SECTION 15770

RADIANT HEATING AND COOLING HYDRONIC PIPING

PART 1 –GENERAL

1.1 SUMMARY

A. Section includes evaporative humidifiers, evaporative pan humidifiers, and spray pumps.

1.2 REFERENCES

A. ARI 410 (Air-Conditioning and Refrigeration Institute) - Forced-Circulation Air-Cooling and Air-Heating Coils.

B. ARI 610 (Air-Conditioning and Refrigeration Institute) - Central System Humidifiers.

C. ARI 630 (Air-Conditioning and Refrigeration Institute) - Selection, Installation and Servicing of Humidifiers.

D. SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) - HVAC Duct Construction Standards, Metal and Flexible.

E. UL 900 (Underwriters Laboratories, Inc.) - Test Performance of Air Filter Units.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit catalog sheets indicating general assembly, dimensions, weights, materials, and certified performance ratings duct and service connections, electric nameplate data and wiring diagrams.

C. Manufacturer's Installation Instructions: Submit assembly and setting operations.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01770 - Execution Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, maintenance and repair data, including instructions for lubrication, filter replacement, cleaning and spare parts lists.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes and laws as well as the Stanford University Facilities Design Guidelines and all Stanford University Contract documents.

B. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.7 PRE-INSTALLATION MEETING

A. Section 01330 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01660 - Product Requirements: Product storage and handling requirements.

B. Accept units on site in factory packing. Inspect for damage.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 WARRANTY

A. Section 01770 - Execution Requirements: Product warranties and product bonds.

B. Provide a five year factory warranty.

1.11 MAINTENANCE SERVICE

A. Section 01770 - Execution Requirements: Maintenance service.

PART 2 –PRODUCTS

2.1 EVAPORATIVE HUMIDIFIERS

A. Manufacturers:
   1. OEM equipment compatible only

B. Construction: Factory assembled accordance with ARI 610 consisting of casing, tank, filters, and spray pumps, water and drain connections.

2.2 CASING

A. Assembly: Stainless steel, minimum 0.0635 inch, reinforced and braced with galvanized steel angles, cadmium plated cap screws.

B. Connection: 1-1/2 inch flanges on inlet and outlet with ¼ x 1 inch adhesive backed neoprene gasket.

C. Doors: Quick opening access door on one side with ¼ inch thick Plexiglas inspection window.

D. Finish: Two coats of zinc chromate, iron oxide, phenolic resin.

E. Gasket and flange pipe penetrations, inspection panels, access doors, and other openings in casing.

2.3 DRAIN TANK

A. Tank: Welded stainless.

B. Connections: 3/4 inch adjustable float valve assembly with brass rod and brass float; 2 inch drain and overflow with removable copper suction screen.

C. Fabrication: Lap and weld corners watertight. Weld fittings and piping supports to tank.

2.4 FILTERS

A. Filters: Two rows of neoprene coated filter mats in removable frames.

2.5 PUMPS

A. Spray Pump:
   1. Type: Horizontal shaft, Single stage, close coupled, radially split casing, for 125 psig maximum working pressure.

2. Case: Cast iron with gage ports, drain plug, flanged suction and discharge.
3. Impeller: Bronze, fully enclosed, keyed to motor shaft extension.
4. Shaft: Stainless steel.
5. Seal: Carbon rotating against a stationary ceramic seat.

2.6 EVAPORATIVE PAN HUMIDIFIERS

A. Manufacturers:
   1. OEM equipment compatible only

B. Units: ARI 610; evaporative pan with stand or cabinet enclosure, humidistat, heating coil, pre-wired except for humidistat, for use with heating hot water, steam or electronic heating elements.

2.7 COMPONENTS

A. Pan, Cover, Screws and Bolts: Stainless steel.

B. Overflow and Drainage Fittings: Copper or Brass.

C. Float Valve Mechanism: Stainless steel or brass with ¼-inch fill connection.

D. Coil Steam or Hot Water: 7/8 inch OD copper.

E. Coil Electric: Shielded electric immersion heating element with safety cutout switch set at 225 degrees F to disconnect electric heating element on low water level in pan.

F. Blower Fan: Forward curved fan, direct driven by fused, fractional hp motor.

G. Floor Stand: Extruded aluminum.

H. Cabinet Enclosure: Galvanized sheet metal with baked enamel finish.

I. Control: Humidistat cycles blower fan and opens inlet solenoid valve to steam or hot water for electric coils energizes electric heating element.

J. Flush Cycle: Timers allow one to four flushes per day of three to 120 minutes duration by shutting off power to heating element and opening drain valve.

PART 3 –EXECUTION

3.1 INSTALLATION

A. Install in accordance with ARI 630.

B. Connect evaporative pan humidifier to hot water supply. Provide gate or ball valve and solenoid valve on heating water supply line, and globe valve on heating water return line.

C. Connect evaporative pan humidifier to steam supply. Provide gate valve and solenoid valve on steam line and thermostatic steam trap on condensate.

D. Pipe all units, except for steam grid type, from overflow and manual drain with valve to floor drain.

E. Install evaporative pan humidifier piping with unions or flanges for easy removal of pan for servicing.

F. Connect evaporative pan humidifier to ducts. Keep duct runs minimum length and slope back to humidifier.

G. Insulate exterior of evaporative humidifiers as specified for ductwork.

H. Place evaporative humidifiers on 2-inch thick rigid insulation board same size as unit tank. Flash and counterflash with 0.0396 inch galvanized steel on entering and leaving sides.

I. Connect evaporative, evaporative pan and sprayed coil humidifiers to domestic cold water supply. Provide gate or ball valve and pressure reducing valve (as needed) on water supply line. Provide ¾ inch hose bibb accessible from interior.

J. Bolt-evaporative humidifier pumps directly to tank fitting. Insulate external spray piping.

K. Provide evaporative humidifiers with globe valve and solenoid valve in ½ inch bleed line from drain.

L. Provide evaporative humidifiers with low water cut-off in drain pan to stop spray pump.

END OF SECTION