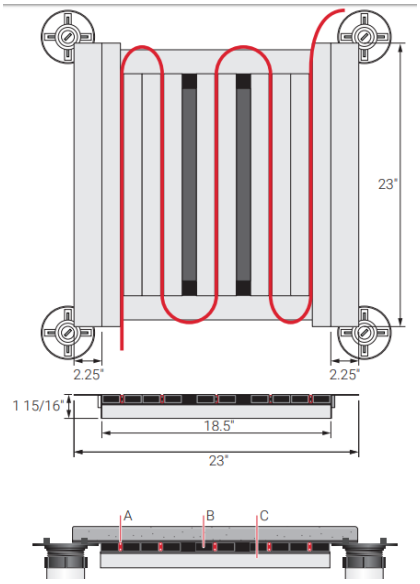
SECTION 32 17 43
PAVEMENT SNOW MELTING SYSTEMS

PEDESTAL MOUNTED PAVER HEATING SYSTEM

This specification is dated 03/01/2019 and supersedes all previous versions.

Any text in RED indicates a choice the user needs to decide upon to suit project requirements and deleted prior to incorporating into final contract documents. For detailed design information, please contact your local representative, our website www.nventthermal.com or nVent Thermal Technical Support 800-545-6258.



PART 1 GENERAL

1.1. SUMMARY

A. Section includes a pedestal mounted heating system for paver snow melting and consists of a tray consisting of five (5) aluminium extrusions which are specifically designed to tightly hold up to five (5) runs of heat tracing cable.

B. Related Requirements
   1. Section 03 06 00 – Schedules for Concrete
   2. Section 26 00 00 – Electrical

1.2. REFERENCES

A. Reference Standards
   1. UL515 – Electrical Resistance Heat Tracing for Commercial Applications
   2. IEEE 515.1-2012 Standard for the Testing, Design, Installation & Maintenance of Electric Resistance Trace Heating for Commercial Applications.
   3. CSA Standard C22.2 No. 130-03 Requirements for Electrical Resistance Heating Cables & Heating Device Sets
   4. NFPA 70 - National Electrical Code
   5. CSA Standard C22.1 – Canadian Electrical Code

1.3. SYSTEM DESCRIPTION

A. Custom-engineered pedestal mounted paver heating system designs shall be supplied for paver snow melting. The system consists of insulated aluminum trays mounted on adjustable pedestal supports. Each tray consists of five (5) aluminum extrusions which are specifically designed to tightly hold up to five (5) runs of heat tracing cable. The trays shall be designed so that maximum amount of heat is transferred to pavers. This is to be achieved by providing good thermal contact of channels with heat tracing cables (cables slip-fit into slots), large surface area in contact with the pavers, and insulation to prevent heat loss to surrounding environment. The corners of the tray are designed to mount onto four adjustable pedestal supports (supplied by others). Trays are sized so that lower portion of tray fits between pedestal support bodies and the heat tracing cable can be routed between adjacent trays.

1.4. ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

A. Product Data
   1. Pedestal mounted system data sheet
   2. System installation and operation instructions
   3. System installation details
   4. Controller wiring diagram

B. Shop Drawings

C. Provide detailed engineered isometric drawings showing heat tracing circuit layouts indicating power connections, end seals, and cable length.

1.5. QUALITY ASSURANCE

A. Source Limitations: All system components [top section, heating cable, and controller] shall be sourced from a single manufacturer, under no circumstances shall any components be installed other than those supplied by the cable manufacturer, to ensure system integrity and meet warranty requirements.

B. Qualifications
   1. Manufacturers
      a. Manufacturer to show minimum of forty (40) years of experience in manufacturing electric self-regulating heating cables.
      b. Manufacturer will be ISO-9001 registered.
      c. Manufacturer to provide heating cable consistent with IEEE 515.1 and CSA 22.2 No 130-03 requirements.
      d. The self-regulating heating cable shall be qualified and tested to demonstrate a useful lifetime in excess of 20 years.
      e. The manufacturer shall provide an extensive global reference list for this application, including installations that have been in operation for over 15 years.
   2. Installers
      a. System installer shall have complete understanding of product and product literature from manufacturer or authorized representative prior to installation. Electrical connections shall be performed by a licensed electrician.
   3. Electrical Components, Devices, and Accessories: Listed and labelled as defined in NFPA 70, Article 100, by a Nationally Recognized Testing Laboratory (NRTL), and marked for intended use.

C. Certifications
   1. None.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements
   1. Deliver, store and handle products to prevent their deterioration or damage due to moisture, temperature changes, contaminates or other causes.

2. Deliver products to site in original, unopened containers or packages with intact and legible manufacturers' labels identifying the following:
    a. Product and Manufacturer
    b. Length/Quantity
    c. Lot Number
    d. Installation and Operation Manual
    e. MSDS (if applicable)

B. Storage And Handling Requirements
1. Store the heating cable in a clean, dry location with a temperature range 0°F (-18°C) to 140°F (60°C).
2. Protect the heating cable from mechanical damage.

1.7. WARRANTY

A. Manufacturer Warranty
1. nVent warrants all goods listed below for two (2) years from date of purchase against faulty workmanship and use of defective materials when such goods are properly installed, operated, and maintained according to product documentation. See Limited Product Warranty (H57396) at www.nventthermal.com.
    a. Heating cables, connection kits and accessories
    b. Thermostats, controllers, panels contactors, sensors and accessories

B. Special Warranty –
1. Contractor shall provide the owner an extended product warranty for the heat tracing products listed below. The contractor must complete and forward to owner the Installation, Inspection or Commissioning Record(s), and complete the online warranty registration form within thirty (30) days from the date of installation, otherwise only standard limited warranty applies. See Limited Product Warranty Extension details (H57397) at www.nventthermal.com
    a. Heating Cable and Components warranty shall be Ten (10) Years from Date of Purchase

C. Heating cables, connection kits and accessories not automatically offered with a 10 year manufacturer's warranty, as a standard matter of course, will not be allowed. Warranty information must be published on the manufacturer's website.

PART 2 PRODUCTS

2.1. HEAT TRACING SYSTEM

A. Manufacturers
1. Basis of Design Manufacturer: Subject to the compliance with requirements, provide nVent RAYCHEM heat tracing products **of nVent Thermal Management, LLC Redwood City 94063, 800-545-6258;**

Email: **thermal.info@nvent.com** Website: **www.nventthermal.com**

Specifier: Retain one of the two paragraphs below based upon Project requirements.

2. Submit comparable products of one of the following for approval by the specifier:
    a. [Specifier: Insert name of manufacturer with comparable products]
    b. Submit request for substitutions in accordance with Instructions to Bidders and Division 01 General Requirements.
3. Provide specified product; Owner will not consider substitution requests.

B. Materials
1. Pedestal Mounted Paver Heating System.
    a. The Pedestal Mounted Paver Heating System shall be RAYCHEM PMPH panels manufactured by nVent Thermal Management.
    b. The heating cable trays consist of an arrangement of aluminum extrusions that provide slots into which self-regulating heating cables are placed. The top surface of the tray is 23” x 23”, and the thickness is approximately 2”.
    c. The PMPH panels should allow for heating cable to traverse from one panel to the next to form a complete circuit. Each panel should have five (5) runs of heating cable to ensure adequate heat for snow melting.
2. Heating cables shall be RAYCHEM QTVR, self-regulating heating cables specifically designed for this application.
    a. The construction of the self-regulating heating cable shall consist of a continuous core of conductive polymer that is radiation cross-linked, extruded between two (2) 16 AWG nickel-plated copper bus wires that varies its power output in response to panel temperature changes.
    b. The heating cable shall have a modified polyolefin inner jacket for dielectric integrity and long life expectancy.
    c. The heating cable shall have a tinned copper braid with minimum 70% coverage for ground path and mechanical ruggedness.
    d. The heating cable shall have a FLUOROPOLYMER (-CT) outer jacket printed with cable model number, agency listings, batch number and meter marks (for ease of installation within maximum circuit length).
    e. The heating cable shall have a self-regulating factor of at least 70 percent. The self-regulating factor is defined as the percent reduction of the heating cable power output going from a 0°F to 80°F temperature.
    f. The heating cable shall operate on line voltages of 120, 208, 240 **or** 277 volts without the use of transformers**. [Select one].**
    g. The heating cable shall be part of a UL Listed, CSA Certified system.
    h. Constant wattage cables are not acceptable.
3. Energy Efficient Control System
    a. Group Control (includes power distribution and control) – RAYCHEM SMPG1 snow melting power distribution and control panel Group snow/ice melting controller shall have a main breaker and integrated 30-mA, alarming, ground-fault circuit breakers. Use in conjunction with up to six (6) CIT-1 aerial temperature and moisture sensors.
    b. Remote Control Unit. An RCU remote status and activation switch shall be provided and installed in an accessible area. The RCU shall indicate the status of the heat trace system and provide the owner with the ability to manually activate the snow melt system.

