

1. **Design Criteria:**

- a. Permitted single ply roofing assemblies:
 - i. Fully adhered (where odors do not present issues)
 - ii. Mechanically fastened (if odors cannot be mitigated)
 - iii. Ballasted (where roof is below windows or higher roofs above)
 1. ballast to be smooth river bottom stone
- b. Insulation: Meet or exceed Vermont Commercial Building Energy Code requirements.
- c. Replace all insulation when re-roofing an existing roof.
- d. FM Global Requirements:
 - i. RoofNav: Installer to submit complete "RoofNav" for each roof deck and roof assembly. Submit completed "Form X2688 Application for Acceptance of Roofing System"
 - ii. Design Criteria(confirm current FM Global requirements prior to design):
 1. Wind Speed: ≥ 90 mph
 2. Ground Roughness Coefficient: C
 3. Building Importance Factor: Confirm with Building Code and Owner
 4. Snow Load: 40 psf ground, 36 psf roof.
 5. Rain Load: 100 year, 60 minute intensity of 2.25 inches
- e. Provide a vapor barrier at all low slope roofs on deck.
- f. Ensure no galvanic action between materials. Provide University proof of compatibility of materials prior to final construction documents being issued
- g. Provide means of secondary drainage for all roofs. Coordinate height of secondary drainage outlet above primary drainage with structural properties of roof.
- h. Scuppers are to be used for secondary drainage only, not for primary means of removing water from a roof.
 - i. Exception: Flat roofs over unconditioned spaces may use scuppers as the primary means of drainage. Scuppers used as primary drainage shall extend beyond roof edge and be detailed with sufficient drip edge so water does not wash down building face.
- i. Fully plumbed (mechanically attached) roof drains are preferred where access to interior drain lines exists.

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- i. Insert type roof drains reducing the piping area are permitted on re-roofing projects if the diameter of the roof leader is 4 inches or greater to provide adequate drainage capacity and avoid overflow-related leaks AND when drainage calculations confirm the existing leader piping diameter is adequate to drain the volume and intensity of expected rainfall.
 - j. Roof drains to have cover domes.
 - k. During design the locations of air intake systems on the project building and nearby buildings must be determined and coordinated with the Physical Plant Department to determine necessary shutdown periods and air quality control plans during construction to avoid pollution of those air systems by the roofing work.
 - l. Roof edge notification systems required on all UVM projects containing roofing work. Safety monitoring systems without visual warning or guard elements are prohibited
 - m. Roof Anchor arrays shall be provided at a new building and be designed for the specific conditions of each building. The feasibility of adding roof anchors for roof replacement projects shall be discussed with Physical Plant Department.
 - i. Portable anchor systems are allowed as an alternative to permanent systems.
 - n. Provide grease resistant protective layer around kitchen exhausts
 - o. Provide chemical resistant membrane where lab or other caustic exhaust vents or fans are present. Review exhaust fume contents with UVM for appropriate membrane selection
 - p. Reference Standards: To be specified by Design Professional but must include FM Global, NRCA standards for the roofing type being installed, and ES-1.
- 2. **Submittals to be reviewed by University:**
 - a. All proposed materials and installation methods information
 - b. All exposed color selections by Design Professional
 - c. FM Global requirements described above.
 - d. MSDS data prior to start of construction

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

- a. Acceptable manufacturers limited to: (except for other manufacturers explicitly approved by UVM):
 - i. Carlisle Syntec, Inc.
 - ii. Firestone Building Products, Bridgestone Americas Holding, Inc.
 - iii. Johns Manville
- b. Acceptable membrane types:
 - i. EPDM – for black roofing installations
 - 1. White EPDM is prohibited
 - ii. PVC – for white reflective roofing installations
 - 1. Walkway pads are required for PVC roofing
- c. Membrane minimum thickness:
 - i. 0.060 inch at all non-traffic areas
 - ii. 0.090 inch at traffic or areas subject to snow damage and below windows. Confirm locations with University.
 - iii. Roof pavers or pads are acceptable alternative to 0.090 inch membrane
- d. Walkway Protection Pads: 30" x 30" min. Match material and color of roof membrane. Concrete pads not acceptable.
 - i. Locations to install protection pads:
 - 1. As directed by UVM
 - 2. Around roof mounted mechanical equipment
 - 3. Between roof access points and roof mounted mechanical equipment
 - 4. Between roof access points and other roof access points to higher or lower roofs
 - 5. Where ice or water falls from higher roofs.
- e. Protect against damage to roof insulation under walkway pads by either of the following:
 - i. Providing high compressive strength cover board between roofing and insulation
 - ii. Installing substantially thick rubber pad between pad and roofing that extends beyond pad to sufficiently spread weight over larger area of insulation.
- f. Color of membrane, flexible flashings and visible sealants:
 - i. At EPDM membranes: Black

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- ii. At PVC membranes: White
 - g. Rigid insulation to have min. 25 psi compressive strength. All insulation to be HCFC free. Higher compressive strength insulation or cover boards to be utilized under high traffic areas
 - h. All EPDM seams to be installed according to manufacturer instructions AND shall have an additional 6" flashing strip from the same manufacturer adhered over the membrane plys equally lapped at both sheets.
- 4. **Installation, Fabrication, and Construction:**
 - a. As required to meet manufacturer's and FM Global requirements
- 5. **Warranties:**
 - a. No dollar limit, total system warranty
 - b. Warranty period: minimum 20 years. Provide all upgrades and enhancements need to provide this warranty.
 - c. Warranty wind speed: 72 mph
 - d. Total Warranty: Contractor to provide a 1 year comprehensive material and labor warranty beginning at substantial completion.