Entry Spaces Standard

FACILITIES
AND CAMPUS SERVICES

Cornell Standard : Entry Spaces 013015 Process

2015 2016 2017 2018 2019

- Series of projects with entry space deficiencies _

Duffield Slate Flooring, Malott Hall Storefront, Olin Library Storefront and Paving

- Formation of Entry Space Standards Committee _ 2018 Fall/Winter
- Cross functional nature of Team, representation

  from Energy & Sustainability Mark Howe

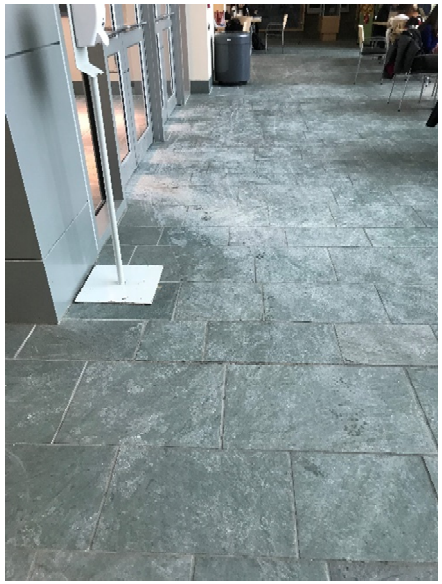
  Grounds Dan Scheid UA's office J. Shermeta

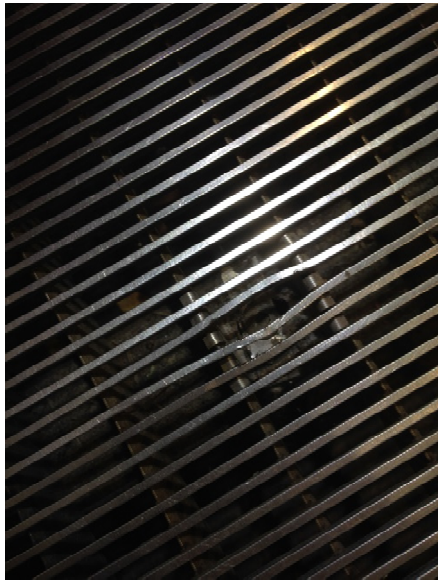
  Engineering & Project Management

  Matt Reiter, Rob Murray, Jason Coolbaugh, Steve Byers, Erik Eshelman and Ram Venkat
- Draft Standard, Circulation, Review & Approval _ 2019 Spring
- Publish Entry Spaces Standard _ 2019 December
- New projects following Entry Spaces standard _ 2020

Observations

- Impact of de-icing salts
- Storefront corrosion
- Walk off mats and lack of drainage
- Stormwater infiltration
- Air and wind infiltration
- Durability of finishes





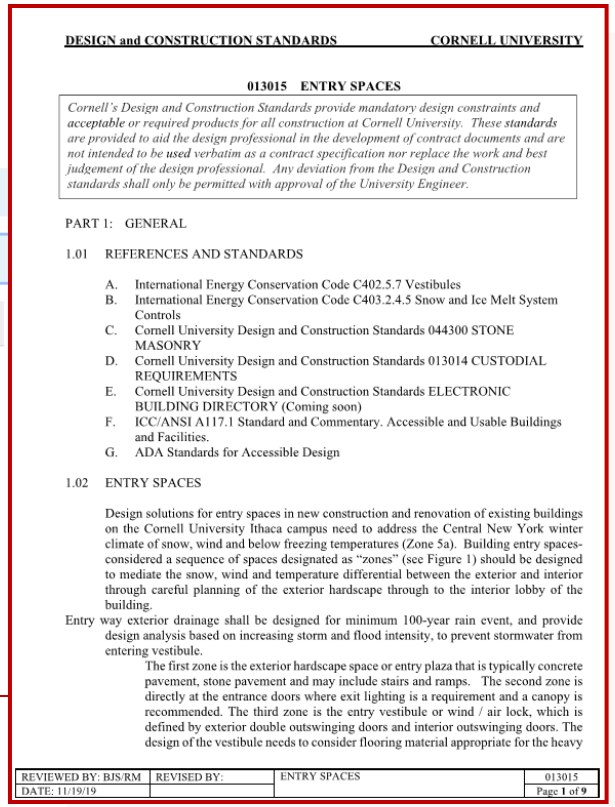
Design Standards and Details

Expand all

Design Standards

Division 1: General Design Requirements

Section #	Section Name	Date Reviewed	Date Revised
011110	Environmental health and safety guidelines	08-09-16	08-09-16
013000	Space programming requirements	08-31-17	08-31-17
013010	Accessibility for people with disabilities	11-05-18	11-05-18
013011	Inclusive restroom and locker/ shower facilities	12-08-17	12-08-17
013012	Collaborative spaces	06-30-17	06-30-17
013013	Lactation room (mothers' room)	06-30-17	06-30-17
013014	Custodial requirements	11-05-18	11-05-18
013015	Entry Spaces	12-03-19	12-03-19
017839	Structural record documents	06-30-17	06-30-17
018000	Standard practice bldg envelope commissioning	06-30-15	06-30-15



DESIGN and CONSTRUCTION STANDARDS CORNELL UNIVERSITY

013015 ENTRY SPACES

*Cornell's Design and Construction Standards provide mandatory design constraints and **acceptable** or required products for all construction at Cornell University. These **standards** are provided to aid the design professional in the development of contract documents and are not intended to be **used** verbatim as a contract specification nor replace the work and best judgement of the design professional. Any deviation from the Design and Construction standards shall only be permitted with approval of the University Engineer.*

PART 1: GENERAL

1.01 REFERENCES AND STANDARDS

A. International Energy Conservation Code C402.5.7 Vestibules
B. International Energy Conservation Code C403.2.4.5 Snow and Ice Melt System Controls
C. Cornell University Design and Construction Standards 044300 STONE MASONRY
D. Cornell University Design and Construction Standards 013014 CUSTODIAL REQUIREMENTS
E. Cornell University Design and Construction Standards ELECTRONIC BUILDING DIRECTORY (Coming soon)
F. ICC/ANSI A117.1 Standard and Commentary. Accessible and Usable Buildings and Facilities.
G. ADA Standards for Accessible Design

1.02 ENTRY SPACES

Design solutions for entry spaces in new construction and renovation of existing buildings on the Cornell University Ithaca campus need to address the Central New York winter climate of snow, wind and below freezing temperatures (Zone 5a). Building entry spaces- considered a sequence of spaces designated as "zones" (see Figure 1) should be designed to mediate the snow, wind and temperature differential between the exterior and interior through careful planning of the exterior hardscape through to the interior lobby of the building.

Entry way exterior drainage shall be designed for minimum 100-year rain event, and provide design analysis based on increasing storm and flood intensity, to prevent stormwater from entering vestibule.

The first zone is the exterior hardscape space or entry plaza that is typically concrete pavement, stone pavement and may include stairs and ramps. The second zone is directly at the entrance doors where exit lighting is a requirement and a canopy is recommended. The third zone is the entry vestibule or wind / air lock, which is defined by exterior double outswinging doors and interior outswinging doors. The design of the vestibule needs to consider flooring material appropriate for the heavy

REVIEWED BY: BJS/RM	REVISED BY:	ENTRY SPACES	013015
DATE: 11/19/19			Page 1 of 9

Entry Spaces

1.03 ENTRY SPACES – Design Principles

- Design solutions for entry spaces in new construction and renovation of existing buildings on the Cornell University Ithaca campus need to address the Central New York winter climate of snow, wind, and below freezing temperatures.

- Entry way exterior drainage shall also be designed for minimum 100-year historic rain event and include a design analysis based on increasing storm and flood intensity, to prevent storm water from entering vestibule.

- Building entry spaces – considered a sequence of spaces designated as "zones" – should be designed to mediate the snow, wind and temperature differential between the exterior and interior through careful planning of the exterior hardscape through to the interior lobby of the building.

Entry Spaces

1.03 ENTRY SPACES – Design Principles

- Guide consultants to design entry spaces to reduce fall risks, improve longevity of material finishes, and reduced environmental impact caused by repeated renovations and limits on the embodied energy of materials.

- Building maintenance of entrances will not require the use of de-icing salts, which will eliminate the adverse effect of de-icing chemicals on the interior of buildings that are known to cause premature failure of finishes.

