

SECTION S920 - WATER METER VAULT (3-INCH TO 10-INCH DOMESTIC METERS)

S920-1 DESCRIPTION

Work consists of the construction of a new water meter vault complete with all appurtenances as required in the Contract Documents and as directed by the Project Manager.

Work is to be in conformance with the requirements of Section S900 General Water Provisions.

S920-2 MATERIALS

S920-2.01 Hardware

All nuts and bolts located inside the vault shall be made of type 304 stainless steel.

S920-2.02 Vault

Vault shall be precast reinforced concrete in conformance with the requirements of ASTM Standard Specification for Underground Precast Concrete Utility Structures, Designation C 858, ACI 318 – Building Code Requirements for Structural Concrete and ASTM Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures, Designation C 857. Concrete shall have a minimum compressive strength of 4000 psi at 28 days. Vault shall be designed to support AASHTO HS-20-44 with 30% impact and equivalent soil pressure of 130 psf. Flotation forces must be considered, where applicable.

Joints between precast sections shall be provided with a round rubber gasket when assembled, shall be self centering and make a uniform watertight joint. A protective bituminous coating shall be provided on the exterior of the vault.

Opening in vault cover for manhole/hatch shall be appropriately sized and located to facilitate safe access and removal of meter and appurtenances.

Vault shall be furnished with a sump.

S920-2.03 Water Meter

Water meter shall be purchased in advance from the Water Bureau. Extended lead time may be required for delivery of large meters from the manufacturer.

S920-2.04 Manhole/Hatch

At the owner's option, vaults located in lawn areas not subject to vehicular traffic loads may be furnished with an aluminum access hatch with Type 316 stainless steel hardware, designed to support 300 psf minimum loading. Vaults located in sidewalks and pavement shall have either a heavy duty cast iron manhole frame and cover or an aluminum access hatch, designed for AASHTO HS-20 wheel loading, as approved by the Water Bureau.

Manhole frame and cover shall be heavy duty cast iron conforming to the type and model as indicated in the Contract Documents, or approved equivalent. Manhole cover shall have non-penetrating pick holes and a rubber gasket cemented into a machined groove on the underside of the water manhole cover. Word "WATER" shall be cast into the top of the cover. Vault manhole frame and cover and access hatches shall have a minimum clear opening of 30-inches. Minimum manhole/hatch clear opening dimensions vary depending on size and type of meter, Cast iron manholes with a clear opening of 42-inches and larger shall have a smaller removable offset lid cast into the cover.

S920-2.05 Fixed Ladder

Fixed ladder shall be hot dip galvanized and shall meet all OSHA requirements. Ladder shall be secured to the vault using stainless steel hardware. The distance between rungs shall not exceed 12-inches. The minimum clear length of rungs shall be 16-inches. A telescoping ladder safety post shall be furnished and securely attached to the top of the ladder. Safety post shall be steel with hot dip galvanized finish. Ladder shall be offset from wall to conform to OSHA requirements and facilitate entry through the access manhole/hatch.

S920-2.06 Water Pipe and Fittings

Water pipe, fittings, joints, joint restraints and hardware shall be in conformance with the requirements of Sections S900 General Water Provisions and S901 Water Main Pipe and Fittings.

Water pipe and fittings 3" and larger located within the vault shall be cement lined ductile iron with flanged joints except where sliding couplings are shown on the drawings. Thickness class of flanged pipe shall be Class 53 minimum. Adapter flanges are not permitted for use.

Water pipe and fittings located around the outside of the vault, up to and including the bypass and bypass tees, shall be cement lined ductile iron with polyethylene tube encasement. Thickness class of pipe outside of vault shall be Class 52 minimum. All exterior pipe and fitting joints shall be furnished with joint restraint devices and shall be electrically bonded in conformance with the requirements of Section S962 Joint Bond.

S920-2.07 Wall Penetration - Modular Seal

Modular seals shall be used for all pipe penetrations through vault walls to seal the annular space between the pipe and opening in the vault wall. The modular seal shall include a rubber sealing element, pressure plates and stainless steel hardware that is used to expand and secure the seal within the annular space.

S920-2.08 Strainer

Strainer sediment trap is required for all meters 3-inches and larger. Strainer shall be approved 150 psi maximum working pressure plate-type Bureau approved strainer. FM/UL Strainers are furnished as part of meter assembly for all Fire Series meter assemblies.

S920-2.09 Non-Shrink Grout

Grout shall be non-shrink type grout with a minimum compressive strength of 4,000 psi in 24 hours, and shall be in conformance with NYSDOT Section 701-05 Concrete Grouting Material.

S920-2.10 Damp-proofing

Exterior damp-proofing shall be bitumastic sealant.

S920-2.11 Crushed Stone

Crushed stone shall be size designation 1 in conformance with the requirements of NYSDOT Section 703-02 Coarse Aggregate.

S920-2.12 Locking Bleeder Valve Assembly

Locking bleeder valve assembly is required to satisfy OSHA "double block and bleed" requirements. Assembly shall consist of a tapping saddle with 3/4-inch female iron pipe (F.I.P.) threaded outlet (not AWWA taper thread), 3/4-inch curb stop with male iron pipe (M.I.P.) threaded ends, padlock wings and threaded cap on outlet.

S920-2.13 Valves

Valves located outside of vault shall be resilient seated mechanical joint gate valves, open right, with valve box, in conformance with S903 Resilient Seat Gate Valve with Valve Box. Valves located inside of vault shall be resilient seated flanged end gate valves, open left, with handwheel.

S920-2.14 Miscellaneous Appurtenances

Miscellaneous appurtenances installed with the vault shall be as required in the Contract Documents and shall be in conformance with the appropriate section for the required item.

S920-3 CONSTRUCTION DETAILS

It is the intent of this specification to secure soundly constructed and watertight vaults and openings. Prior to installation, Contractor shall submit shop drawings to the Project Manager for approval of the vault structure, water manhole, castings, hatch and other miscellaneous appurtenances to be used in the work. Design calculations, prepared by a New York State licensed professional engineer shall be submitted for the vault structure.

Vault shall be constructed complete with all appurtenances as required in the Contract Documents. Construction details for these appurtenances shall be in conformance with the appropriate section for the required item. Contractor shall provide support for all appurtenances being installed within the vault as recommended by the manufacturer and as directed by the Project Manager.

Per OSHA requirements for confined space entry, water mainline valves are to be located at each end of the vault where the water pipe passes thru the vault wall, on both the inside and the outside of the vault. The water meter shall be ordered from the Water Bureau Meter Services Office in advance and meter fee paid upon placement of order. Contractor shall be responsible for picking up the meter at the Water Bureau's office and delivering it to the work site.

Strainer sediment trap is required for all water meters 3-inches and larger, and is to be mounted directly on the inlet side of the water meter to prevent objects greater than 3/16 inches in diameter from entering or damaging the water meter.

All exterior surfaces including the bottom of the vault structure shall receive two coats of damp-proofing material prior to installation. Damp-proofing materials shall be delivered to the site in the manufacturer's sealed containers, clearly marked with name of the product. Application methods and temperature shall be in accordance with the written recommendations of the manufacturer.

Vault shall not be placed upon frozen or muddy subgrade material. Vault shall be placed on a compacted leveling course consisting of a minimum of 6 inches of crushed stone.

Lift precast vaults at lifting points designated by the manufacturer. Lower, set level and firmly position base section before placing additional sections. Install rubber gasket joints between precast sections in accordance with manufacturer's specifications.

Minimum 12 inch by 12 inch by 3 inch deep sump shall be located in one corner of the vault floor for drainage purposes. Sump pumps and other electrical devices located inside of vault are not allowed without prior approval of the Water Bureau. When ground elevations outside of the vault allow for gravity drainage from the sump to the exterior, a gravity drain pipe shall be installed. Otherwise, sump shall be used only as a location to place temporary pump suction line if required to access the vault. Interior floor of vault is to be level.

Contractor is to install a 4-inch by 4-inch by 6 foot long pressure treated wood post adjacent to the vault and a 1-inch PVC conduit from the post to the vault and through the vault wall to be used by the Water Bureau for installing and mounting an electronic or radio meter reading device. The bottom of the post and the PVC conduit shall be installed 3 feet below ground.

Select granular backfill shall be used to backfill the excavation and shall be placed in accordance with the requirements of Section R203 Excavation and Embankment. Excavation shall not be backfilled until all of the mortar and waterproofing materials have completely set. When located in lawn area, the ground surface is to be sloped away from the hatch or cover.

Upon completion of the vault installation, Contractor shall thoroughly clean the interior of the vault to remove any dirt, debris, or loose grout and shall immediately inform the Water Bureau's Meter Services Office of the completed installation. A representative of the Water Bureau will then install an electronic or radio meter reading device, inspect the meter installation, install a lock on the bleeder valve assembly and install a valve box locking device on the exterior bypass valve.

S920-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be on a lump sum basis for the work completed for each vault constructed.

S920-5 BASIS OF PAYMENT

The lump sum unit price bid shall include the cost of: coordination of work with Bureau of Water; furnishing and installing vault structure; sump; drain pipe; ladder; castings; hatch or manhole frame and cover; joint materials; damp-proofing; grade rings; modular wall seals; post and PVC conduit for electronic or radio meter reading device; connection to water main; furnishing and installing all interior water pipe valves, fittings, meter; strainer, fittings, hardware, and appurtenances; exterior piping, valves and fittings up to and including bypass and bypass tees; joint bonds; temporary sheeting; trench protection; excavation; crushed stone leveling course; backfill; and furnishing all labor, material, and equipment necessary to complete the work.

Water pipe and appurtenances installed outside the vault structure beyond the bypass tees, magnesium anodes and cathodic protection test stations will be paid for under separate bid items.

Excavation that is included in the pay item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S920.01XXXX	Water Meter Vault (Size and Location)	Lump Sum

REVISED February 18, 2011