ATTENTION: This is not an order. Read all instructions, terms and conditions carefully.

IMPORTANT: BID AND ADDENDUM MUST BE RECEIVED BY 01/07/2020 @ 3:00 P.M. LEXINGTON, KY TIME

Bidder must acknowledge receipt of this and any addendum as stated in the Invitation for Bids.

1. Please refer to and incorporate within the offer, the attached written questions and answers.

2. Please refer to additions and changes made to project specifications (Tab 13):

   a. SECTION 033000 - CAST-IN-PLACE CONCRETE (New)
   b. SECTION 042000 - UNIT MASONRY (New)
   c. SECTION 052100 - STEEL JOIST FRAMING (New)
   d. SECTION 052100 - STEEL JOIST FRAMING (New)
   e. SECTION 071113 - BITUMINOUS DAMPPROOFING (New)
   f. SECTION 072419 - EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) (New)
   g. SECTION 079200 - CAULKING AND SEALANTS (New)
   h. SECTION 084313 - ALUMINUM ENTRANCE AND STOREFRONT (New)
   i. SECTION 085113 - ALUMINUM WINDOWS (New)
   j. SECTION 099100 – PAINTING (Heading updated only)
   k. SECTION 230553 – MECHANICAL IDENTIFICATION (heading updated only)
   l. SECTION 230700 – HVAC INSULATION (Heading updated only)
   m. SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS (Heading updated only)

   **Header changed to “ENVIRONMENTAL QUALITY MANAGEMENT BUILDING ADDITION UNIVERSITY OF KENTUCKY – LEXINGTON, KENTUCKY”**

3. Please refer to changes made to EQMC Drawing on “CCK-2454-20_Addendum 3_EQMC_Drawings Update”.
Kenneth Scott  12/20/2019

Ken Scott / (859) 257-9102

Typed or Printed Name
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How do we address the grade outside the addition? The current seat wall is a retaining wall holding back hillside. The new Addition wall is not designed as a retaining wall</td>
<td>Adjust grade to provide minimum 2% slope away from building. Allowance No. 2 provides $5,000 related for earthwork/grading.</td>
</tr>
<tr>
<td>2.</td>
<td>The $5,000.00 allowance for JCI and the $3,000.00 allowance for outages is in the spec. Are these needed and is there a Simplex allowance we need to include?</td>
<td>$5000 allowance required for fire alarm system work. $3000 outage allowance is now removed from project requirements.</td>
</tr>
<tr>
<td>3.</td>
<td>Doors 100A and 100B are aluminum doors and schedule shows a hollow metal frame. Should these frames be aluminum?</td>
<td>Yes.</td>
</tr>
<tr>
<td>4.</td>
<td>Does the Receptionist Window have glass or is it a wood trimmed opening?</td>
<td>Wood Trim.</td>
</tr>
<tr>
<td>5.</td>
<td>Are the exterior Windows fixed aluminum frames with insulated glass?</td>
<td>Yes. See window specification.</td>
</tr>
<tr>
<td>6.</td>
<td>The Demo plans calls for removal of stumps and a sidewalk. Are we to regrade and sod area at completion?</td>
<td>Yes.</td>
</tr>
<tr>
<td>7.</td>
<td>Plan page F-110                                                                                                                                  Sheet Note 3.</td>
<td>“Design and install water wall wash system on both sides of wall (ALLOWANCE PROVIDED).”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>The hardware sets shown on sheet A-002 do not show door #s that apply to the door schedule directly above it. Please provide correct sets and set assignments for the openings in the door schedule.</td>
<td>See revised sheet A-002.</td>
</tr>
<tr>
<td>9.</td>
<td>Would it be possible to get a copy of the sign-in sheet from the pre-bid meeting for the above project?</td>
<td>Yes. See attachment.</td>
</tr>
<tr>
<td>10.</td>
<td>Why is there a $5,000 fire alarm allowance for work by JCI? There is a notifier panel serving this building, not JCI/Simplex. Will the allowance cover the cost of work performed by the notifier vendor?</td>
<td>Simplex is responsible for all work on Notifier-brand panel. $5000 allowance will cover this work.</td>
</tr>
<tr>
<td>11.</td>
<td>Does the allowance for fire alarm include cost for temporary heat detection?</td>
<td>No.</td>
</tr>
<tr>
<td>12.</td>
<td>Will UKIT be responsible for the cabling and programming for the AIRPHONE and Ceiling Sensor shown on E-110 that are to be relocated?</td>
<td>Electrical contractor ressp. for all security pathways, including the pathways to the two new door strikes and hardware.</td>
</tr>
<tr>
<td>13.</td>
<td>Note (9) on E-110 says to install data connection to HVAC control module, will this be done by UKIT?</td>
<td>No. Data line to control module to be run by electrical contractor.</td>
</tr>
<tr>
<td>14.</td>
<td>Will there be any low voltage lighting controls for this project? I only see a 120V line voltage OS1 switch mentioned for controls. Do we know if the selected LED fixtures are compatible?</td>
<td>No. Philips LED fixtures have on-board controls.</td>
</tr>
<tr>
<td>15.</td>
<td>Sheet E-112 says that the electrical contractor is responsible for providing and installing data wiring, is this correct? E-110 says that jacks and cable are furnished and installed by others…</td>
<td>Sheet E-110, note 1, refers to office data cabling. Sheet E-112 refers to HVAC communications cables. UK IT will install &amp; terminate office data lines. Electrical contractor will run HVAC data cables.</td>
</tr>
<tr>
<td>16.</td>
<td>Could you please clarify the responsibility matrix on E-112? It states that the electrical contractor is responsible to provide and install controls power power &amp; comm wiring and conduit, including thermostats, sensors, ETC… Does that mean that the electrical contractor is furnishing thermostats and sensors, or does that simply mean that we need to provide conduit and controls cable for thermostats and sensors?</td>
<td>See addendum notes on sheet E-112.</td>
</tr>
<tr>
<td>17.</td>
<td>Keeping with question (7) on E-112 sheet notes 5 and 7 mentions to install discharge air temperature sensor and return air temperature sensor as well as to install duct air temperature sensors… Is the electrical contractor responsible for installing these devices? If so, can you provide details on what that requires?</td>
<td>See addendum notes on sheet E-112.</td>
</tr>
</tbody>
</table>
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Concrete masonry units.
      2. Mortar and grout.
      3. Steel reinforcing bars.
      5. Ties and anchors.

1.3 DEFINITIONS
   A. CMU(s): Concrete masonry unit(s).
   B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 ACTION SUBMITTALS
   A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS
   A. Material Certificates: For each type and size of the following:
      1. Masonry units.
      2. Mortar admixtures.
      3. Grout mixes.
      4. Reinforcing bars.
      5. Joint reinforcement.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Store masonry units on elevated platforms in a dry location.
   B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
      Do not use cementitious materials that have become damp.
   C. Store masonry accessories, including metal items, to prevent corrosion and
      accumulation of dirt and oil.

1.7 FIELD CONDITIONS
   A. Protection of Masonry: Cover partially completed masonry when construction is not in
      progress.
B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect surfaces of door frames, as well as similar products with painted and integral finishes, from mortar droppings.

C. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.


PART 2 - PRODUCTS

2.1 UNIT MASONRY, GENERAL


B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

2.2 CONCRETE MASONRY UNITS

A. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2,150 psi (14.8 MPa).
2. Density Classification: Normal weight.
3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.

2.3 MASONRY LINTELS

A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold weather construction.

1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Masonry Cement: ASTM C 91/C 91M.
E. Mortar Cement: ASTM C 1329/C 1329M.