Entry Spaces

Part 1 : General 1.04 ENTRY SPACES

EVALUATION

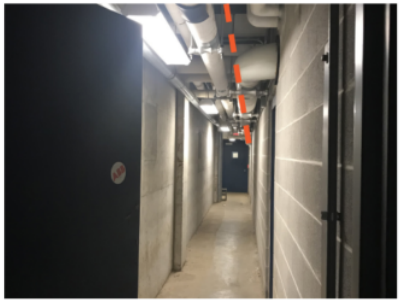
- Colleges and Units initiating a capital project should evaluate their existing facility and consider incorporating performance driven design for entry spaces where they currently do not exist or add scope to renovate building exterior entrances where they are found to be deficient.

- Designers to determine additional cost impact on project to include snow melt systems with a life cycle cost comparison between options. Material costs, risk assessment from slip and fall injuries to be included in comparison.

Snow Melt Systems

Colgate Snowmelt System

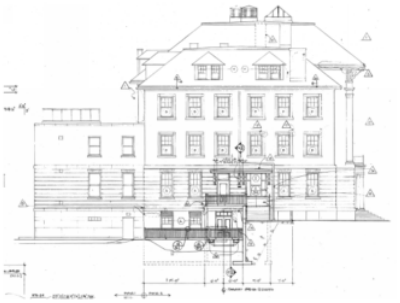

2.1


2.2


2.3


Potential Manifold Location 2.4


2.5


2.6

Distribution Path

FE feasibility study – CCC West stair replacement project

Snow Melt System Feasibility

Facilities Engineering (FE) surveyed the existing CCC building systems for a high-level feasibility of including an exterior snow melt system.

FE found no major issues that would preclude inclusion of a snow melt system in this project.

From a spatial standpoint, there is adequate room for connections within the mechanical room, space to install new distribution piping within the building, and clear access to the west exterior of the building.

Proposed Construction Sequence

1. Tap off existing return hot water piping in subbasement mechanical room (Figure 2.1).
2. Run new supply and return piping through subbasement corridor (Figure 2.2).
3. Provide openings in floor at west stair so piping can reach basement level (Figure 2.3).
4. Provide space for piping manifold adjacent to fire alarm panels (Figure 2.4).
5. Core existing exterior wall for snow melt PEX piping loops (Figure 2.5 & 2.6).

