SECTION 073
SPECIFICATIONS – PIPELINE LOCATION MARKING SYSTEMS

Pipeline location marking systems shall be constructed by the Contractor to designate the location of underground pressurized sewer systems or where specified on project plans. Pipeline location marking systems include both interconnected systems of tracer boxes and tracer wires as well as surface pipeline markers.

1.0 Tracer Boxes and Tracer Wires

Tracer wire shall be constructed simultaneously with the pipe construction and in contact with the constructed pipe in accordance with the Project Plans, these Specifications and the recommendations of the tracer wire manufacturer.

Tracer boxes shall be constructed at locations shown on the Project Plans. Where specified, access to tracer wire shall also be provided within other structures such as vaults and manholes. Collectively, tracer boxes and other structures into which tracer wire is introduced for the purpose of providing access shall be referred to as protective structures.

When providing access to tracer wire through structures other than tracer boxes, tracer wire shall be constructed in constant contact with:

- the structure for the entire vertical length of the outer wall to the top of the flat-top component,
- the top of the flat-top component, and
- from the edge of the flat-top to the bottom of the sealant below the casting.

Wire shall be secured by means such as tape and its position maintained during backfilling operations.

Distances between protective structures shall not be greater than five hundred feet (500’). Tracer boxes shall be located near but not in direct contact with manholes at the termination locations of the constructed pipe(s). Where constructed near structures, tracer boxes shall not be in direct contact with the structures or castings.

Tracer boxes shall be constructed by vertically standing risers of six-inch (6”) PVC, SDR 26, pipe, on foundations of concrete blocks laid on shelves of undisturbed material that are offset, yet in proximity to, the constructed pipe. The elevations of the foundations of constructed tracer boxes shall be such that tracer wires are easily introduced into the bottom of the vertical PVC pipe. The vertical riser shall be constructed with the bell of the pipe turned downward. The spigot of the uppermost section of pipe shall be slid within the interior of a casting whose top is to be seen at the ground surface. Tracer box castings shall be the VB-294W as manufactured by Sigma Corporation.

At the location of a tracer box, tracer wires from both directions of the constructed pipe shall be bundled and brought through the concrete block foundations into the bottom of the vertical risers. The tracer wires shall remain coupled together throughout the vertical run through the riser.

Near the ground surface within protective structures the pair of tracer wires shall be connected using SnakeBite Corrosion Proof Wire Connectors, as manufactured by Copperhead Industries, LLC, or 3M Scotchcast Electrical Insulating Resin. Within the castings of structures other than tracer boxes, tracer wires shall be kept towards the outside of circumference of the casting and flat-top opening.

Within the vertical riser of tracer boxes, connected tracer wires shall be turned down to an elevation just

below the bottom elevation of the specified casting. To avoid being out-of-reach, the wires shall not be recessed more than one-foot (1') below the rim of the casting.

Tracer wires shall be tagged inside of protective structures so that users can easily discern which wire is coupled with the constructed pipe both upstream and downstream. The tracer wire that is coupled with the constructed pipe upstream of the protective structure shall be tagged by wrapping red electrical tape around the wire at a location near the split-bolt connector. The downstream wire shall be tagged with black electrical tape. For the purpose of this specification within the context of pressurized systems it shall be understood that "upstream" means that pipe that is closest to the pumping station.

Except where lengths of pipes constructed using HDD methods exceed five hundred feet (500'), constructed tracer wire shall extend from protective structure to protective structure without a splice or joining of disconnected wires between. Tracer boxes or other protective structures shall be located at the ends of all constructed tracer wire such that no joints between tracer wires are necessary to provide continuity between tracer boxes or other protective structures. Splicing of tracer wire will only be allowed where lengths of pipes constructed using HDD methods exceed five hundred feet (500') and only for the purpose of constructing intermediate tracer boxes. Where splicing is allowed, the constructed tracer wire shall be exposed and spliced to allow extensions to a tracer box constructed at or near the ground surface. Splicing of tracer wire shall be completed using appropriately-sized SnakeBite Corrosion Proof Wire Connectors, as manufactured by Copperhead Industries, LLC, or an equal approved prior to the receipt of proposals.

Regardless of pipe material, tracer wire shall be constructed with the pipe constructed using HDD methods. For tracer wire coupled with pipe constructed using HDD methods, the tracer wire shall be Copperhead SoloShot 845G-EHS-CCS HDPE 45 MIL as manufactured by Copperhead Industries, LLC, or an equal approved prior to the opening of proposals. For tracer wire coupled with pipe constructed using excavation methods, the tracer wire shall be Copperhead High Strength Tracer Wire 1030G-HS-CCS HDPE 30 MIL as manufactured by Copperhead Industries, LLC, or an equal approved prior to the opening of proposals. Insulation coloring shall be green for sewer.

Contractor shall provide a continuity test of the completed network to verify that a 3-watt tracer can trace the entire network from locator box to locator box without interruption. In the event of failure, contractor shall repair the system and retest until test passes.

2.0 Pipeline Location Markers

Systems of surface pipeline markers shall consist of marker posts constructed within unimproved surfaces, both above the locations of bends that change the horizontal trajectory of the pipeline and at intervals of no less than five hundred feet (500'). Where possible, pipeline location markers shall be constructed in proximity to the locations of tracer boxes.

Pipeline location markers shall be constructed using sixty-inch (60") TriView Marker Posts with soil anchors, both as manufactured by Rhino Marking and Protection Systems. The color of the posts shall be standard green; the color of the caps shall be standard black. Installation of the posts and anchors shall be in accordance with the directions of the manufacturers.

Decals shall be placed on each side of each post to warn of the presence of a sewer pipeline. Decals shall be either model GD8-1316K or model GD-1316K, both as manufactured by Rhino Marking and Protection

Systems, and installed in accordance with the directions of the manufacturer.

Where specified by GPSD, contractor shall install at-grade markers provided by GPSD.

END OF SECTION