DIVISION 7

THERMAL & MOISTURE PROTECTION
1.0 WATERPROOFING

Fluid applied waterproofing manufacturers: Hydrotech 6125., or 3M Co., Scotch Clad Brand Water Containment System.

2.0 INSULATION

Inject grout or sealant around window and door frames where voids occur between rough opening and finished frame. Fill voids to avoid air infiltration.

Unfaced or Craft-paper faced batt insulation is not acceptable

Closed cell extruded polystyrene is not acceptable due to outgasing and odor.

Drawings must clearly identify locations of firesafing insulation.

Insulation "R" Value **Minimums**:

- **Walls:**
  - R = 19 minimum above grade.
  - R = 10 minimum below grade.
- **Roofs:** R = 30 average.
- **Soffits:** R = 19 minimum.

Above-Grade Slabs over Unheated Spaces: R = 19 minimum.

All exposed exterior building columns and beams shall be insulated from the interior at the same R = 19 rating as for walls.

Insulate above-grade floor slabs where underside is exposed to the weather or unheated space to achieve an R = 19 rating minimum.

Insulate around support and support cross-beams.

Prefer 2” Tongue and Groove perimeter and underslab insulation. R10 minimum.

3.0 ROOFING TILE

Specifying roofing tile will need prior approval by the Project Manager and Campus Architect.

Manufacturer: Ludowici-Celadon. Substitutions must meet the strength of Ludowici-Celadon for consideration.

Shape: 16-inch length, straight Barrel Mission style.

Color: to match existing:

- Pans FMS Red Range 100%
- Covers:
Weathered red dark 20%
Weathered red medium 20%
Weathered brown dark 20%
Weathered X61 light brown 40%
Total Covers 100%

Provide stainless steel Snow guards. Show all locations on drawings. Install at least 3 or more staggered rows, as the size of roof requires at all sloped roofs.

Ice Dam Material to be rubberized asphalt and polyethylene laminated self-adhesive sheet, 40 mils thick. By one of the following manufacturers:

"Bituthene Ice and Water Shield" by W.R. Grace.
"Polyguard Deck Guard" by Polyguard Products, Inc.
"Polyken 640 Underlayment Membrane" by Polyken Technologies

All flashing and counterflashing shall be copper.

4.0 BASIC ROOF SYSTEM

Roofing System
Use four ply hot mop applied or cold applied built-up roofing systems only.

Roofing system shall meet NRCA Guidelines.

All masonry shall have proper through-wall flashing to control moisture penetration.

Roof System Components
Slope structure to achieve drainage. Use tapered insulation for crickets only.

Underlayment: Over the concrete and lightweight concrete decks, a single ply of #28 fiberglass base sheet shall be installed. The sheet shall have 3” side laps and 6” end laps.

Underlayment Attachment-Concrete Deck: Prime deck after removing any loose material with asphalt roof primer applied at the rate of 1 gallon per 250 sf. After primer has dried, set underlayment sheet in hot, fluid, solid moppings of ASTM D 312, Type III asphalt.

Insulation: The first layer of insulation shall consist of 1.5” thick urethane/isocyanurate foam (HH-I-1972/2) board with fiberglass facers. The second layer (top layer) of insulation shall consist of a tapered perlite board system (ASTM C 728). The field slope shall be constructed with a 1/8” per foot factory cut tapered perlite board system on Section 1. On Section 2 the field slope shall be established with 1/4” per foot factory cut tapered perlite board insulation system.

Insulation Attachment: Over all of the deck areas, the first layer of insulation shall be set in hot solid fluid moppings of hot ASTM D 312, Type III asphalt. The successive layers of insulation shall be set in hot fluid solid moppings of ASTM D 312, Type III asphalt also.

Membrane: ASTM D 2178-81, Type IV, fiberglass roofing felt, four piles, set in ASTM D 312, Type III asphalt, so as to result in a UL Class A surface after gravel application.
Aggregate: ASTM D 1863-80, 1/2” built-up roof aggregate, gravel shall be installed in a flood coat of ASTM D 312, Type III asphalt. Do not apply aggregate where pavers are to be installed.

Cant Strips: ASTM C 208-72, 3”x3” or as required by conditions on drawings.

Crickets: Tapered perlite insulation boards (ASTM C 728) shall be installed in the areas shown on the drawings. The factory cut crickets shall have 1/4” per foot of finished (installed) slope. The insulation shall be set in hot fluid solid moppings of ASTM D 312, Type III asphalt.

Flashing: Modified bitumen roofing sheet, mop applied, as recommended by the BUR Manufacturer. Install modified bitumen sheet over mop applied sheet of #28 fiberglass felt. Fiberglass composition flashings not acceptable. Sheet must be granule surfaced.

Roof Drain Baskets shall be cast metal.

Pitch pans can be used when there is no other alternative.