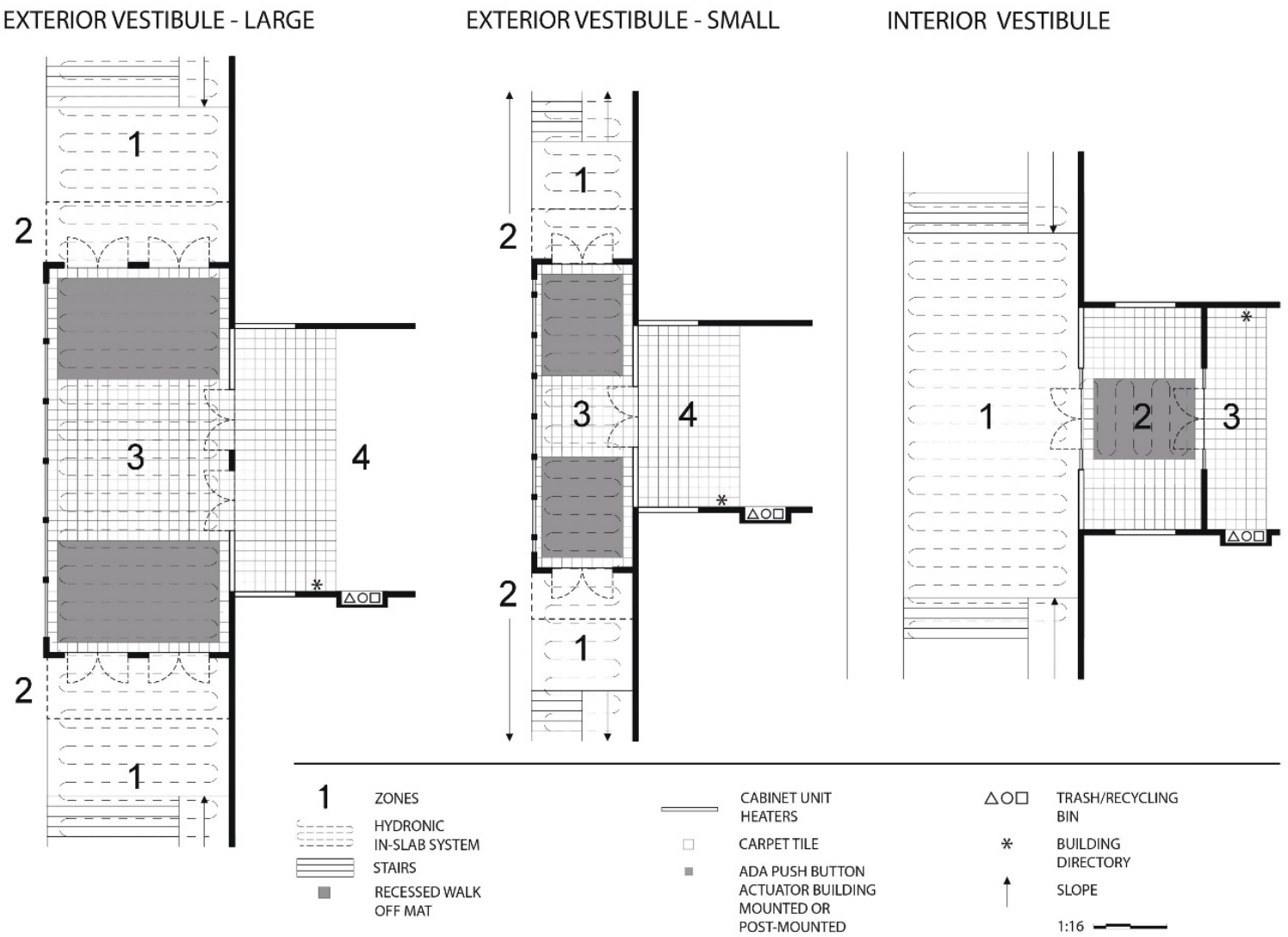
Cost

- Comparable project: 2018 Olin Library Entry - snow melt installed within a 23' x 24' concrete slab; 550 SF+
- Applicable divisions related to snow melt total $93,000+/- ($377,000 total project cost)
- Assume $170/SF to add snow melt to new concrete slabs

Coordination/Constraints

- The snow melt system requires a manifold to distribute supply heating water to zones in adjacent exterior concrete slabs. This requires a closet or cabinet with locked door.
- Proposed and closest location of manifold conflicts with existing fire alarm panel (Figure 2.4).
- Existing fire alarm panel is obsolete and requires replacement. Potential synergy to condense panel and free wall space for manifold (Figure 2.4).
- Coring/cutting floor slab for piping access to basement level might be difficult, but could occur in an existing crawlspace.

Entry Spaces
DIAGRAMS



Design Strategies Per Zone

Zone 1 – Exterior Hardscape

The first zone is the exterior hardscape space or entry plaza that is typically concrete pavement, stone pavement, and may include stairs and ramps.

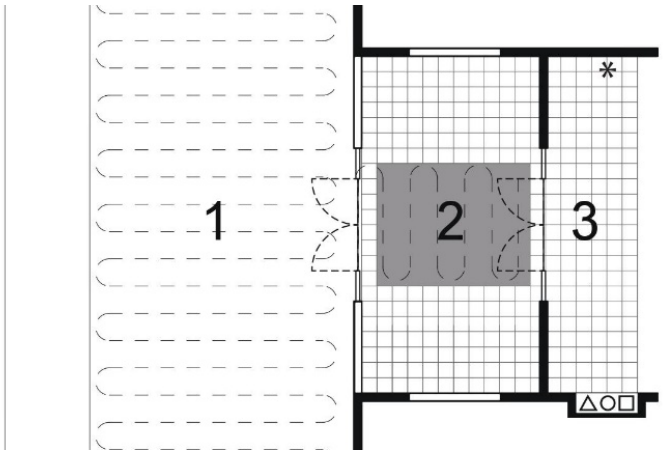
- **Concrete sidewalk and entry patio at the approach to a building should include a hydronic snowmelt system, glycol based with an interior manifold accessible within 10' of the interior vestibule entry doors (extent of glycol-based loop to be developed during design).**
  - **Extent of glycol-based loop to be developed during design.**
- **Cornell Utilities preference is to cascade lower temperature return water within buildings to improve energy efficiency.**
  - **Snow melt systems to utilize existing return hot water of mechanical equipment to avoid initial energy use to heat water.**
- **Stairs and ramps within the snowmelt zone are to be designed with snow melt system.**
- **Provide a feasibility study to determine costs for snow melt system including stairs and ramps within 10 ft of entry doors.**
  - **If project budget does not include costs for full system installation, provide pex tubing in concrete slab for future tie-ins at mechanical room. Provide pressurized testing and sealing of tubing per industry standards.**
- **Review design standards for stone selection for the exterior approach, retaining walls and low walls at building entry**
- **Provide adequate turning radius for Grounds snow removal equipment to limit hand shoveling**
- **Slope grade away from building and vestibule**

