

SECTION 23 8323

RADIANT CEILING HEATING SYSTEMS (Commercial Projects)

This section includes editing notes to assist the user in editing the section to suit project requirements. These notes are included as hidden text, and can be revealed or hidden by one of the following methods:

Microsoft Word 2007: Click the OFFICE button, select WORD OPTIONS, select DISPLAY, then select or deselect the HIDDEN TEXT option.

Microsoft Word (earlier versions): From the pull-down menus select TOOLS, then OPTIONS. Under the tab labeled VIEW, select or deselect the HIDDEN TEXT option.

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GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Architectural Series heating panels.
 - 2. Thermostat controls.
 - 3. Connection to power supply.

- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section [06 1100 - Framing and Sheathing:] [__ ____ - ____:] Wood ceiling framing.
 - 3. Section [09 2200 - Metal Suspension Systems:] [__ ____ - ____:] Metal ceiling suspension system.
 - 4. Section [09 2900 - Gypsum Board:] [__ ____ - ____:] Gypsum board ceilings.
 - 5. Section [09 5100 - Acoustical Ceilings:] [__ ____ - ____:] Metal ceiling suspension system.

1.2 REFERENCES

- A. Canadian Standards Association (CSA) - Canadian Electrical Code
- B. National Fire Protection Association (NFPA) 70 - National Electrical Code.
- C. Underwriters Laboratories, Inc. (UL) - Product Directories.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include reflected ceiling plans with heating panel layout, panel sizes, and power supply locations.
 - 2. Product Data: Manufacturer's descriptive data for heating panels and accessories, including electrical characteristics.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum [2] [__] years [documented] experience in work of this Section.

- B. Electrical Products: Tested by Underwriters Laboratories, Inc.
 - 1. Bear UL Listing Mark.
 - 2. Listed in UL Product Directory.

**** OR ****

C. Electrical Products: Certified by CSA.

**** OR ****

D. Electrical Products: Certified by an independent laboratory approved by authorities having jurisdiction.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle panels in manner to prevent damage.

1.6 WARRANTIES

A. Furnish manufacturer's [10] year warranty providing coverage against defects in materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Contract Documents are based on products by Therma-Ray (www.thermaray.com).

B. Substitutions: [Under provisions of Division 01.] [Not permitted.]

2.2 COMPONENTS

A. Radiant Ceiling Heating Panels:

1. Product: Architectural Series.
2. Utilize alloy resistance wire element, electrically insulated, rated to 250 degrees C, uniformly distributed over panel face.
3. Utilize reflective foil to adhere heating elements to panels.
4. 2-inch-thick, 4 PSF density high temperature mineral wool insulation. [or 1-inch-thick, 4 PSF density high temperature mineral wool insulation]
5. 22 gage precoat galvanized steel frame.
6. Front panel finish: [High-temperature baked-on powder coating, [white.] [custom color to be selected.]] [Silk-screened to match architectural ceiling panels.] [Type [304] [316] stainless steel.]
7. Watt density range of 65 to 95 watts per square foot at rated voltage.
8. Internal electrical junction box.
9. Hanger support clips at each panel corner.
10. Size and electrical characteristics:
 - a. 24 x 24 inches, 120 VAC: [250] [310] [335] [375] watts.
 - b. 24 x 24 inches, 208 VAC: [250] [310] [355] [375] watts.
 - c. 24 x 24 inches, 240 VAC: [250] [310] [325] watts.
 - d. 24 x 24 inches, 277 VAC: [210] [250] [335] [375] watts.
 - e. 24 x 24 inches, 347 VAC: [250] [300] [360] [375] watts.
 - f. 24 x 48 inches, 120 VAC: [500] [625] [750] watts.
 - g. 24 x 48 inches, 208 VAC: [515] [535] [625] [715] [750] watts.
 - h. 24 x 48 inches, 240 VAC: [500] [625] [725] watts.
 - i. 24 x 48 inches, 277 VAC: [500] [660] [675] [750] watts.
 - j. 24 x 48 inches, 347 VAC: [500] [625] [650] [700] [750] watts.
 - k. 14 x 48 inches, 120 VAC: 350 watts.
 - l. 14 x 48 inches, 208 VAC: [300] [400] [435] watts.
 - m. 14 x 48 inches, 240 VAC: [300] [435] watts.
 - n. 14 x 48 inches, 277 VAC: [350] [435] watts.
 - o. 14 x 48 inches, 347 VAC: 400 watts.
 - p. 14 x 60 inches, 120 VAC: 350 watts.
 - q. 14 x 60 inches, 208 VAC: 450 watts.
 - r. 14 x 60 inches, 240 VAC: [375] [530] [550] watts.

- s. 14 x 60 inches, 277 VAC: [375] [535] watts.
 - t. 14 x 60 inches, 347 VAC: 540 watts.
 - u. 20 x 60 inches, 120 VAC: 700 watts.
 - v. 20 x 60 inches, 208 VAC: 615 watts.
 - w. 20 x 60 inches, 240 VAC: 790 watts.
 - x. 20 x 60 inches, 277 VAC: [375] [535] watts.
 - y. 20 x 60 inches, 347 VAC: [675] [725] watts.
11. Sealtite flexible conduit and connectors and silicone sealed seams.
- B. Mounting System: [[Surface] [Plaster] mounting frame sized to panel size.] [Tegular reveal edge for 15/16 inch suspension grid.] [Fineline Tegular reveal edge for 9/16 inch suspension grid.]

2.3 ACCESSORIES

- A. Thermostat Controls: No. SR-240/120 ThermaRay Comfort Controller.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install panels and accessories in accordance with manufacturer's instructions, approved Shop Drawings, and [NFPA 70.] [Canadian Electrical Code.]
- B. Locate thermostat controls [where indicated.] [____.]
- C. Install hangers at each corner of panels suspended from structure. Do not suspend hangers directly from metal deck, ducts, pipes, or conduit.

**** OR ****

- D. Support panels in mounting frames attached to ceiling framing.
- E. Wire panels to branch circuits in parallel.
- F. Connect to power supply and control wiring.

3.2 TESTING

- A. Test installed panels at rated voltage using ammeter. Ensure that ammeter values are same as calculated for heating load.

END OF SECTION