

**Boston Water and Sewer Commission  
Standard Specifications  
For  
Water Meters**

This specification is intended to cover all meters to be purchased for use in the Boston Water and Sewer Commissions water distribution system.

**Section One - System Compatibility**

1.1 The vendor/manufacture shall provide the Commission, at no separate cost, a perpetual license to use their meters in combination with any meter reading equipment, to the extent that such license would be necessary or appropriate to avoid infringement of any patent or other intellectual property rights as may be claimed by such manufacturer or supplier; provided however, that such other equipment can be demonstrated not to damage or materially compromise the performance of the manufacturers or suppliers meters. This license may be transferred by the Commission only in the conduct of its normal business.

1. 2 All meters shall have a unique serial number stamped or embossed on the main case. The first two digits of the number shall indicate the year of manufacture.

1.3 5/8", 3/4", and 1" meters shall be warranted to meet or exceed AWWA standards for capacity and accuracy for new meters for five years from the date of shipment. 1-1/2" and 2" meters shall be warranted to meet or exceed AWWA standards for capacity and accuracy for new meters for two years from the date of shipment. Meters 3" or larger shall be warranted to meet or exceed AWWA standards for capacity and accuracy for new meters for one year from the date of shipment.

1. 4 The vendor/manufacture shall provide the Commission, at no separate cost, a letter stating that equipment furnished will be 100 % compatible to the meter reading system the Commission currently has installed.

**Section Two - Encoder-Type Remote Registration System**

To be considered acceptable for use in the Boston Water and Sewer Commission's water system, encoder-type remote registration devices shall be manufactured in strict accordance with American Water Works Association (AWWA) specification C 707 including the latest revision for "Encoder-Type Remote Registration Systems for Cold-Water Meters". All encoder-type remote registration devices shall meet or exceed the requirements of AWWA C707 as well as the supplemental specifications contained herein.

## **Section 2A - General**

2A.1. The vendor/manufacture shall submit an affidavit of compliance that all systems or components to be furnished are in compliance with AWWA C 707 standards, including the latest revision, as well as the supplemental specifications contained herein.

2A.2. The register shall be warranted to be free of defects for a minimum period of five years from the date of shipment. Any register that fails during the warranty period shall be replaced with a new register. The vendor shall specify the specifications of the encoder, and must agree that as long as any third party meets these specifications it will not affect the manufacturer's warranty.

2A.3 The encoder-type remote registration system shall supply a digital system and shall encode a minimum of the six most significant meter registration digits.

## **Section 2B. - Design**

2B.1. The meter register assembly shall have a minimum of six wheels, which registers in cubic feet.

2B.2. The register shall be interchangeable with other registers of the same manufacturer based on size and type.

2B.3. The meter register assembly shall be factory set, tamper resistant, and hermetically sealed.

2B.4. The register shall be secured to the meter case with a tamper-proof seal pin or tamper-proof screw.

2B.5 Registers shall be straight reading, equipped with a test (leak indicator) sweep hand.

2B.6 The register shall be designed in a manner that prevents the formation of condensation within the register.

2B.7 Any register with a potted/water proof lead must be 22 AWG solid wire with a length approved by the Commission.

2B.8 The register head must be a true encoder. (No Batteries)

## **Section Three - Turbine Meters and Strainers (3-inch through 10-inch)**

To be considered acceptable for use in the Boston Water and Sewer Commission's water

system, turbine meters shall be manufactured in strict accordance with American Water Works Association (AWWA) specification C701, including the latest revision, for “Cold-Water Meters - Turbine Type, For Customer Service”. In addition, all meters shall meet or exceed the supplemental specifications contained herein.

**Section 3A.- General**

3A.1. The vendor/manufacturer shall submit an affidavit of compliance that the turbine meters to be furnished are Class II and in compliance with AWWA C701 including the latest revision, as well as the supplemental specifications contained herein.