F. Aggregate for Mortar: ASTM C 144.
   1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.


H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

I. Water: Potable.

2.5 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

C. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.
   2. Wire Size for Side Rods: 0.148-inch diameter.
   4. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
   5. Provide in lengths of not less than 10 feet (3 m) with prefabricated corner and tee units.


2.6 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

2.7 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
   1. Do not use calcium chloride in mortar or grout.
   2. For reinforced masonry, use portland cement-lime mortar.
   3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Mortar for Unit Masonry: Comply with ASTM C 270 Specification.
C. Grout for Unit Masonry: Comply with ASTM C 476.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that foundations are within tolerances specified.
   2. Verify that reinforcing dowels are properly placed.
   3. Verify that substrates are free of substances that impair mortar bond.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

D. Cut slot in block, as required, for installation of full-length vertical rebar indicated within the confined area.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:
   1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
   2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
   3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2-inch total.

B. Joints
   1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in stacked bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Build non load-bearing walls full height to underside of solid floor above unless otherwise indicated.
   1. Install compressible filler in joint between top of partition and underside of structure above.

3.5 MORTAR BEDDING AND JOINTING
A. Lay CMUs as follows:
   1. Bed face shells in mortar and make head joints of depth equal to bed joints.
   2. Bed webs in mortar in grouted masonry, including starting course on concrete walls.
   3. Fully bed entire units, including areas under cells, at starting course on concrete walls where cells are not grouted.
   4. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

3.6 MASONRY-JOINT REINFORCEMENT
A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches. Radius or curve the joint reinforcing to match the wall curve, refer to the drawings
   1. Space reinforcement not more than 16 inches o.c.
   2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
C. Provide continuity at wall intersections by using prefabricated T-shaped units.
D. Provide continuity at corners by using prefabricated L-shaped units.
E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 ANCHORING MASONRY TO STRUCTURAL CONCRETE
A. Anchor masonry to concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
   1. Anchor masonry with anchors embedded in masonry joints and attached to structure.
   2. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.
3.8 LINTELS
   A. Install steel lintels where indicated.
   B. Provide masonry lintels where shown and where openings of more than 24 inches are shown without structural steel or other supporting lintels.
   C. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

3.9 REINFORCED UNIT MASONRY INSTALLATION
   A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
      1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
      2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
   B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
   C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
      1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
      2. Limit height of vertical grout pours to not more than 60 inches.

3.10 REPAIRING, POINTING, AND CLEANING
   A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
   B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
   C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
   D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
      1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
      2. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
      3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
4. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.11 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000
 sectional includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 PREINSTALLATION MEETINGS
A. Preinstallation Conference: Conduct conference at location to be determined by UK project manager.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Design Mixtures: For each concrete mixture.
C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement.

1.4 INFORMATIONAL SUBMITTALS
A. Material certificates.
   1. Cementitious materials.
   2. Admixtures.
   3. Steel reinforcement and accessories.
   4. Curing compounds.
   5. Floor and slab treatments.
   6. Adhesives.
   7. Semirigid joint filler.
B. Components
   2. Vapor Retarder
   3. Repair materials.
   4. Waterproofing
C. Material test reports: For the following, from a qualified testing agency:
D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
E. Field quality-control reports.
F. Minutes of pre-installation conference.

1.5 QUALITY ASSURANCE
A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated. The agency to provide a certified special inspector on pour days to gather concrete test cylinders.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
   a. Contractor's superintendent.
   b. Independent testing agency responsible for concrete design mixtures.
   c. Ready-mix concrete manufacturer.
   d. Concrete Subcontractor.

1.7 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 306.1.
   1. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M).

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301 (ACI 301M).
   2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."
C. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

2.4 CONCRETE MATERIALS

A. Cementitious Materials:
   1. Portland Cement: ASTM C 150/C 150M, Type I or Type III.
   2. Fly Ash: ASTM C 618, Class F.

B. Normal-Weight Aggregates: ASTM C 33/C 33M, graded.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C 260/C 260M.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

E. Water: ASTM C 94/C 94M and potable.

2.5 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. BASF Construction Chemicals - Construction Systems.
   2. Bon Tool Co.
   3. Brickform; a division of Solomon Colors.
   4. ChemMasters, Inc.
   5. Dayton Superior.
   6. Euclid Chemical Company (The); an RPM company.
   8. L&M Construction Chemicals, Inc.
   10. Metalcrete Industries.
   14. TK Products.
15. Vexcon Chemicals Inc.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. BASF Construction Chemicals - Construction Systems.
2. ChemMasters, Inc.
3. Dayton Superior.
4. Euclid Chemical Company (The); an RPM company.
5. Kaufman Products, Inc.
7. Lambert Corporation.
10. Right Pointe.
12. TK Products.
13. Vexcon Chemicals Inc.

2.6 RELATED MATERIALS


2.7 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).

B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

C. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.8 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Normal-Weight Concrete:
1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum W/C Ratio: 0.40.
3. Slump Limit: 4 inches (100 mm), plus or minus 1 inch.
4. Air Content: 6.0 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

2.9 FABRICATING REINFORCEMENT
   A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.10 VAPOR RETARDERS
   A. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 8 mils thick.

2.11 CONCRETE MIXING
   B. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
      1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg. F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION
   A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
   B. Construct formwork so concrete members and structures are of size, shape, radius, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).
   C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
      1. Class B, 1/4 inch for rough-formed finished surfaces.
   D. Construct forms tight enough to prevent loss of concrete mortar.
   E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
      1. Install keyways, reglets, recesses, and the like, for easy removal.
      2. Do not use rust-stained steel form-facing material.
   F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
   G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely
braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Construct formwork so concrete slabs-on-grade are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).

3.2 REMOVING AND REUSING FORMS

A. General: Formwork for sides of walls and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete must be hard enough to not be damaged by form removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.3 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Owner's Representative.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one fourth of concrete thickness as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when
cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).

3.6 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

C. Broom Finish: Apply a fine broom finish to concrete floor surface.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Owner's Representative before application.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.
3.8 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
   a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film finish coating system.
2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
   a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, stoops, and elsewhere as indicated.

3.11 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Owner's Representative. Remove and replace concrete that cannot be repaired and patched to Owner's Representative approval.
PART 1 - GENERAL

1.1 SUMMARY
   A. Section Includes:
      2. Joist accessories.

1.2 ACTION SUBMITTALS
   A. Product Data: For each type of joist, accessory, and product.
   B. Design Submittals - Shop Drawings
      1. Include layout, designation, number, type, location, and spacing of joists.
      2. Include joining and anchorage details; bracing, bridging, and joist accessories;
         splice and connection locations and details; and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS
   A. Welding certificates.
   B. Manufacturer certificates.
   C. Mill Certificates: For each type of bolt.
   D. Field quality-control reports.

1.4 QUALITY ASSURANCE
   A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists
      complying with applicable standard specifications and load tables in SJI's "Specifications."
      1. Manufacturer's responsibilities include providing professional engineering services
         for designing special joists to comply with performance requirements.
   B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS
      D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Vulcraft
   B. SMI Joist Company
2.2 K-SERIES STEEL JOISTS
   
   B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

2.3 PRIMERS
   A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.4 JOIST ACCESSORIES
   A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
   
   B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
   
   C. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.5 CLEANING AND SHOP PAINTING
   A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories.
   
   B. Apply one coat of shop primer to joists and joist accessories.
   
   C. Shop priming of joists and joist accessories is specified in Section 099100 "Painting."

PART 3 - EXECUTION

3.1 INSTALLATION
   A. Do not install joists until supporting construction is in place and secured.
   
   B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written instructions, and requirements in this Section.
      
      1. Before installation, splice joists delivered to Project site in more than one piece.
      2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.

C. Field weld joists to supporting steel bearing plates. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: a qualified testing agency to perform tests and inspections.

