PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 11 - Cleaning.

.3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Section 01 78 00 - Closeout Submittals.

.5 Section 01 91 00 - Commissioning - Mechanical and Electrical Installation.

.6 Section 23 05 05 - Installation of Pipework.

1.2 REFERENCES

.1 Unless otherwise indicated, all Work must be done in accordance with the latest edition of the National Building Code.

.2 Furthermore, the works will be done in accordance with any other code or standard having jurisdiction, as per the latest edition, notably including, but not limited to:

.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME).

.1 ANSI/ASME B16.15 2006, Cast Bronze Threaded Fittings, Classes 125 and 250.

.2 ANSI/ASME B16.18 2001, Cast Copper Alloy Solder Joint Pressure Fittings.

.3 ANSI/ASME B16.22 2001, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

.4 ANSI/ASME B16.24 2001, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Classes 150, 300, 400, 600, 900, 1500, and 2500.

.2 American Society for Testing and Materials International (ASTM).

.1 ASTM A182, Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.

.2 ASTM A268/A268M, Standard Specification for Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service.

.3 ASTM A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.4 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.5 ASTM A312/A312M, Standard Specification for Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes.

.6 ASTM A403, Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings.

.7 ASTM B32, Standard Specification for Solder Metal.

.8 ASTM B88M, Standard Specification for Seamless Copper Water Tube (Metric).

.9 ASTM F492, Standard Specification for Propylene and Polypropylene (PP) Plastic-Lined Ferrous Metal Pipe and Fittings.

.10 ASTM B283/B283M, Standard Specification for Copper and Copper-Alloy Die Forging (Hot-Pressed).

.3 American National Standards Institute/American Water Works Association (ANSI/AWWA).

.1 ANSI/AWWA C111-07, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.4 Canadian Standards Association (CSA International).

.1 CSA B242-M1980 (R1998), Groove and Shoulder Type Mechanical Pipe Couplings.

.5 Manufacturer's Standardization Society of the Valves, and Fittings Industry (MSS).

.1 MSS-SP-70-1998, Cast Iron Gate Valves, Flanged and Threaded Ends.

.2 MSS-SP-71-1997, Cast Iron Swing Check Valves, Flanged and Threaded Ends.

.3 MSS-SP-80-2003, Bronze Gate, Globe, Angle and Check Valves.

.6 National Sanitation Foundation (NSF).

.1 NSF 61, Drinking Water System Components.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for insulation and adhesives, and include product characteristics, performance criteria, physical size, finish, and limitations.

.3 Closeout Submittals:

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 HEALTH AND SAFETY

.1 Take necessary measures to ensure health and safety on construction site in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling, in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.

.5 Fold up metal and plastic banding, flatten and place in designated area for recycling.

1.6 QUALITY ASSURANCE

.1 All components used in the potable water distribution must follow NSF 61 Standard.

PART 2 - PRODUCTS

2.1 PIPING

.1 Domestic cold water within building.

.1 NPS 2 ½ and above: Schedule 10, 304L stainless steel according to ASTM and NSF/ANSI-61 Standards.

2.2 FITTINGS

.1 Stainless Steel:

.1 NPS 2 ½ and above: Schedule 10, welded, according to ASTM A403, grade WP-304L, and ANSI B16.9 Standards.

.2 Cast stainless steel flanges, Class 150, according to ASTM A182, grade F304L, and ANSI B16.5 Standards.

.3 Union: Class 3000, forged stainless steel, according to ASTM A182, grade F304L Standard.

2.3 JOINTS

.1 Rubber Gaskets (1.6 mm thick): To AWWA C111/A21.11.

.2 Bolts, Nuts, Hex Head, and Washers: To ASTM A307, Heavy Series.

.3 Dielectric Connections between Dissimilar Metals: Dielectric fitting, complete with thermoplastic liner.

2.4 BUTTERFLY VALVES

.1 NPS 2½ and over, flanged:

.1 ASME B16.50 face-to-face dimensions.

.2 To MSS-SP-67, Class 125/150. Ductile iron body and plated disc, stainless steel stem, EPT liner. Gear operated.

.1 Acceptable products: Nibco, FD-5765-0.

2.5 FLOWMETER

.1 Approvals:

.1 CSA approved.

.2 OIML R49 (Organisation internationale de métrologie légale).

.2 Performance:

.1 Flowmeter with reduced bore to improve flow profile and to keep good accuracy even if pipe layout is shorter than normally specified.

.2 Accuracy: ±0.4%.

.3 Characteristics:

.1 Electromagnetic.

.2 Carbon steel housing.

.3 Liner material: Elastomer.

.4 Ambient temperature limitation: -20 to 70°C.

.5 Stainless steel 316 L electrode.

.6 Flanged connections NPS 8, Class 150.

.4 Flowmeter Transmitter:

.1 Characteristics:

.1 Power supply: 100-230 VAC, 60 Hz.

.2 4-20 mA with communication and pulse output.

.3 Illuminated display.

.4 Diagnostic message and error code as per Namur NE107 Standards.

.5 Acceptable Products: ABB, Watermaster FER Series.

PART 3 - EXECUTION

3.1 APPLICATION

.1 Manufacturer's Instructions: Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install in accordance with National Building Code, and local authority having jurisdiction.

.2 Install pipe work in accordance with Section 23 05 05 - Installation of Pipework, supplemented as specified herein.

.3 Assemble piping using fittings manufactured to ANSI Standards.

.4 Install piping close to walls and ceilings to reduce overcrowding of space. Group piping and install parallel to walls.

.5 Connect to fixtures and equipment in accordance with manufacturer's written instructions, unless otherwise indicated.

3.3 VALVES

.1 Isolate equipment, fixtures, and branches with ball valves.

.2 Balance recirculation system using lockshield globe valves. Mark settings and record on as-built drawings upon completion.

3.4 PRESSURE TESTS

.1 Complying with requirements of Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

.2 Test Pressure: Greater than one time maximum system operating pressure or 860 kPa during 2 hours.

3.5 PRE-START-UP INSPECTIONS

.1 Systems to be complete, prior to flushing, testing, and start-up.

.2 Verify that system can be completely drained.

3.6 CLEANING AND DISINFECTION

.1 Every pipe segment and equipment must be thoroughly cleaned and disinfected and rinsed before installation.

.2 Disinfecting Solution: Sodium hypochlorite, complying to ANSI/AWWA B300 Standard.

3.7 START-UP

.1 Provide continuous supervision during start-up.

.2 Establish circulation and ensure that air is eliminated.

.3 Rectify start-up deficiencies.

3.8 PERFORMANCE VERIFICATION

.1 Scheduling:

.1 Verify system performance after pressure and leakage tests and disinfection are completed, and Certificate of Completion has been issued by authority having jurisdiction.

.2 Procedures:

.1 Verify that flow rate and pressure meet design criterion.

.2 Verify compliance with safety and health requirements.

.3 Confirm water quality consistent with supply standards, and ensure no residuals remain as result of flushing or cleaning.

.3 Reports: In accordance with section 01 33 00 - Submittal Procedures.

3.9 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION