

## **PART 1 – GENERAL**

### **1.01 SECTION INCLUDES**

- A. Provide all labor, materials, transportation, equipment and services to install a hydronic radiant floor heating system where indicated on contractual drawings supplied for the project.
- B. Inspect all other portions of the contract documents for work or other terms and conditions related to the requirements of this section.

### **1.02 RELATED WORK**

### **1.03 REFERENCES**

- A. ASTM F-876 – Standard specification for cross-linked polyethylene tubing (PEX).

### **1.04 REGULATORY REQUIREMENTS**

- A. PVC (polyvinylchloride) pipe cannot be substituted for PEX.

### **1.05 SUBMITTALS**

- A. Submit catalogue cuts of all system components proposed for use including, but not limited to:
  - 1) PEX tubing
  - 2) Manifold Components:
    - a) Thermometers
    - b) Supply/Zone valves for each loop
    - c) Return/Balancing valve for each loop
    - d) Air Vents
    - e) Hose Bib for purging
    - f) Fittings
    - g) Support Brackets
  - 3) Tubing Fasteners
  - 4) Control Components
    - a) Zone Valves
    - b) Room Thermostats
    - c) Transformers
    - d) Mixing Devices

### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. All PEX tubing shall remain covered and protected from sunlight (UV rays).
- B. All tubing should be installed using a manufacturer's approved tube dispenser which will keep the tubing from twisting or kinking.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

- A. All products, components, etc. specified herein shall be manufactured and/or supplied by Embassy Industries, Inc.

### **2.02 PIPING**

- A. Tubing shall be Embassy Industries, Inc. “Liquipex” cross-linked polyethylene with an oxygen barrier.
- B. The PEX tubing shall be manufactured in accordance with ASTM F-876 and have a rated operating temperature of 180 deg. F. @ 100 psi.
- C. The tubing shall have an oxygen diffusion barrier, which prevents oxygen from entering the heating system through the tubing wall. It is extremely important to note that abrasion of the tubing will strip this thin protective coating off of the underlying PEX material.
- D. The minimum bend radius for cold bending of the PEX tube shall not be less than six times the outside diameter. Bends with a radius less than stated shall require the use of bend supports as supplied by the tube manufacturer.
- E. The PEX tubing dimensions shall be:
  - 1. 3/8” nominal inside diameter in accordance with ASTM F-876.
  - 2. 1/2” nominal inside diameter in accordance with ASTM F-876.
  - 3. 5/8” nominal inside diameter in accordance with ASTM F-876.
  - 4. 3/4” nominal inside diameter in accordance with ASTM F-876.
- F. Tubing shall be covered by a twenty-five year manufacturers warranty.

### **2.03 MANIFOLDS**

- A. Manifolds shall include manual air vents, hose bib, supply modules with manual shut off valves also capable of adapting a motorized zone valve, return modules with visible flow indication for balancing, and supply/return thermometers.
- B. Manifold assembled components containing rubber o-rings shall be lubricated with non-toxic silicon grease to ensure proper seating of the modules.

### **2.04 FITTINGS**

- A. Compression fittings shall be made of dezincification resistant brass. These fittings must be supplied by the PEX tubing manufacturer.
- B. The compression fitting shall be composed of three parts:
  - 1. Barbed insert
  - 2. Compression ring
  - 3. Compression nut

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. The tubing shall be installed in accordance with the tubing manufacturer's recommendations and the details as shown on the contractual drawings.
- B. All manifolds, fittings and components should be accessible for maintenance. The only exceptions are for repair splices as mentioned in Section 3.01C.
- C. The tubing loops shall be installed without splices from the point at which the tubing enters the radiant panel to the point at which it exists the radiant panel. Should on site damage occur to the tubing, it is acceptable to install a repair splice within an embedded loop. This emergency repair must be authorized and brought to the attention of all parties involved. Refer to the PEX tubing manufacturer's installation handbook on the proper installation of the repair coupling.
- D. Installation shall follow the contract drawings for tube layout, tube spacing, manifold configuration, manifold location, and controls.
- E. Piping entering or exiting a slab shall be protected from shear stress fracture by the use of a protective PVC elbow.
- F. Piping crossing any expansion/control joints shall be protected by a foam pipe extending a minimum of two inches on both sides of the joint
- G. The tubing and manifold components shall be pressurized with air or water in accordance with applicable codes or to a pressure of 60 psi for twenty-four hours prior to the encasement of the tubing system. The tubing shall remain pressurized during the layer covering installation for a period of forty-eight hours thereafter to ensure the integrity of the system.
- H. The contractor is responsible for ensuring that the system is freeze proof should the ambient air temperature be anticipated to drop below 32 deg. F and the system is not under normal and full operating conditions.
- I. The contractor assumes all liabilities for safety precautions and testing, including the use of compressed air.
- J. Water shall not be used as a means of pressurizing the system if the ambient air temperature may drop below the freezing point.

**END OF SECTION**