ITEM NO. 823
DIRECTIONAL BORING FOR CUSTOMER'S YARD PIPE (WATER)

823.1 DESCRIPTION: This item shall govern the furnishing and installation of customer yard piping and conduit by the method of directional boring as shown on the plans and in conformity with this specification.

823.2 MATERIALS:

1. The materials for customer yard piping installation and adjustment shall conform to the specifications contained within the latest revision of SAWS' Material Specification, "Copper Tubing", Item No. 15-01 and "Brass Goods", Item 15-40.
2. The Polyvinyl Chloride (PVC) conduit shall be Schedule 80 or Certa T-Lock PVC where applicable and shall conform to ASTM D 1785. The fittings for the PVC pipe shall be Schedule 80 and shall be in accordance with ASTM D 2467.

823.3 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 SAWS; Standard Specification "Designation of Yard Piping", Item No. 822.3.1. Directional boring method should be used to avoid disruption to landscaping, trees, driveways, retaining walls, privacy walls, structures, or sprinkler systems that cannot be economically be replaced, or as directed by the Construction Inspector. The yard piping shall be placed in 2 inch or 4 inch Inside Diameter (I.D.) PVC conduit as appropriate when directed by the Construction Inspector.

2. Designation of Yard Piping: Refer to SAWS Standard Specification Item No. 822.3.1

3. Materials: Refer to SAWS' Standard Specification Item No. 822.3.2

4. Installation: Directional Boring Method machine as manufactured by "Ditch Witch" or "Vermeer" or equal, capable of drilling minimum of 300 feet continuous bore.

Refer to SAWS' Standard Specification Item No. 822.3.3 for installation procedures for customer yard piping.

Directional boring shall be completed with the use of a directional boring machine, as manufactured by "Ditch Witch", "Vermeer", or equal. The directional boring machine shall be supplied with an output signal inside the housing of the drill bit. The output signal shall have a constant output signal to allow a person to track the location of the beacon at all times. The drill bit shall be located a maximum of every 5 feet for exact location of the service line to be pulled in. When bore is completed, contractor shall provide SAWS with a pilot of the bore path.

The drilling machine shall be set up at such a location to avoid disruption of private yard and landscaping. 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. The pilot hole shall not be greater than 4 inches in diameter, except when a 4" PVC conduit is installed. The Contractor shall make necessary provisions to keep water and soil out of the installed yard piping.

The drilling machine shall be equipped with a drilling fluid compatible for the on-site conditions. 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 conduit, preventing settlement of the ground. Adequate drilling fluids shall be used to avoid a "hydra-lock" condition. The directional head shall be capable of accepting a variety of cutting bits for varied soil conditions.

Any damage to customer's property, landscaping or trees caused by Contractor's operation for installation of yard piping, shall be replaced to the customer's and SAWS satisfaction at no additional cost to SAWS.

Contractor shall take a video DVD recording of the customer's yard prior to commencing any work in the area. A DVD video shall be turned into SAWS before starting work.

823.4 **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 conduit installed.

823.5 **PAYMENT:** Payment for "Directional Boring for Customer's Yard Piping" will

be made at the unit price bid for each linear foot of customer's new yard piping or conduit installed. Payment for customer yard piping shall be made under item "Yard piping – directional bore method". When the yard piping is installed in conduit it shall be paid under items 2" Inner Diameter (I.D.) PVC conduit – directional bore method, and "yard piping installed in conduit", or items 4 inch I.D. PVC conduit – directional bore method" and yard piping installed in conduit

Such payment shall include excavation, hauling and disposition or surplus material, approved backfill material, removal and replacement of customer's lawn turf and whatever other surface vegetation and surface structure encountered, copper tubing, PVC conduit, and brass fittings or whatever size necessary to complete the tie at the customer's point of connection.