

General Specification

Surface Snow and Ice Melting

Part 1 . . . General

Furnish and install an engineered surface snowmelt system complete with layout drawings, UL Listed heating cable and components and control panel with snow sensor and ground fault protection equipment. Heating cable must be suitable for direct burial in concrete or asphalt. The heat tracing system shall conform to IEEE Standard 515.1. Comply with manufacturer's installation instructions in its entirety.

Part 2 . . . Products

1. The heating cable and termination components shall be UL Listed specifically as electric de-icing and snow-melting equipment.
2. The heating cable shall be of parallel resistance construction capable of being cut-to-length and terminated in the field. Series resistance, constant wattage cables or mats shall not be allowed.
3. The cable shall provide the heat necessary to melt snow and ice through a power limiting coiled resistor alloy element helically wound around two (2) fluoropolymer insulated 12 AWG stranded nickel-plated copper bus conductors. The heater will be covered by a fluoropolymer dielectric jacket, fiberglass cushion braids for impact resistance, a nickel-plated copper braid for grounding purposes and an overall silicone outer jacket for added protection during installation.
4. The heating cable must reduce power output at elevated temperatures to prevent overheating and system damage if accidentally energized during ambient temperatures exceeding 40°F. Heating cable must be of the power-limiting type so as not to require circuit breaker oversizing as is required when using self-regulating type cables.
5. The cable must avoid elevated cold start currents at temperatures below +50°F that would require oversizing power distribution and circuit breakers. Heating cables that exhibit high in-rush current shall not be allowed.
6. The heater shall operate on a line voltage of (select 208, 240, 277 or 480) Vac without the use of transformers. Voltage rating of the dielectric insulation shall be 600 Vac.
7. Power connections and end seal terminations shall be made in junction boxes as described under Part 6, Installation. Power connections and end seal terminations are not to be buried in concrete or asphalt.
8. Acceptable products and manufacturers: SMB™ Power Limiting Heating Cable as manufactured by Bylin Engineered Systems, El Dorado Hills, CA (1-888-313-5666)

Part 3 . . . Power Distribution and Control

The control system shall include a remote snow sensor located outdoors in accordance with manufacturer's instructions and control panel containing branch circuit breakers, ground fault protection, contactors, power on light and an auto, on, off control switch.

The control system shall be custom engineered and supplied by Bylin Engineered Systems, El Dorado Hills, CA (1-888-313-5666).

Part 4 . . . System Performance

1. Heating cable spacing shall be based on (select a, b, c or d design method listed below):
 - a. Manufacturer's snow melting design guide for a (select: non-critical or critical area) with (select: light, moderate or heavy) snowfall level.
 - b. Chapter 45, Snow Melting, of the ASHRAE Handbook utilizing data for the city of _____ . Design shall meet the (insert percentage) level of clear surface under normal snowfall conditions per Table 1.
 - c. Section 6.3, Snow Melting, of the IEEE Standard 515.1 – 1995 Recommended Practice for the Testing, Design, Installation and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications.
 - d. 30 wts/ft² based on heating cable power output during steady state snowmelting conditions. The design shall not be based on startup or cable inrush characteristics.
2. System performance shall be based on heated surface temperatures of 32°F (minimum) during the snow melting process. Start up in cold concrete shall be used for circuit breaker sizing only.

Part 5 . . . Supplier

1. The supplier shall demonstrate experience designing and engineering snow and ice melting systems and shall have at least 10 years experience in the custom engineering, design and supply of complete surface snowmelt systems. The supplier shall be Bylin Engineered Systems, El Dorado Hills, CA (1-888-313-5666).

Part 6 . . . Installation

1. Heating cable shall be installed:
 - a). Concrete--Poured in place within 2"-4" of the finished surface.
 - b). Asphalt--Embedded in asphalt within 1"-2" of the finished surface.
 - c). Pavers--Installed in the sand bed below the finished paver surface.
2. Installer shall follow supplier's installation instructions and design guide for proper installation and layout methods.
3. Power connections and end seal terminations shall be located in Nema 4 or 4X junction boxes. The heating cable located between the junction boxes and concrete shall be encased in rigid metal conduit (with protective bushings at each end) that extend 12" into the concrete, asphalt or substrate.
4. Contractor shall provide and install: power wiring to the control panel, from the control panel to the heating circuit power termination boxes and from the snow sensor to the control panel. Locate the automatic snow detector sensor as indicated on systems drawings provided by the supplier.
5. All installations and terminations must be made to conform to the NEC and any applicable other national or local code requirements.
6. Circuit breakers supplying power to the heat tracing must be equipped with 30 mA minimum ground-fault equipment protection or equivalent ground fault protection system (5mA GFCI shall not be used as nuisance tripping may result).

Part 7 . . . Testing

1. Heating cable should be tested with a 2,500 Vdc megohmmeter (megger) between the heating cable bus wires and the heating cable's metallic braid. While a 2,500 Vdc megger test is recommended, the minimum acceptable level for testing is 1,000 Vdc. This test should be performed a minimum of four times:

- a. While the cable is still on the reel, prior to installation;
- b. After installation of cable and completion of circuit fabrication kits but prior to concrete, asphalt or paver placement.
- c. During the placement of concrete, asphalt or pavers. (ABSOLUTE REQUIREMENT!)

Note: Should the cable be damaged during the concrete pour, the pour shall stop, the electrician and concrete foreman shall locate the damaged cable, repair the cable with an approved splice kit, reinstall the cable on the rebar or wire grid, retest the repaired cable before the concrete pour can continue.

- d. Upon completion of placement of concrete or asphalt.
2. The minimum acceptable level for the megger readings is 20 megohms, regardless of the circuit length.
3. The Construction Manager for the project or authorized representative should witness megger tests. Results of the megger readings should be recorded and submitted to the Construction Manager.