

SECTION 22 05 33 - HEAT TRACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Heat tracing for the following:
 - a. Under freezer floors as indicated on Drawings.
 - b. Water piping subject to freezing and as indicated on Drawings.
 - c. Gutter and downspouts as indicated on Drawings.

B. Scope

1. The plumbing installer shall be responsible for furnishing and installing heat tracing for plumbing work. The electrical installer shall furnish and install the power supply to a junction box and 30mA ground fault protection required (GFEP) by NEC for each heat trace circuit. The electrical installer shall furnish automatic controls as specified in Part 2 Article "Controls," if required.
2. The electrical installer shall be responsible for furnishing and installing heat tracing under freezer floors and gutter and downspouts as indicated on Drawings. The electrical installer shall furnish and install the power supply to a junction box and 30mA ground fault protection required (GFEP) by NEC for each heat trace circuit. The electrical installer shall furnish automatic controls as specified in Part 2 Article "Controls," if required.

1.2 SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for each type of product indicated.
1. Schedule heating capacity, length of cable, spacing, and electrical power requirement for each electric heating cable required.
- B. Field quality-control test reports.
- C. Operation and maintenance data.
- D. Warranty: Special warranty specified in this Section.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4 WARRANTY

- A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace electric heating cable that fails in materials or workmanship within specified warranty period.

- 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 HEAT TRACING

- A. Manufacturers:

- 1. BH Thermal Corporation.
 - 2. Chromalox, Inc.; Wiegard Industrial Division; Emerson Electric Company.
 - 3. Delta-Therm Corporation.
 - 4. Easy Heat Inc.
 - 5. Nelson Heat Trace.
 - 6. Pyrotenax; a division of Tyco Thermal Controls.
 - 7. Raychem; a division of Tyco Thermal Controls.
 - 8. Thermon Manufacturing Co.
 - 9. Trasor Corp.

- B. Basis of Design for Under Freezer Floor Applications: Raychem, a division of Tyco Thermal Controls; Type "Raysol 1" with Type FTC-XC Termination Kits.

- 1. Comply with standard Details on Drawings.

- C. Basis of Design for Gutter and Downspouts De-icing Applications: Raychem, a division of Tyco Thermal Controls; # GM-IX.

- 1. For gutters of 6 to 12 inches (152 to 305 mm) wide, provide two runs of cable secured with GM-RAKE.
 - 2. Provide a single run of heat trace for downspouts.
 - 3. Provide RayClic type termination kits with the system.

- D. Basis of Design for Condensate Applications: Raychem, a division of Tyco Thermal Controls; # 5XL1-CR.

- 1. Provide for plumbing water and condensate drain piping exposed to freezing conditions indoors and outdoors.
 - 2. Provide RayClic Type Termination Kits with the system.

- E. Comply with UL 1673 and IEEE 515.1.
- F. Provide electrical insulating jacket.

2.2 CONTROLS

- A. Pipe-Mounting Thermostats for Freeze Protection for Cold Water Lines to Mechanical and Exposed to Outdoor Ambient Conditions: Raychem, a division of Tyco Thermal Controls; # EC-TS-AMB for ambient control or # EC-TS-25 for pipe sensing.
- B. Automatic Control for Gutter and Downspout Applications:
 - 1. System Without Ground Fault Protection: Raychem, a division of Tyco Thermal Controls; # GIT-3/APS-3C for 120 or 208/240V. Provide Raychem, a division of Tyco Thermal Controls; # CIT-1/GIT-1 moisture/temperature sensors with system.
 - 2. System With Integrated Ground Fault Protection: Raychem; a division of Tyco Thermal Controls ; # GIT-4/APS-4C for 277V or 480V, 3-phasesystem. Provide Raychem; a division of Tyco Thermal Controls; # CIT-1/GIT-1 moisture/temperature sensors with system.

2.3 ACCESSORIES

- A. Cable Installation Accessories: Fiberglass tape, heat-conductive putty, cable ties, silicone end seals and splice kits, and installation clips all furnished by manufacturer, or as recommended in writing by manufacturer.
- B. Warning Tape: Continuously printed "Electrical Tracing"; vinyl, at least 3 mils thick, and with pressure-sensitive, permanent, waterproof, self-adhesive back.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install electric heating cable or mats across expansion, construction, and control joints according to manufacturer's written recommendations using cable protection conduit and slack cable to allow movement without damage to cable.
- B. Do not energize cables embedded in concrete or plaster until those assemblies are cured.
- C. Electric Heating Cable Installation for Freeze Protection for Piping:
 - 1. Install electric heating cables after piping has been tested and before insulation is installed.
 - 2. Install electric heating cables according to IEEE 515.1.
 - 3. Install insulation over piping with electric cables according to Division 22 Section "Plumbing Insulation."

- 4. Install warning tape on piping insulation where piping is equipped with electric heating cables.
- D. Set field-adjustable switches and circuit-breaker trip ranges.
- E. Protect installed heating cables, including nonheating leads, from damage.
- F. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- G. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

- A. Testing: Perform tests after cable installation but before application of coverings such as insulation, wall or ceiling construction, or concrete.
 - 1. Test cables for electrical continuity and insulation integrity before energizing.
 - 2. Test cables to verify rating and power input. Energize and measure voltage and current simultaneously.
- B. Repeat tests for continuity, insulation resistance, and input power after applying finished surface on heating cables.
- C. Repeat tests for continuity, insulation resistance, and input power after applying thermal insulation on pipe-mounting cables.
- D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 22 05 33