DESIGN CRITERIA

1. Related Sections: See Division 07 Section SHEET METAL FLASHING AND TRIM for shop- or field-fabricated sheet metal copings, fasciae, gravel stops, flashing receivers, equipment support flashings, roof penetration flashings, and counter-flashings.

2. This Section specifies fully adhered EPDM black membrane roofing systems including roof insulation, base flashings, walkways, and auxiliary roofing materials.

   A. UFC 3-110-03 ROOFING (01 MAY 2012) requires that the designer of record determine wind uplift pressures and dimensions of the corners, perimeter, and field of the roof in accordance with ASCE-7, Minimum Design Loads for Buildings and other Structures. Coordinate roof design with UFC 3-101-01 ARCHITECTURE (28 NOV 2011) which provides design criteria for the building envelope as a whole, including the roof. UFC 3-101-01 includes requirements for air and vapor barriers associated with roofing systems as well as the required dew point calculation to determine the need for a vapor barrier and to verify that the vapor retarder has been positioned correctly in the roof assembly. Roofing system shall include a coverboard installed directly below the roof membrane, regardless of design wind speed.

   B. The basis-of-design system specified is for installation over metal decking mechanically fastened through a top layer of roof insulation and secured to the metal decking for buildings and other structures located where the basic design wind speed (3-second gust) does not exceed 90 mph as indicated in UFC 3-301-01 STRUCTURAL ENGINEERING (01 JUN 2013).

   C. For locations where the design wind speed is greater than 90 mph, design of cover board membrane underlayment is required in accordance with the membrane roofing system manufacturer. The membrane underlayment shall not be fire retardant treated (FRT) plywood, article 2-13, UFC 3-600-01 FIRE PROTECTION ENGINEERING FOR FACILITIES (26 SEP 2006) with Change 3 (01 MAR 2013).

3. Provide insulation materials with a total minimum Long Term Thermal Resistance (LTTR) R-value of 20, unless climatic conditions or local Installation energy code requirements dictate a higher R-value. Current Federal Energy Reduction Mandates may require the use of increased insulation thicknesses. This will be determined through energy usage calculations prepared as part of project development.

4. UFC 3-110-03 ROOFING requires that if a cool roof is selected, system shall comply with ASHRAE Standard 90.1 (2010) Chapter 5 values for cool roofing. If a cool roof is not selected in climate zones 1 through 3, meet one of the exception requirements listed in ASHRAE Standard 90.1 (2010) Chapter 5 or provide thermal insulation above the deck with a minimum R-value of 33 or greater.

5. Design roof slope in accordance with UFC 3-110-01 and roofing manufacturer's recommendations, but no less than 1/4" per foot to interior drains using roof structure for slopes. Achieving roof slope with insulation is not acceptable, except at drainage crickets, preformed saddles, tapered edge strips, and perimeter edge strips.

6. Keep interior vertical drops from roof drains to a minimum, combining when practical and locating them in concealed void spaces and storage areas. Do not locate exposed within customer areas.

7. If appropriate, locate overflow roof drains adjacent to normal roof drains with overflow outlets exposed on exterior wall of building.

8. Provide access to roof for equipment maintenance via ships ladder and roof hatch from mechanical equipment mezzanine, or stair tower from ground floor of building with standard steel door and frame roof access to roof.

9. Indicate roof walkways necessary to access roof mounted equipment requiring maintenance.

END OF SECTION