

SECTION 33 11 00 WATER DISTRIBUTION AND TRANSMISSION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Water distribution and transmission system identification, valves, boxes, service connections and accessories.
- B. This section is applicable to potable and non-potable water pressure systems.

1.2 REFERENCES

- A. ACPA: American Concrete Pipe Association.
- B. Applicable water company requirements.
- C. AWWA C600: AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
- D. AWWA C605: AWWA Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
- E. AWWA C800: AWWA Standard for Underground Service Line Valves and Fittings.
- F. AWWA M11: AWWA Manual for Steel Pipe -Design and Installation.
- G. CDA: Copper Development Association.

1.3 PERFORMANCE REQUIREMENTS

- A. Depth of Cover:
 - 1. 48 inches minimum to top of pipe, service line, or as indicated in local building code. 72 inches maximum unless ENGINEER authorizes otherwise.
 - 2. If less cover, provide additional protection to withstand frost and external loads.
- B. Remove any section of pipe already placed that is found to be defective or damaged. Relay or replace without additional cost to OWNER.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions.
- B. Commissioning: Submit testing data indicated in Section 33 08 00.
- C. Record Documents: Submit documents, Section 01 78 39. Include details of underground structures, connections, thrust blocks and anchors. Show interface and spatial relationship between piping and adjacent structures.
- D. Operating and Maintenance: Submit data. Include maintenance data, parts lists, product data, and shop drawings.

1.5 SITE CONDITIONS

- A. Minimize neighborhood traffic interruptions. Barricade stockpiles.
- B. Secure acceptance of pipeline lateral tie-in work.
- C. Repair public and private facilities damaged by CONTRACTOR.

- D. Do not turn on or turn off any valve outside of the Work prior to securing ENGINEER's or water company's permission.

PART 2 PRODUCTS

2.1 PIPES AND FITTINGS

- A. Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, and capacities indicated. Use only NSF approved products in drinking water systems. All such products shall be appropriately stamped with the NSF logo.
- B. Where not indicated, provide proper selection as determined by installer and acceptable to ENGINEER to comply with installation requirements.
- C. Provide sizes and types of equipment connections for fittings of material that matches pipe material used in the piping system. Where more than one type of material or product Option is indicated, selection is installer's choice.
- D. Provide pipe fittings and accessories of same material and weight or class as pipe, with joining method indicated or recommended by manufacturer.

2.2 VALVES

- A. Section 33 12 16.

2.3 VALVE BOX

- A. Buried Valves In Traffic Areas: 2 piece, cast iron, screw adjustable sleeve, 5 -1/4 inch shaft, with a drop lid.
- B. Buried Valves in Non-traffic Areas: Slip type of height required for the installation.
- C. Markings: On cover of valve box, cast the appropriate utility lettering.

2.4 VALVE CHAMBER

- A. General: Refer to applicable design criteria requirements explained in Laws and Regulations.
- B. Basin: Class 4000 concrete floor and walls.
- C. Steps: Plastic, cast into sidewalls greater than 4 feet deep.
- D. Top: Flat slab class 4000 concrete.
- E. Frame and Cover: Scoriated asphalt coated, heavy duty ductile iron conforming to Section 05 56 00 with flat top design and appropriate utility lettering. Shape and size as indicated.

2.5 MORTAR, GROUT, AND CONCRETE

- A. Mortar: Cement.
- B. Grout: Cement, Section 03 61 00.
- C. Concrete:
 - 1. Cast-in-place: Class 4000, Section 03 30 04.
 - 2. Precast: Class 5000, Section 03 40 00.

2.6 TAPPING SADDLES

- A. Provide bronze alloy, ductile iron, or stainless steel saddles with stainless steel double straps.
- B. Provide tapping saddles that have a minimum rated working pressure of 300 psi, neoprene Buna N gaskets, and bronze tapered threads.

2.7 SERVICE CONNECTION

- A. Type K copper pipe; Section 33 05 03 with flare type 200 psi compression fittings in accordance with AWWA C800. If materials used in main line are non-copper, provide a plastic nipple to separate the metals.

2.8 ACCESSORIES

- A. Bolts, Nuts, Washers: Steel, Section 05 05 23.
- B. Anchorages: Provide anchorages for tees, wyes, crosses, plugs, caps, bends, valves, and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages.
- C. Corporation Stops: All bronze with tapered threads.
- D. Hydrant and Valve: Dry barrel, Section 33 12 19.
- E. Water Meter and Valve: Section 33 12 19.
- F. Grease: Non-oxide.
- G. Polyethylene Sheet: 8 mil thick.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify Trench Excavation is ready to receive work, and dimensions, and elevations are as indicated.
- B. Commencing installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Excavation, Section 31 23 16. Hand trim to required elevations. Correct over excavations.
- B. Remove stones or other hard matter that could damage pipe embedment or impede backfilling or compaction.
- C. Examine areas and conditions under which materials and products are to be installed. Do not proceed with system installation until unsatisfactory conditions have been corrected in manner acceptable to system installer.
- D. Clearly identify and promptly set aside defective or damaged pipe.
- E. Use pipe cutting tool acceptable to pipe manufacturer.

