

UNDERGROUND STEAM & CONDENSATE PIPING

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GENERAL:

Federal Government Guideline for Class A drainage, dryable and air testable (DDT) conduit piping.

Summary

Scope of this standard includes applicable references, materials of construction, design and installation features and acceptable manufacturers of underground piping used for steam and condensate return service required by the University of Delaware.

Submittals

- A. Submit piece mark shop drawings from manufacturer. Manufacturer shall design anchorage, hard expansion loops, pitch and penetrations.
- B. Submit piping lay-out of manhole detailing all main, branch and secondary trap piping for Owners review. Active valves require critical positioning such that they can be accessed by reach rods from grade through manhole top openings.

PRODUCTS:

Approved Manufacturers

Pre-insulated Piping: Rovanco, Perma-Pipe

Valving & Specials: See Building Steam and Condensate Piping CSI Section 15670

Design and Construction

- A. Underground steam and condensate piping are installed in separate casings. No steam and condensate will be installed in same casing.
- B. Steam piping shall be Class A, DDT schedule 40 and seamless, with high temperature foam glass insulation.
- C. Condensate return piping shall be foam insulated, plastic jacketed, and schedule 160.

- D. Jacket shall be PPE. Underground steam piping is Perma-Pipe or Rovanco prefabricated air testable and drainable conduit piping system. Steam casing pipe is galvanized steel (minimum 1/8") with waterproof covering. Steam carrier pipe is Sch.40, ERW (Electric Resistance Weld), plain end, black pipe. Condensate casing pipe is PVC sch.40, or galvanized steel (minimum 1/8") with water proof covering. Condensate carrier pipe is Schedule 120, A-106 seamless, plain end, weldable pre-insulated foam pipe system.
- E. All anchorage and thermal expansion by way of hard bends should be installed in the underground not in the manhole vault. All expansion of underground piping systems shall be hard by use of anchors, loops, oversized elbows, etc. located outside of manholes and buildings. Expansion, thrust, and general pipe movement will be engineered to permit safe operation of underground piping systems at pressures 45psig to 75psig inclusive (for 45psig system), and at pressures 125psig-140psig inclusive (for 125psig system).Thrust blocks do not rely on adjacent manhole walls or building walls for support.
- F. All steam piping shall be insulated with removable perlite blankets. Exclude condensate return, all valves and trap piping.
- G. Add dual link seals to close each piping penetration. Link seals are required. Wall sleeves and core-bored hole dimensions meet manufacturer's approved tolerances for link seal installation.
- H. The system will not be activated until building is closed up and there is temperature control in the building.
- I. Shop drawing submittal of each piping routing as well as hard expansion loop for Owner and Facilities review and approval.
- J. Manhole piping lay-out submittal including all main and secondary piping
- K. Underground holiday and pressure testing to be certified by the approved OEM representative by completing written verification that all required manufacturer's requirements were performed. Link seals are lined-up and secured (no pipe movement possible) before any concrete or slurry mixes are used during installation. Steam lines are installed level or with gradual fall (1/8"-1/4" per foot) to a manhole or building. Steam line runs do not have low spots where condensate can collect. Condensate lines can change elevation vertically without trapping points. All underground piping will be overlaid with durable, brightly colored marking tape designed for marking underground utilities.

EXECUTION:

- A. At a minimum, documented inspection of all field joints, thrust blocks, and hydrostatic testing of carrier and casing piping shall be performed by manufacturer's field support inspector.
- B. Extend vent of steam piping closure plate to top of manhole and ensure bottom drain is plugged.
- C. Major pipe formations should be built above ground and tested to the maximum possible extent vs. positioning in the trench first.
- D. Add trace wire to non-metallic pipe
- E. Do not run the chill water & steam in the same manhole or trench.

DO'S AND DON'TS:

DO'S: N/A

DON'TS: N/A

-- END OF SECTION --