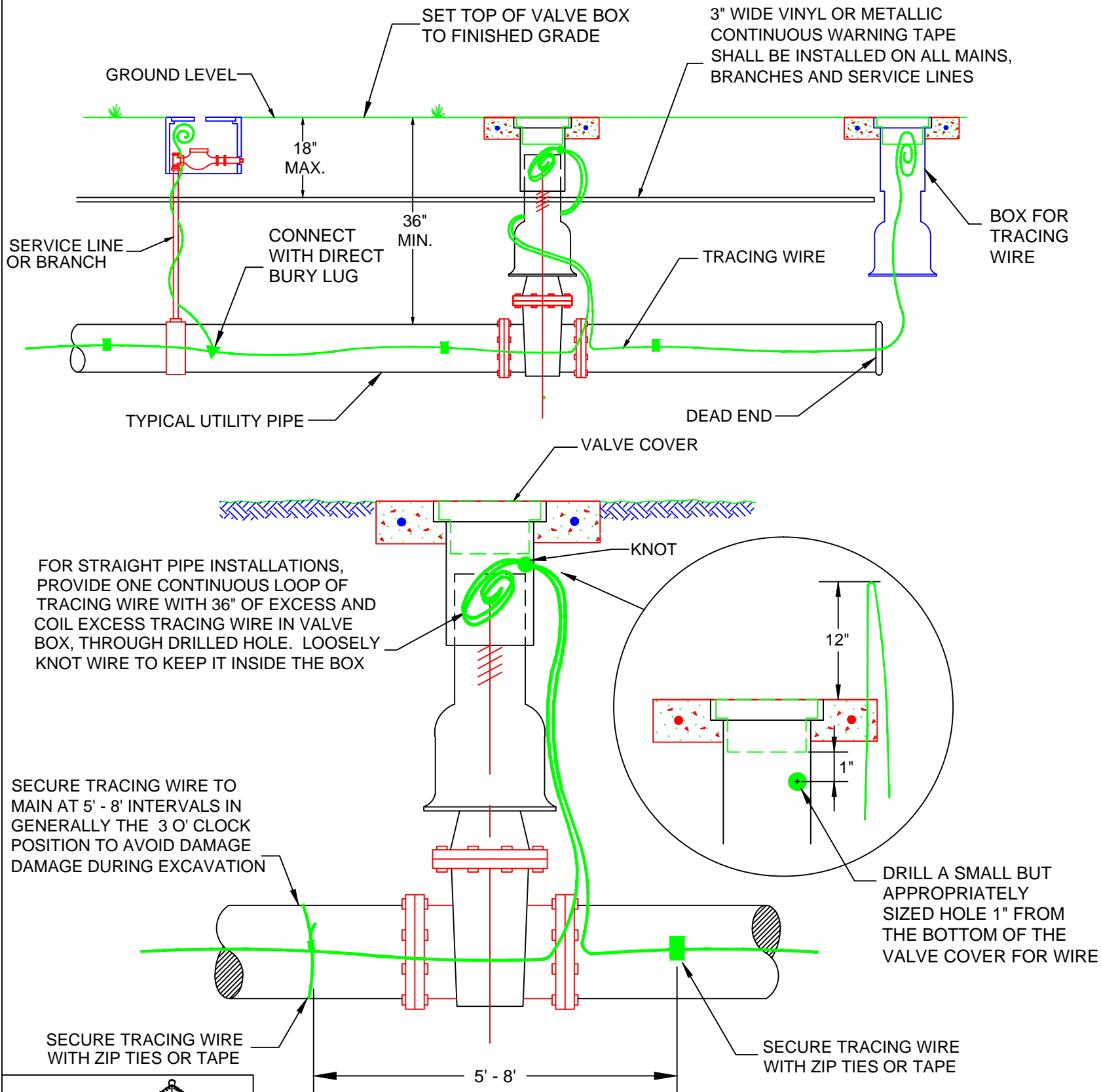


PUBLIC WORKS & UTILITIES ENGINEERING & DESIGN STANDARDS



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 OR DETERIORATION OF SIGNAL OR WITHOUT THE TRANSMITTED SIGNAL MIGRATING OFF THE WIRE. THE CONTRACTOR SHALL BE REQUIRED TO PERFORM A CONTINUITY TEST ON ALL TRACING WIRE IN 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 MATERIAL:
WIRE FOR DIRECT BURY APPLICATIONS: TRACING WIRE SHALL BE #12 AWG HIGH STRENGTH COPPER CLAD STEEL CONDUCTOR (HS-CCS), INSULATED WITH A 30 MIL, HIGH MOLECULAR WEIGHT - HIGH DENSITY POLYETHYLENE (HMW-HDPE) INSULATION, BREAK LOAD 380# MINIMUM, AND RATED FOR DIRECT BURIAL USE AT 30 VOLTS AS MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC, OR APPROVED EQUAL.

WIRE FOR DIRECTIONAL DRILL APPLICATIONS: TRACING WIRE SHALL BE #12 AWG EXTRA HIGH STRENGTH COPPER CLAD STEEL (EHS-CCS), INSULATED WITH A 45 MIL, HIGH MOLECULAR WEIGHT - HIGH DENSITY POLYETHYLENE (HMW-HDPE) INSULATION, BREAK LOAD 1150# MINIMUM, 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 VOLT MAXIMUM

DIRECT BURY WIRE NUTS: SHALL BE DRYCONN™ MANUFACTURED BY KING INNOVATION, DBY OR DBR SERIES MANUFACTURED BY 3M™, SNAKEBITE™ MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC, OR APPROVED EQUAL.

DIRECT BURY LUGS: SHALL BE DRYCONN™ MANUFACTURED BY KING INNOVATION, OR APPROVED EQUAL.

EXECUTION:
