

San Antonio Water System Standard Specifications for Construction

**ITEM NO. 823
Directional Boring For
Customer's Water Yard Pipe**

823.1 DESCRIPTION: This item shall govern the furnishing and installation of customer yard piping and casing by the method of directional boring as shown in the contract documents and as directed by the Engineer.

823.2 REFERENCED STANDARDS: Reference standards cited in this Specification Item No. 823 refer to the current reference standard published at the time of the latest revision date logged at the end of this Specification Item No. 823, unless a date is specifically cited.

1. San Antonio Water System (SAWS):
 - a. Specifications for Water and Sanitary Sewer Construction
 - b. SAWS Materials Specifications
2. City of San Antonio (COSA) Standard Specification for Construction
3. Texas Commission of Environmental Quality (TCEQ)
 - a. TCEQ 290 Rules and Regulations for Public Regulations for Public Water Systems
4. American Society of Civil Engineers (ASCE)
 - a. ASCE 108, ASCE Manuals and Reports on Engineering Practice No. 108, Pipeline Design for Installation by Horizontal Directional Drilling
 - b. ASCE 38, Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data
5. American Society for Testing and Materials (ASTM) International:
 - a. ASTM D 2657, Practice for Heat-Joining of Polyolefin Pipe and Fittings
 - b. ASTM D 3035, Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter
 - c. ASTM F 512, Standard Specification for Smooth-Wall Poly(Vinyl Chloride) (PVC) Casing and Fittings for Underground Installation
 - d. ASTM F 714, Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
 - e. ASTM F 1962, Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Casing Under Obstacles, Including River Crossings
 - f. ASTM F 2160, Standard Specification for Solid Wall High Density Polyethylene (HDPE) Casing Based on Controlled Outside Diameter (OD)
6. Institute of Electrical and Electronic Engineers (IEEE)
 - a. National Electrical Safety Code ASC C2
 - b. IEEE Guide for Installation of Cable Using the Guided Boring Method, Std 1333

823.3 SUBMITTALS: All submittals shall be in accordance with most recent version of SAWS's General Conditions requirements. Submit the following prior to performing any work.

1. Certifications:
 - a. Per General Conditions section 5.12.2 all Contractor submittals for all pipe and other products or materials furnished under this specification shall be

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- marked as reviewed and approved by Contractor for compliance with Contract Documents and the referenced standards.
- b. The Manufacturer shall provide ISO 9001 Certificate by a third party.
 - c. Submit written verification from the pipe Manufacturer demonstrating compliance with the production and delivery schedule of the pipe as indicated in the Contractor's schedule.
2. **Work Plan**
 - a. Prior to beginning work, the Contractor must submit to the Engineer a general work plan outlining the procedure and schedule to be used to execute the project.
 - b. Plan should document the thoughtful planning required to successfully complete the project
 3. Contractor shall submit Manufacturer's product data, installation recommendations, shop drawings, and certifications.
 4. **Shop Drawings:**
 - a. Catalog Data Sheets for all materials confirming pipe, fittings, and other materials conform to requirements of this specification.
 - b. Pipe Supplier Information. Submit company name, contact name, and contact number.
 5. A detailed plan of the bores.
 6. Pre and Post construction videos.

823.4 MATERIALS: The materials for customer yard piping installation and adjustment shall conform to the specifications contained within the latest revision of SAWS' Material Specification Item Nos. 15-01, "Copper Tubing,". 19-01 HPDE Tubing, and 15-40, "Brass Goods."

1. The polyvinyl chloride (PVC) casing shall be Schedule 80 or Certa T- Lock PVC, where applicable, and shall conform to the latest provision of ASTM D1785 or most applicable approved equal provision.
2. The fittings for the PVC pipe shall be Schedule 80 and shall be in accordance with the latest provision of ASTM D2467 or most applicable approved equal provision.

823.5 CONSTRUCTION:

1. Determination for Directional Boring Method: Directional boring method shall be used for installations of customer's "short yard piping" or "long yard piping" when open-cut method is not feasible. Refer to Item No. 822.3.1, "Designation of Yard Piping."
2. Directional boring method should be used to avoid disruption to items such as, but not limited to, substantial landscaping, trees, driveways, retaining walls, privacy walls, structures, or sprinkler systems that cannot be economically be replaced, or as directed by the Inspector.
3. The yard piping shall be placed in 2 inch or 4 inch inside diameter (I.D.) PVC casing as appropriate when directed by the Inspector.
4. Designation of Yard Piping: Refer to Specification Item No. 822.
5. Materials: Refer to Specification Item No. 822.3.2.
6. Refer to Specification Item No. 822 for installation procedures for customer yard piping.

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7. **Installation:** Directional boring shall be completed with the use of a directional boring machine, as manufactured by “Ditch Witch”, “Vermeer,” or other approved equal capable of drilling a minimum of a 300 feet continuous bore.
 - a. The directional boring machine shall be supplied with an output signal inside the housing of the drill bit.
 - b. The output signal shall have a constant output signal to allow a person to track the location of the beacon at all times.
 - c. The drill bit shall be located a maximum of every 5 feet for exact location of the service line to be pulled in.
 - d. When bore is completed, contractor shall provide SAWS with a pilot of the bore path.
8. The drilling machine shall be set up at such a location to avoid disruption of private yard and landscaping.
9. The operator of the drilling unit shall check the bore path and position of boring pit at every five feet and make necessary correction to stay along the alignment.
10. The pilot hole shall not be greater than 4 inches in diameter, except when a 4inch PVC casing is installed.
11. The Contractor shall make necessary provisions to keep water and soil out of the installed yard piping.
12. The drilling machine shall be equipped with a drilling fluid compatible for the onsite conditions.
13. The fluid, such as bentonite, shall be used for lubricating the pipe during pull-back, forcing spoils out of the pipe pit, assisting in holding the hole open during pull back, and hardening into a clay substance around the outside of the casing, preventing settlement of the ground.
14. Adequate drilling fluids shall be used to avoid a “hydra-lock” condition.
15. The directional head shall be capable of accepting a variety of cutting bits for varied soil conditions.
16. Any damage to customer’s property, landscaping or trees caused by the Contractor’s activities of installing yard piping, shall be replaced to both the inspector’s and customer’s satisfaction, at no additional cost to SAWS.

823.6 MEASUREMENT: Directional Boring for Customer’s Yard Piping” will be measured by the linear foot of the various types and sizes of customer’s yard piping or casing installed.

823.7 PAYMENT: Payment for “Directional Boring for Customer’s Yard Piping” will be made at the unit bid price bid per for "Short yard piping" or "Long yard piping."

1. Payment for customer yard piping shall be made under item “Yard piping directional bore method”.
2. When the yard piping is installed in casing it shall be paid under items 2 inch I.D. PVC casing – directional bore method, and “yard piping installed in casing”, or items 4 inch I.D. PVC casing – directional bore method” and yard piping installed in casing.
3. Such payment shall include: excavation, hauling and disposition of surplus material, approved backfill material, removal and replacement of Customer's lawn turf, permits, and any other surface vegetation/landscaping and surface structure encountered, yard piping, and brass fittings of necessary size to complete the tie at

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the Customer's point of connection, PRV, Customer Valve, and required appropriate sized boxes

End of Specification