3A.2. The vendor/manufacturer shall submit a certificate showing that each turbine meter has been tested for accuracy and that each meters accuracy is within the parameters set forth in AWWA C701, section 4.2.7. Such certificate shall be attached to each meter.

3A.3. Turbine meters shall be supplied exclusive of companion flanges, nuts, bolts or gaskets.

3A.4. Turbine meters and strainers shall be shipped individually or with strainers attached, and strapped to skids.

**Section 3B. - Materials**

3B.1. Meter and Strainer main casings, including flanges and main case cover, shall be made of a copper alloy as specified in AWWA C701, section 4.1.

3B.2. All external fasteners shall be made of stainless steel as specified in AWWA C701, s. 4.1.8.

**Section 3C – Design**

3C.1. Typical Operating Range

<u>Meter Size</u>	<u>Normal Operating Range</u> <u>@100% Accuracy (+/- 1.5%)</u>
3-inch	5 gpm to 450 gpm
4-inch	10 gpm to 1200 gpm
6-inch	20 gpm to 2500 gpm
8-inch	35 gpm to 4000 gpm
10-inch	50 gpm to 6500 gpm

3C.2. Meter, Strainer and Overall Length

The length of turbine meters, strainers, and overall length measured from flange face to flange face shall be:

<u>Meter Size</u>	<u>Meter</u>	<u>Strainer</u>	<u>Overall Length</u>
3-inch	12 inches	6 inches	18 inches
4-inch	14 inches	7 ½ inches	21 ½ inches

6-inch	18 inches	9 inches	27 inches
8-inch	20 inches	10 inches	30 inches
10-inch	26 inches	15 inches	41 inches

3C.3. All turbine meters shall be supplied by the meter manufacture with a strainer of appropriate size and length (see 6C.2) and shall be shipped separately or with the strainer attached. If shipped separately, nuts, bolts and gaskets must be included. Strainer nuts and bolts shall be bronze or stainless steel. The internal straining material shall be stainless steel.

3C.4. All turbine meters shall have an internal measuring unit which is interchangeable with other meters of the same manufacturer and size.

**Section Four - Turbine Fire Meters with Metered By-Pass**  
**Sizes 4-inch through 10-inch**

To be considered acceptable for use in the Boston Water and Sewer Commission’s water system, turbine fire meters shall be manufactured in strict accordance with American Water Works Association (AWWA) specification C703 including the latest revision, for “Cold-Water Meters - Fire Service Type”. In addition, all turbine fire meters shall meet or exceed the supplemental specifications contained herein.

**Section 4A.- General**

4A.1. The vendor/manufacturer shall submit an affidavit of compliance that the turbine fire meters to be furnished are in compliance with AWWA C703, latest revision, as well as the supplemental specifications contained herein.

4A.2. The vendor/manufacturer shall submit a certificate showing that each turbine fire meter has been tested for accuracy and capacity, and that each meter’s accuracy and capacity is within the parameters set forth in AWWA C703, s. 4.2.6 and 4.2.2. Such certificate shall be attached to each meter.

4A.3. Turbine fire meters shall be supplied exclusive of companion flanges, nuts, bolts or gaskets.

4A.4. Turbine fire meters shall be shipped individually in crates, with strainers attached, and strapped to skids.

**Section 4B. - Materials**

4B.1. Main casings and strainers, including flanges and main case cover, shall be made of stainless steel.

4B.2. All external fasteners shall be made of stainless steel as specified in AWWA C703, s. 4.1.8.

4B.3. All components of the meter assembly shall be Underwriter's Laboratories (UL) listed, as well as Factory Mutual (FM) approved for fire service use.

### **Section 4C - Design**

4C.1. Typical Operating Range with by-pass meter size shown

<u>Meter Size</u>	<u>Normal Operating Range</u> <u>@100% Accuracy (+/- 1.5%)</u>
4-inch with 1" by-pass*	3/4 g.p.m. to 1200 g.p.m.
6-inch with 1 1/2" by-pass	1 1/2 g.p.m. to 2500 g.p.m.
8-inch with 2" by-pass	2 g.p.m. to 4000 g.p.m.
10-inch with 2" by-pass	2 g.p.m. to 6500 g.p.m.

