Part 1 General

1.1 REFERENCES

.1 ASME

.1 ASME Boiler and Pressure Vessel Code (BPVC), Section VII-2013.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 00 10 – General Instructions.

.2 Shop Drawings:

.1 Submit in accordance with Section 01 00 10 – General Instructions.

.3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.3 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 00 10 – General Instructions.

.2 Operation and Maintenance Data: submit operation and maintenance data for HVAC water treatment systems for incorporation into manual.

.3 Include following:

.1 Log sheets as recommended by manufacturer and Departmental Representative.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 00 10 – General Instructions and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect HVAC water treatment systems from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MANUFACTURER

.1 Equipment, chemicals, and service provided by one supplier.

2.2 POT FEEDER

.1 Welded steel, pressure rating 860 kPa. Temperature rating: 90 degrees C.

2.3 CHEMICAL FEED PIPING

.1 Resistant to chemicals employed. Pressure rating: 860 kPa.

2.4 SHIPPING/FEEDING CHEMICAL CONTAINERS

.1 High density moulded polyethylene, with liquid level graduations, cover.

2.5 WATER TREATMENT FOR HYDRONIC SYSTEMS

.1 Glycol system: pot feeder, 19 L, operating pressure 860 kPa.

.2 Micron filter for each pot feeder:

.1 Capacity 2% of pump recirculating rate at operating pressure.

.2 Six (6) sets of filter cartridges for each type, size of micron filter.

2.6 CHEMICALS

.1 Provide 1 years supply.

.2 Obtain chemicals from manufacturer with existing valid contract with PWGSC.

2.7 TEST EQUIPMENT

.1 Provide one set of test equipment for each system to verify performance.

.2 Complete with carrying case, reagents for chemicals, specialized or supplementary equipment.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for HVAC water treatment systems installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.3 INSTALLATION

.1 Install HVAC water treatment systems in accordance with ASME Boiler and Pressure Code Section VII, and requirements and standards of authorities having jurisdiction, except where specified otherwise.

.2 Ensure adequate clearances to permit performance of servicing and maintenance of equipment.

3.4 CHEMICAL FEED PIPING

.1 Install crosses at changes in direction. Install plugs in unused connections.

3.5 CLEANING OF MECHANICAL SYSTEM

.1 Provide copy of recommended cleaning procedures and chemicals for approval by Departmental Representative

.2 Flush mechanical systems and equipment with approved cleaning chemicals designed to remove deposition from construction such as pipe dope, oils, loose mill scale and other extraneous materials. Use chemicals to inhibit corrosion of various system materials that are safe to handle and use.

.3 Examine and clean filters and screens, periodically during circulation of cleaning solution, and monitor changes in pressure drop across equipment.

.4 Drain and flush systems until alkalinity of rinse water is equal to make-up water. Refill with clean water treated to prevent scale and corrosion during system operation.

.5 Disposal of cleaning solutions approved by authority having jurisdiction.

3.6 WATER TREATMENT SERVICES

.1 Provide water treatment monitoring and consulting services for period of 1 year after system start-up. Service to include:

.1 Initial water analysis and treatment recommendations.

.2 System start-up assistance.

.3 Operating staff training.

.4 Visit plant every 4 days during period of operation and as required until system stabilizes, and advise on treatment system performance.

.5 Provide necessary recording charts and log sheets for 1 year operation.

.6 Provide necessary laboratory and technical assistance.

.7 Provide clear, concise, written instructions and advice to operating staff.

3.7 FIELD QUALITY CONTROL

.1 Start-up:

.1 Start-up water treatment systems in accordance with manufacturer's instructions.

.2 Commissioning:

.1 Commissioning Agency: to be installing water treatment supplier.

.2 Timing:

.1 After start-up deficiencies rectified.

.2 After start-up and before TAB of connected systems.

.3 Pre-commissioning Inspections: verify:

.1 Presence of test equipment, reagents, chemicals, details of specific tests performed, and operating instructions.

.2 Suitability of log book.

.3 Currency and accuracy of raw initial water analysis.

.4 Required quality of treated water.

.4 Commissioning procedures - applicable to Water Treatment Systems:

.1 Establish, adjust as necessary and record automatic controls and chemical feed rates.

.2 Monitor performance continuously during commissioning of connected systems and until acceptance of project.

.3 Establish test intervals, regeneration intervals.

.4 Record on approved report forms commissioning procedures, test procedures, dates, times, quantities of chemicals added, raw water analysis, treated water analysis, test results, instrument readings, adjustments made, results obtained.

.5 Establish, monitor and adjust automatic controls and chemical feed rates as necessary.

.6 Visit project at specified intervals after commissioning is satisfactorily completed to verify that performance remains as set during commissioning (more often as required until system stabilizes at required level of performance).

.7 Advise Departmental Representative in writing on matters regarding installed water treatment systems.

.5 Commissioning procedures - Water Softeners:

.1 Demonstrate compliance with specifications by chemical analyses of raw water and treated water.

.2 Determine, demonstrate actual softening capacity between regenerations.

.3 Establish regeneration intervals and procedures.

.4 Train O M personnel in regeneration procedures.

.6 Commissioning procedures - Water side of closed circuit coolers, Cooling Tower Systems:

.1 Verify operation of bleed-off system.

.2 Establish bleed-off flow rate.

.3 Establish rate of chemical feed - continual and periodic.

.4 Test system water for chlorides, TDS, suspended solids, algae, slime, inhibitor level, pH, alkalinity, hardness, other impurities and microbiological organisms.

.5 Compare with readings of total dissolved and suspended solids metre.

.6 Read make-up water metre, compare with chiller load summation (ton-hours).

.7 Test make-up water for chlorides, hardness.

.8 Compare test results with readings from TDS metre.

.9 Record quantity of make-up water, compare with summation of chiller load (in ton-hours).

.10 Record types, quantities of chemicals applied.

.7 Commissioning procedures - Closed Circuit Hydronic Systems:

.1 Analyze water in system.

.2 Based upon an assumed rate of loss approved by Departmental Representative, establish rate of chemical feed.

.3 Record types, quantities of chemicals applied.

.8 Training:

.1 Commission systems, perform tests in presence of, and using assistance of, assigned O M personnel.

.2 Train O M personnel in softener regeneration procedures.

.9 Certificates:

.1 Upon completion, furnish certificates confirming satisfactory installation and performance.

.10 Commissioning Reports:

.1 To include system schematics, test results, test certificates, raw and treated water analyses, design criteria, other data required by Departmental Representative.

.11 Commissioning activities during Warranty Period:

.1 Check out water treatment systems on regular basis and submit written report to Departmental Representative.

3.8 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 00 10 – General Instructions.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION