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### 1. Design Criteria:

- a. As this section covers many types of items, not all statements will universally apply to all products.
- b. Manufacture and install copings and roof-edge flashings that are listed in FM Approvals' "RoofNav""(see References section) and approved for windstorm classification. Identify materials with FM Approvals' markings.
- c. Coping and roof -edge flashing shall be fastened to the substrates according to FM Global requirements.
- d. Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement, due to defective manufacture, fabrication, installation, or other defects in construction.
- e. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress because of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - i. Use standard design temperature range for the climate zone the building is located in.

### 2. References

- a. FM Global Approvals Guide: <https://www.fmaprovals.com/approval-guide>
- b. FM Global RoofNav: <https://www.fmaprovals.com/roofnav>
- c. NRCA (RM) - The NRCA Roofing Manual
- d. NRCA Waterproofing Manual
- e. SMACNA (ASMM) - Architectural Sheet Metal Manual
- f. Copper Development Association – Architectural Detailing Guide
- g. FM Global Design Standards

### 3. Required Submittals:

- a. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- b. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work. Include the following:

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- i. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
    - ii. Details of termination points and assemblies, including fixed points.
    - iii. Details of special conditions.
  - c. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.
  
- 4. **Products, Materials & Equipment:**
  - a. The following list of roof specialty components should be reviewed with the UVM Project Manager prior to the roof design being completed. The Design Consultant shall give the UVM Project Manager the opportunity to review these items with their team and submit additional requirements, preferences, or detail concerns to the Design Consultant so they can be incorporated into the drawings and specs.
    - i. Roof Edge Flashings and Copings
    - ii. Factory Fabricated Cornices
    - iii. Control and Expansion Joint Covers
    - iv. Louvered Vents
    - v. Pipe and Penetration Flashings
    - vi. Counter-flashings
    - vii. Pipe Penetration Wall Seal
    - viii. Pipe Penetration Wall Seal and Insulation Protection System
    - ix. Vapor Barriers
    - x. Roof Vents
    - xi. Attic Vents
    - xii. Roof Penetration Sealing Systems
    - xiii. Engineered Roof Perimeter Blocking
    - xiv. Engineered Roof Ventilation
    - xv. Eave Vent System
    - xvi. Roof tie off system
  
- 5. **Installation, Fabrication, and Construction:**
  - a. Installer shall examine substrates, areas, and conditions to verify actual locations, dimensions, and other conditions affecting performance of the Work.
  - b. Installer shall examine walls, roof edges, and parapets for suitable conditions for roof specialties.

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- c. Installer shall verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- d. Proceed with installation only after unsatisfactory conditions have been corrected.
- e. Installation, General:
  - i. Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required by type and material of specific roof specialties to complete roof-specialty systems.
    - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
    - 2. Provide uniform, neat seams with minimum exposure of solder (where applicable) and sealant (where applicable).
    - 3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
  - ii. Protect metals against galvanic action by separating dissimilar metals from contact with each other, or with corrosive substrates, by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
    - 1. Coat concealed side of uncoated aluminum and stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
    - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet.
  - iii. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
  - iv. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint.

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6. **Warranties:**

- a. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - i. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
    - 1. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - 2. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - 3. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - ii. Finish Warranty Period: minimum 20 years from date of Substantial Completion.
- b. The GC shall furnish the Owner with a 1-year warranty on workmanship and a 20-year warranty on any and all roof installations covering materials. Said warranty shall cover full replacement cost and warrant watertight condition including responsibility for any damages that may result from any leaks in the roof, flashing, curbs, or other appurtenances. The warranty may be from the Contractor or Manufacturer in a form approved by the Owner.