

OKLAHOMA STATE UNIVERSITY - BUILDING DESIGN STANDARDS

DESIGNER NOTE: SPECIFIC APPROVAL MUST BE OBTAINED FROM OSU ARCHITECTURE SERVICES STAFF PRIOR TO SPECIFYING THIS ROOFING SYSTEM

PART 1 GENERAL

1.01 SYSTEM DESCRIPTION:

A. Manufacturer's Recommendations:

1. All products comprising the total roofing system, including the insulation, shall be acceptable to the roofing membrane manufacturer.
2. The published and written general requirements and specific recommendations of the various materials manufacturers shall become a part of the project specification to the extent referenced hereinafter.
3. The manufacturer's recommendations will govern the construction when not in conflict with the specific provisions of the project specification.
4. In the event of conflict, the specific provisions of this specification will prevail over such requirements or recommendations of the manufacturers. Any such conflict shall be called to the attention of the General Contractor, Architect, and Owner with submittal.
5. Provide vapor barrier for roofs over pools, shower rooms, kitchens, and other high humidity areas recommended by roofing manufacturer. Provide vapor barrier of type recommended by roofing manufacturer.

1.02 SUBMITTALS:

- A. Submit product data for membrane and base flashing materials.
- B. Provide number of copies as requested, but not less than three, of the manufacturer's specifications and application instructions for all roof installations used; one copy each shall be furnished to the Owner and the Architect and one copy shall be kept on the job site until the roof installation is complete.
- C. Submit certification of manufacturer's approval of this specific project regarding warranty requirements. Certification shall be submitted prior to roofing application.
- D. Submit manufacturer's certification that materials meet or exceed specified requirements.
- E. Shop Drawings: For tapered insulation systems, furnish layout shop drawings showing thickness, slopes, valleys, ridges, top elevations, straight and tapered unit locations, as required to provide uniform drainage pattern and meet thermal performance requirements.

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- F. Submit two samples of each type of piping and conduit support for approval. Include detail indicating method of anchorage to roof structure and method of flashing. Coordinate with Divisions 15 and 16.
- G. Submit aggregate sample for approval color, size, weight, etc.

1.03 QUALITY ASSURANCE:

A. Qualifications:

1. Applicator: Company specializing in builtup bituminous roof application with five years continuous experience under the same company name, approved by roofing materials manufacturer, and who has installed a minimum of 500 squares of similar roofing to the type required for this project during that five years.
2. Roofing components shall be provided from a single manufacturer source to assure compatibility and conformance to manufacturer's warranty conditions.
3. Installer's Field Supervision: Require roofing Installer to maintain a fulltime supervisor on the job site during application of builtup roofing and who is experienced in the installation of roofing system.

B. Regulatory Requirements:

1. Underwriters Laboratories, Inc. (UL): Class A Fire Hazard Classification.
2. Factory Mutual Engineering Corporation (FM): Roof assembly classification, FM Construction Bulletin 128, Class I Construction for steel decks.
3. Roof system shall comply with all I.C.B.O. requirements, match FM I-90 wind up-lift resistance and 2006 FM Global Property Loss guidelines as minimum criteria and be compatible with application on specified deck.

C. Preinstallation Conference:

1. Convene a preinstallation conference one week prior to commencing work of this section and after approval of system, submittals and foreman's resume.
2. Require attendance of parties directly affecting work of this section including: Foreman of each type of roofing, campus roofer, professional roofing consultant, and inspector.
3. Review installation procedures and coordination required with related work including the following:

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- a. Review the specifications and details with the Owner, Contractor, Architect and roofing applicator.
- b. Confirm that the applicator and manufacturer accept the roofing specifications and details as a proper and functional system. If the applicator and manufacturer have any apprehension or concerns they shall discuss and resolve them at this time.
- c. Confirm that the applicator and manufacturer accepts the roofing substrate. Coordinate with appropriate party any remedial action required to make substrate acceptable.
- d. Establish where the roofing project will start and how the installation will proceed.
- e. Determine what type of equipment will be used for the roofing application.
- f. Resolve where and how the materials are to be stored on the project.
- g. Determine the weather conditions under which the roofing applicator will install the roofing system. The Architect, Owner and Contractor must acknowledge that if the weather conditions do require the roofing applicator to stop the installation of the roofing system that pressure will not be brought to bear on the roofing applicator to ignore the predetermined conditions and continue the installation. (Provide for contingent temporary dryin under all circumstances.)
- h. Establish a program with the mechanical subcontractor as to exactly how and where the mechanical equipment will be transported across the roof area. If two men cannot carry the equipment to the base it shall be placed directly on the base by crane. Under no conditions can any equipment or materials be transported across roofing without the prior approval of the roofing applicator, and adequate protection weight/ point loading shall be reviewed and approved prior to placement.
- i. All penetrations and walls must be in place prior to the roofing application.
- j. Establish a program for controlling all traffic across finished roofing.

1.04 WARRANTY:

- A. Provide a written minimum five year complete system warranty. The system warranty shall provide for the roof membrane, all accessories that comprise the roof system and all contractor labor for the first five years of the roof system. The Warranty shall be non-prorated, provide for no dollar limit and shall not exclude any portions of the system due to acts of nature or use by the Owner.

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PART 2 PRODUCTS

2.01 MANUFACTURERS:

- A. GAF Building Materials Corp.
- B. Johns Manville Corp.
- C. Tamko Asphalt Products.
- D. An approved equal.

2.02 ROOFING SYSTEMS:

- A. Factory Mutual Class 1, U.L. Class A type roofing system with FM I90 windstorm rated for installation over specified deck system.
- B. Built-Up Roofing System: Fourply, asphalt applied glassfiber reinforced felts, with insulation and gravel surface.
- C. Comply with roofing system manufacturer's recommendations for component roofing system materials as required for manufacturer's warranty.

2.03 SHEET MATERIALS:

- A. Glass Fiber Felts: ASTM D2178, Type IV or VI.
- B. Base Sheet: ASTM D2626, No. 45; plain.

2.04 BITUMINOUS MATERIALS:

- A. Asphalt Bitumen: ASTM D312, Type I and Type III.
- B. Asphalt Primer: ASTM D41.
- C. Plastic Cement: ASTM D2822, cutback asphalt type.
- D. Asphalt Emulsion: ASTM D1227, Type I or II.
- E. Flashings: SBS flashing with polyester reinforcing acceptable to primary roofing membrane manufacturer with granular surface.

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2.05 INSULATION:

- A. All insulation shall bear U.L. label.
- B. Total insulation thickness shall be a minimum of 3 inches with an average thermal resistance R-Value = 30. Where boards are hot mopped, limit maximum board size to 48 inches x 48 inches.
- C. Insulation: FS HHI1972; polyisocyanurate foam with bituminous saturated roofing felt facings; thermal resistance (R-Value at 75°F.) when aged in accordance with ASTM C128902.
- D. Insulation: ASTM C728; expanded perlite mineral aggregate board; density of 10 lb./cu. ft.; K factor of 0.36; square edges.
 - 1. Overlay Board: 0.75" thickness.
 - 2. Tapered Insulation Board: 1 inch minimum thickness.
 - 3. Slope of Tapered Insulation Board: To achieve a minimum slope of 0.25" per foot.

2.06 AGGREGATE SURFACING:

- A. Aggregate: ASTM D1863, Size No. 7; sound, hard, washed, clean river gravel, 400 lb/sq.
 - 1. Embed aggregate in flood coat of asphalt. Remove loose gravel.

2.07 CANTS:

- A. Fiber Cant and Tapered Edge Strips: Asphalt impregnated wood fiberboard, preformed to 45 degree angle.
- B. Wood cants may be used provided they are preservative treated and conform to roofing system manufacturer's recommendations.

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2.08 ACCESSORIES:

THE DESIGN CONSULTANT IS TO RECOMMEND AND RECEIVE CONCURRENCE FROM THE UNIVERSITY CONCERNING A SPECIFIC APPLICATION OF INSULATION. SLOPE STRUCTURE TO ACHIEVE DRAINAGE ON NEW CONSTRUCTION AND USE TAPERED INSULATION FOR CRICKETS ONLY. ON EXISTING "FLAT" ROOFS, USE TAPERED INSULATION AS REQUIRED TO ACHIEVE ADEQUATE DRAINAGE

- A. Insulation Joint Tape: Asphalt treated glass fiber reinforced; 4 to 6 inches wide; self adhering.
- B. Roofing Nails: Galvanized or nonferrous type, size as required to suit application.
- C. Traffic Surfacing: 3/4-inch by 36 inches by 60 inches with granular surface, W.R. Meadows Sealtight "Whitewalk" or an approved equal.
- D. Mechanical Fasteners for Insulation: Appropriate to purpose intended and approved by Factory Mutual; length required for thickness of material; corrosion resistant.
- E. Prefabricated Control or Expansion Joint Flashing:
 - 1. 60 mil EPDM sheet bellows with closed cell urethane foam backing, seamed into 26 gage galvanized metal flashing flanges, including counter-flashing each side.
 - 2. Install control and expansion joints on curb in conformance with NRCA recommendations.
- F. Thermal Barrier: ASTM C442 gypsum backing board or ASTM C36 gypsum board, 0.625" thick, Type X, 4 feet wide, square edge.

END OF SECTION 07510