SECTION 15182 - LOFLO HYDRONIC DISTRIBUTION SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section governs the materials and installation of closed hydronic systems associated with building heating and cooling. The following systems, where applicable, shall be installed as specified herein.

1. Hot Water Heating System
2. Chilled Water Cooling System
3. Dual Temperature Water System
4. Heat Pump Circulating System
5. Closed Circuit Cooling Tower System
6. Run-Around Heat Recovery System

1.2 EQUIPMENT SUBSTITUTION

A. All items eligible for substitution require submission of request for substitution 10 days prior to bid date. This submittal shall include specific models and capacities of equipment and not just manufacturer’s literature. The prior approval request package shall also include an engineered flow schematic showing that the manufacturer has a detailed understanding of the temperature cascade. This schematic shall be sealed by a professional engineer. This schematic shall show the entering and leaving temperature, load, and flow at every terminal unit. In addition the prior approval package shall include an owner contact list for 50 single pipe distribution jobs this manufacturer has successfully installed over the last five years. A system performance guarantee shall also be provided along with manufacturer’s liability policy cover page. This entire package must be received 10 days prior to bid. Only written approval issued via addendum will be notification of vendor approval. No verbal approvals will be acknowledged.

1.3 TESTING & APPROVING AGENCIES

A. Where items of equipment are required to be provided with compliance to U.L., A.G.A., or other testing and approving agencies, the contractor may submit a written certification from any nationally recognized testing agency, adequately equipped and competent to perform such services, that the item of equipment has been tested and conforms to the same method of test as the listed agency would conduct.

1.4 SUBMITTAL DATA

A. See Section 01300 for general submittal requirements.

B. Provide manufacturer's literature for all products specified in this Section, which will be installed under this project.

C. Provide performance curves for all pumps. Plot the specified operating point for each pump on its respective curve.

D. Provide complete literature for all components of packaged systems. These include pump performance, heat exchanger calculations, expansion tank capacity, data for all accessories and valves and complete wiring diagrams specific to the exact unit to be supplied. The wiring diagram shall indicate all required field and factory wiring.

E. The submittal package shall include the engineered flow schematic as described in the substitution section.

PART 2 - PRODUCTS

2.1 SYSTEM

1. The LOFlo distribution system shall include LOFlo Mixing Block with circulators, twin tees, design suite of software, and system guarantee. The manufacturer shall provide a complete system including LOFlo Mixing Block with circulators, twin tees, primary pumps, system air control, expansion components, heat exchangers, design suite of software and system guarantee. The manufacturer shall have a minimum of 50 single pipe distribution jobs installed within the last five years

B. LOFlo Mixing Block.

1. The LOFLo Mixing Block shall consist of an injection circulator and a zone circulator with an interconnecting decoupler pipe with connections to the primary and zone circuits. The interconnecting decoupler piping shall be stainless steel with flanged connections for field servicing and removal of the circulators. Circulators and interconnecting decoupler shall be factory assembled as one unit.
2. The injection circulator shall be operated variable speed to control the supply water temperature to the terminal unit for the zone.
3. The zone circulator shall be operated either constant or variable speed to maintain the space temperature in the zone.
4. Circulators shall be Taco Model LoadMatch® circulator or approved equal.

C. LoadMatch® Circulator.

1. Circulators shall be Taco Model LoadMatch® circulator or approved equal.
2. The circulator shall be water lubricated, direct drive, requiring no seals, couplers or bearing assembly. Ceramic shaft and carbon bearing construction shall be capable of running without fluid for 10 days without damage to shaft or bearings.
3. The circulator shall be repairable in-line without removal of the circulator from the piping using a stainless steel replaceable cartridge. Circulator shall be provided with a 3 year warranty.
4. The circulator shall incorporate a removable integral spring loaded flow check to eliminate fluid circulation when the pump is off.
5. The circulator shall incorporate an integral condensate baffle to eliminate condensation on the motor housing when supplying chilled water down to 20°F. Alternative manufacturing processes that delay the effect of condensation versus preventing it shall not be allowed. Specifically extra coating on the windings is not acceptable.

6. Circulator shall be rated for 200 psi working pressure at 220°F fluid temperature.
7. An integral variable speed drive (VSD) shall accept a 0-10 Vdc or 4-20 mA modulating control signal to control the speed of the circulator motor. VSD shall incorporate an exercise sequence to run the pump for 20 seconds if there has been no run signal for 72 hours.
8. Circulator shall bear UL label.
9. The manufacturer shall guarantee system operation for one full heating season and one full cooling season, to the extent that the HVAC system shall deliver the heating and cooling capacities as specified. The value of the guarantee shall be equal to the value of retrofitting the system to a two-pipe system.

D. Twin Tee

1. Tee fittings for terminal unit tie in to system distribution piping shall be Taco Twin Tee.
2. Twin Tee fittings shall be made of ductile iron or bronze and shall be rated for 200 psi.
3. The fitting shall be manufactured with two system connections and two terminal unit connections. The system connections shall be offered in three types: sweat, threaded, and grooved. Terminal unit connections shall all be threaded.
4. The fitting shall include an internal baffle that prevents short circuiting of the terminal unit fluid from inlet to outlet.

E. Design software for temperature cascade

1. Manufacturer shall provide, as part of the system, a software package that allows the construction team to design, document, and manage the temperature cascade in a single pipe distribution system. This software shall produce a flow diagram that sizes all equipment and pipe based on inputted loads and temperature differentials. The software shall document all of these design calculations in a flow schematic. The flow schematic shall show all loads, entering and leaving temperatures, and flow for each terminal unit. In the case of dual temperature systems and heat pumps, it shall document data for both heating and cooling modes.

F. System Guarantee

1. The manufacturer shall provide a written letter of guarantee certifying the performance of the entire system. This includes but is not limited to terminal unit performance.

PART 3 - EXECUTION

3.1 PUMPS

A. General

1. All pumps, other than circulators, shall be fitted with a multi-purpose or balancing valve or other means of providing system balance.
2. All pumps shall be fitted with instrument test port on inlet and outlet ports unless otherwise indicated.
3. All pump groups (over one pump in parallel) on a single system shall utilize a check valve on the outlet to prevent reverse flow.

B. Circulator

1. Circulator shall be mounted with motor shaft in the horizontal position.
2. Start-Up
   a. The primary loop shall be purged of air with the LOFlo secondary terminal loop shutoff valves closed.
   b. The primary loop shall be cleaned of debris by starting the primary pumps and continuously circulating water in the primary loop. The system shall be cleaned by frequently cleaning the start-up screens in the primary pump suction diffusers until the screens do not collect any more debris.
   c. Once the suction diffuser start-up screens are clean then the shutoff valves to the LOFlo secondary terminal loops can be opened.
   d. The secondary terminal loops shall be purged of air by opening the manual air vents on the terminal units.
   e. When the secondary terminal unit piping is purged of air then the LOFlo Mixing Block circulators can be started.

END OF SECTION 15182