

7 Thermal & Moisture Protection

GENERAL

Designers shall verify that all applicable portions of these standards are incorporated into the project's design, drawings, specifications and final construction. Requests for variances from these standards shall be submitted in writing to the DCM Project Manager, using the KU Standards Variance Request Form found in [Appendix A1.1](#), for review and written approval or rejection as indicated on the form.

RELATED DOCUMENTS & REQUIREMENTS

Refer to the following for requirements that also apply to work of this section.

- Division 1 - General Requirements**; refer to sections regarding construction testing and field quality control requirements.
 - Unless directed otherwise, the Owner shall separately contract for quality control testing during construction, not the Contractor. Verify with DCM for each project.
- Division 2 –Sitework**: Contains information about foundation and storm drainage systems, to which all roof drainage systems shall connect, unless otherwise approved by KU.
- Division 16 – Electrical**: Contains requirements for lightning protection, which is required for all University of Kansas buildings, unless specifically approved otherwise by DCM.

WATERPROOFING AND FOUNDATION DRAINAGE – DESIGN GUIDELINES

General: Waterproof membranes, drainage membranes and/or granular fill, and foundation drains shall be provided on all foundation walls of below-grade interior spaces.

- Waterproof membranes shall be sheet goods only. Liquid-applied waterproofing is not allowed.
- Sheet waterproofing shall be provided beneath all wood floors on slabs-on-grade, in lieu of less effective vapor barriers.
- Utility tunnels shall also have waterproof membranes and foundation drainage, unless otherwise directed by DCM.
- Dampproofing shall not be used in lieu of waterproofing systems.

Foundation and Underfloor Drains: 4" diameter rigid perforated PVC and pre-fabricated fittings. Flexible bellows-type drainage piping is not to be used.

Underfloor Drainage: Provide beneath all slabs-on-grade that occur below finish grade and are in areas where water tables or sub-surface water is possible to occur.

Waterstops: Bituminous flexible strip waterstops may be preferable over traditional rubber or PVC waterstops with fused or prefab covers at splices. Provide waterstops in all concrete joints below grade, whether in walls or slabs, or where walls meet slabs or other walls.

Below-Grade Expansion Joints: Designers shall detail sealant on backer rod on both sides of below-grade expansion joints, such as when a new foundation wall abuts an existing wall, even if exterior-side of joint is covered by a waterproof membrane. Continue joints in all directions, vertically and horizontally, to provide continuous water protection.

INSULATION – DESIGN GUIDELINES

Energy conservation is an important goal of the University. Structures shall be well insulated; preferably beyond minimum industry standards.

Expanded Polystyrene (EPS) Insulation: If used, EPS insulation must be 2.0 PCF or higher.

- When used as a roofing insulation, provide with ½" high-density wood fiberboard factory-bonded to top.

Tapered Roof Insulations: Taper to 1" minimum thickness, and complete remainder of taper with fiber or perlite edge.

ROOFING – GENERAL DESIGN GUIDELINES

General: Roofing systems and their detailing are an area of great concern to the University. Consultants shall select an appropriate roofing system for each project that is of the highest possible quality. The proposed roofing systems and associated details shall be reviewed thoroughly with KU, with special care and attention given these by the consultant to ensure that durable, watertight, easily maintained roofing systems are achieved on each project.

Wind Uplift: Systems shall be designed to be consistent with UL F-90 wind uplift requirements.

Class Rating: All roofing systems shall be UL Class A compliant.

Roofing Warranties: KU projects shall be required to stipulate roofing warranty requirements in accordance with Appendix A7.1, in lieu of MasterSpec's text or the warranty provisions of roofing manufacturers.

- ❑ Consultants shall verify the warranty requirements for each project with DCM. In some cases, where long-term warranties are offered by the manufacturer, the University may wish to consider them; EX: 50-year warranties on synthetic slate roofing materials.

Color: Main campus has an aesthetic tradition for red roofs that should be respected and continued on all roof assemblies, both steep-sloped and low-sloped.

Vapor Barriers: Detail in locations required for vapor control or temporary moisture protection. Typically by means of 43# vapor barrier felts mopped-down directly onto concrete roof decks or onto ½" gypsum board adhered to steel roof decks; verify acceptable system with roofing manufacturer.

