

**SECTION XXXXXX**

**ELECTRIC ROOF AND GUTTER DEICING SYSTEM**

1. GENERAL
	1. SECTION INCLUDES
		1. Roof deicing factory terminated assembly with MI cable.
		2. Roof deicing field assembled Self Regulating (SR) roof deicing cable system (Bartec PSB series or Eltherm NA series).
		3. Roof deicing system controller.
		4. Roof deicing components, accessories and installation material for a complete operating system.
	2. REFERENCES
		1. Canadian Standards Association (CSA).
		2. National Electric Code (NEC): Article 426 Fixed Outdoor Electric Deicing and Snow-Melting Equipment.
		3. Underwriter's laboratory (UL)
		4. Factory Mutual (FM).
	3. SUBMITTALS
		1. Submit under provisions of Section XXXXX
		2. Manufacturer's data sheets.
		3. Installation Instructions.
	4. PROJECT RECORD DOCUMENTS

 A. Accurately record locations of heating cable, temperature and moisture sensors,

and branch circuit connections.

* 1. QUALITY ASSURANCE
		1. Manufacturer Qualifications:
			1. Minimum 20 years of experience in design, engineering, manufacture and support of specified system and components.
		2. Product Requirements:
			1. Roof and Gutter Deicing Installations: Installation shall safely control and maintain heat energy compatible with roof and gutter material (Cable output to be determined based on geographical location).
				1. Minimum 5 w/lft and not to exceed 12 w/lft on asphalt roofs or metal roof
			2. Heating equipment furnished under this section shall be supplied by a single manufacturer.
			3. UL Listed and CSA Certified Mineral Insulated (MI) roof deicing cable assembly
			4. CSA, UL or FM Certified Self Regulating (SR) cables for wet locations.
			5. Automatic control with moisture and temperature sensor.

6. 30mA Ground fault protection to be provided by heat trace relay/contactor panel.

* 1. DELIVERY, STORAGE, AND HANDLING
		1. Store products in manufacturer's unopened packaging until ready for installation.
		2. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
	2. PROJECT CONDITIONS
		1. Coordinate installation of heating cable with Electrical Contractor and General Contractor.
		2. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer. Do not install products under environmental conditions outside manufacturer's limits.
1. PRODUCTS
	1. MANUFACTURERS
		1. System shall be supplied by:

Innovair Solutions USA Delta-Therm; 6711 Sands Rd Suite A, Crystal Lake, IL 60014, Phone: 800-526-7887, Fax: 847-526-4456, Email: info@Delta-Therm.com, Web: www.Delta-Therm.com.

* + 1. Substitutions: No substitutions are permitted.
	1. HEATING CABLE
		1. Mineral Insulated (MI) Heating Cable:
			1. UL Listed and CSA Certified Mineral Insulated (MI), seamless copper sheathed, series resistance heating cable.
			2. MI heating cable construction shall consist of MI copper sheath or MI stainless steel sheath, terminated in factory splice to stranded wire connection leads.
			3. MI heating cable construction shall consist of MI copper sheath and have a Low Smoke Zero Halogen jacketing (LSZH) to provide extra corrosion and mechanical protection.
			4. Connection leads shall be of enough length to reach junction boxes or power panel as shown on detailed drawings. Connection leads shall be of stranded wire to provide maximum flexibility for ease in pulling to junction boxes or panel. Only connection leads in conduit shall exit from heated zone.
			5. Insulator shall be Magnesium Oxide; a Fiberglass insulator is not permitted.
			6. No combustible materials between heating conductor wire and ground sheath.
			7. Cross section of heated portion of cable not to exceed 0.4 of an inch.
			8. Cable rating shall be:
				1. 120 VAC
				2. 208 VAC
				3. 240 VAC
				4. 277 VAC
		2. PSB Series or NA Series, Field Terminated Self Regulating (SR) cable assembly:
			1. Self-Regulating cable construction shall consist of two 16 AWG, stranded, nickel plated copper bus wires between which a positive temperature coefficient conductive polymer heating element is placed.
			2. Cable shall have tinned copper braid and:
				1. Non-organic corrosive resistant jacket (CR or AO/BO).
				2. Organic corrosive resistant jacket (CF or BOT).
			3. Cable shall be terminated using approved Manufacturers power connection and end termination kits.
			4. Cable rating shall be:
1. 120 VAC
2. 208 VAC
3. 240 VAC
4. 277 VAC
	1. CONTROLS
		1. Controller with moisture and temperature sensing capabilities
			1. Line or Pilot Duty
			2. Adjustable hold-on timer
			3. Multiple Sensor capabilities
			4. Adjustable temperature set-point
		2. Power Control Panel with G.F.E.P:
			1. Controller shall have:
				1. NEMA 4X rated panel enclosure with one Ground Fault protective device for all circuit.
				2. One white “Power On” LED, one red “Control On” LED, and one yellow “Ground Fault Indicator” LED on panel door.
				3. Power Control Panel Model shall be:

 GFEP-2-N

 GFEP-4-N

 GFEP-6-N

 GFEP-8-N

 GFEP-12-N

* 1. ACCESSORIES

* + 1. Roof Clips, Downspout Hanger Kit:
			- 1. RM-25-AL model single run aluminum clips for metal roofs.
			1. RM-25-CU model single run copper clips for metal roofs.
			2. RM-AL6 model dual run aluminum clip for metal roofs.
			3. RM-CU6 model dual run copper clip for metal roofs.
			4. RS-STR-CU model extended copper strap with single run clip for slate roofs.
			5. RS-STR-CU6 model extended copper strand with dual run clip for slate roofs.
			6. RR-STR-CU model extended copper strap with single run clip and slotted strap for retrofitting.
			7. ELB-RCLIP single run aluminum clips for asphalt shingle and metal roofs
			8. ELB-21 stainless steel gutter mounting plate.
			9. ELB-20 stainless steel downspout 90⁰ mounting plate.
		2. VHB Pads:
			1. VHB Pad model double sided 3” x 2” pads to fasten roof clips to metal roofs. Pads eliminate the need for epoxy installation method.

2. SB-190 Roof Clip Adhesive used to bond roof clips to metal or asphalt roofs

1. EXECUTION
	1. EXAMINATION
		1. Installer to verify field measurements are as shown on Drawings.
		2. Installer to verify that required power is available, in proper location, and ready for use.
		3. Do not begin installation until substrates have been properly prepared.
	2. PREPARATION
		1. Clean surfaces prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer.
	3. INSTALLATION
		1. Complete installation shall conform to all applicable codes. Shall be in accordance with manufacturer's instructions.
		2. Install cable heaters in accordance with detailed layout drawings.
		3. Only SR Cable can be cut to length required.
		4. The heating cable shall be installed according to the manufacturer’s recommendations, and the instructions supplied with the heating cable and components.
		5. Heating-cable repairs and splices shall be made using a splice kit provided by the manufacturer and specifically approved for the purpose. They shall pass the Megger test after installation.
		6. Pull M.I. stranded wire (cold leads) through conduit from M.I. Assembly supplied conduit body junction boxes
	4. FIELD QUALITY CONTROL
		1. Test continuity of heating cable.
		2. Perform insulation resistance (megger) test on each heater section.
			1. Minimum acceptable megger reading shall be 10 megohms.
		3. Measure voltage and current at each unit after installation is complete.
		4. Submit written test report showing values measured on each test for each cable.
	5. ADJUSTING AND CLEANING
		1. Keep automatic control system’s sensor(s) clean of dirt and debris.
	6. PROTECTION
		1. Protect installed products until completion of project.
		2. Repair or replace damaged products before Substantial Completion.

END OF SECTION