B. Visually inspect field welds according to AWS D1.1/D1.1M.

C. Prepare test and inspection reports.

END OF SECTION 052100
PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Roof deck.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of deck, accessory, and product indicated.
B. Shop Drawings
   1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS
A. Welding certificates.
B. Product Certificates: For each type of steel deck.
C. Evaluation reports.
D. Field quality-control reports.

1.4 QUALITY ASSURANCE
A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.2 ROOF DECK
A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
   2. Deck Profile: As indicated or Type IR, intermediate rib.
   3. Profile Depth: 1-1/2 inches.
   4. Design uncoated-steel thickness: As indicated.
2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.

G. Galvanizing Repair Paint: ASTM A 780/A 780M.

H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.

B. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

C. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

D. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

E. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches apart with at least one fastener at each corner.

1. Install reinforcing channels or zees in ribs to span between supports and mechanically fasten.

F. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions mechanically fasten to substrate to provide a complete deck installation.

1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Prepare test and inspection reports.

3.3 PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 053100
SECTION 071113 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes the following dampproofing for use on the cavity face of concrete block and below grade concrete:
      1. Cold-applied, asphalt emulsion dampproofing.

1.3 SUBMITTALS
   A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
   B. Product data for each type of product specified, including data substantiating that materials comply with requirements for each dampproofing material specified. Include recommended method of application, recommended primer, number of coats, coverage or thickness, and recommended protection course.

1.4 QUALITY ASSURANCE
   A. Installer Qualifications: Engage an experienced Installer who has completed bituminous dampproofing similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
   B. Single-Source Responsibility: Obtain primary dampproofing materials and primers from one source and by a single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

1.5 PROJECT CONDITIONS
   A. Substrate: Proceed with dampproofing only after substrate construction and penetrating work have been completed.
   B. Weather Limitations: Proceed with dampproofing only when existing and forecasted weather conditions will permit work to be performed according to manufacturer's recommendations and warranty requirements.
   C. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has thoroughly cured.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cold-Applied, Asphalt Emulsion Dampproofing:
   b. Euclid Chemical Co.
   c. Karnak Chemical Corporation.
   d. Koppers Industries, Inc.
   e. Meadows: W.R. Meadows, Inc.
   f. or approved equal.

2.2 BITUMINOUS DAMPPROOFING

A. General: Provide products recommended by manufacturer for designated application.

B. Cold-Applied, Asphalt Emulsion Dampproofing: Asphalt-based emulsions recommended by the manufacturer for dampproofing use when applied according to the manufacturer's instructions.

1. Trowel Grade: Emulsified asphalt mastic, prepared with mineral-colloid emulsifying agents suitable for application in a relatively thick film, complying with ASTM D 1187, Type I.

2. Spray Grade: Emulsified asphalt, prepared with mineral-colloid emulsifying agents without fibrous reinforcement, complying with ASTM D 1227, Type III.

2.3 MISCELLANEOUS MATERIALS

A. Primer: Asphalt primer complying with ASTM D 41, for asphalt-based dampproofing.

B. Protection Course, Board Type: Premolded, 1/8-inch-thick, multi-ply, semirigid board, consisting of a mineral-stabilized asphalt core sandwiched between layers of asphalt-saturated felt, and faced on one side with polyethylene film.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrate of projections and substances detrimental to work; comply with recommendations of prime materials manufacturer.

B. Install cant strips and similar accessories as shown and as recommended by prime materials manufacturer even though not shown.

C. Fill voids, seal joints, and apply bond breakers, if any, as recommended by prime materials manufacturer, with particular attention at construction joints.

D. Install separate flashings and corner protection stripping, as recommended by prime materials manufacturer, where indicated to precede application of dampproofing.
Comply with details shown and with manufacturer's recommendations. Pay particular attention to requirements at building expansion joints, if any.

E. Prime substrate as recommended by prime materials manufacturer.

F. Protection of Other Work: Do not allow liquid and mastic compounds to enter and clog drains and conductors. Prevent spillage and migration onto other surfaces of work by masking or otherwise protecting adjoining work.

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's recommendations except where more stringent requirements are indicated and where Project conditions require extra precautions to ensure satisfactory performance of work.

B. Application: Apply dampproofing to the following surfaces.
   1. Exterior, below-grade surfaces of exterior concrete or masonry walls in contact with earth or other backfill and where space is enclosed on opposite side.
   2. Back side of concrete or masonry retaining walls and stone facing to prevent percolating of water through the wall or facing.
   3. Exterior surface of inside wythe of double-wythe, exterior masonry walls above grade, to prevent water-vapor penetration through the wall.

C. Cold-Applied Asphalt Dampproofing: For exterior surfaces, provide either emulsified or cut-back, asphalt dampproofing materials, at Contractor's option. For interior surfaces, provide only emulsified asphalt materials.

D. Bituminous Cant Strips: Install 2-by-2-inch (50-by-50-mm) cant strip of bituminous grout at base of vertical dampproofing where it meets horizontal surface.

E. Apply vertical dampproofing down walls from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches (150 mm) over outside face of footing. Extend 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when the Project is completed.

3.3 COLD-APPLIED, ASPHALT EMULSION DAMPPROOFING

A. Spray Grade: Brush or spray apply a coat of asphalt emulsion dampproofing at a rate of 1.5 to 2.5 gal./100 sq. ft., depending on substrate texture, to produce a uniform, dry-film thickness of not less than 15 mils. Apply in 2 coats, if necessary, to obtain required thickness, allowing time for complete drying between coats.

B. Semimastic Grade: Brush or spray apply a coat of asphalt emulsion dampproofing at a rate of 5 gal./100 sq. ft., to produce a uniform, dry-film thickness of not less than 30 mils.

C. Trowel Grade: Trowel apply a coat of mastic asphalt emulsion dampproofing onto substrate at a minimum rate of 7 gal./100 sq. ft., to produce an average, dry-film thickness of 60 mils but not less than 30 mils at any point.

3.4 PROTECTION AND CLEANING
A. Protect exterior, below-grade dampproofing membrane from damage until backfill is completed. Remove overspray and spilled materials from surfaces not intended to receive dampproofing.

3.5 INSTALLATION OF PROTECTION COURSE

A. General: Where indicated, install protection course of type indicated over completed-and-cured dampproofing treatment. Comply with dampproofing materials manufacturer's recommendations for method of support or attaching of protection materials. Support with spot application of trowel-grade mastic where not otherwise indicated.

END OF SECTION 071113
SECTION 072419 - EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section includes:
      1. EIFS-clad drainage-wall assemblies that are field applied over substrate.
      2. Water-resistive coatings.
   B. Related requirements:
      1. Section 079200 "Caulking and Sealants" for sealing joints in EIFS with elastomeric joint sealants and for perimeter joints between system and other materials.

1.3 DEFINITIONS
   A. Definitions in ASTM E 2110 apply to work of this Section.
   B. EIFS: Exterior insulation and finish system(s).

1.4 ACTION SUBMITTALS
   A. Product Data: For each EIFS component, trim, and accessory, including water-resistive coatings.

1.5 INFORMATIONAL SUBMITTALS
   A. Qualification Data: For Installer.
   B. Manufacturer Certificates: Signed by EIFS manufacturer certifying the following:
      1. EIFS complies with requirements.
      2. Substrates to which EIFS is indicated to be attached are acceptable to EIFS manufacturer.
      3. Accessory products installed with EIFS, including joint sealants, flashing, water-resistive coatings, trim, whether or not furnished by EIFS manufacturer and whether or not specified in this Section, are acceptable to EIFS manufacturer.
   C. Product Certificates: For cementitious materials and aggregates and for insulation and joint sealant, from manufacturer.
   D. Product Test Reports: For each EIFS assembly and component, and for water-resistive coatings, for tests performed by a qualified testing agency.
   E. Field quality-control reports and special inspection reports.
F. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For EIFS to include in maintenance manuals.

1.7 QUALITY ASSURANCE
   A. Installer Qualifications: An installer who is certified in writing by EIFS manufacturer as qualified to install manufacturer’s system using trained workers.
   B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, to set quality standards for materials and execution, and to set quality standards for fabrication and installation.

1.8 DELIVERY, STORAGE, AND HANDLING
   A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.
   B. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.
      1. Stack insulation board flat and off the ground.

1.9 FIELD CONDITIONS
   A. Weather Limitations: Maintain ambient temperatures above 40 deg F for a minimum of 24 hours before, during, and after adhesives or coatings are applied. Do not apply EIFS adhesives or coatings during rainfall. Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.

1.10 WARRANTY
   A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of EIFS-clad drainage-wall assemblies that fail in materials or workmanship within specified warranty period.
      1. Failures include, but are not limited to, the following:
         a. Bond integrity and weathertightness.
         b. Deterioration of EIFS finishes and other EIFS materials beyond normal weathering.
      2. Warranty coverage includes the following components of EIFS-clad drainage-wall assemblies:
         a. EIFS finish, including base coats, finish coats, and reinforcing mesh.
         b. Insulation installed as part of EIFS including foam build-outs.
         c. Insulation adhesive and mechanical fasteners.
         d. EIFS accessories, including trim components and flashing.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with EIFS components.

2.2 PERFORMANCE REQUIREMENTS

A. EIFS Performance: Comply with ASTM E 2568 and ICC-ES AC219 and with the following:

1. Weathertightness: Resistant to uncontrolled water penetration from exterior, with a means to drain water entering EIFS to the exterior.
2. Structural Performance: EIFS assembly and components shall comply with ICC-ES AC219 when tested according to ASTM E 2568.
4. Bond Integrity: Free from bond failure within EIFS components or between EIFS and substrates, resulting from exposure to fire, wind loads, weather, or other in-service conditions.
5. Abrasion Resistance of Finish Coat: Sample consisting of 1-inch- thick EIFS mounted on 1/2-inch- thick gypsum board; cured for a minimum of 28 days and shows no cracking, checking, or loss of film integrity after exposure to 528 quarts of sand when tested according to ASTM D 968, Method A.
6. Mildew Resistance of Finish Coat: Sample applied to 2-by-2-inch clean glass substrate; cured for 28 days and shows no growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274.

2.3 EIFS MATERIALS

A. Primer/Sealer: EIFS manufacturer's standard substrate conditioner designed to protect substrates from moisture penetration and to improve the bond between substrate and insulation adhesive with VOC content of 250 g/L or less that complies with the testing and product requirements of the California Department of Public Health's (formerly, California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Water-Resistive Coatings: EIFS manufacturer's standard formulation and accessories for use as water-resistant barriers; compatible with substrate and complying with physical and performance criteria of ASTM E 2570.

C. Flexible-Membrane Flashing: Cold-applied, self-adhering, self-healing, rubberized-asphalt and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.
D. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; specifically formulated to be applied to back side of insulation in a manner that creates open vertical channels designed to serve as an integral part of the water-drainage system of the EIFS-clad drainage-wall assembly; compatible with substrate; with VOC content of 50 g/L or less that complies with the testing and product requirements of the California Department of Public Health's (formerly, California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers"; and complying with one of the following:

1. Factory-blended dry formulation of portland cement, dry polymer admixture, and fillers specified for base coat.
2. Factory-mixed non-cementitious formulation designed for adhesive attachment of insulation to substrates of type indicated, as recommended by EIFS manufacturer.

E. Drainage Mat: Three-dimensional, nonwoven, entangled filament, nylon or plastic mat designed to drain incidental moisture by gravity; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer with manufacturer's standard corrosion-resistant mechanical fasteners suitable for intended substrate.

F. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with ASTM C 578, Type I; and EIFS manufacturer's requirements for most stringent requirements for material performance and qualities of insulation, including dimensions and permissible variations, and the following:

1. Aging: Before cutting and shipping, age insulation in block form by air drying for not less than six weeks.
2. Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, according to ASTM E 84.
3. Dimensions: Provide insulation boards of not more than 24 by 48 inches thick or in other thickness indicated, but not more than 4 inches thick or less than the thickness allowed by ASTM C 1397.
4. Channeled Board Insulation: EIFS manufacturer's standard factory-fabricated profile with linear, vertical-drainage channels, slots, or waves on the back side of board.

G. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multi-end strands with retained mesh tensile strength of not less than 120 lbf/in. according to ASTM E 2098 and the following:

1. Reinforcing Mesh for EIFS, General: Not less than weight required to meet impact-performance level specified below.
2. Strip Reinforcing Mesh: Not less than 3.75 oz./sq. yd.
3. Detail Reinforcing Mesh: Not less than 4.0 oz./sq. yd.
4. Corner Reinforcing Mesh: Not less than 7.2 oz./sq. yd.

H. Base-Coat Materials: EIFS manufacturer's standard mixture complying with one of the following:

1. Factory-blended dry formulation of portland cement, dry polymer admixture, and inert fillers to which only water is added at Project site.
2. Factory-mixed non-cementitious formulation of polymer-emulsion adhesive and inert fillers that is ready to use without adding other materials.
I. Waterproof Adhesive/Base-Coat Materials: EIFS manufacturer's standard waterproof formulation with VOC content of 50 g/L or less that complies with the testing and product requirements of the California Department of Public Health's (formerly, California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" and complying with one of the following:

1. Job-mixed formulation of portland cement complying with ASTM C 150/C 150M, Type I, white or natural color; and manufacturer's standard polymer-emulsion adhesive designed for use with portland cement.
2. Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.

J. Primer: EIFS manufacturer's standard factory-mixed, elastomeric-polymer primer for preparing base-coat surface for application of finish coat.

K. Finish-Coat Materials: EIFS manufacturer's siliconized acrylic-based coating complying with the following:

1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.
2. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, and fillers used with stone particles for embedding in finish coat to produce an applied-aggregate finish.
   a. Aggregate: Marble chips of size and color to match existing color(s).
3. Colors: Match existing.
4. Textures: Match existing.

L. Sealer: Manufacturer's waterproof, clear acrylic-based sealer for protecting finish coat.

M. Water: Potable.

N. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with EIFS manufacturer's written instructions; manufactured from UV-stabilized PVC; and complying with ASTM D 1784, manufacturer's standard cell class for use intended, and ASTM C 1063.

1. Casing Bead: Prefabricated, one-piece type for attachment behind insulation, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.
2. Drip Screed/Track: Prefabricated, one-piece type for attachment behind insulation with face leg extended to form a drip, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.
3. Weep Screed/Track: Prefabricated, one-piece type for attachment behind insulation with perforated face leg extended to form a drip and weep holes in track bottom, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg; designed to drain incidental moisture that gets into wall construction to the exterior at terminations of EIFS with drainage.
4. Expansion Joint: Prefabricated, one-piece V profile; designed to relieve stress of movement.
5. Window sill Flashing: Prefabricated type for both flashing and sloping sill over framing beneath windows; with end and back dams; designed to direct water to exterior.
6. Parapet Cap Flashing: Type for both flashing and covering parapet top with design complying with ASTM C 1397.
2.4 MIXING

A. Comply with EIFS manufacturer’s requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as recommended by EIFS manufacturer. Mix materials in clean containers. Use materials within time period specified by EIFS manufacturer or discard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Begin coating application only after surfaces are dry.
   2. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.

B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind drainage plane of EIFS and deterioration of substrates.

C. Prepare and clean substrates to comply with EIFS manufacturer’s written instructions to obtain optimum bond between substrate and adhesive for insulation.
   1. Concrete Substrates: Provide clean, dry, neutral-pH substrate for insulation installation. Verify suitability of substrate by performing bond and moisture tests recommended by EIFS manufacturer.

3.3 EIFS INSTALLATION, GENERAL

A. Comply with ASTM C 1397, ASTM E 2511, and EIFS manufacturer’s written instructions for installation of EIFS as applicable to each type of substrate indicated.

3.4 SUBSTRATE PROTECTION APPLICATION

A. Primer/Sealer: Apply over substrates and where required by EIFS manufacturer for improving adhesion of insulation to substrate.

B. Water-Resistive Coating: Apply over sheathing to provide a water-resistant barrier.
1. Tape and seal joints, exposed edges, terminations, and inside and outside corners of sheathing unless otherwise indicated by EIFS manufacturer's written instructions.

C. Flexible-Membrane Flashing: Install over weather-resistive barrier, applied and lapped to shed water; seal at openings, penetrations, terminations, and where required by EIFS manufacturer. Prime substrates if required and install flashing to comply with EIFS manufacturer’s written instructions and details.

3.5 TRIM INSTALLATION
A. Trim: Apply trim accessories at perimeter of EIFS, at expansion joints, sills, and elsewhere as indicated. Coordinate with installation of insulation.

1. Weep Screed/Track: Use at bottom termination edges, at window and door heads, and at floor line expansion joints of water-drainage EIFS unless otherwise indicated.
2. Windowsill Flashing: Use at windows unless otherwise indicated.
3. Expansion Joint: Use where indicated on Drawings.
4. Casing Bead: Use at other locations.
5. Parapet Cap Flashing: Use where indicated on Drawings.

3.6 DRAINAGE MAT INSTALLATION
A. Drainage Mat: Apply wrinkle free, continuously, with edges butted and mechanically secured with fasteners over water-resistive barrier.

3.7 INSULATION INSTALLATION
A. Board Insulation: Adhesively and mechanically attach insulation to substrate in compliance with ASTM C 1397 and the following:

1. Apply adhesive to ridges on back of channeled insulation by notched-trowel method in a manner that results in full adhesive contact over the entire surface of ridges, leaving channels free of adhesive once insulation is adhered to substrate.
2. Press and slide insulation into place. Apply pressure over the entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.
3. Allow adhered insulation to remain undisturbed for not less than 24 hours, beginning rasping and sanding insulation or applying base coat and reinforcing mesh.
   a. Concrete and Masonry: 1 inch.
4. Apply insulation over substrates in courses with long edges of boards oriented horizontally.
5. Begin first course of insulation from a level base line and work upward.
6. Stagger vertical joints of insulation boards in successive courses to produce running bond pattern. Locate joints so no piece of insulation is less than 12 inches wide or 6 inches high. Offset joints not less than 6 inches from corners of window and door openings and not less than 4 inches from aesthetic reveals.
   a. Adhesive Attachment: Offset joints of insulation not less than 6 inches from horizontal and 4 inches from vertical joints in sheathing.
   b. Mechanical Attachment: Offset joints of insulation from horizontal joints in sheathing.
7. Apply channeled insulation with drainage channels aligned vertically.
8. Interlock ends at internal and external corners.
9. Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.
10. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
11. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/32 inch from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch. Prevent airborne dispersal and immediately collect insulation raspings or sandings.
12. Cut aesthetic reveals in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that comply with profiles and locations indicated. Do not reduce insulation thickness at aesthetic reveals to less than 3/4 inch.
13. Install foam build-outs where indicated.
15. Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.
16. After installing insulation and before applying field-applied reinforcing mesh, fully wrap board edges. Cover edges of board and extend encapsulating mesh not less than 2-1/2 inches over front and back face unless otherwise indicated on Drawings.
17. Treat exposed edges of insulation as follows:
   a. Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.
   b. Encapsulate edges forming substrates of sealant joints within EIFS or between EIFS and other work with base coat and reinforcing mesh.
18. Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and water-resistive barrier.

B. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, and as follows:
   1. At expansion joints in substrates behind EIFS.
   2. Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.
   3. Where wall height or building shape changes.
   4. Where EIFS manufacturer requires joints in long continuous elevations.

3.8 BASE-COAT INSTALLATION

A. Waterproof Adhesive/Base Coat: To exposed surfaces of insulation, apply in minimum thickness recommended in writing by EIFS manufacturer over sloped surfaces and foam build-outs.

B. Reinforcing Mesh: Embed reinforcing mesh in wet base coat to produce wrinkle-free installation with mesh continuous at corners, overlapped not less than 2-1/2 inches (64 mm) or otherwise treated at joints to comply with ASTM C 1397 and EIFS manufacturer's written instructions. Do not lap reinforcing mesh within 8 inches of
corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are invisible.

C. Double-Layer Reinforcing-Mesh Application: Where indicated or required, apply second base coat and second layer of reinforcing mesh, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C 1397 and EIFS manufacturer's written instructions in same manner as first application. Do not apply until first base coat has cured.

D. Additional Reinforcing Mesh: Apply strip reinforcing mesh around openings, extending 4 inches beyond perimeter. Apply additional 9-by-12-inch strip reinforcing mesh diagonally at corners of openings (re-entrant corners). Apply 8-inch-wide, strip reinforcing mesh at both inside and outside corners unless base layer of mesh is lapped not less than 4 inches on each side of corners.
   1. At aesthetic reveals, apply strip reinforcing mesh not less than 8 inches wide.
   2. Embed strip reinforcing mesh in base coat before applying first layer of reinforcing mesh.

E. Double Base-Coat Application: Where indicated, apply second base coat in same manner and thickness as first application, except without reinforcing mesh. Do not apply until first base coat has cured.

3.9 FINISH-COAT INSTALLATION

A. Primer: Apply over dry base coat according to EIFS manufacturer's written instructions.

B. Finish Coat: Apply over dry primed base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by EIFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.

3.10 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
   1. As stipulated in Ch. 17 of the IBC.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. EIFS will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.11 CLEANING AND PROTECTION

A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.
SECTION 079200 CAULKING AND SEALANTS

PART I - GENERAL

1.01 DESCRIPTION
A. Scope: Work of this Section shall include all materials and installation necessary to provide Caulking and Sealants, as shown and detailed on the drawings and specified herein.

1.02 QUALITY ASSURANCE
A. References:
B. Qualifications:
   1. General: The manufacturer of the sealant used shall have been in the business of manufacturing the specified types of such sealants for not less than ten (10) years.
   2. Applicator: Installer specializing in the work of this Section with minimum five (5) years documented experience
   3. Volatile Organic Compounds (VOC): Use only products in compliance with VOC content limits required by Federal and State EPA regulations.
C. Compatibility with Substrate: Verify that caulking and sealants used are compatible with joint materials.
D. Joint Tolerances: Comply with manufacturer's joint width/depth ratio limitations.

1.03 SUBMITTALS
A. General: Refer to Special Conditions for additional information.
B. Samples: Submit manufacturer's standard colors prior to application.
C. Product Data: Submit manufacturer's specifications, data, and installation instructions for review prior to purchase or application.
D. Certificates: Submit certification that sealants proposed for use, comply with the Contract Documents.

1.04 PRODUCT HANDLING
A. Storage: Per manufacturer's recommendations for proper precautions for shelf life, temperature, humidity and similar storage factors to ensure the fitness of the material when installed.

1.05 SITE CONDITIONS
A. Environmental Requirements: Do not apply materials when temperature is below 40°F, nor under extreme temperature conditions when joint openings are at maximum or minimum width.
1.06 MAINTENANCE

A. General: Refer to Special Conditions for close-out procedures.

B. Guarantee: Provide five (5) year written guarantee commencing from date of final acceptance by University's Representative.

PART II - PRODUCTS

2.01 MATERIALS

A. Caulking and Sealants:
   1. Manufactured by Tremco, Inc., unless otherwise noted.
   2. Pecora Chemical Corp., or equal.
   3. Color to be selected by University's Representative.

B. Exterior Joints:
   1. Vertical Surfaces: Non-sag polyurethane; by Dymeric or equal.
   2. Pre-compressed Expanding Sealant Tape:
      a. PC-SA manufactured by Emseal Joint Systems, Ltd., or equal.
      b. Pecora Chemical Corp., or equal.
   3. Horizontal Paving Joints: Self-leveling polyurethane; THC 900; interior and exterior.

C. Interior Joints: Acrylic Latex.

D. Joint Cleaner: Provide cleaner recommended by sealant manufacturer for specific joint surface and condition.

E. Joint Primer and Sealer: As recommended by sealant manufacturer for each condition.

F. Bond Breaker Tape: Pressure sensitive polyethylene tape.

G. Other Materials: Manufacturer's standard for items required or type best suited for intended use.

PART III - EXECUTION

3.01 PREPARATION

A. General: Refer to Special Conditions for Project Coordination requirements.

B. Conditions of Work in Place:
   1. General: Carefully examine before beginning work; report defects.
   2. Substrate: Inspect surfaces to ensure that no bond-breaker materials contaminate the surface to which the sealant is to adhere and to ensure that unsound substrates are repaired.

C. Preparation of Surfaces:
   1. Surfaces: Prepare joints in accordance with manufacturer's recommended instruction to ensure maximum adhesion. Prime as required, protecting adjacent exposed surfaces.
2. Sealants: Prepare sealant as required, including proper mixing of multicomponent sealants.

3.02 APPLICATION

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Protection: Protect surfaces adjacent to joints to receive sealant. Cover joints in walking surfaces with heavy duty, non-staining tape, until material has dried.

C. Installation:
   1. General: Install sealant materials per manufacturer's instructions. Prevent three-sided adhesion. Provide sealant depth of ½ joint width; minimum depth of ¼”; maximum of ⅛”, unless otherwise required by the manufacturer.
   2. Backer Rod: Install using blunt or rounded tools to insure uniform (±⅛”) depth without puncturing material. Use oversize backer rod; minimum of 33% for closed cell type; minimum of 50% for open cell type, unless otherwise required by the manufacturer.

3.03 CLEANING

A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instructions. Perform cleaning in a manner that will not affect the appearance of the sealant or the adjacent finish material.

END OF SECTION 07920
SECTION 084313 ALUMINUM ENTRANCE AND STOREFRONT

PART I - GENERAL

1.01 DESCRIPTION

A. Scope: Work under this Section shall include all materials and installation necessary to provide Aluminum Entrances and Storefronts as shown and detailed on the Drawings and specified herein.

1.02 QUALITY ASSURANCE

A. References:

B. Design Requirements: Aluminum frame members must span vertically to withstand 25 psf wind load, minimum, per CBC; provide internal reinforcing as required; maximum deflection of 1/175 of span.

1.03 SUBMITTALS

A. Shop Drawings: Submit design calculations, manufacture and installation details, including fastenings.

B. Samples: Submit manufacturer's standard colors.

1.04 SITE CONDITIONS

A. Environmental Requirements: Do not install sealants when temperature is less than 40°F.

B. Protection: Protect prefinished components with wrapping or strippable coating; adhesive papers and sprayed coatings not acceptable.

PART II - PRODUCTS

2.01 MATERIALS

A. Entrance and Storefront:
   1. General: Series 2400 Window Wall as manufactured by Blomberg Window Systems, the Kawneer Co., Inc., or equal.
   2. For automatic doors to connect to card access system: doors shall unlock and open when card access control system reads an authorized card or when unlocked by remote station. Doors shall close and lock after each use. Coordinate with security.
access control contractor. Door contractor shall provide 12 VDC relays to allow access control system to automatically control the door functions.

B. Doors:
   1. General: Manufacturer's standard narrow style, with mohair pile weather-stripping where required.
   2. Hardware: see Specifications in Architectural General Notes Drawing.

C. Operating Windows: not applicable.

D. Finish: Thermosetting acrylic or anodized; color as selected by university project architect.

E. Glass: Provide low-E-coated clear insulating glass to comply with system performance requirements and as shown. Safety glazing required where indicated by the Kentucky Building Code, current edition.

F. Fasteners: As recommended by manufacturer to meet design wind pressures.

G. Protective Coatings:
   1. General: Bituminous, FS TT-C-494, Type II.
   2. Gasketing: Chromate type.
   3. Sealant: As specified in Specifications Section 079200 – Caulking and Sealants.

PART III - EXECUTION

3.01 INSTALLATION

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Storefront:
   1. General: Install level, plumb, straight and aligned with adjacent surfaces, with hairline watertight joints; free of dents, buckles, twists, or other imperfections, as shown. Install flashings where shown.
   2. Anchorage:
      a. General: Anchor to adjacent structure; permit sufficient adjustment to accommodate construction tolerances and other irregularities. Use No. 12 sheet metal screws, or wood screws at 18” on center with a minimum of 1” penetration into structure.
      b. Tolerances: Maximum variation from plumb of 0.06” every 3’-0” non-cumulative or 1/16” per 10’-0”, whichever is less. Maximum misalignment of two (2) adjoining members abutting in plane of 1/32”.
   3. Thermal Isolation: Provide where components penetrate or disrupt building insulation. Coordinate attachment and seal of perimeter air and vapor barrier materials.

C. Glazing:
   1. General: As specified under Division 8, Section 08810 – Glass and Glazing.
   2. Glazing Stops: Anchor glass holding assemblies with frame clips and machine screws.
D. Doors:
   1. General: Hang doors level, plumb, straight in vertical plane, with proper fit and alignment and moving parts operating freely without bind.
   2. Weatherstripping: Seal doors, meeting stiles of pairs of doors, door tubing, and stops on frames and astragals.
   3. Thresholds: Set in bed of sealant and secure.
   4. Hardware: Per Specifications listed in Architectural General Notes Drawing.

E. Dissimilar Materials: Isolate from other metals, plaster or concrete.

F. Sealant: Install per Specification Section 079200 – Caulking and Sealants.

3.02 ADJUSTMENT
   A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

3.03 CLEANING
   A. Glass: Upon completion, remove labels and thoroughly clean glass surfaces.
   B. Aluminum: Remove protective covering per manufacturer's instructions. Clean aluminum surfaces of stains, marks, or other defects, using soap and clean water.

END OF SECTION 084313
SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish and install aluminum architectural windows complete with all related components as shown on drawings and specified in this section.

B. All windows shall be Winco (Series 1550) AW100. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
   1. A sample window (size and configuration) as per requirements of architect.
   2. Detail cuts and product data.
   3. Test reports documenting compliance with requirements of section 1.05.

C. Glass and Glazing
   1. All units shall be factory glazed.

1.02 RELATED WORK

A. Section 084313 – Aluminum Storefronts

1.03 TESTING AND PERFORMANCE REQUIREMENTS

A. Test Units

B. Test Procedures and Performances
   1. All windows shall conform to ANSI/AAMA/NWWDA 101/I.S.2-97. Requirements for referenced window type in section 1.01B. In addition, the following specific performance requirements shall be met:

   2. Air Infiltration Test
      a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 283 at static air pressure of 6.24 psf.
      b. Air infiltration shall not exceed .1 cfm per square foot.

   3. Water Resistance Test
      a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 331 at static pressure difference of 12 psf.
      b. There shall be no uncontrolled water leakage.

   4. Uniform Load Deflection Test
a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference (positive and negative) of 150 psf.  

b. During the test, no member shall deflect more than 1/175 of its span.

5. Uniform Load Structural Test

a. With window sash and ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 150 psf.  
b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage, which would cause the window to be in operable.

6. Condensation Resistance Test (CRF)

a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.  
b. Condensation Resistance Factor (CRF) shall not be less than 64.

7. Thermal Transmittance Test (Conductive U-Value)

a. With window sash closed and locked, test unit in accordance with AAMA 1503.1.  
b. Conductive thermal transmittance (U-Value) shall not be more than 44 BTU/hr/sf/ per degree F.  
c. Manufacturer shall provide certified test reports.

1.06 QUALITY ASSURANCE

A. Provide test reports from AAMA accredited laboratory certifying the performance as specified in Section 1.05.

B. Test reports shall be accompanied by the window manufacturer’s letter of certification stating that the tested window meets or exceeds the afore mentioned criteria for the appropriate ANSI/AAMA/NWWDA 101/I.S.2-97.

1.07 SUBMITTALS

A. Contractor or window manufacturer shall submit shop drawings, finish samples, test reports, and warranties, per requirements of architect.

1. Shop Drawings: Include typical unit elevations, full- or half-scaled detail sections and typical installation details. Include type of glazing, screening, and window finish.

2. Product Data: Manufacturer’s specifications, recommendations and standard details for window units.

3. Samples of materials may be requested without cost to owner, i.e. frame sections, corner samples, mullions, extrusions, anchors, and glass.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store and handle windows and other components in strict compliance with manufacturer’s instructions.

B. Protect units against damage from the elements, construction activities and other hazards before, during, and after installation.

1.09 WARRANTIES
A. Total Window System

1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total window installation, which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc. as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings. Also, the glazing shall be warranted for 10 years against seal failure.

2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at his expense during the warranty period.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aluminum

1. Extruded aluminum shall be 6063-T6 alloy and temper, with a tensile strength of 24,000 PSI.

2. Frames must be installed using a minimum of 1 3/4" x 1 3/4" trim and clip around perimeter.

B. Weather strip

1. All weather strip shall be double Santoprene® thermo plastic rubber or equal.

C. Thermal Barrier:

1. Poured-in-place structural thermal barrier shall transfer shear during bending and provide composite action between frame components.

2. Thermal barrier pocket on aluminum extrusions shall be Azo-Braded to create a mechanical lock to improve the adhesion properties between the polyurethane polymer and the surface of the thermal barrier pocket.

3. Window manufacturer must provide a warranty from the manufacturer of the polyurethane thermal barrier that warrants against product failure as a result of thermal shrinkage beyond 1/8 inch (3.2 mm) from each end and fracturing of the polyurethane for a period not to exceed ten years from the date of window manufacture.

4. Thermal barriers made of crimped in place polyamide (insulbar®) strips are not acceptable unless all strips are covered and tooled with Dow 795 silicone caulking to eliminate water migration.

D. Glass

1. Insulated glass shall be 1" Grey Tint low-e glass as manufactured by Gaurdian or equivalent, consisting of 1/4" Grey Tempered exterior, 1/2" argon air spacer, and 1/4" Clear Sungaurd SN-68 or equivalent interior.

2.02 FABRICATION

A. General

1. All aluminum frame and vent extrusions shall have a minimum wall thickness of 0.125".
2. Depth of main frame shall not be less than 4-1/2”.

B. Frame
   1. Frame components shall be assembled by means of mechanical fastening with screws. Joinery to be sealed with small joint sealant.

C. Glazing
   1. All units shall be glazed with butyl tape, silicone cap bead on the exterior, with glazing vinyl and extruded snap-in aluminum glazing bead on the interior.

D. Finish
   1. Anodic
      a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22(*)
         Color is to be specified by Architect.

<table>
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<tr>
<th>AADesignation</th>
<th>Description</th>
<th>Mills</th>
<th>AAMA Guide Spec.</th>
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<td>* A41</td>
<td>Class I Clear Anodized</td>
<td>0.7 or Greater</td>
<td>611-98</td>
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PART 3 - EXECUTION

3.01 INSPECTION
A. Job Conditions
   1. Verify that openings are dimensionally correct and within allowable tolerances. Openings must be plumb, level, and clean. Provide a solid anchoring surface that is in accordance with approved shop drawings.

3.02 INSTALLATION
A. Use only skilled craftsmen for work to be done in accordance with approved shop drawings and specifications.
B. Set square and level aligning window faces in a single plane for each opening. Windows and materials must be set square and level. Adequately anchor window so when subjected to normal thermal movement, specified building movement, and specified wind loads, so windows will maintain a permanent position.
C. Adjust windows for proper ease of operation after installation has been completed.
D. Contractor furnish and apply sealant, per manufacturers recommendations, to provide a weather tight installation at all opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
E. Manufacturer recommends window flashings, sub-sills and end dams on all window installations.
3.03 PROTECTION AND CLEANING

A. After completion of window installation, windows shall be inspected, adjusted, and left in working order. Windows shall be left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the building occupant.

*Santoprene is a registered trademark of Advanced Elastomer Systems.*

END OF SECTION 085113
SECTION 099100 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section includes surface preparation and the application of paint systems on interior and exterior substrates.
B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, University’s Representative will select from standard colors and finishes available.
C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1.3 DEFINITIONS
A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
   1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
   2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
   3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
   4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SECTION REQUIREMENTS
A. Submittals:
   1. Product Data: For each type of product. Include preparation requirements and application instructions.
B. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.
C. Extra Materials: Deliver to Owner 1 gallon of each color and type of finish coat paint used on Project, in containers, properly labeled and sealed.
PART 2 - PRODUCTS

2.1 PAINT

A. Subject to compliance with requirements, provide products by one of the following:
   1. Sherwin-Williams Company (The).
   2. Benjamin Moore & Co.
   3. PPG Architectural Finishes, Inc.
   4. ICI Paints

B. Material Compatibility: Provide materials that are compatible with one another and with substrates.
   1. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. Use interior paints and coatings that comply with the following limits for VOC content:
   1. Flat Paints and Coatings: 50 g/L.
   2. Nonflat Paints, Coatings: 150 g/L.
   3. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
   4. Clear Wood Finishes, Varnishes: 350 g/L.
   5. Clear Wood Finishes, Lacquers: 550 g/L.
   6. Floor Coatings: 100 g/L.
   7. Stains: 250 g/L.
   8. Primers, Sealers, and Undercoaters: 200 g/L.

D. Colors: As indicated on project drawings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove hardware, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.

B. Clean and prepare surfaces in an area before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.

C. For metal surfaces, any weld surface, edges and sharp corners shall be ground to a curve and all weld splatter removed.

3.2 APPLICATION

A. Paint exposed surfaces, new and existing, unless otherwise indicated.
   1. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
   2. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   3. Paint the back side of access panels.
   5. Do not paint prefinished items, items with an integral finish, operating parts, and labels unless otherwise indicated.
B. Apply paints according to manufacturer's written instructions.
   1. Use brushes only for exterior painting and where the use of other applicators is not practical.
   2. Use rollers for finish coat on interior walls and ceilings.
C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
   1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
D. Apply stains and transparent finishes to produce surface films without color irregularity, cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other imperfections. Use multiple coats to produce a smooth surface film of even luster.

