SECTION 238323 - RADIANT-HEATING ELECTRIC PANELS

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section includes prefabricated radiant-heating electric panels.
			2. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include rated capacities, operating characteristics, and furnished specialties and accessories.

* + - * 1. Shop Drawings: For electric heating panels.

Include plans, sections, details, and attachments to other work.

Include diagrams for power, signal, and control wiring.

Retain "Samples for Initial Selection" and "Samples for Verification for Radiant-Panel Finishes" paragraphs below for two-stage Samples. Delete first paragraph if colors are preselected and specified or scheduled. Retain second paragraph with or without first paragraph.

* + - * 1. Samples for Initial Selection: For units with factory-applied color finishes.
				2. Samples for Verification for Radiant-Panel Finishes: **[12 by 12 inches] <Insert size>.**

Retain "Coordination Drawings" paragraph below for situations where limited space necessitates maximum utilization for efficient installation of different components or if coordination is required for installation of products and materials by separate installers. Coordinate paragraph with other Sections specifying products listed below. Preparation of coordination drawings requires the participation of each trade involved in installations within the limited space.

* + - * 1. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

Revise subparagraphs below to suit Project.

Ceiling suspension assembly members.

Method of attaching hangers to building structure.

Structural members to which heating panels and suspension systems will be attached.

Size and location of initial access modules for acoustical tile.

Items installed in finished ceiling, including the following:

Lighting fixtures.

Air outlets and inlets.

Speakers.

Sprinklers.

Access panels.

Perimeter moldings.

**<Insert item>**.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + - * 1. Field quality-control reports.
				2. Sample Warranty: For special warranty.
			1. CLOSEOUT SUBMITTALS
				1. Operation and Maintenance Data: For electric heating panels to include in operation and maintenance manuals.
			2. WARRANTY

When warranties are required, verify with Director’s Representative's that warranties stated in this article are not less than remedies available to Director’s Representative under prevailing local laws.

* + - * 1. Special Warranty: Manufacturer agrees to repair or replace electric heating panels that fail in materials or workmanship within specified warranty period.

Verify available warranties and warranty periods for radiant-heating electric panels.

Warranty Period: **[Three] [Five] <Insert number>** years from date of Substantial Completion.

1. PRODUCTS

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures.

* + - 1. GENERAL REQUIREMENTS FOR RADIANT-HEATING ELECTRIC PANELS
				1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
			2. PREFABRICATED RADIANT-HEATING ELECTRIC PANELS
				1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Berko; Marley Engineered Products.

QMark; Marley Engineered Products.

SSHC, Inc.

Approved equivalent.

* + - * 1. Description: Sheet-metal-enclosed panel with heating element suitable for **[lay-in installation flush with T-bar ceiling grid] [surface mounting] [recessed mounting]**. Comply with UL 2021.

Panel: Minimum 0.0276-inch- thick, galvanized sheet steel back panel riveted to minimum 0.0396-inch- thick, galvanized sheet steel front panel with fused-on crystalline surface.

Retain one of two "Heating Element" subparagraphs below.

Heating Element: Powdered graphite sandwiched between sheets of electric insulation.

Heating Element: Insulated resistive wires.

Electrical Connections: Nonheating, high-temperature, insulated-copper leads, factory connected to heating element.

Retain one of three "Exposed-Side Panel Finish" subparagraphs or "Surface-Mounted Trim" subparagraph below. If more than one type of finish is required, indicate each type in a schedule on Drawings.

Exposed-Side Panel Finish: Apply silk-screened finish to match appearance of Director’s Representative-selected acoustical ceiling tiles.

Exposed-Side Panel Finish: Factory prime coated, ready for field painting.

Exposed-Side Panel Finish: Baked-enamel finish in manufacturer's **[standard] [custom]** paint color as selected by Director’s Representative.

Retain "Surface-Mounted Trim" subparagraph below for surface-mounted panels.

Surface-Mounted Trim: Sheet metal with baked-enamel finish in manufacturer's **[standard] [custom]** paint color as selected by Director’s Representative.

* + - * 1. Wall Thermostat: Bimetal, sensing elements calibrated from 55 to 90 deg F; with contacts suitable for **[low] [line]**-voltage circuit, and manually operated on-off switch with contactors, relays, and control transformers.

If Project has more than one type or configuration of prefabricated radiant-heating electric panel, delete "Capacities and Characteristics" paragraph below and schedule on Drawings. See Evaluations for sample schedule.

* + - * 1. Capacities and Characteristics:

Nominal Panel Size: **[24 by 24 inches] [24 by 36 inches] [24 by 48 inches] [24 by 60 inches] <Insert custom size>**.

Heating Capacity: **[250] [375] [500] [570] [625] [750] [950] <Insert value>** W.

Electrical Characteristics for Single-Point Connection:

Volts: **<Insert value>**.

Phase: **<Insert value>**.

Hertz: **<Insert value>**.

Full-Load Amperes: **<Insert value>**.

Minimum Circuit Ampacity: **<Insert value>**.

Maximum Overcurrent Protection: **<Insert amperage>**.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine surfaces and substrates to receive electric heating panels for compliance with requirements for installation tolerances and other conditions affecting performance.

Ensure surfaces in contact with electric heating panels are free of burrs and sharp protrusions.

Ensure surfaces and substrates are level and plumb.

* + - * 1. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. INSTALLATION

Indicate location of controls on Drawings.

* + - * 1. Install radiant-heating panels level and plumb.
				2. Support for Radiant-Heating Panels in or on Grid-Type Suspended Ceilings: Use grid as a support element.

Install a minimum of four ceiling-support-system rods or wires for each panel. Locate not more than 6 inches from panel corners.

Support Clips: Fasten to panel and to ceiling grid members at or near each panel corner with clips designed for the application.

Panels of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support panels independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.

Retain subparagraph below if Project is in a seismic area.

Install at least one independent support rod or wire from structure to a tab on panel. Wire or rod shall have breaking strength of the weight of the panel at a safety factor of 3.

To comply with requirements of the Americans with Disabilities Act, verify mounting height in paragraph below with authorities having jurisdiction.

* + - * 1. Verify locations of thermostats with Drawings and room details before installation. Install devices **[48 inches] [60 inches] <Insert dimension>** above finished floor.
			1. CONNECTIONS
				1. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
				2. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
			2. FIELD QUALITY CONTROL

Retain "Testing Agency," "Manufacturer's Field Service," and "Perform the following tests and inspections" paragraphs below to identify who shall perform tests and inspections. If retaining second option in "Testing Agency" paragraph or if retaining "Manufacturer's Field Service" or "Perform the following tests and inspections" paragraph, retain "Field quality-control reports" paragraph in "Informational Submittals" Article.

Retain "Manufacturer's Field Service" paragraph below to require a factory-authorized service representative to perform tests and inspections.

* + - * 1. Manufacturer's Field Service: Engage a Company Service Advisor to test and inspect components, assemblies, and equipment installations, including connections.

Retain "Perform the following tests and inspections" paragraph below to require Contractor to perform tests and inspections.

* + - * 1. Perform the following tests and inspections**[ with the Company Field Advisor per OGS Spec Section 014216]**:

Operate electric-heating elements through each stage to verify proper operation and electrical connections.

Test and adjust controls and safeties.

* + - * 1. Radiant-heating electric panels will be considered defective if they do not pass tests and inspections.
				2. Prepare test and inspection reports.
			1. PROTECTION
				1. Protect installed radiant-heating electric panels from damage during construction.
				2. Remove and replace damaged radiant-heating electric panels.

END OF SECTION 238323