\*1" by-pass meter shall be a frost bottom type.

Accuracy shall not drop below 90 percent during changeover from by-pass to turbine, or vice versa.

4C.2. Overall Length

The length of turbine fire meters, including strainer, measured from flange face to flange face shall be:

<u>Meter Size</u>	<u>Overall Length</u>
4-inch	33 inches
6-inch	45 inches
8-inch	53 inches
10-inch	68 inches

4C.3. All turbine fire meters shall be fitted with a strainer in accordance with AWWA C703, s.

4.3.13. Strainer shall be UL listed or FM approved and National Fire Protection Association (N.F.P.A.) approved.

4C.4. The mainline shall include a tapped test plug, which is removable for field test purposes.

4C.5. The by-pass assembly shall consist of two isolation ball valves (one upstream and one downstream) of the displacement meter and check valve. The by-pass meter (screw-end type) shall include couplings, bushings, tailpieces and a check valve between the isolation valves to allow for future meter testing and replacement.

4C.6. A stainless steel, spring loaded, mainline check valve, with a semi-hard rubber seat, shall

be located downstream of the turbine meter. Such check valve shall have a clear opening at least equal in size to the turbine meter. No leaded parts shall be incorporated in the check valve assembly.

4C.7. Each component of the fire meter (both turbine and displacement) shall be interchangeable with other turbine and displacement meters of the same manufacturer based on size and type.

4C.8. Every other fire meter of each size purchased under this contract shall have the by-pass meter installed on the opposite side of the main line.

## **Section Five - Residential Displacement Meters**

To be considered acceptable for use in the Boston Water and Sewer Commissions water system, displacement type residential meters (5/8, 3/4, 1, 1 1/2 and 2 inch) shall be manufactured in strict accordance with American Water Works Association (AWWA) specification "C700 including the latest revision, for Cold-Water Meters - Displacement Type, Bronze Main Case". In addition, all displacement meters shall meet or exceed the supplemental specifications contained herein.

### **Section 5A.- General**

5A.1. The vendor/manufacturer shall submit an affidavit of compliance that the displacement meters to be furnished are in compliance with AWWA C700, latest revision, as well as the supplemental specifications contained herein.

5A.2. The vendor/manufacturer shall submit a certificate showing that each displacement meter has been tested for accuracy and capacity, and that each meters accuracy and capacity is within the parameters set forth in AWWA C700, s. 4.2.2 and 4.2.8. Such certificate shall be attached to each meter.

5A.3. Residential Displacement Meters shall be packaged in cartons or crates consecutively numbered, and marked with the serial number of the meter contained therein. Such cartons or crates shall be secured on 39" x 44" wooden skids or pallets to facilitate handling by forklift.

### **Section 5B. - Materials**

5B.1. Bottom main case covers on 5/8, 3/4, and 1-inch meters shall be breakable (frost protection) cast iron, in accordance with AWWA C700, s. 4.1.9. Such cover shall be plastic or rubber lined, in addition to the non-corrosive treatment given the bottom.

5B.2. All external fasteners shall be made of stainless steel as specified in AWWA C700, s. 4.1.

5B.3. The vendor/manufacturer shall submit an affidavit of compliance that all meters to be furnished are in compliance with ANSI/NSF 61 /ANSI/NSF 372, Drinking Water System Components – Health Effects in addition to the requirements of the Safe Drinking Water Act, as

well as the supplemental specifications contained herein.

### **Section 5C – Design**

5C.1. All meters shall be the nutating disc or piston type and shall be provided with a removable stainless steel or plastic strainer in accordance with AWWA C700, s. 4.3.6.

5C.2. All meters shall have a magnetically coupled drive.