DIRECT BURY INSTALLATION: INSTALL IN THE SAME TRENCH WITH PIPE, LAYING TRACING WIRE FLAT AND SECURELY AFFIXED TO THE PIPE AT 5 TO 8 FOOT INTERVALS IN GENERALLY THE THREE O-CLOCK POSITION TO AVOID DAMAGE DURING EXCAVATION. METALLIC FASTENERS ARE NOT TO BE USED. INSTALL WIRE WITH SOME SLACK TO ALLOW FOR BENDS IN LAYING AND FOR FUTURE INSTALLATION OF JOINTS, SPLICES, TAPPING SADDLES, ETC. THE SLACK SHOULD BE SUFFICIENT TO ALLOW FOR SMALL EARTH MOVEMENTS OCCURRING DURING COMPACTION, TRENCH FILL OR NATURAL SUBSIDENCE. NO BREAKS OR CUTS IN THE TRACING WIRE OR WIRE INSULATION IS PERMITTED. AT WATER SERVICE SADDLES, 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. ALWAYS ATTACH THE TRACING WIRE TO THE LEAD END OF THE PIPE WHEN BORING OR PLOWING 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, OR PUSHED TO THE BOTTOM OF THE VALVE BOX WHERE THEY ARE INACCESSIBLE TO THE LOCATOR. TO MITIGATE THESE PROBLEMS, WIRE SHALL ENTER THE VALVE BOX NEAR THE TOP WHERE IT CAN BE COILED JUST UNDER THE VALVE COVER. THE WIRE SHALL EXTEND A MINIMUM OF 12" ABOVE THE TOP OF VALVE SO THAT IT CAN BE EASILY PULLED OUT OF THE WAY BEFORE OPERATING THE VALVE. ON FORCE MAINS, DEAD END MAINS, 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.

TRACING WIRE IN A VAULT: TRACING WIRE SHALL BE BROUGHT UP ON THE OUTSIDE OF THE VAULT AND PLACED INSIDE THE VAULT THROUGH A GROUT 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: EXCEPT FOR APPROVED SPLICE-IN CONNECTIONS, TRACING WIRE SHALL BE CONTINUOUS AND WITHOUT SPLICES FROM EACH TRACING WIRE 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 5/8" 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 OVER TORQUE. 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