

SECTION 23 21 20**PEDESTRIAN WALKWAY SNOW MELT SYSTEMS****PART 1 – DESIGN DIRECTIVES****1.1 SUMMARY**

- A. Where possible, pedestrian walkways should be designed to be a minimum of 5 (five) feet in width with sufficiently gentle curves and grades to facilitate maintenance with conventional sidewalk plows. Designs should include adequate areas for snow storage.
- B. Use of exterior stairways without coverings should be minimized where possible. Where such stairways are deemed to be necessary, open metal grates with non-slip surfaces should be considered to minimize the need for manual snow and ice removal. Snow melt systems should be considered where feasible if open grates are not possible.
- C. In order to conserve energy, use of snow melt systems should be limited to pedestrian walkways in the vicinity of building entrances where one or more of the following conditions exist.
 - 1. Inability to easily maintain the area with mechanized equipment due to access issues or concerns regarding structural limitations to use of such equipment.
 - 2. Inadequate area(s) for long-term snow storage immediately adjacent to the walkways.
 - 3. Areas immediately adjacent to building entrances with a high level of pedestrian traffic that must continually be kept clear of snow and ice for safety reasons.

1.2 DESIGN CRITERIA

- A. Snow melt systems may include electric or hot water heating elements. Energy system capacity and operating cost should be considered in selecting the type of system used.
- B. Snow melt systems shall use an inhibited propylene glycol and water solution mixed to a minimum concentration of 50% glycol by weight.
- C. System shall be capable of communication with the campus building automation system (BAS) via BACnet IP.
- D. At a minimum, the following read/write points shall be available via BACnet:

- a. BAS outdoor air temperature.
 - b. Melt setpoint.
 - c. Idle setpoint.
 - d. Warm weather shutdown.
 - e. Cold weather cut out.
 - f. Outdoor air temperature sensor enable.
 - g. Idle mode enable/disable.
- E. Snow melt systems must include automatic controls capable of turning the system on and off according to the following criteria.
 - 1. System shall be provided with the following functionality:
 - a. Ability to use campus BAS outdoor air temperature input.
 - b. Ability to use snow/ice sensors to automatically detect snow or ice and begin operation of the system.
 - c. Ability to be manually started/stopped via command at the BAS workstation.
 - d. Warm weather shutdown and cold weather cut out mode.
 - e. Idle mode operation.
 - 2. System shall turn on if precipitation is detected and outdoor air temperature is less than 40 degrees Fahrenheit, or via command at the campus BAS workstation.
 - 3. System turns off when pavement temperatures reach 50 degrees Fahrenheit and outdoor air temperature exceeds 40 degrees Fahrenheit.
 - 4. System shall be provided with idle mode capability to maintain a snow melt surface pre-set temperature.
- F. All designs must include consideration of snow and ice falling from adjoining roofs. This condition should be avoided wherever possible, but if a limited amount of falling snow and/or ice are anticipated, safety precautions must be taken to protect pedestrians, and this added material must be considered when designing snow melt systems and/or necessary capacity for snow storage.
- G. Where a snow melt system is to be installed, there must be provision for adequate drainage for melted snow and ice to readily drain off the surface and not re-freeze.
- H. Installation of energy submetering should be considered, especially for large snow melt systems, to allow Dartmouth to monitor energy use and system operation.

PART 2 – PRODUCTS

2.1 NO SPECIAL REQUIREMENTS