PART 3 EXECUTION

3.1. EXAMINATION

A. Preinstalling Testing

1. Prior to installing, an insulation resistance test shall be performed by the installing contractor to ensure integrity of heating cable as described in the installation and maintenance manual.

3.2. PREPARATION

A. Protection Of In-Place Conditions

1. All heating cable ends shall be protected from moisture ingress until cable is terminated.

3.3. INSTALLERS

A. Acceptable Installers

1. Subject to compliance with requirements of Contract Documents, installer shall be familiar with installing heat-trace cable and equipment

3.4. INSTALLATION

A. Since efficient heat transfer from tray to paver depends on good thermal contact between the upper surface of the tray and the lower surface of the paver, the lower surface of the paver shall be free of protrusions that rise significantly above the average height of its normal rough surface.

1. Concrete Pavers: Production methods of concrete pavers may cause the existence of several significantly high protrusions on the lower surface of the paver. These protrusions shall be removed.
2. Porcelain Pavers: Production methods of porcelain pavers result in a consistent lower surface texture without significant protrusions. These pavers provide higher thermal conductivity than concrete pavers and are less than half the thickness, resulting in faster, more efficient surface heating. They are approximately 1/3 the weight of concrete pavers.

B. The entire lower area of the tray shall be insulated with 1” thick rigid, closed-cell Polyisocyanurate with reflective outside layers. Other exposed aluminium tray surfaces shall be insulated with ¼” thick neoprene/vinyl/Buna-N foam.

3.5. FIELD QUALITY CONTROL

A. Initial start-up and field testing (commissioning) of the system shall be performed by factory technician or factory representative per the owner’s requirements.

B. Field Tests And Inspections

1. The system shall be commissioned in accordance to the Pedestal Mounted Paver Heating System Installation and Operation manual.(H60001)
2. The heating cable circuit integrity shall be tested using a 2500 Vdc megohmmeter at the following intervals below. Minimum acceptable insulation resistance shall be 1000 megohms or greater.
    a. Before installing the heating cable

b. After heating cable has been installed
c. Prior to initial start-up (commissioning)
d. As part of the regular system maintenance

3. The technician shall verify that the controller parameters are set to the application requirements.
4. All commissioning results will be recorded and presented to the owner.

C. Non-Conforming Work
1. Any heat tracing circuit which fails the any of the above tests must be corrected prior to commissioning or startup of the system.

D. Retain the services of nVent RAYCHEM Management to provide factory design build and inspection services to prepare submittals for complete design layouts, wiring diagrams, installation details for all heat trace equipment including heating cable, connection kits, controllers and sensors. nVent shall supply 11”x17” isometric drawings for every circuit for a complete heat tracing system.

E. Provide factory inspection report as part of a complete manufacturer approved installation that is compliant to Code.

F. Start-up – Start-up of system shall be performed by factory technician or factory representative per the owner’s requirements.

3.6. SYSTEM STARTUP
1. Provide a factory-certified technician or manufacturer’s representative for startup and commissioning of the heat tracing system and controller.
2. Coordinate all controller settings with engineer prior to programming the controller.
3. Provide commissioning report in submittals package to owner.

3.7. MAINTENANCE

A. Maintenance Service
1. Comply with manufacturer’s recommendations in their Installation and Operation Manual.

END OF SECTION