Roof Drains: Interior roof drain lines shall be not less than 4" diameter.

Roof Access: Designers shall provide a built-in means of accessing every low-slope roof area for maintenance, by means of stairs to roofs, ladders and roof access hatches, ladders between varying roof levels, and similar means. Verify specific provisions with DCM and FO.

Roof Walkways: Provide to all rooftop equipment that may require periodic maintenance and at high traffic areas. Walkways shall extend from roof hatches or other designated access points to and around all sides of each piece of equipment. Walkway material shall be as approved by roofing manufacturer, and shall be adhered to roofing membrane.

Rooftop Equipment: Permanent visual screening shall be provided around all equipment located on roofs and visible to pedestrians from any point on campus. Verify specific requirements with DCM.

Maintenance Materials: Verify roofing materials and quantities that are to be specified as maintenance materials with DCM and FO (DSH, on their projects).

STEEP-SLOPE ROOFING SYSTEMS – DESIGN GUIDELINES

General: The University prefers steep sloped roofs be incorporated on projects to the greatest extent possible, rather than low-slope roofing systems.

Acceptable Steep Slope Roofing Systems:

- Clay Tile (Ludowici or equal)
- Slate
- Synthetic Slate (Eternit or equal)
- Metal Roofing (concealed fasteners, mechanically-seamed)
- Asphalt Shingles are discouraged and shall be used only as approved by DCM.
- Others as approved or requested by KU.

Steep-Slope Roofing Underlayment: All steep roofing systems, regardless of roofing type used, are to be specified and detailed to require the provision of a layer of an "Ice Barrier"-type, adhesive, elastomeric underlayment material under 100% of the roof area, in lieu of traditional 30# felt underlayment.

- Acceptable Manufacturers: Manville; GAF; Tamko

LOW-SLOPE ROOFING SYSTEMS – DESIGN GUIDELINES

General: Low-slope ("flat") roofs shall be used judiciously. Typically, these systems can be expected at areas where rooftop equipment is clustered or other project requirements make them advisable.

- All low-slope roofs shall be sloped ¼" per foot minimum over their entire surface area, with no flat areas permitted, and with positive drainage over entire area to roof drains, gutters, downspouts or scuppers.
- Water is not permitted to sheet drain over roof edges, but shall be directed down and away from buildings in a controlled manner acceptable to Owner.
- Red granular facings on low-slope roofing systems have had mixed success, and shall be used only if approved or requested by DCM. Granular colors of any type must be approved prior to installation by DCM.

Acceptable Low-Slope Roofing Systems:

- EPDM
- Modified Bitumen
- Reinforced PVC
- Others as approved or requested by KU.

Installation Method: Roofs shall either be fully adhered or, if approved by DCM, mechanically anchored.

- Pavers and gravel ballast are not recommended.
- Ballasted EPDM roof systems with loose rock ballast are not allowed.

ROOF ACCESSORIES – 07720

Equipment Roof Curbs: Details or specifications shall require all roof curbs to extend a minimum of 8” above adjacent roof surfaces.

- Roof curbs shall be insulated, with wood nailer on top.
- Bid documents shall clearly stipulate whether roof curbs are to be provided by the General Contractor or each trade furnishing the equipment to be supported.

PLASTIC UNIT SKYLIGHTS – 07810

General: All skylights shall be required to have thermal-break frames and double glazing. Verify frame finish colors with DCM.

JOINT SEALANTS – 07920

Sealant Materials: Polyurethane, one or two-part sealants, are typically used on campus. Silicone sealants are typically limited to glazing systems.

Sealant Application: Installers shall be required to submit proof of at least five years successful experience applying products of the type specified. Designers are expected to check on these qualifications prior to approving proposed subcontractors and submittals.

- Joints in horizontal masonry systems, such as copings, sills and ledges, shall be sealed with joint sealant in lieu of mortar.

Sealant Colors: Verify proposed colors with DCM Architectural Manager for each sealant location. Do not leave this decision to construction personnel.

- As a general rule, it is recommended to match the brick color rather than the mortar color, since sealants will then tend to blend into the field color of the brick and be less noticeable.