

SECTION 07 50 00 -- ROOFING SYSTEMS

PART 1 - GENERAL

- A. All assemblies shall conform to Factory Mutual Engineering Corporation (FM): Roof Assembly Classification, FM Construction Bulletin 1-28, I-90 uplift, Class 1 Construction. Enhanced securements are required at 4 foot square perimeter areas.
- B. Factory Mutual (FM) Engineering Corporation roof inspections shall be required at pre-construction and at 25% completion with approved reports.
- C. Design new sloped roofs with a minimum pitch of 4 in 12 for seal-tab shingles, and 5 in 12 for slate and tile. When that criteria cannot be met based on existing conditions, for sloped roofs pitched less than 4 in 12 but above 2 in 12, use full coverage of peel and stick underlayment (Ice and Water Shield by W. R. Grace & Co. or equal approved in writing by the Brown University Project Manager). Calculations show that condensation will NOT occur on the underside of the underlayment below 2 in 12.
- D. Perform a roof drain calculation and size drains accordingly. Elevate the perimeter of the roof to promote drainage to interior drains. Make provisions for overflow drainage in the event of drain blockage. Roof drains and drain lines shall be insulated.
- E. Proper ventilation shall be required for all roofing.
- F. Post warranty info at all roof access points.

1.2 Single-Ply Membrane Roof Systems:

- A. Acceptable assembly shall consist of vapor retarder if required, mechanically attached polyisocyanurate insulation, GP Dens-Deck cover board, and fully adhered single-ply membrane. Provide manufacturer's recommended walkway pads from roof access points to and around all mechanical equipment.
- B. Ballasted and mechanically attached single-ply membrane systems are not acceptable.
- C. Acceptable material is 60 mil nonreinforced EPDM complying with ASTM D 4637, Type I, with exposed face color as approved by the Brown University Project Manager. Use polyisochloroprene or Sarnafil PVC membrane around mechanical equipment or grease exhaust where oils or grease may contaminate the membrane.
- D. Acceptable manufacturers are Carlisle Syntec Systems or Firestone Building Products.

- E. Acceptable warranty period is a minimum of 15 years from date of Substantial Completion. Provide manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks. Warranty shall include roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, roof pavers, walkway products and other components of membrane roofing system.
- F. Provide submittals indicating location of mechanical equipment supports, penetrations, and edge details. Provide flood testing when required by the Brown University Project Manager.
- G. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- H. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- I. Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to the Brown University Project Manager, who shall be notified 48 hours in advance of date and time of inspection. All work done after final inspection must be re-inspected and certified by the roofing system manufacturer's technical personnel.

1.3 Roof and Deck Insulation:

- A. Roof insulation shall be used which meets current performance requirements and which, at a minimum, provides the insulating value required by all applicable building and energy codes.
- B. Whenever codes or other conditions require mechanically fastened insulation, the fasteners shall comply with FM Global requirements and be reviewed and approved by the Brown Project Manager.
- C. No R-value per inch must be specified; instead, all current energy codes shall be met as well as specific Brown University energy requirements.
- D. Where possible, slope structural decks to drain and minimize the quantity of tapered insulation needed.
- E. A protection board shall be used between the insulation and the roofing membrane.

- F. Consider the potential for recyclability when choosing roof insulation for any application where the roof insulation may need to be discarded in the future.

1.4 Asphalt Shingle and Slate Shingle Sloped Roof Systems:

- A. Acceptable fiberglass shingle manufacturers are Certaineed and GAF unless otherwise approved by the Brown University Project Manager. Performance level standard shall be a minimum of 30 years for asphalt shingles.
- B. Acceptable slate roofing manufacturers are Evergreen and Vermont Structural unless otherwise approved by the Brown University Project Manager. Artificial slate shall not be allowed, unless otherwise approved in writing by the Brown University Project Manager.
- C. Installation warranty for roofs shall be not less than 2 years unless approved by a Brown University Project Manager.
- D. Specifications shall include workmanship guarantee for interior damage caused by roof leaks during removal and installation of new roof to be repaired at no additional cost to the owner.
- E. Prior to installation provide a Manufacturer's Certificate certifying that products meet or exceed specified requirements.
- F. Prior to installation submit shop drawings in conjunction with roofing installation.
- G. Prior to installation submit samples of products specified. Mock-up may be required; coordinate with Brown Project Manager.

1.5 Snow Protection:

- A. Snow guards or snow rails shall be installed on all sloped roofs which could deposit snow and ice on pedestrian walkways and parking lots irrespective of the ground surface.
- B. Avoid roof configurations that deposit snow on landscaping, pedestrian entrances, parked cars, etc.
- C. Pay attention to the location of landscaping items that might be damaged by falling snow and icicles.
- D. Intersecting gables at entrance porticos are a traditional method to avoid snow accumulating in front of the door.
- E. When these methods are not an option, snow guards and fences are needed.

- F. Use high-quality, non-rusting components.
- G. Attach snow guards need to a deck of sufficient thickness (often 1 inch thick plywood, not 3/4 inch) with proper fasteners.
- H. Slate roofs shall have both snow guards and rails .
- I. Snow fences often need to be attached through the deck to structural members. These attachments need to be shingled in with the waterproofing to prevent leakage.
- J. Review and approval is required by Brown Project Manager.

1.6 Gutters & Downspouts

- A. Roof drainage design strategy shall be reviewed with Brown Project Manager.
- B. If gutters are provided, they must connect to underground drain line, and shall have clean-out location within 12" of tie-into underground drain line.
- C. Any gutter installation shall review need for leaf guards with Brown Project Manager.

END OF SECTION