DESCRIPTION

Under these Items, the Contractor shall provide all labor, materials and equipment necessary or required to furnish and install the Water Meter with Remote Read Device, the RPZ and the Structure for the combined meter pit/backflow preventer in concrete enclosure including all piping, fittings, valves, test tee, and test tee valve, if required, and other incidentals necessary to complete plumbing work and connection to water service and water feed lines in accordance with the plans specifications, and directions of the Engineer. RPZ (Reduced Pressure Zone) device is also known as a Backflow Preventer. The Water Meter and Remote Reader shall include Water Meter, Water Meter Strainer and Automatic Reading & Billing System (also known as Remote Reading Device). All factory plumbing work is to be done by a Licensed Plumber. All on-site plumbing work is to be done by a Licensed Plumber. The Contractor shall comply with all rules, regulations, and requirements of all regulatory agencies having jurisdiction. In addition, the Contractor shall furnish extra material to NYSDOT for maintenance of the system, as specified below under the heading “Extra Materials”.

MATERIALS

Unless otherwise provided for herein, all materials and methods of construction shall conform to the requirements, standards, details and specifications of the Municipality. Each entire unit shall be fabricated and installed in accordance with this specification and the applicable water details sheet of the Contract plan set.

Concrete Structures: Materials used for the construction of the enclosure structures for the RPZ and water meter shall be as indicated on the plans, and/or Standard Sheets, and shall conform to the requirements of the following:

- Cast-in-Place Concrete – Class A
- Frames and Grates
- Concrete Repair Material
- Concrete Grouting Material
- Concrete Repair Material – High Early Strength
- Precast Concrete Driveway and Sidewalk Pavers
- Premolded Resilient Joint Filler
- Masonry Mortar
- Reinforced Concrete Pipe
- Precast Concrete Drainage Units
- Bar Reinforcement, Grade 60
- Wire Fabric for Concrete Reinforcement
- Cold Drawn Wire for Concrete Reinforcement
- Steps for Manholes
Manhole Frame and Cover: All cast gratings, covers, and frames manufactured in conformance to the Standard Sheets “Cast Manhole Frames, Grates and Covers” shall meet the requirements of §715-05 Iron Castings, Class No. 30B or Class No. 35B. All other covers and frames shall meet the requirements of §715-02, Steel Castings, Grade N-1; or §715-07, Proof Loaded Iron Castings; or §715-09, Malleable Iron Castings, Grade 32510, at the Contractor’s option. No substitutions will be allowed.

Water Piping: Materials requirements are specified in the following subsections:

- High Strength Bolts, Nuts and Washers 715-14
- Ductile Iron Water Pipe, Fittings and Encasement 722-01
- Wedge Type Mechanical Restraint Glands 722-07

Materials for water systems shall meet the appropriate American Water Works Association (AWWA) standards and American National Standards Institute (ANSI) specifications, except as modified by these specifications. Asbestos cement pipe or lead-tipped gaskets shall not be used. The materials provided shall meet the requirements specified in the “Owner Requirements for Water Mains and Appurtenances”.

RPZ: The RPZ (Reduced Pressure Principle Backflow Prevention device) shall be on the current listing of acceptable devices issued by the New York State Department of Health. The design of the backflow prevention device installations shall be approved by the New York State Department of Health or County Department of Health, and all backflow prevention devices shall be acceptable to the Municipality. No RPZ backflow devices shall be placed in service until such time as a completed works approval has been issued by the New York State Department of Health or the County Department of Health. After installation, all backflow prevention devices shall be tested in place, by a certified backflow prevention device tester in the presence of the Municipality authorized representative. The tester’s written certification shall be furnished to the Municipality within ten (10) days after the test has been performed. A new service line will not be put into service before certification is received and approved by the Municipality. Any backflow prevention device which fails to function properly shall be repaired or replaced within thirty (30) days, or as directed by the Municipality, and tested after the repair or replacement by a certified backflow prevention device tester. The tester’s written report shall be forwarded to the commissioner within ten (10) days after the test has been performed.

The results of all tests, as specified herein under this section, shall be forwarded to the Engineer in Charge by the tester within ten (10) days after the test has been performed.
ITEM 663.62000008 – 2” WATER METER, RPZ, AND STRUCTURE
ITEM 663.64000008 – 4” WATER METER, RPZ, AND STRUCTURE

Electrical Grounding: For continuity of Electrical Grounding (during RPZ Maintenance), the Contractor is to furnish and install one (1) #2 tinned copper ground conductor and copper alloy ground connector. Grounding work is to be done prior to any painting or insulation if needed.

Water Meter: Water Meter shall be of a type approved by the Municipality and shall be magnetic drive cold water meters, compound type, straight reading in cubic feet equipped with separate strainer and tapped boss for testing and shall meet the latest AWWA Standard C-702 entitled “Cold Water Meters-Compound Type,” and shall be equipped with electrically operated remote register, which shall be direct reading in cubic feet and connected by a two-wire connection to the generator. The generator shall be self-powered (by the energy of the water passing through the meter), waterproof, and equipped with an indoor totalizer and test circle, and shall meet the latest AWWA Standard C-706. An affidavit of compliance that the meter and remote register complies with all applicable requirements of these standards shall be furnished to the Municipality for their approval prior to the meter installation.

To ensure accuracy, each meter must be accompanied by a factory test tag certifying the accuracy at the flows required by AWWA C700 (low, intermediate, and full flow).

Strainer: All meters shall contain a strainer as noted on the contract plans.

Remote Reader: The Remote Reader shall be as approved by the Municipality and shall be a self-contained encoder register metering system designed to obtain remote simultaneous water meter registration directly from the register odometer. The metering information shall be obtained through a remotely located receptacle using a compatible data capture system. The system shall consist of the Encoder Meter Register and Remotely Mounted Receptacle.

Encoder Meter Register: Shall be direct mounted with encoded odometer wheels and digital stream. Batteries or pulses are not allowed.

Registration: The register shall provide a six-digit visual registration at the meter. The unit shall, in a digital format, simultaneously encode the four or six most significant digits of the meter reading for transmission through the remotely located receptacle. (The most significant meter registration digits are defined as those digits on the register number wheels that denote the highest recorded values of water consumption.) A quick indexing mechanism shall be employed which shall prevent ambiguous reading. The register shall have a full test sweephand or dial divided into gradients of down to 1/100th of the units of registration. Register test rings shall be available for shop testing. The units of registration shall be in U.S. gallons. These units shall be clearly designated on the face of the register. The month and year of manufacture and other identification information shall appear on the face of the register. The register shall employ a leak
detection indicator on the dial face. Registers using pulse generation or conversion of pulses to digital output is not permitted. Batteries shall not be required.

**Mechanical Construction:** Materials used in the construction of the register shall be compatible with the normal water meter environment and with each other. The unit shall possess a copper bottom and incorporate a rubber o-ring seal. Where indicated, pit set registers must be provided with moisture protection for all internal components when operating under flooded-pit conditions. The register shall be attached to the meter case by a bayonet attachment. Fastening screws or nuts shall not be required. A tamperproof plastic seal pin shall be used to secure the register to the main case. No special tools shall be required to remove the register. The register head must swivel 360 degrees without removing from the meter without disassembling the meter body and shall permit field installation and/or removal without taking the meter out of service. Provision shall be made in the register for the use of seal wires to further secure the register. Terminal screws must be accessible on the register for transmission wire connection to the remote receptacle or future connections to a telephone system.

**Electrical Construction:** The materials employed for contacts and connectors shall inhibit corrosion and shall suffer minimal effect from environmental conditions to which they are exposed. The number wheels used in the register assembly shall be provided with spring-type bifurcated metal contacts to insure a high probability of information transmission.

Connection shall be made to the register by three screw-type terminals, sonically inserted into the register top. Access to the terminals shall be available to all models of register. A port cover shall be provided to cover the terminals after they have been wired. Digitally formatted data transmitted from the register shall incorporate a check sum character to verify correct information transmission and integrity. Data errors shall be indicated by the reading equipment.

**Meter Reading Information:** The encoder register shall provide up to six digits of information to the reading equipment. A ten-digit identification number shall also be provided with each reading. The utility shall have the option to reprogram the internal register identification number an unlimited number of times. The encoder register must have the capability to provide additional custom information to the reader. This information shall be programmed (and reprogrammed at any time) by the Municipality. Information on programming the register, equipment needed and encoder meter reading output shall be provided with each proposal.
Remote Mounted Receptacle: Remote receptacle shall provide a communication link for the transmission of information from the register.

Mechanical Construction: Where indicated, a remote receptacle must be provided for attachment to a pit meter lid with another unit also designed for attachment by wall mounting. The materials employed shall be corrosion resistant, resist ultraviolet degradation, unaffected by rain or condensation, and compatible with rugged service and long life. The pit mounted receptacle shall be mounted to the water meter access lid of the meter concrete structure using two screws to be provided by the utility. The hole size to be drilled in the access lid shall not exceed 3/8” each. The pit mounted receptacle shall be provided with a minimum length of ten feet of wire connected and sealed at the receptacle without terminal exposure.

Electrical Construction: The receptacle construction shall incorporate the function of a cable clamp or strain relief. Design of the unit shall be such that it provides for mechanical and electrical connection between the receptacle and interrogation equipment.

