
Part 1 General

1.1 DESCRIPTION

- .1 This section shall be responsible for all labour, plant, tools equipment and materials necessary for the hydronic snow and ice melting system installation as specified and as indicated on the drawings.

1.2 STANDARD SPECIFICATIONS

- .1 Design of hydronic snow and ice melting system in accordance to the latest edition of:
 - .1 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - .2 ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
 - .3 ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops
 - .4 ASTM F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing
 - .5 ASTM F877 Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
 - .6 ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing

1.3 SUBMITTALS

- .1 Product Data: Submit manufacturer's product submittal data and installation instructions.
 - .1 Shop Drawings
 - .1 Provide installation drawings indicating tubing layout, manifold locations, zoning requirements and manifold schedules with details required for installation of the system.
 - .2 Samples: Submit selection and verification samples of piping.
 - .3 Quality Assurance and Control Submittals: Submit the following.
 - .1 Manufacturer's certificate indicating products comply with specified requirements
 - .2 Documentation indicating the installer is trained to install the manufacturer's products
 - .4 Closeout Submittals: Submit the following.
 - .1 Warranty documents specified herein
 - .2 Operation and maintenance data
 - .3 Manufacturer's field reports specified herein
 - .4 Final as-built tubing layout drawing
 - .5 Design Requirements
 - .1 Standard grade hydrostatic pressure ratings from plastics pipe institute in accordance with TR-3 as listed in TR-4.

1.4 PERFORMANCE REQUIREMENTS

- .1 Provide hydronic snow and ice melting system that is manufactured, fabricated and installed to comply with regulatory agencies and authorities with jurisdiction, and maintain performance criteria stated by the PEX tubing manufacturer without defects, damage or failure.

1.5 PRODUCT DELIVERY, HANDLING AND STORAGE

- .1 Comply with manufacturers ordering instructions and lead time requirements to avoid construction delays.
- .2 Deliver materials in manufacturers original, unopened, undamaged containers with identification labels intact.
- .3 .Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1.6 WARRANTY

- .1 Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.

Part 2 Products

2.1 MANUFACTURR

- .1 Snow and Ice Melting System:
 - .1 Uponor Inc.
 - .2 Approved equal in accordance with Section B6.

2.2 TUBING

- .1 Material: Crosslinked polyethylene (PEX) manufactured by PEX-a or Engle method
- .2 Material Standard: Manufactured in accordance with ASTM F876 and ASTM F877 and tested for compliance by an independent third-party agency.
- .3 Pressure Ratings: Standard Grade hydrostatic design and pressure ratings as issued by the Plastics Pipe Institute (PPI), a division of the Society of the Plastics Industry (SPI).
- .4 Minimum Bend Radius (Cold Bending): No less than six times the outside diameter. Use the PEX tubing manufacturer's bend supports if radius is less than stated.

2.3 FITTINGS

- .1 For system compatibility, use fittings offered by the PEX tubing manufacturer.
- .2 The fitting assembly must comply with ASTM F877 and CAN/CSA B137.5 requirements.
- .3 Use Uponor QS20 compression fittings or Uponor ProPEX fittings as applicable.

2.4 Manifolds

- .1 Reuse existing.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Comply with manufacturer's product data, including product technical bulletins, installation instructions and design drawings, including the following.
 - .1 Uponor Snow and Ice Melting Design Manual
 - .2 Uponor Radiant Floor Installation Handbook

3.2 EXAMINATION

- .1 Verify that site conditions are acceptable for installation of the snow and ice melt system.
- .2 Do not proceed with installation of the snow and ice melt system until unacceptable conditions are corrected.

3.3 INSTALLATION

- .1 Install in accordance with manufacturers specifications.
- .2 Fasten the tubing to flat wire mesh in accordance with the PEX tubing manufacturer's installation recommendations.
- .3 The submitted snow-melt design specifies the tubing on-center distance(s) and loop lengths. On-center distances will not exceed 12 inches (305mm).
- .4 Do not install tubing closer than 150mm from the edge of the heated slab.
- .5 Install the tubing at a consistent depth below the surface elevation as determined by the project engineer. Tubing installation will ensure sufficient clearance for all control joint cuts.
- .6 Metal or plastic bend supports will be used to support the tubing when departing from the slab in a 90 degree bend.

3.4 FIELD QUALITY CONTROL

- .1 To ensure system integrity, pressure test the system before covering tubing in concrete or when other trades are working in the vicinity of the tubing.
- .2 Test all electrical controls in accordance with respective installation manuals.

3.5 ADJUSTING

- .1 Balancing Across the Manifold
 - .1 Balance loops across each manifold for equal flow resistance based on actual loop lengths and total manifold flow.

- .2 Balancing is unnecessary when all loop lengths across the manifold are within 3 percent of each other in length. Install the supply and return piping to the manifold in a reverse-return configuration to ensure self-balancing.
- .2 Balancing between manifolds is accomplished with a flow control device installed on the return piping leg from each manifold when direct return piping is used for the supply and return mains.
- .3 Adjust all boiler and system controls after the system has stabilized to ensure proper operation in accordance with the system design.
- .4 Remove temporary coverings and protection of adjacent work areas.
- .5 Repair or replace damaged installed products.
- .6 Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.
- .7 Remove construction debris from project site and legally dispose of debris.

3.6 PROTECTION

- .1 Protect installed work from damage caused by subsequent construction activity on the site.

End of Section 22 83 16