3.3 LOCATING POTABLE WATER PIPE

- A. Comply with Utah Drinking Water Act. As a minimum locate potable water pipe at least 18 inches vertical and 10 feet horizontal edge to edge between water and sewer lines. Place water lines above sewer line.
- B. Where potable water pipe crosses under gravity-flow sewer lines, fully encase the sewer pipe in concrete for a distance at least 10 feet each side of the crossing.
 - 1. Do not locate any joint in the water line within 36 inches of the crossing.

2. Encase water line if it is within 24 inches of a sewer force main or inverted siphon.
 3. Encase sewer main joints in concrete if joints are horizontally closer than 36 inches to the water line.
- C. Do not put potable water lines in the same Trench with sewer lines, storm drains or electric wires.

3.4 INSTALLATION -PIPE AND FITTING

- B. Steel Pipe: AWWA M11.
- C. Ductile Iron Pipe: AWWA C600.
- D. Copper Tube: CDA "Copper Tube Handbook".
- E. Polyethylene Pipe: For 3 inches and smaller pipe follow AWWA C901. Install all other sizes per manufacturer's installation instructions.
- F. Polyvinyl Chloride Pipe: AWWA C605.
- G. Concrete Pipe: ACPA "Concrete Pipe Handbook".
- H. Wedges: Install metal wedges on all metal pipe systems.

3.5 INSTALLATION – CONCRETE THRUST BLOCKS

- A. Do not make hydrostatic tests of Section 33 08 00 until thrust block concrete has cured for at least 5 days.
- B. Provide thrust blocks on all plugs, caps, tees, hydrants and vertical or horizontal bends.
- C. Provide stainless steel or epoxy coated steel tie rods and clamps or shackles to restrain thrust.
- D. Unless otherwise indicated or directed by ENGINEER, place the base and bearing sides of thrust blocking directly against undisturbed earth.
- E. Sides of thrust blocking not subject to thrust may be placed against forms. Place thrust blocking so the fitting joints will be accessible for repair.

3.6 INSTALLATION -VALVES AND VALVE BOXES

- A. Valves:
 1. Ensure all parts are in working order.
 2. Set location of valves outside of sidewalk limits, Driveway Approaches and other pedestrian or vehicular interference.
 3. Install plumb with stems pointing up.
 4. Grease all exposed bolts and nuts then apply polyethylene sheet and tape wrap.
- B. Valve Boxes:
 1. Set over valve nut so operator's key is plumb with clearance in valve box when opening and closing the valve.
 2. Adjust box to finish grade.
 3. Clean all dirt or foreign material out of box.

3.7 INSTALLATION – TAPS

- A. Apply for and pay for applicable permits from water company for the indicated size and location of tap to water main. Comply with all connection requirements of water company.

- B. Make all service taps with a tapping machine acceptable to the water company. Use teflon tape on all taps unless indicated otherwise.
- C. The minimum distance between taps is 24 inches, with a 5 degree stagger. Do not make service taps within 24 inches of the end of pipe. Install taps at 60 degrees from vertical, or authorized by ENGINEER.
- D. Service saddles are required on all taps except, 3/4 inch or 1" taps to new ductile iron pipe
- E. Grease all exposed bolts and nuts then apply polyethylene sheet and tape wrap.

3.8 INSTALLATION – SERVICE LINES

- A. Replacing Existing Water Service Line:
 - 1. Follow AWWA C800, Utah public drinking water regulations and Utah plumbing code requirements.
- B. Looping Existing Water Service:
 - 1. Minimum pipe diameter 3/4 inch.
 - 2. Pinching tools used to close and open service lines may be used only if allowed by ENGINEER. When service line pinches cannot be returned to previous shape or flow, remove and replace damaged portion of pipe.
 - 3. Soldered joints or connections not allowed.
 - 4. For copper to iron connections use a brass pack joint compression coupling with joint locking device.
 - 5. For copper-to-copper connections use a brass flare coupling.
 - 6. Follow details shown in the Drawings.
- C. Meter Box: Install meter boxes back of the curb, outside of sidewalks and Driveway Approaches and outside of other pedestrian and vehicular interference.

3.9 INSTALLATION – WATER MAIN LOOP (SYPHON)

- A. Existing water mains may not match standard size. Excavate to obtain actual pipe diameter and match size.
- B. Do not shutdown pipeline until couplings and fittings are on site. Coordinate shutdown with water company.
- C. Connections to steel or transite pipe requires transition couplings or sleeves with transition gaskets.
- D. Grease all exposed bolts and nuts then apply polyethylene sheet and tape wrap
- E. Provide thrust blocks except where joints are welded. Follow details shown on the Drawings.

3.10 DISINFECTION

- A. Section 33 13 00.
- B. After disinfection, legally dispose of disinfection water.

3.10 BACKFILLING

- A. Prior to Backfilling:

1. Secure ENGINEER's acceptance of brass wedge installations and concrete thrust block installations.
 2. For pressure pipe testing follow Section 33 08 00 requirements and for disinfection follow Section 33 13 00 requirements.
- B. Trenches: Section 33 05 20.

3.11 SURFACING RESTORATION

- A. Roadway Trenches and Patches.

END OF SECTION