SECTION 9100 TRACER WIRE PIPE DETECTION SYSTEM

9101 GENERAL. Install electrically continuous tracer wire with access points as described herein to be used for locating pipe with an electronic pipe locator after installation. Tracer wire shall be installed on all plastic water mains and services and sanitary sewer mains and services.

Tracer wire system and detection marking tape shall be included in the unit price bid for the installation of the pipe. Submit shop drawings and manufacturer's literature to the Engineer for approval in accordance with this Section.

9102 MATERIALS.

A. Tracer Wire. Tracer wire shall be a minimum 12 gauge solid copper with thermoplastic insulation recommended for direct burial on top of plastic pipe and connected to valve boxes and existing iron piping as shown on the Standard Drawing.

B. Detection Marking Tape. Detection marking tape shall be solid aluminum foil core tape completely encased in polyethylene jacket, 5.5 mils thick minimum, 6 inches (15cm) wide; Allen Systems, Inc. “Detectatape” or Reef Industries, Inc. “Terra Tape D” or approved equal.

   For water lines, the detection marking tape shall be blue in color and have “Buried Water Line Below” printed on the tape at 20 to 30 inch (50 to 75 cm) intervals. For sanitary sewer lines, the detection marking tape shall be green in color and have “Buried Sanitary Sewer Line Below” printed on the tape at 20 to 30 inch (50 to 75 cm) intervals. The detection and marking tape shall be installed directly above the centerline of the pipe and 18 to 24 inches (45 to 60 cm) below finish grade.

C. Connectors. All mainline trace wires must be interconnected in intersections, at mainline tees and mainline crosses. At tees, the three wires shall be joined using a single 3-way lockable connector. At Crosses, the four wires shall be joined using a 4-way connector. Use of two 3-way connectors with a short jumper wire between them is an acceptable alternative.

   Direct bury wire connectors – shall include 3-way lockable connectors and mainline to lateral lug connectors specifically manufactured for use in underground trace wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion, and shall be installed in a manner so as to prevent any uninsulated wire exposure.

   Non locking friction fit, twist on or taped connectors are prohibited.

D. Termination. All trace wire termination points must utilize an approved trace wire access box (above ground access box or grade level/in-ground access box as applicable), specifically manufactured for this purpose. Test stations shall be

Handley Industries (T2PS3B) 2 inch test stations or approved equal. Lids shall be cast iron and color coded blue for water, or green for sanitary sewer.

Service Laterals on public property - Trace wire must terminate at an approved grade level/in- ground trace wire access box, located at the edge of the road right-of-way, and out of the roadway.

All grade level/in-ground access boxes shall be 15 inch ABS plastic boxes with flanged top. Terminals shall be solid brass. Lids shall be cast iron and appropriately identified with "sewer" or "water" cast into the cap and be color coded blue for water, or green for sanitary sewer. A minimum of 2 ft. of excess/slack wire is required in all trace wire access boxes after meeting final elevation.

All trace wire access boxes must include a manually interruptible conductive/connective link between the terminal(s) for the trace wire connection and the terminal for the grounding anode wire connection. Grounding anode wire shall be connected to the identified (or bottom) terminal on all access boxes.

9103 INSTALLATION. Tracer wire shall be installed on all plastic water mains, and on sanitary sewer service lines within the public right-of-way. The wire shall be installed in such a manner as to properly trace the pipe without loss or detection of signal or without the transmitted signal migrating off the tracer wire.

A. Sanitary Sewer System:

1. Trace wire installed on all sanitary service laterals within the public right-of-way must terminate at an approved trace wire access box color coded green and located directly above the service lateral adjacent to the two-way cleanout at the edge of road right-of-way per detail D30-6.
2. Trace wire will be required to be installed on the private sanitary sewer service line only, within public right-of-way only, from the mainline sanitary sewer main to the edge of the roadway right-of-way.
3. Trace wire will not be required to be installed on the public mainline sanitary sewer main.

B. Water System:

1. A mainline trace wire must be installed, with all service lateral trace wires properly connected to the mainline trace wire, to ensure full tracing/locating capabilities from a single connection point.
2. Lay mainline trace wire continuously, by-passing around the outside of valves and fittings on the North or East side.
3. Trace wire on all water service laterals must terminate at an approved trace wire access box color coded blue and located directly above the service lateral at the edge of road right of way.
4. Above-ground tracer wire access boxes will be installed at all fire hydrant valves.

5. All conductive and non-conductive service lines shall include tracer wire.

C. Trace 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 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 all trace wire access points.

D. Trace wire access points shall in general be no more than five-hundred (500) feet and at every proposed 24" x 24" x 6" concrete valve box collar. Concentrations of multiple proposed valves near pipe intersections, i.e. tees or crosses, may require more than one access point assembly in each concrete valve box collar. Trace wire access points shall be within public right-of-way or public utility easements.

E. 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.

F. Tracer wire shall be laid flat and securely affixed to the pipe at 10 foot intervals. The wire shall be protected from damage during the execution of the work. 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.

G. Except for approved spliced-in connections, tracer wire shall be continuous and without splices from each trace wire access point. Where any approved spliced-in connections occur, 3M DBR water tight connectors, or approved equal, shall be used to provide electrical continuity.

H. 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.

I. 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.

J. Spliced connections between the main line tracer wire and branch connection tracer wire shall only be allowed at water main tees, crosses or at iron or copper 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.

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

9104 TESTING. All new trace wire installations shall be located using typical low frequency line tracing equipment, witnessed by the contractor, engineer and facility owner as applicable, prior to acceptance of ownership. This verification shall be performed upon completion of rough grading and again prior to final acceptance of the project. Continuity testing in lieu of actual line tracing shall not be accepted.