Design Strategies Per Zone

Zone 2 – Entrance Canopy at Exterior Doors

The second zone is directly at the entrance doors where exit lighting is a requirement and a canopy is recommended.

- **A canopy is highly recommended for a minimum of 6' from the entry doors to protect occupants from snow and rain**
- **Careful location of push button actuator will help with the flow of traffic during periods of heavy throughput**
- **Building mounted actuators are preferred within 6' of entry doors. Pole mounted actuators are permitted with concrete footing if building mounted actuator is not achievable within 6'**
- **Provide exit lighting at Zone 2 per International Energy Conservation Code Table ECC 405.5.2(1)**

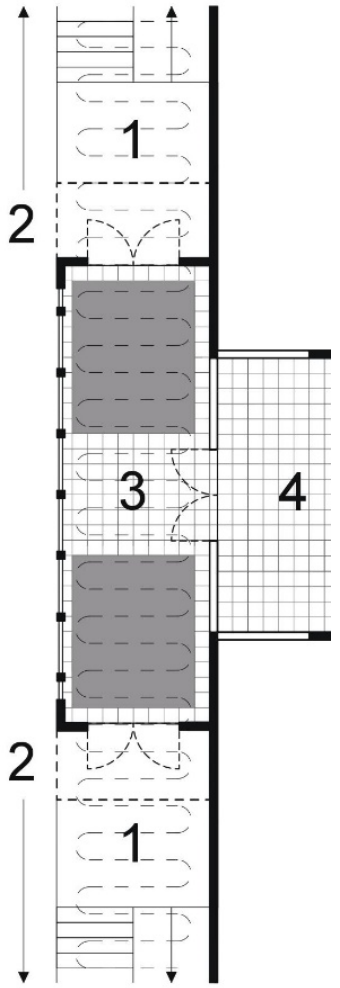


Design Strategies Per Zone

Zone 3 – Vestibule or Wind/Air Lock

The third zone is the entry vestibule or wind/air lock, which is defined by the exterior double outswinging doors and interior outswinging doors. The design of the vestibule needs to consider flooring material appropriate for the heavy amounts of snow and the use of de-icing salts on the Cornell campus.
The design should address the air infiltration through heating and cooling units required at these doors, accessibility and code compliant clearance dimensions between outswinging doors.

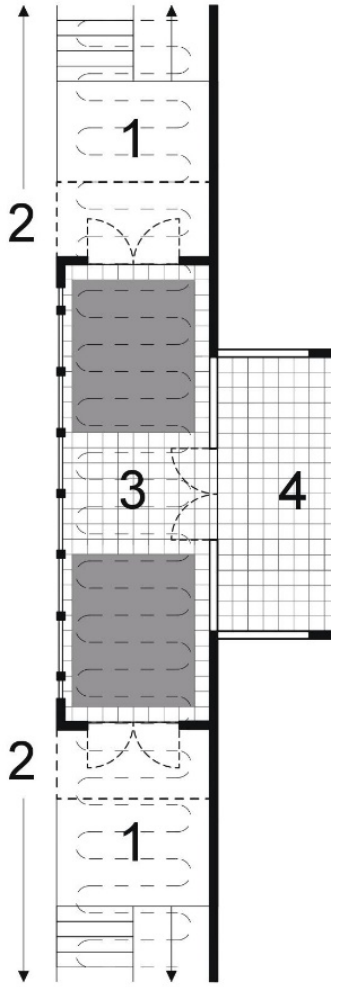
- **This vestibule is the critical buffer space that adjusts cold conditions on the exterior and temperate conditions in the building and should be designed with consideration for the volume of the vestibule spaces as well as the position of heating and cooling sources and piping required to reach these units**
- **Orientation of the two entry doors (exterior and interior) at a perpendicular arrangement prevents a continuous flow of cold air into lobby spaces**
- **Within in the first 6' of the exterior doors, provide a removable aluminum/tread insert entrance mat similar to Construction Specialties "Pedimat" in a recessed floor pan, no drain required**
    - **Continuous stainless sheet pan and robust waterproofing system over concrete**



