the branch connection.

When tying new construction to old construction, tracer wire will not be terminated to or on another tracer wire or metallic utility line unless the two systems are demonstrably compatible. This is to reduce the potential for rapid corrosion of one system due to a 'reverse' cathodic effect.

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

512.4 Testing Requirements

Contractor shall perform a continuity test on all trace wire in the presence of the Engineer or the Engineers' representative.

- A. All tracer wire for new utility installations will be tested before acceptance. The test will take the following form:
 1. A standard 5-watt generator will be used to provide an AC current on the wire.
 2. The frequency of the signal from the generator will be initially restricted to 33 kHz or less.
 3. A standard handheld detector will be used to trace the signal.
- B. The installed tracer wire will be deemed to pass the test if using this set up:
 1. The tracer wire is accessible at all access points.
 2. The tracer wire can be traced from access point to access point.
 3. Widely spaced access points can be traced out in the worst case from each 'end' to a common meeting point between them.
 4. Depth readings are consistent and accurate to within 15 to 1 depth to diameter ratio.
- C. If the trace wire is found to be not continuous after testing, Contractor shall repair or replace the failed segment of the wire.

512.5 Measurement and Payment

There is no separate payment for the supply and installation of tracer wire on any construction or installation of non-metallic water main or force main by the Contractor. The Contractor shall consider the supply and installation of the tracer wire incidental to all construction of non-metallic water main and force main.

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