DIVISION 22 31 00 - DOMESTIC WATER SOFTENER

PART 1 - GENERAL

1. SUMMARY
   1. Section Includes:
      1. Water Softener
2. SUBMITTALS
   1. Product Data:
      1. Include construction details, material descriptions, dimensions of individual components and profiles.
   2. Shop Drawings:
      1. Include plans, details, and connections to piping systems.
      2. Wiring Diagrams: Power, signal, and control wiring.
3. CLOSEOUT SUBMITTALS
   1. Operation and Maintenance Data:
      1. Provide operation, and maintenance manuals.

PART 2 – PRODUCTS

1. COMMERCIAL WATER SOFTENERS
   1. Basis of Design Product: Canature WaterGroup.
      1. Model: **105MTS 270-2Q8000**
      2. Configuration: Quadplex Mineral tank and Four brine tanks
      3. Mineral Tank
         1. Provide mineral tanks for water softening systems as indicated on the Drawings or a comparable product by Canature WaterGroup.
         2. The mineral tanks shall have a diameter of 610 mm (24”) and a height of 1829 mm (72”).
         3. Certification must meet NSF/ANSI 44 standards for Materials and Structural Integrity.
         4. The tank construction shall feature a polyethylene liner and outer winding composed of high-performance fiberglass and epoxy resin. It should withstand a m) and operating pressure of 1034 kPa gauge (150 psig), operate within a temperature range of 1 °C – 49 °C (34 °F – 120 °F), and endure a maximum vacuum of 127 mm Hg (2.46 psi).
         5. Each water softening system shall include Four (4) mineral tanks.
         6. The mineral tanks shall be accompanied by a five (5) years warranty.
      4. Media
         1. The ion exchange resin must possess a total capacity of 1.9 eq/L in the sodium form. Each mineral tank should contain 255L (9 ft³) of Aquafine AQ100-Na resin, WQA certified to NSF/ANSI 44 standards, and compliant with the US FDA Code of Federal Regulations, Section 173.25.
      5. Brine Tank
         1. Each softener unit shall be equipped with one (1) brine tank. The total system shall include Four (4) brine tanks.
         2. The brine tank shall have a diameter of 840 mm (33”) and a height of 1335 mm (53”).
         3. The brine tank shall include essential components such as a salt plate, removable salt lid, brine well, safety float, and brine well cap.
         4. The brine well must extend above the shoulders of the tank, allowing for the heaping of salt past the shoulders.
         5. The wall thickness of the brine tank shall be 6.4 mm (0.25”).
         6. The brine tank shall be covered by a one (1) year warranty.
      6. Control Valve
         1. Each mineral tank must be equipped with a 50mm (2”) Canature WaterGroup 105 series top-mounted control valve, featuring a plastic PPO (Noryl) body and a motor-driven, piston/seal/spacer type mechanism. The valves come complete with an electronic slave controller, interlinked with a separate main controller through interlinking cables that deliver power to system.
         2. Operating valves must efficiently perform essential functions such as backwash, brine draw, slow rinse, rapid rinse, and brine tank refill. Additional features include an integrated turbine meter and an LCD display indicating unit address, along with two (2) programmable auxiliary output relays.
         3. For operational flexibility, each valve shall include a 50 mm (2”) electronic ball valve on the outlet side and must regenerate co-currently, ensuring consistent system performance.
         4. Certified to NSF/ANSI 44 standards for materials and structural integrity, these valves shall be designed to operate under pressures ranging from 137 – 862 kPa gauge (20 – 125 psig) and within a temperature range of 1 °C (34 °F) to 43 °C (110 °F).
         5. The control valves shall be covered by a five (5) years warranty.
      7. Controller Programming
         1. The master controller, shall operate independently without being attached to any valve, will feature a color, graphical user interface complete with a 73 mm (2.875”) screen.
         2. The user interface on the master controller's main page shall present crucial information, including the total number of units, the current time of day, total system flow rate, remaining system volume, softener unit addresses, and the status of each softener (ON-LINE, Standby, or Backwash). Additionally, it shall also display the percent capacity available in each softener, the flow rate through each softener (if applicable), and the time left in the backwash/regeneration cycle (if applicable).
      8. System Set up and Operations:
         1. The system shall be set up as a demand recall system, initiating regeneration through a totalized hardness calculation.
         2. For operational safety, the maximum recommended operating pressure for the system must be set between 139-689 kPa gauge (20-100 psig).
         3. To facilitate electrical connections, only the main controller shall be linked to an electrical outlet capable of supplying 120V at 60Hz.
         4. Each softener within the system shall be designed to maintain a continuous flow rate pressure drop of 103 kPa (15 psi) at a flow rate of 3.09 lps (49 USGPM). During peak flow rates of 4.42 lps (70 USGPM), the pressure drop will be 172 kPa (25 psi).
   2. Capacities and Characteristics:
      1. Water Analysis:
         1. Hardness: **……………** grains/gal.
      2. Peak Service Flow Rate: **……………** gpm at 25-psig pressure drop
      3. Manifold Pipe Size: **……………**”
      4. Number of Mineral Tanks: Four
      5. Mineral Quantity, Each Tank: **……………** cu. ft.
      6. Mineral Exchange Capacity: **……………** grains per cubic foot
      7. Electrical Characteristics: **……………** Volt
      8. Salt Capacity: **……………** lbs

PART 3 – EXECUTION

1. INSTALLATION
   1. Maintain manufacturer's recommended clearances.
   2. Arrange units so controls and devices that require servicing are accessible.
2. DEMONSTRATION
   1. Engage a manufacturer’s approved to train Owner's maintenance personnel to adjust, operate, and maintain domestic water softeners.

**END OF SECTION 22 31 00**