Cable: The connecting cable shall be of the two-wire conductor type in sheath which shall be abrasion and moisture resistant. Each conductor shall be color coded.

CONSTRUCTION DETAILS

Excavation: The Contactor shall excavate to the lines as shown in the drawings. Temporary sheeting will be required in excavation for the precast concrete structure, for which separate payment will be made under the applicable item for temporary timber sheeting.

Setting of Water Meter Vault Installation: The concrete water meter vault shall be placed as shown in the Contract Plans.

The Contractor shall install supports for the water meter at the height shown on the Contract Drawings. The meter shall be set so that the dial faces upward and is horizontal. The dial shall not be more than (3) feet above the floor. The encoder register shall be installed on meter as per manufacturer’s instructions. The remote reader receptacle shall be installed in the pit cover as per the manufacturer’s directions and recommendations, allowing reading of the meter from above ground level. The Contractor shall allow sufficient Water Meter Remote Reader cable slack for manhole cover removal. The RPZ shall be installed as shown on the Contract Drawings and per manufacturer’s instructions.

Connections: The Contractor shall connect the water piping as shown on the Contract Drawings for a complete and satisfactory operating unit to the satisfaction of the Engineer. Connections shall be made to The Water Meter by coupling union or flange union on both inlet and outlet ends of the meter and bored for sealing with holes not less than one-eighth
ITEM 663.62000008 – 2” WATER METER, RPZ, AND STRUCTURE
ITEM 663.64000008 – 4” WATER METER, RPZ, AND STRUCTURE

(1/8) of an inch in diameter – solder connections are not permitted. Connections to the RPZ shall be as shown on the Contract Drawings and per the manufacturer’s instructions. Upon completion of the RPZ/Water Meter/Chamber unit, the Contractor shall have the system tested by a certified tester to ensure the unit functions properly and operates to the satisfaction of The Municipality.

Extra Materials: The Contractor shall furnish RPZ Repair Kits (furnish only, not install) and deliver to the NYSDOT representative:

One (1) Each for each size RPZ – RPZ Major Repair Kit, as manufactured for the make and size installed, for each RPZ installed, consisting of new materials obtained from the manufacturer of the RPZ installed. Repair kit shall include all consumable or replacement items including, but not limited to, relief valve seat disc and check seat disc, bushings, washers, o-rings, bolts, etc. All furnished material shall be properly identified with the RPZ model, size and installation location.

Submittals and Certifications:

The Contractor shall submit for the approval of the Engineer five (5) copies of shop drawings and catalog cuts for all materials in this specification.

Shop Drawings: Shop drawings are required showing installation of the complete RPZ assembly, water meter, piping, pipe supports, and the concrete structures.

Catalog Cuts: The Contractor shall submit Catalog Cuts of the RPZ, water meter, meter reading system, control valve, double check valve, and all connecting piping for approval prior to installation.

Certifications: The Contractor shall be responsible for obtaining all certifications necessary to comply with the Municipality and the NYS Dept. of Health regulations for RPZ’s (before and after installation), including Certification by Backflow Prevention Device Tester; Certification of the Licensed Plumber responsible for the RPZ and Meter installation, and a Professional Engineer’s or Registered Architect’s Certification that the installation is in accordance with the approved Plans. The Contractor shall prepare and submit copies of the initial test results and certifications to the Municipality and approving agent for issuance of Completed Works Approval. The Department of Health – Form 1013 has been designed for both the certified test results and the designer’s certification of the installation. The Engineer shall receive copies in triplicate of all such submittals. The NYSDOT shall be copied on all such submittals. The Contractor shall be held completely responsible to ensure that all Work is in compliance with NYS Department of Health, Form Gen. 215B.
METHOD OF MEASUREMENT

For the furnishing and installation of each Water Meter Vault, Water Meter with Remote, RPZ, including installation of all plumbing work, certifications, etc., complete in place, in accordance with the plans, specifications, and directions of the Engineer, the Contractor will receive the appropriate unit price bid.

BASIS OF PAYMENT

The price bid for each Water Meter Vault, Water Meter with Remote, RPZ, shall include the cost of all labor, materials, equipment, and any incidental expenses necessary, including certifications, all plumbing work, fittings, valves and appurtenances within the structure, connection to the water service at the structure limits, the concrete structure, including reinforcing steel, brick masonry, rungs, and manhole cover, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

In addition, the Contractor shall deliver Extra Materials as outlined above to the NYSDOT representative. One repair kit is required for each size/model RPZ installed. No additional payment will be made for furnishing Extra Materials.

“Excavation” and “Select Fill” will be paid for under separate contract Items. Piping and all water service work beyond the exterior face of the concrete structure will be paid for separately under the appropriate items.