5C.3. The 1 ½ inch and 2-inch nutating disc or piston type displacement meters (screw end type) shall be furnished with standard bronze union couplings composed of tailpiece couplings and bushings. Coupling nuts shall be drilled for sealing purposes.

### **Section Six - Compound Meters and Strainers (Sizes 3-inch through 6-inch)**

To be considered acceptable for use in the Boston Water and Sewer Commission's water system, compound meters shall be manufactured in strict accordance with American Water Works Association (AWWA) specification C702 latest revision, for "Cold-Water Meters - Compound Type". In addition, all compound meters shall meet or exceed the supplemental specifications contained herein.

### **Section 6A.- General**

6A.1. The vendor/manufacture shall submit an affidavit of compliance that the compound meters to be furnished are in compliance with AWWA C702 latest revision, as well as the supplemental specifications contained herein.

6A.2. The vendor/manufacture shall submit a certificate showing that each compound meter has been tested for accuracy and capacity, and that each meters accuracy and capacity is within the parameters set forth in AWWA C702, s. 3.2 and 3.6. Such certificate shall be attached to each meter.

6A.3. Compound meters shall be supplied exclusive of companion flanges, nuts, bolts or gaskets.

6A.4. Compound meters and strainers shall be shipped individually or with strainers attached, and strapped to skids

### **Section 6B. - Materials**

6B.1. Meter and Strainer main casings, including flanges and main case cover, shall be made of a copper alloy as specified in AWWA C702, s. 2.2.

6B.2. All external fasteners shall be made of stainless steel as specified in AWWA C702, s. 2.8.

6B.3. All Compound meters shall be supplied by the meter manufacturer with a strainer of appropriate size and length (see 6C.2) and shall be shipped separately or with the strainer attached. If shipped separately, nuts, bolts and gaskets must be included. Strainer nuts and bolts shall be bronze or stainless steel. The internal straining material shall be stainless steel.

**Section 6C - Design**

6C.1. Typical Operating Range

<u>Meter Size</u>	<u>Normal Operating Range @100% Accuracy (+/- 1.5%)</u>
3-inch	1/2 g.p.m. to 450 g.p.m.
4-inch	1 g.p.m. to 1000 g.p.m.
6-inch	1 1/2 g.p.m. to 2000 g.p.m.

Accuracy shall not drop below 90 percent during changeover from by-pass to turbine, or vice versa.

6C.2. Meter, Strainer, and Overall Length

The length of compound meters, strainer, and overall length measured from flange face to flange face shall be:

<u>Meter Size</u>	<u>Meter</u>	<u>Strainer</u>	<u>Overall Length</u>
3-inch	17 inches	6 inches	23 inches
4-inch	20 inches	7 1/2 inches	27 1/2 inches
6-inch	24 inches	9 inches	33 inches

6C.3. All compound meters shall be fitted with a stainless steel strainer screen in accordance with AWWA C702, s. 4.1.2.1

6C.4. The mainline shall include a tapped test plug which is removable for field test purposes.

6C.5. A stainless steel, spring loaded, mainline check valve, with a semi-hard rubber seat, shall be located downstream of the turbine meter. Such check valve shall have a clear opening at least equal in size to the turbine meter. No leaded parts shall be incorporated in the check valve assembly.

6C.6. Each component of the compound meter shall be interchangeable with other compound meters of the same manufacturer based on size and type.



**Amended:** At the May 29<sup>th</sup>, 2013 meeting at the Boston Water and Sewer Commission, the Commission voted to authorize under M.G.L. c. 30B, s 14 proprietary specifications for the purchase of either Neptune or Badger Water Meters for large sized meters 3 inch through 10 inch. As referenced in Section Three - Turbine Meters (3-inch through 10-inch), Section Four - Turbine Fire Meters with Metered By-Pass (Sizes 4-inch through 10-inch), Section Six - Compound Meters (Sizes 3-inch through 6-inch) of this Standard.

(Revised: 8/02/2017)