

THERMAL & MOISTURE PROTECTION

This section of the Washington University School of Medicine (WUSM) Design Standards addresses the following requirements for Thermal & Moisture Protection and its application in WUSM projects:

MEMBRANE ROOFING ROOF ACCESSORIES JOINT SEALANTS

A Roof System Meeting shall be conducted during the Schematic Design phase to review the design of all new roof construction or roof replacements. The Design Team, Structural Engineer, WUSM Project Manager, and Roof Consultant must be present for this meeting. An additional meeting shall be held during the Design Development phase, and the Roof Consultant shall participate in the Final Review Meeting.

References:

[FM RoofNav Assembly](#)

[Occupational Safety and Health Administration \(OSHA\) Guidelines](#)

[American National Standards Institute \(ANSI\)](#)

[American Society for Testing and Materials \(ASTM\)](#)

[International Building Code \(IBC\)](#)

Standards References:

MEMBRANE ROOFING

DESIGN GUIDELINES

1. This Standard shall apply to all new roof construction or roof replacements for Washington University School of Medicine (WUSM) properties.
2. Washington University School of Medicine is FM Insured.
3. All roof systems shall have an FM RoofNav Assembly number.
4. A 42-inch high parapet is required on all new buildings to meet OSHA guidelines and eliminate the need for complex & costly fall protection components.
5. Perimeter edge nailer assemblies shall comply with Factory Mutual DS 1-49.
6. Perimeter edge metal with the exception of gutters shall be ANSI SPRI ES 1 tested and approved per the International Building Code (IBC).

PRODUCT REQUIREMENTS

1. The preferred roofing membrane assembly shall be a modified bitumen membrane assembly. A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Manufacturers:
 - a. Modified Bitumen Membrane, Adhesive Applied.
 - i. Derbigum Americas
 - ii. John-Manville
 - iii. Siplast "Paradiene 20 TG/30 FR TG".
 - iv. Soprema.
 - Thickness: 114 mils base and stripping ply and 140 mils finish ply.
 - Surfacing: Granular.
 - Auxiliary materials: As recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
 - b. Flashing Membrane: Metal-Clad or Granular Modified Bitumen Flashing Sheet
 - i. Thickness: 142 mils.
 - ii. Surfacing: Aluminum metal foil or granular surface.
2. Alternate roof membrane in certain situations or circumstances where the preferred modified bitumen membrane assembly is not appropriate, the following single ply system may be employed.
 - a. Polyvinyl-Chloride (PVC) Membrane Fully Adhered.
 - i. Carlisle Syntec Sureweld.
 - ii. Sarafil Type II feltback fiberglass reinforced.
 - iii. Versico VersiWeld
 - Thickness: 115 or 135 mils.

- Exposed Face Color: White.
 - Auxiliary Materials: As recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
- b. Thermoplastic Polyolefin (TPO) Membrane Fully Adhered.
- i. Carlisle Syntec Sureweld.
 - ii. Firestone Ultra-Ply.
 - iii. Versico VersiWeld
 - Thickness: 60 or 80 mils.
 - Exposed Face Color: White. Other colors by exception only.
 - Auxiliary Materials: As recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
3. When appropriate and feasible, the preferred method of creating an insulated substrate shall be the installation of insulated lightweight concrete deck fill.
- a. Insulated Light Weight Concrete.
- i. Siplast, Cellcore, and Elastizell may be considered. Review proposed system with WUSM Project Manager.
- b. All other insulation shall be a closed cell product.
- i. Maximum water absorption shall be less than or equal to 1.5%.
 - ii. Minimum thermal resistance shall be equal to or greater than 2.9 per inch.
 - iii. Insulation shall have a minimal bearing capacity in order to avoid impressions.
 - iv. Insulation product selection and fastening method shall be compatible with the roofing membrane manufacturer specification.
4. Anodized Aluminum is the preferred material for architecturally visible and exposed applications. Kynar prefinished galvanized may be considered. Stainless Steel material shall only be used when aluminum cannot be used when environmental corrosive circumstances are expected.
- a. Gauges shall be selected appropriate to the application and fastening detail. Cap flashings with maximum dimension of less than 12-inches shall be a minimum 24-gauge. Cap/Coping flashings greater than 12-inches shall be a minimum 22-gauge.
- b. Roof membrane termination detail shall meet the manufacturer's typical detail to maintain warranty.
5. Roofing membrane system shall include a 20-year manufacturer's material and a 2-year labor warranty. Prefinished metal shall have a 20-year guarantee which states finish will not chalk in excess of an eight rating or fade in excess of a five rating.
6. Slope shall be incorporated into the roof deck structure and/or the roofing system to achieve positive drainage and eliminate ponding.
7. Traffic protection shall be included in the project from all primary access points to and around all roof top equipment requiring service. Traffic protection material and installation shall be per manufacturer's recommendation. Concrete pavers are not permitted.

INSTALLATION

1. A pre-installation meeting and completed checklist is required prior to the start of construction.

ROOF ACCESSORIES

DESIGN GUIDELINES

1. All roofs shall be accessible by either a roof hatch or man door.
 - a. Roof hatches shall be designed to provide an efficient and secure service access to all critical areas on roofs
2. Snow guards shall be provided at all clay tile roofs.
3. All exterior lighting shall be located where efficient and secure access is available for maintenance of each fixture.

PRODUCT REQUIREMENTS

1. Roof hatches shall be reinforced for 150 pounds per square foot (psf) loading.

INSTALLATION

1. All roof accessories (penthouse, equipment, stairways, etc.) to be OSHA compliant.

JOINT SEALANTS

DESIGN GUIDELINES

1. Exterior joints in vertical surfaces and horizontal non-traffic surfaces shall be mildew-resistant neutral-curing silicon joint sealants. Other types of joint sealants shall be by exception only.

PRODUCT REQUIREMENTS

1. Acceptable silicone joint sealants shall be as follows:
 - a. Dow Corning 790 Silicone Building Sealant by Dow Corning Corporation shall be used where a lower modulus of elasticity is required.
 - b. Dow Corning 795 Silicone Building Sealant by Dow Corning Corporation shall be used where a greater modulus of elasticity is required.
 - c. Dow Corning AllGuard Silicone Elastomeric Coating by Dow Corning Corporation shall be used where silicone sealant needs to be painted.

INSTALLATION

1. Joint sealant installation shall comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.