Pavers: Where shown on the drawings, lay new concrete pavers on the protective membrane on the new roof. The pavers shall be cast from 3,000 psi concrete and shall have Dur-O-Wall wire reinforcement. The dimensions of each paver shall be 2’x2’x1-1/2”.

Roof Hatch: to be Bilco Type L service stair access 30”X96”. If VE is needed Mines will not accept anything less than the Bilco ship stair access 30”X54”.

Work so that each area of the BUR is completed the same day it is begun. This includes all base flashings. Graveling of the membrane may be delayed for up to thirty days.

One, thirty-gallon per minute puddle type pump must be available on the job in case water must be removed from the roof surface on an emergency basis.

Workers will not have access to the interior of a building unless it is related to associated interior work.

Wood Installation
All wood should be pressure treated wood to meet American Institute of Timber Construction.

When attaching wood to the deck, fasten at not more than 2’ O.C. and also within 6” of each end. Use the appropriate fastener for each deck type.

When attaching wood to wood, nail 18” O.C. staggered, and also within 6” of ends.

Brush apply one coat of the concentrated solution of the preservative used in treatment onto all cut surfaces of the treated wood.

Drain design: closely coordinate roof drain daylighting with site and landscape to avoid pedestrian hazards. Tie lines to storm system wherever possible.

Insulation joint gap shall not exceed 1/4”. If joints are greater, then fill with plastic cement or add insulation to gap.
Aggregate embedment shall average 60%.

**Flashing around Mechanical Equipment**
The contractor shall hire a mechanical contractor with proven five years experience for the lifting and re-setting of any large mechanical units. The owner must be notified in writing 72 hours prior to the shutdown.

Prior to the lifting of the units, the contractor must provide a Method of Procedure indicating the procedure and timing involved with this work.

**Roofing and Waterproofing Inspection**
A roofing consultant should check the roofing documents and inspect the roof during construction. The roofing consultant should commission the roof in conjunction with CSM prior to acceptance of the roof.

5.0 METAL ROOF SYSTEMS

Metal roofing should be 24 gauge galvanized pre-finished steel. Steel roofing should be a clip type system and use mechanical field formed type seams. Seams should be continuous over the length of the panels. Install 3 rows of snow guards over the length of the roof by compression attachment to the standing seams.

Metal roof to color to match Devoe 1R031A PIPPA RUST or Benjamin Moore 2005-20 HOT APPLE SPICE

6.0 FLASHING & SHEET METAL

All flashings between tile roofs and vertical surfaces shall be 16-ounce cold-rolled copper run not less than 2-inch higher than the tile covering the first roll of tile.

Gutters shall be galvanized iron or copper (where applicable) 2 gauges heavier than SMACNA recommendations with a pitch ¼-inch per 10-foot to drain.

All joints shall be welded. Mastic sealed seams are unacceptable.

Gutters and downspouts to be factory coated, color to be approved by Campus Architect.

All gutters and downspouts to drain into subsurface drainage system or run off away from pedestrian walkways.

Provide snap-in cleanouts at each story of construction.

Installations must be designed to withstand 100 mph wind uplift.

Provide 2 year warranty after Notice of Acceptance.

7.0 SPRAYED ON FIREPROOFING

Acceptable Manufacturers:

- Monokote as manufactured by W. R. Grace and Co.
- Calco 300 as manufactured by Isolatex International Corp.
8.0 FIRESTOPPING

Acceptable Manufacturers:
- Hilti Inc.
- FireBlok
- 3M Fire Protection Products
- Specified Technologies Inc
- Tremco, Inc.

Provide **Cable** firestopping system that shall require no maintenance and shall accommodate future cable changes without mechanical adjustment and/or removal or replacement of protective materials. Preferred manufacturer: Specified Technologies Inc, EZ-PATH Fire Rated Pathway

Fire-stop Intumescent Electrical Box Gaskets: The Fire Suppression Gasket shall be manufactured as an intumescent thermoplastic device for use as a fire stop in electrical boxes. Must easily install inside the back of an electrical box, seal off the opening to prevent the spread of flames, include a pre-die cut ground screw opening to ensure metal to metal ground and accessibility for future access, Volume of fire stop gasket shall not exceed 3.0 cubic inches which must include the void created if gasket will not sit flush to the back of the junction box due to the raised nipple for grounding location, Device must be listed for use with plastic or metal faceplates in both 1 hr. and 2 hr. U-300, U-400 and U-411 wall assemblies. Gaskets must be designed to fit easily into electrical boxes without effecting NEC Box ratings and provided with an adhesive strip on the device to hold the gasket in place in the back of the electrical box. Gasket must have passed ASTM-814-10 testing for rated enclosures by an accredited NRTL. As manufactured by FireBlok™ or equal.

Prepare a schedule showing typical penetrations of each penetrating material type with the following information: Construction assembly, Occupancy, Rating Requirements, UL Assembly Number.

END OF SECTION