



SECTION 15770

RADIANT SUBFLOORING

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Radiant Subflooring.
- B. Radiant Heat Carriers.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Floor and wall framing.
- B. Section 09600 - Flooring: Finish Flooring Material to be installed over radiant subfloor.
- C. Section 15050 - Basic Mechanical Materials and Methods: Plumbing fittings and connections.
- D. Section 15500 - Heat Generation Equipment: Hot water heating systems.

1.3 REFERENCES

- A. APA - American Plywood Association: Testing and rating procedures for plywood sheathing.
- B. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- C. ASTM D 3498 - Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems.
- D. ASTM F 876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing.
- E. UPC - Uniform Plumbing Code: Construction codes applicable to radiant heating systems.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [[Product Data](#)]: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Submit manufacturer's drawings detailing the location, layout and pattern of panel and tubing installation.

- D. Selection Samples: For each finish product specified, two samples representing manufacturer's full range of available options.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color and patterns.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer specializing in Radiant subflooring shall provide panel materials and installation patterns and approve radiant tubing, fasteners, and any secondary materials to be installed in conjunction with the radiant subfloor system.
- B. Installer Qualifications:
 - 1. Installer with a demonstrated five (5) years experience successfully installing products of similar type and scope shall install all radiant subfloor panels.
 - 2. All related plumbing connections required by the Work listed in this section shall be performed by contractor or subcontractor licensed or otherwise authorized to install radiant heating systems by authorities having jurisdiction.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship is approved by the Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. At project closeout, provide to the owner a copy of the manufacturer's standard warranty form outlining the terms and conditions of their limited warranty against manufacturing defect.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Warmboard Radiant Subfloor, which is located at: 8035 Soquel Dr. Suite 41 - A ; Aptos, CA 95003; Toll Free Tel: 877-338-5493; Tel: 831-685-9276; Fax: 831-685-9278; Email: nicole@warmboard.com; Web: www.warmboard.com

2.2 MATERIALS

- A. Warmboard Radiant Subfloor: Nominal 1 1/8 inch (28mm) thick plywood subfloor with pre-routed channels for installation of Radiant Heat Tubing.
 - 1. Panel Dimensions: 48 inches x 96 inches (1219mm x 2438mm).
 - 2. Panel Base: 1 3/32 inch (27.8mm) 7-Layer douglas fir tongue-and-groove plywood; APA Rated, Sturd-I-Floor.
 - 3. Radiant Barrier Overlay: 0.025 inch (0.6mm) glare resistant light green aluminum sheet bonded to plywood and conforming to channels
 - 4. Channel Size: Nominal 21/32 inch (16.7mm) diameter.
 - 5. Channel Spacing: 12 inches (305mm) o.c. parallel to panel's long dimension.

- B. Radiant Heat Tubing: Cross Linked Polyethylene (PEX) based tubing designed for transmission of hot water.
 - 1. Tubing Size: 1/2 inch (13mm) inside diameter per ASTM F 876.
 - 2. Hydrostatic Design and Pressure Ratings per Plastic Pipe Institute (PPI):
 - a. 200 F degrees F at 80 psi (93.3 C at 552 KPa).
 - b. 180 F degrees F at 100 psi (82.2 C at 689 KPa).
 - c. 73.4 F degrees F at 160 psi (23 C at 1103 KPa).
 - 3. Maximum Length: 300 feet (91440mm).
 - 4. PEX Aluminum PEX Manufacturer: Kitec.
 - 5. PEX Aluminum PEX Manufacturer: Weil-McLain.
 - 6. PEX Aluminum PEX Manufacturer: Vanguard.
 - 7. PEX Aluminum PEX Manufacturer: Mr. Pex.
 - 8. PEX Aluminum PEX Manufacturer: Infloor Heating Systems.
 - 9. PEX Aluminum PEX Manufacturer: RHT.
 - 10. PEX Aluminum PEX Manufacturer: Aqua-Therm.
 - 11. PEX Aluminum PEX Manufacturer: Wirsbo.

- C. Fasteners, Adhesives and Sealants:
 - 1. Nails: 10d - 3 inch (76mm) nails with twist, ring or otherwise deformed shank.
 - 2. Screws: Minimum 2 1/2 inch (64mm) long coarse thread deck or subfloor screws.
 - 3. Construction Adhesive: Elastomeric Resin Adhesive meeting or exceeding the requirements of ASTM D 3498.

PART 3 EXECUTION

3.1 DESIGN

- A. Contractor shall provide Project Information to the manufacturer which includes a comprehensive plan view of the structure to receive radiant subfloor which includes the following:
 - 1. Locations of all exterior and interior walls
 - 2. Floor joist location and configuration
 - 3. Heating zones
 - 4. Radiant manifold and associated plumbing component locations.
 - 5. Penetrations in the floor
 - 6. Locations of fixtures which may interfere with panel routing.

- B. Upon receipt of Project Information, the Manufacturer shall provide a D size plot that displays the radiant panel configuration, heating zones, PEX tubing configuration and routing and location of radiant manifold and associated plumbing components.

3.2 EXAMINATION

- A. Do not begin installation until floor joists and associated framing components have been properly prepared.

- B. Carefully examine joist spacing and direction to ensure proper location and support of radiant subfloor panels. Floor joists shall be installed plumb, level and square, without warp, rake or skew and must be evenly spaced to ensure panel ends are supported properly. Correct any deficiencies prior to installation of the radiant subfloor.
- C. Unsupported or poorly supported panel ends shall be considered defective work and will be rejected by the Architect.
- D. If floor framing is the responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.

3.3 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer and APA for achieving the best result for the substrate under the project conditions.
- C. Remove all dust, debris and dirt from joist tops. Trim joist hangers and mounting hardware that may interfere with the installation.

3.4 PANEL INSTALLATION

- A. Install in accordance with manufacturer's current application instructions.
- B. Locate panels as shown on the manufacturer's provided panel configuration.
- C. Apply 1/4 inch wide beads of construction adhesive to the tops of the floor joists following the adhesive manufacturer's recommendations for use and open time. Apply two beads on joists where panels meet.
- D. Install Panels perpendicular to floor joists. Space panels 1/8 inch (3mm) apart on all sides to allow for thermal and moisture expansion. Tongue ends shall only interface with groove ends. Non-interlocked ends shall be considered defective work and will be rejected by the Architect.
- E. Fasten panels spacing 6 inches (152mm) on center into every joist. Fastener heads must be flush or just below flush.
- F. Where unusual architectural features require custom grooves to be created. Follow the manufacturer's instructions on shaping and finishing grooves.

3.5 RADIANT TUBING INSTALLATION

- A. Do not install radiant tubing until the subfloor has been installed over the entire floor.
- B. Individual tubing runs shall not exceed 300 feet (91440mm).
- C. Carefully position and lock into place the tubing, avoiding sharp bends which may kink or otherwise damage the tubing.
- D. Using a weighted roller, roll tubing into place. Tubing must be flush with the top surface of the subfloor in all locations.

3.6 PLUMBING CONNECTIONS

- A. Plumbing connections are to be performed in accordance with Uniform Plumbing

Code (UPC) and local building codes.

3.7 FINISHED FLOORING

- A. Install flooring in accordance with requirements of Section 09600.

3.8 PROTECTION

- A. Protect installed products until finished floor surface is installed.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION