TRACING WIRE GENERAL NOTES:

A tracing wire shall be installed on all potable water, reclaimed water, and sanitary sewer pipe. The wire shall be installed so that all pipe, including pipe branches, can be traced without loss of determination of signal or without the transmission of a false signal. A tracing wire may be discontinued by the presence of the city’s designated representative using a standard hand-held detector to trace the signal. If the tracing wire is found to be not continuous after testing, contractor shall repair or replace the failed segment of wire.

APPROVED TRACING WIRE MATERIALS:

- **WIRE FOR DIRECT BURY APPLICATIONS**: Tracing wire shall be #12 AWG high strength copper clad steel conductor (HSC-C). The wire shall be installed in the same trench with pipe, laying tracing wire flat and secured to the pipe at 5’ - 8’ intervals, generally the three o’clock position, to avoid damage during excavation. Metallic fasteners are not to be driven through the wire to secure it to the pipe. Install a tracing wire with two black coloring tapes on each of the installation of splices, splices, tapping saddles, etc. The slack should be sufficient to allow for small earth movements occurring during compaction, trench fill, or natural earth erosion. No breaks, or cuts in the tracing wire or wire insulation is permitted. At water service saddle, the wire shall not be allowed to be placed between the saddle and the main.

- **WIRE FOR DIRECTIONAL DRILL APPLICATIONS**: Tracing wire shall be #12 AWG extra high strength copper clad steel (ENG-C). Insulated wire shall be high density polyethylene (HDPE) jacket - high density polyethylene (HMW-HDPE), 30 VOLTS MAXIMUM, and approved for directional drill applications such as Soloshot™ manufactured by Copperhead Industries, LLC, or approved equal.

- **WIRE FOR PIPE BURSTING APPLICATIONS**: Tracing wire shall be multi-strand stainless steel tracing wire approved for pipe bursting applications such as Soloshot™ burst manufactured by Copperhead Industries, LLC or meeting the following minimum requirements:
  - **Wire**:
    - **Material**: 316 Stainless Steel Alloy, 49 Strands, Annealed
    - **Rating**: 30 Volts Maximum, 1,700 LB Break Load
    - **Thickness**: 0.125” overall diameter (dimensionally equivalent to #8 AWG)
  - **Insulating Jacket**:
    - 45 MIL High Molecular Weight - High Density Polyethylene (HMW-HDPE), 30 Volts Maximum

EXECUTION:

- **DIRECT BURY INSTALLATION**: Install in the same trench with pipe, laying tracing wire flat and securely affixed to the pipe at 5’ - 8’ intervals, generally the three o’clock position, to avoid damage during excavation. Metallic fasteners are not to be driven through the wire to secure it to the pipe. Install a tracing wire with two black coloring tapes on each of the installation of splices, splices, tapping saddles, etc. The slack should be sufficient to allow for small earth movements occurring during compaction, trench fill, or natural earth erosion. No breaks, or cuts in the tracing wire or wire insulation is permitted. At water service saddle, the wire shall not be allowed to be placed between the saddle and the main.

- **DIRECTIONAL DRILL OR PIPE BURSTING INSTALLATION**: Install inside the bored holes and casing with pipe during installation. Securely affix the tracing wire to the side of the pipe when boring or drilling and avoid kinking or tangling the wire during installation. A minimum of two tracing wires should be pulled with the pipe in case one of the two wires break.

- **ACCESS POINTS**: Tracing wire access points shall in general be no more than five-hundred (500) feet apart and at every proposed concrete valve box collar. Wire in valve boxes are vulnerable to being twisted around valve keys and snapped, access points shall be within public right-of-way or public utility easements.

- **TRACING WIRE IN A VAULT**: Tracing wire shall be brought up on the outside of the vault and placed inside the vault through a direct hole opposite any access steps. Coil enough wire to extend a minimum of 36’ above ground. Wire should not be placed where a person entering the vault could trip on the wire.

- **CONNECTIONS**: For approved splice-in connections, tracing wire shall be continuous and without splices from each access point. Approved splice-in connections are as follows:
  - **JOINING ENDS OF TRACING WIRE**: Connections into existing tracing wire, connections into tracing wire used during pipe bores, connections between one spool of tracing wire to another, and other similar connections shall be made using a direct bury nut. When connecting tracing wire ends together, strip 8” of insulation from the end of each wire. Insert the two ends firmly into the direct bury wire nut. Twist the wire nut clockwise while pushing the wires firmly into the nut. Do not overtighten. Tie the wires in a loose knot below the wire nut.
  - **JOINING TRACING WIRE - BRANCH TO MAIN**: Connections of tracing wire at tees, crosses, and at locations where the tracing wire will be brought to the surface shall be conducted using a direct bury lug.
  - **JACKET COLOR**: The APWA uniform color code shall be followed. (Blue - Potable Water; Purple - Reclaimed Water; Green - Sanitary Sewer)

- **REPAIRS**: At all repair locations where there is existing tracing wire, the wire shall be properly reconnected and spliced as outlined above. Electrical tape is not an acceptable repair since corrosion will eventually occur and the locate signal will be lost to ground at the connection.

UTILITY PIPE TRACING WIRE, LOCATION & MATERIALS

- **3” WIDE VINYL OR METALLIC CONTINUOUS WARNING TAPE**: Shall be installed on all mains, branches and service lines.

- **CONNECT WITH DIRECT BURY LUG**: Install the wire nut with some slack under the valve cover. The wire shall extend a minimum of 18” below the top of valve so that it can be easily pulled out of the way before operating the valve. On force main dead ends, long utility runs that exceed 500 feet, and other similar applications without a valve or meter box, wire shall be brought to the surface in a metal city-approved valve box for accessibility. Access points shall be within public right-of-way or public utility easements.

- **INSULATING JACKET**: 45 MIL, HIGH MOLECULAR WEIGHT - HIGH DENSITY POLYETHYLENE (HMW-HDPE), 30 VOLTS MAXIMUM

- **APPROVED SPLICE-IN CONNECTIONS**: Are as follows:
  - **DIRECT BURY LUGS**: Shall be dryconn™ manufactured by king innovation, dbv or der series manufactured by 3m™, manufactured by copperhead industries, llc or approved equal.

- **PUBLIC WORKS & UTILITIES ENGINEERING & DESIGN STANDARDS**

GU004-4

ISSUED 2017

REVISED 03/11/2017 by DJB