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1. **Design & Performance Criteria:**

- a. Exterior masonry stairs shall be composed of stone treads with space below to allow drainage of stormwater under the treads.
- b. The design consultant shall be responsible for coordinating the level of concrete below the masonry stairs to leave height available for the components of the stair drainage system.
- c. Fluid-Applied waterproofing membranes shall be used where exterior masonry stairs are built over enclosed space below (i.e.: basement rooms under stairs).

2. **Reference Standards:**

- a. *UVM Facilities Design Standards Section 05-Railings – Exterior* for handrails at exterior stairs.
- b. Refer to the Southwick Hall Exterior Stair Replacement Project (TruexCullins, c. 2016) and Cohen Hall North and West Stair Replacement Project (Scott + Partners, 2018) for examples of drained and protected exterior masonry stairs. Photos included at the end of this section.

3. **Submittals to be reviewed by University:**

- a. All product data

4. **Products, Materials & Equipment:**

- a. Drainage board: HydroDuct or a similar product should be used to allow proper drainage from the top of the stair foundation or frost wall to a perimeter drain, if a perimeter drain is present.
 - i. When appropriate, hydroduct board may act as a conduit for drainage under stair treads.
- b. Waterproofing membrane: It is highly recommended that ProCor or a similar product be applied to the stair foundation or the frost wall. In the likely situation of a renovation project where the frost wall limits you from accessing the foundation wall.

5. **Installation, Fabrication, and Construction:**

- a. Waterproofing membrane shall be adhered to concrete substrates and lapped at seams to provide a continuous path for water to drain down the stairs.

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- b. Drainage space to be created with between stone tread and waterproofing membrane below.
 - i. Space may be created with composite masonry shims under stone treads where the substrate is suitably flat. This is the method preferred by UVM.
 - ii. Space may be built into concrete substructure by provision of min.2” tall by min. 12” wide pads at ends of stair width and min. 1’-8” wide pads where two treads meet. See sample section drawing below.
 - 1. These pads raise the stone treads off the waterproofed concrete below and allow drainage
 - 2. The concrete step below shall be sloped to drain down into granular fill at bottom of stair.
- c. Composite masonry shims supporting masonry treads to be discontinuous to allow cross-drainage of water.
- d. A vertical space shall be created between the impervious bottom landing surface and the lower masonry tread to allow water to drain into the granular fill below.

6. **Warranties:**

- a. N/A

7. **List of attachments:**

- a. Photos 1 and 2 of Southwick Hall stair showing application of waterproofing membrane under stone patio to protect interior space below. Note use of shims under large patio pavers.
- b. Photo 3 of Cohen Hall North Stair replacement showing application of fluid-applied waterproofing membrane under grout bed for stone stair.
- c. Photo 4 of Cohen Hall West Stair replacement showing application of fluid-applied membrane and drainage board under stone stairs.
- d. Sketch of example stone treads on discontinuous raised concrete pads to allow drainage below treads.

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