SECTION 33 05 26.23 - UTILITY IDENTIFICATION TRACER WIRE

PART I - GENERAL

1.1 SECTION INCLUDES

A. Tracer Wires
B. Tracer Wire Connectors
C. Terminal Boxes

1.2 RELATED DOCUMENTS

A. [Note to AE: Include applicable utility section references here.]
B. Drawing 33 05 26.23-01 - Tracer Wire Terminal Box (Fink Box)

1.3 REFERENCES

A. American Public Works Association – Uniform Color Code
B. ANSI Standard Z535 – Safety Colors
C. Applicable ASTM Standards
D. National Electric Code

1.4 COMPLIANCE

A. Products and execution shall be in compliance with all applicable codes and standards including those listed above in paragraph entitled 1.3 REFERENCES.
B. Installation shall be in compliance with Manufacturer’s recommendations and installation instructions.

PART 2 - PRODUCTS

2.1 TRACER WIRE

A. Tracer wire shall be #10 AWG solid copper conductor with 45 mil HDPE insulated jacket. Jacket color shall comply with ANSI Standard Z535 as reflected in the American Public Work Association Uniform Color Code.
B. Conductor shall be annealed copper (soft drawn). Conductor shall meet or exceed all applicable ASTM specifications including ASTM B3 - Standard Specification for Soft or Annealed Cooper Wire and ASTM B-170 Standard Specification for Oxygen-Free Electrolytic Copper. Conductor shall comply with all applicable requirements of the National Electrical Code.

2.2 TRACER WIRE CONNECTORS

A. Tracer wire connectors shall be lockable type specifically manufactured for use in underground tracer wire installations.
B. Connectors shall be dielectric silicon filled to seal out moisture and prevent corrosion.
C. Connectors shall be designed to receive 10 AWG tracer wire and shall be rated for 600 volts.
D. Non-locking, friction fit, twist-on or taped connectors are not acceptable. Twisting of copper wiring is not acceptable.

2.3 TERMINAL BOXES
A. Terminal box, or “fink box”, shall be flush mount type for installation at grade level. Terminal box shall be specifically manufactured for such application.
B. Terminal Box shall consist of tubular housing, terminal board and removable round lid.
C. Minimum dimensions shall be 5-1/2” diameter and 8” high. Base shall be sized to fit 4” schedule 40 PVC pipe.
D. Housing and terminal board material shall be high strength ABS or polycarbonate plastic. All materials of construction shall be impervious to chemicals typically used for snow and ice removal and pavement and hardscape maintenance.
E. Housing and lid shall be designed for service
   1. Turf and landscape areas
      a. Light duty housing with plastic lid
   2. Hardscape areas
      a. Heavy duty housing with cast iron or ductile iron lid
   3. Roadway, driveway and parking lot applications not allowed
F. Terminal board shall have nickel plated brass terminals. Number of terminals shall be as required for specific installation with four spare terminals, minimum.

PART 3 - EXECUTION
3.1 TRACER WIRE
A. Tracer wire shall be color coded to match utility. Colors utilized on the Urbana-Champaign Campus include red for electric; yellow for natural gas, compressed air and steam; green for storm and sanitary sewer; orange for communications; blue for potable water and purple for non-potable and chilled water.
B. Tracer wire shall be provided full length for all buried utilities including natural gas, steam, chilled water, compressed air, water, non-potable water and other utilities as indicated on Construction Documents.
C. Tracer wire shall be installed straight parallel to pipe. Tracer wire shall be installed in manner that prevents distortion of signal. Tracer wires shall not be crossed. Wires shall not be looped upon themselves. Multiple active wires shall not be installed in close proximity to one another.
D. Tracer wire shall be provided in conjunction with all methods of utility installation including open trench and directional drilling.
E. Open trench method
   1. Tracer wire shall be placed a minimum of 8 inches above buried natural gas piping and nonmetallic piping for any service. For other utility piping systems tracer wire shall be laid directly upon pipe and attached at 8-10 ft. intervals with non-conductive tape. Additional attachment shall be provided at offsets and fittings in piping system. Tracer wire shall be placed carefully and great care shall be exercised during backfilling operations to maintain physical integrity and position relative to piping.
2. Splices in tracer wire shall be kept to an absolute minimum. When splices are necessary they shall be made with tracer wire connectors as specified above. Other splicing methods not allowed.

F. Directional drilling method
1. Two tracer wires shall be provided with one wire as backup.
2. Tracer wires shall be pulled through bore hole in conjunction with utility pipe. Wires shall be located on opposite sides of utility pipe
3. Tracer wire splices are not allowed in drilled sections.

G. Tracer wires shall be interconnected at intersections of mainlines and branches utilizing single three-way connector at each point of connection.

H. At a minimum, a terminal box shall be provided at each building utility service entrance and shall be located above piping within 5 ft. of point of entry into building.

I. Terminal boxes shall be located no greater than 1,000 linear feet of developed pipe length apart.

J. Terminal boxes shall not be located in streets, drives, parking lots or other areas subject to vehicular traffic. Terminal boxes shall not be located in areas where access to box is impeded.

K. Terminal boxes shall be installed flush with finished grade and centered in grade level concrete pad. Concrete pad shall be 18" by 18" minimum and shall be 6" thick.

L. PVC pipe riser shall be firmly attached to bottom of terminal box housing and extended downward to an elevation approximately 12" above piping. Riser shall serve as a vertical conduit for guiding tracer wires into bottom of terminal box.

M. Care shall be taken to extend tracer wire from utility pipe to terminal box in an orderly manner as backfill is placed.

M. End of each tracer wire shall be properly landed on dedicated terminal within terminal box and securely tightened. 12-18" excess length shall be provided for each wire within box. Each terminal shall be clearly identified with permanent label. Where tracer wires for multiple utilities are terminated care shall be taken to ensure accuracy of identification at both ends.

N. Final testing of each tracer wire shall be performed after backfill is complete and terminal boxes have been permanently installed and wires terminated. Test shall be witnessed by AE and Owner. It may be advisable for Contractor to perform preliminary test(s) during utility installation prior to final backfill and restoration. Testing shall be accomplished using typical low frequency line tracing equipment. Continuity testing in lieu of actual line tracing is not acceptable.

END OF SECTION 33 05 26.23

This section of the U of I Facilities Standards establishes minimum requirements only. 
It should not be used as a complete specification.