

# **DIVISION 32 – EXTERIOR IMPROVEMENTS**

## **32 17 43 60 PAVEMENT SNOW MELTING SYSTEMS (HYDRONIC)**

### **PART 1 - GENERAL**

#### 1.01 GENERAL

- A. WSU requires that all new buildings, entrance plazas and accessibility remodels be designed to include snow melt systems, unless the exterior walkways are covered.
  - 1. All new building main and ADA-accessible horizontal entrances and ramps shall be protected with snow melt along the full entrance length, a minimum of 72 inches wide.
  - 2. All stair sections shall include at least one section protected with snow melt, a minimum of 88 inches wide.
- B. The preferred method for snow melt is to utilize heat transfer from WSU steam system to Hydronic Uponor plastic pipe system.
  - 1. Where central steam for heat exchange is not available, provisions shall be made to provide a glycol-treated system, preferably heated natural gas.
  - 2. Electric snowmelt shall only be considered where central steam heat and natural gas are not available, and requires prior approval by WSU Engineering Services.

#### 1.02 SCOPE OF SECTION

- A. System shall be a "turnkey" package including, but not be limited to: pumps, expansion tank, pressure relief valves, water system feeder, heat exchanger, thermometers, pressure gauges, air eliminators, air vents, drains and equipment hangers and interfaced with heating system specified.
- B. Water system feeder shall be a 30 gallon (minimum) storage/mixing tank with cover; pump suction hose with inlet strainer; pressure pump with thermal cut-out; integral pressure switch; integral check valve; cord and plug; pre-charged accumulator tank with EPDM diaphragm; manual diverter valve for purging air and agitating contents of storage tank; pressure regulating valve adjustable (5-55 psig) complete with pressure gauge; integral replaceable strainer; built in check valve; union connection; ½" x 36" long flexible connection hose with check valve; and low level pump cut out.
  - 1. Pump shall be capable of running dry without damage.
  - 2. Unit shall be completely pre-assembled and certified by a nationally recognized testing laboratory.
  - 3. Provide low-level makeup tank alarm panel with remote monitoring dry contacts and selectable audible alarm.
- C. Snowmelt pressure relief valve discharge shall be piped back to the storage tank.

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### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Components of the buried tubing system shall be provided by one manufacturer, including tube, fittings, manifolds and other ancillary items required for a complete installation.
- B. Pre-Approved Manufacturers:
  - 1. Uponor Company
- C. Tube
  - 1. The tube shall be cross-linked (Engel method A) polyethylene, rated at 180 degrees F maximum working temperature and 90 psi working pressure. The tube shall be manufactured in accordance with ASTM standard specification F876.
  - 2. The tube shall have an oxygen diffusion barrier capable of limiting oxygen diffusion through the tube to no greater than 0.10 g/m<sup>3</sup>/day at 104 degrees F water temperature.
  - 3. The tube shall be 5/8 inch nominal inside diameter (3/4 inch outside diameter) in accordance with ASTM standard specifications.
  - 4. The minimum bend radius for cold bending of the tube shall not be less than six (6) times the outside diameter (or greater, if recommended by the manufacturer). Bends with a radius less than stated shall require the use of bend support as supplied by the tube manufacturer.
  - 5. Tube shall carry a twenty (20) year non-prorated warranty against failure due to defects in material and workmanship. Manifolds and other ancillary components shall be warranted for eighteen (18) months from date of shipment.
  - 6. The tube shall be crush proof, recovering its original cross sectional area after intermittent flattening due to construction, installation or site abuse.
- D. Manifolds:
  - 1. Manifolds shall be of cast brass construction, manufactured of alloys to prevent dezincification or equivalent material and shall have integral circuit balancing valves.
  - 2. Manifolds shall be able to vent air from the system.
  - 3. Manifolds shall be isolated from supply and return tubing with valves that are suitable for isolation and balancing.
- E. Fittings: Fittings shall be manufactured by dezincification resistant brass or equivalent material. These fittings must be supplied by the tube manufacturer. The fittings shall consist of a barbed insert, a compression ring and a compression nut.

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- F. Systems shall be provided for heating water systems (snow melting system).
  - 1. Non-ferrous corrosion protection shall be provided by the use of Nalco Trac 107 or equal.
  - 2. System shall also be treated with biocides to prohibit biological growth within the closed system.
  - 3. Freeze protection product shall be Dow Frost HD Propylene Glycol Industrial by Dow Chemical, 50 percent glycol/50 percent water solution by weight.
- G. Hydronic Feeder System:
  - 1. Axiom Industries SF100 w R1A 10-1

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- A. All installation shall be in accordance with the manufacturer's recommendations.
- B. The tubing system shall be pressurized with water or air, in accordance with applicable codes or to a pressure to 60 psig 24 hours prior to encasement in the radiant panel. The tubing systems shall remain at this pressure during the panel installation and for a minimum of 24 hours after installation to ensure system integrity. The Contractor shall provide the water or air for the pressurization of the tubing system. The Contractor assumes all liabilities for suitable safety precautions and testing, including the use of compressed air, when applicable.
- C. Piping shall have top of reducers level with top of pipe and mains shall be graded slightly up to ends to facilitate venting of air and for drainage of system. Eccentric fittings shall be used for each change in size of mains or branches.
- D. Provide manual air vents at all high points of piping systems.
- E. Preferred sources for fill and makeup water shall be de-ionized or RO water, maximum 2.0 meg-ohm conductivity.

**END OF SECTION**