Design Strategies Per Zone

Zone 3 – Vestibule or Wind/Air Lock (Con't)

- Provide adequate heating for evaporation
- **Radiant heat in the concrete subfloor** as part of the continuous glycol based snowmelt system assists in mitigating the amount of snow in the interior of lobby and will decrease the need for the de-icing salts
- Provide **carpet tile adhered to the concrete subfloor for ease of replacement and maintenance.**
- Provide two push button actuators, and actuator to open the interior doors for arriving visitors and an actuator to open the exterior doors for exiting.
- Actuators to be located within 6 feet of doors
- Provide cabinet unit heaters, radiant fin tube heaters or alternative energy efficient solutions in close proximity to the front doors to limit the infiltration of cold air
- Vestibules are not required to meet the 68 degree interior temperature, however occupied spaces have a minimum temperature per Code
- Protect sprinklers from freezing, consider use of sidewall sprinkler heads

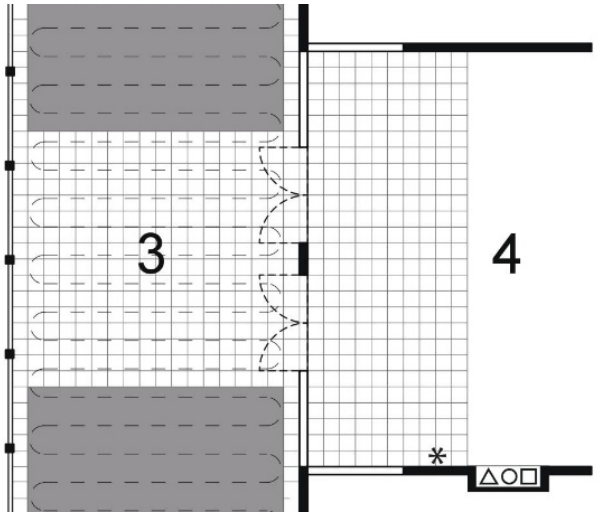


Design Strategies Per Zone

Zone 4 – Interior Lobby/Atrium

The fourth zone is the entry lobby or atrium, a space that also requires careful design of heating and cooling systems and floor materials and lighting.

- **The lobby of the interior vestibule typically has higher ceilings and is used for student/building wide events**
- **Energy saving are best achieved by mixing the warm and cool air in the vestibule, placing less demand on the heating system in the interior lobby**
- **Flooring in this spaces is recommended as terrazzo, terrazzo tile, porcelain tile or a carpet tile that can be replaced after the end of useful life**
- **Finished Concrete is not an acceptable flooring material in lobbies.**
- **Provide push button actuator within 6' of interior exit doors**



Case Studies
Statler Hall East Avenue Entry

- Snowmelt system
- Doors are at 90 degrees
- Large vestibule volume
- Heating and cooling at vestibule
- Snowmelt system at interior
- Carpet tile
- Removable pedi-mat
- Interior carpet in lobby

Olin Library West Entrance

- Snowmelt system
- New Storefront system
- Granite pavers

116 Maple Ave Vestibule

Campus Store East Entrance

- Removable pedi-mat
- Heating at vestibule
- New storefront, existing overhang

Malott Hall North Vestibule

- Removable pedi-mat
- Heating at vestibule
- New storefront, existing overhang
- Safety markings per NY State labor department law

Questions ?