MI-Melt Heating Cable Specification For Section 15778 Electric Snow/Ice Melting System

Organized in conformance with 1995 Master Format of Construction Specification Institute.

The Section/Division assignment of these specifications may differ from traditional convention and/or installation trade/discipline. Specifiers shall coordinate in such manner as may best serve the interest of all parties.

SECTION 15778
ELECTRIC SNOW/ICE MELTING SYSTEM

PART 1 GENERAL

1.1 Furnish and install automatic snow/ice melting system as shown on the drawings.

1.2 System includes
- A. Electric heating cable(s).
- B. Snow/ice sensor(s) and associated controls.
- C. Accessories, such as contactors, junction boxes, splicing materials, etc.

1.3 Codes and Standards
- A. Underwriters Laboratories, Inc. [Canadian Standards Association]
- B. National Electrical Code, NFPA-70 (latest edition) – Article 426. [Canadian Electrical Code, Part I, C22.1-940 (latest edition).]
- C. ASHRAE Handbook 1999 Applications–Chapter 49.
- D. IEEE Standard 515.1-1995.

Do not request submittals if drawings sufficiently describe the products of this section or if submittals are enumerated in another Section of the Specifications.

1.4 Submittals
- A. Shop Drawings–CAD general arrangement of snow/ice melting cables with tabulation denoting catalog number, physical dimensions, cold lead length, pigtail length and electrical characteristics.
- B. Product Data–Data sheets describing heating cables, sensor and associated controlsand accessory equipment and materials.
- C. Instructions–Installation and operating instructions.

Coordinate the following requirements with Division 1 and with the responsibility for determining project conditions defined in the Conditions of the Contract.

1.5 Project Conditions
- A. Make field measurements of the snow/ice melting target area.
- B. Determine all pavement finished surface elevations, gradients and crowns to assure proper drainage of melt-off.
- C. Determine the location and extent of all obstructions/interferences (i.e. curbs, drains, manholes, planters, flag poles, etc.).
- D. Determine the locations and extent of all planned pavement expansion joints.
- E. Determine the depth below finished surface of all required reinforcing rod or mesh.

PART 2 PRODUCTS

2.1 Heat Cable
- A. Description: Copper alloy series resistance conductor in [single] [two] conductor configuration with inorganic Magnesium Oxide dielectric, all contained in a continuous, fully-annealed Incoloy 825 sheath. Heating conductor shall be joined to a sheathed cold lead section by a factory-made watertight,silver soldered joint within a stainless steel sleeve with overall stainless steel splint providing mechanical protection and strain relief. Cold lead conductors shall be factory-brazed to 600V. insulated, stranded copper pigtails within a watertight gland nut box connector having 3/4" NPT thread.
  1. Copper conductors shall be corrected for temperature coeficient of resistance at the expected operating temperature.
- B. Heat cable shall be designed to provide a uniform output of [_____] watts per square foot when operating at [120][208] [240] [277] [480] volt.
- C. Heat cable shall be fabricated to the required length.
- D. Sheathed cold leads shall be furnished in [7-foot (standard)] [___-foot] lengths.
- E. Cold lead pigtails shall be furnished in [1-foot (standard)] [___-foot] lengths
- F. All heating cables shall be constructed and tested to requirements.
- G. Each heating cable shall have a permanently affixed stainless steel tag, containing required identification/rating data, and shall be shipped in an individual package with the heating cable identification clearly marked on the outside.
- H. Manufacturer: Easy Heat Inc. [SMI (single conductor)] [DMI (two conductor)] [DDI (two conductor)].

PART 3 EXECUTION

3.1 Installation

A. Install heating cable in accordance with manufacturer's instructions.

1. Test each heating cable before removal from shipping package.
   a. Heating element resistance shall be within 10% of specified value.
   b. Use 500 VDC insulation resistance tester; minimum resistance between heating element and metal sheath shall be 20 Megohms.
2. Uncoil heating cables along floor or smooth, level surface; avoid kinking or twisting and do not exert stress at the cold lead joint.
3. Install heating cables after concrete forming and reinforcing are complete.
4. Do not route heating cable across pavement expansion joints; use manufacturer's recommended installation technique.
5. Do not cross heating cable over itself.
6. Maintain specified spacing between adjacent runs of heating cable.
7. Maintain uniform minimum depth of heating cable within pavement.
8. Minimum inside radius of field bends shall not be less than five times the outside diameter of the heating cable; avoid bends within 6"of cold lead joint and factory fittings.
9. When the location of all runs and bends is correct, secure heating cable at approximately 3-foot intervals with plastic straps or ties to concrete reinforcing.
10. Repeat continuity and insulation resistance tests both prior to and after paving. [For asphalt paving, defer final tests until surface has cooled to 100°F to avoid faulty readings.]
11. Heating cable shall not be energized until pavement has been fully cured.

PART 4 CONTROLS

4.1 All installed snow/ice melting system branch circuits shall have automatic control.

4.2 Sensors

A. Snow/ice sensors shall incorporate a microprocessor that, in conjunction with integral ambient air temperature and moisture detectors, will verify presence of moisture at 38°F (3.3°C) and below.

The following requirement is (only) applicable to the SIT- 5E Pavement-Mounted Sensor

1. *Sensors controlling snow/ice melting shall temperature to minimize thermal stresses that my contribute to concrete cracking and shall maintain slab temperature at 44°F (6.7°C).*

B. Sensor design and operation shall effectively eliminate snow/ice bridging phenomenon.

C. Sensors shall operate at low voltage.

D. Sensor enclosure shall be non-ferrous metal and shall be constructed to adequately withstand the rigors associated with the intended location.

1. All electronic components shall be water-proofed with U-L 94-V-0 flame retardant epoxy.

E. Sensor(s) shall be [CIT-1 for installation in exposed, elevated locations.] [SIT-5E for flush installation in pavement.]

4.3 Control Panel

A. Control panel shall be microprocessor based to provide effective, economical automatic system control.

1. Control panel shall accommodate up to six snow/ice sensors of various types on the detection loop.
2. Control panel shall have a user-adjustable timer, providing up to 10 hours of system operation after snowfall ceases for complete melting.
3. Control panel shall have a manual cycle push-button permitting system operation for the following:
   a. Manual system operation for the hold-on period to clear tracked slush and drifted snow.
   b. Manual termination of the hold-on period during timedown.
   c. Manual system test operation independent of weather conditions for a fixed one minute period with a mandatory two-minute cooldown time.
4. Control panel shall have individual LEDs to provide indication of power supply, sensor status and heater operation.
5. Control panel shall be capable of providing remote monitor/control via 2- conductor NEC Class 2 wiring.
6. Control panel enclosure shall be suitable for NEMA 1, 2, 3R, 12 and 13 applications and shall incorporate safety barriers to isolate line and low voltage compartments.
7. Control panel shall operate satisfactorily over an ambient temperature range of –40 to 136°F (-40 to 58°C).
8. Control panel shall have a DPDT output relay capable of switching resistive loads up to 24 ampere or directly operating both mechanically and electrically-held remote contactors.

B. Control Panel shall be APS-3B; supply voltage shall be [120] [208/240] volt.