3.3 EXTERIOR PAINT APPLICATION SCHEDULE
   A. Not Used.

3.4 INTERIOR PAINT APPLICATION SCHEDULE
   A. Concrete, Nontraffic Surfaces:
      1. Flat Latex: Two coats over primer/sealer: MPI INT 3.1A.
   B. Concrete Masonry Units:
      1. Semigloss Latex: Two coats over latex block filler: MPI INT 4.2A.
   C. Steel:
      1. Semigloss Alkyd Enamel: Two coats over alkyd anticorrosive primer: MPI INT 5.1E.
   D. Galvanized Metal:
      1. Low-Sheen Latex: Two coats over waterborne galvanized-metal primer: MPI INT 5.3J.
   E. Gypsum Board:
      1. Eggshell or Satin Latex: Two coats over primer/sealer: MPI INT 9.2A.

END OF SECTION 099100
SECTION 230553 – MECHANICAL IDENTIFICATION

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SCOPE OF WORK

A. Mechanical identification on piping, ductwork and equipment, identification of underground pipe, valve tags, and architectural access panels. **Scope includes new piping sections only.**

1.3 UNIVERSITY COLOR AND LETTER STANDARDS

A. Piping: All plumbing and mechanical piping must be color coded and labeled, including sprinkler lines, every 15 feet above a ceiling system and every 10 feet in an open mechanical room.

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**University of Kentucky Standard Color Coding for Mechanical Piping**

<table>
<thead>
<tr>
<th>Type of Service</th>
<th>Markings</th>
<th>Color*</th>
<th>No.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic cold Water</td>
<td>D.C.W.</td>
<td>Safety Green</td>
<td>SW408 5</td>
</tr>
<tr>
<td>Domestic hot Water</td>
<td>D.H.W.</td>
<td>Green Byte</td>
<td>SW407 6</td>
</tr>
<tr>
<td>Medium temperature hot water &amp; return</td>
<td>M.T.H.W. &amp; M.T.H.W.R.</td>
<td>Safety yellow</td>
<td>SW408 4</td>
</tr>
<tr>
<td>Reheat supply &amp; return</td>
<td>R.S. &amp; R.R.</td>
<td>Junction yellow</td>
<td>SW403 3</td>
</tr>
<tr>
<td>Chilled water supply &amp; return</td>
<td>C.W.S. &amp; C.W.R.</td>
<td>Safety blue</td>
<td>SW408 6</td>
</tr>
<tr>
<td>Condenser water supply &amp; return</td>
<td>C.D.W.S. &amp; C.D.W.R.</td>
<td>Slate gray</td>
<td>SW402 6</td>
</tr>
<tr>
<td>Natural gas</td>
<td>GAS</td>
<td>Deck Red</td>
<td>SW404 0</td>
</tr>
<tr>
<td>Safety valve vents</td>
<td>S.V.V.</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Cast iron soil &amp; waste vents</td>
<td>W.&amp;V.</td>
<td>Vacuum Black</td>
<td>SW403 2</td>
</tr>
<tr>
<td>Chilled hot water</td>
<td>C.H.W.</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Air (steel pipe)</td>
<td>AIR</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Air (copper pipe)</td>
<td>AIR</td>
<td>None</td>
<td>--</td>
</tr>
<tr>
<td>Vacuum (copper pipe)</td>
<td>VAC</td>
<td>None</td>
<td>--</td>
</tr>
<tr>
<td>Description</td>
<td>Color</td>
<td>Type</td>
<td>Code</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------</td>
<td>------------</td>
<td>------</td>
</tr>
<tr>
<td>Vacuum (steel pipe)</td>
<td>VAC</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Roof leaders</td>
<td>R.L.</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Soft water</td>
<td>S.W.</td>
<td>Pillar White</td>
<td>SW402 9</td>
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<tr>
<td>De-mineralized water</td>
<td>D.W.</td>
<td>None</td>
<td>--</td>
</tr>
<tr>
<td>Distilled water</td>
<td>DIST. W.</td>
<td>None</td>
<td>--</td>
</tr>
<tr>
<td>Elevator oil lines</td>
<td>E.O.L.</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Condensate pump discharge</td>
<td>COND. P.D.</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Sump pump discharge</td>
<td>S. PUMP DIS.</td>
<td>Galvano</td>
<td>SW402 7</td>
</tr>
<tr>
<td>Fire suppression / sprinkler system</td>
<td>FIRE</td>
<td>Safety Red</td>
<td>SW408 1</td>
</tr>
</tbody>
</table>

NOTES: * Color and number are from the Sherwin Williams System 4000 color selection guide dated 1999.
B. Valves:
   1. All valves must have labels, both a tag on the valve and on the ceiling grid.
   2. All labels for valves must be on ceiling grid (see UK’s standard for lettering below).

   **U.K.’s Standards for Standard Lettering:**

   Attach Seton-Ply Discs to ceiling grid under equipment or to access doors in non-accessible ceiling.

   **EQUIPMENT: COLOR:**

   | Valve Yellow  | V. |
   | Volume Damper Black | V.D. |
   | Variable Volume Unit Red | V.V. |
   | Heating Coil Blue | H.C. |

   **PART 2 - PRODUCTS**

   **2.1 EQUIPMENT LABELS**

   A. Plastic Labels for Equipment:

   1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
   2. Letter Color: Black.
   4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
   5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   7. Fasteners: Stainless-steel rivets or self-tapping screws.

   B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

   C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch (A4) bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.
2.2 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.

2.3 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.


C. Background Color: Green.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions or as separate unit on each duct label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.
2.4 STENCILS

A. Stencils: Prepared with letter sizes according to ASME A13.1 for piping; minimum letter height of 1-1/4 inches for ducts; and minimum letter height of 3/4 inch for access panel and door labels, equipment labels, and similar operational instructions.

1. Stencil Material: Fiberboard or metal.
2. Stencil Paint: Exterior, gloss, acrylic enamel black unless otherwise indicated. Paint may be in pressurized spray-can form.
3. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1 unless otherwise indicated.

2.5 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.

4. Tag Material: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
5. Fasteners: Brass wire-link or S-hook. Wire shall not be used as a method for connecting the tags to the valve. The tags shall be installed after insulation has been installed.

B. Valve Schedules: Not used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

1. Venturi air valves

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Piping Color-Coding: Painting of piping is specified in Section 099100 "Painting."
B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels with painted, color-coded bands or rectangles on each piping system.

1. Identification Paint: Use for contrasting background.

C. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each valve and control device.
2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
4. Near major equipment items and other points of origination and termination.
5. Spaced at maximum intervals of 25 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
7. Space every 10' in mechanical rooms.

END OF SECTION 230553
1.01 SUMMARY

This Design guideline contained herein includes the requirements for HVAC insulation and 2-hour fire-resistant rated duct enclosure wrap for air distribution & exhaust systems.

1.02 SCOPE

A. Extent of mechanical insulation required by this section is indicated on drawings and schedules, and by requirements of this section.

B. Types of mechanical insulation included in this section include the following:

1. Piping System Insulation:
   a. Fiberglass.
   b. Flexible Unicellular.
   c. Aluminum Jackets.

2. Ductwork System Insulation:
   a. Fiberglass.
   b. Flexible Unicellular.
   c. Fire-rated Duct Wrap.

1.03 REFERENCE STANDARDS

The following published specifications, standards, or tests apply to duct insulation and/or flexible, fire-rated duct wrap systems in this section:

A. NFPA 101, 92A, 92B
B. International Organization for Standardization (ISO)
C. International Building Code (IBC)
D. International Mechanical Code (IMC)

NOTE: The Authority Having Jurisdiction has final responsibility for approving equipment, materials, procedures, and performance requirements for their respective jurisdiction.
1.04 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of mechanical insulation products, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Installer's Qualifications: Firm with at least 3 years successful installation experience on projects with mechanical insulations similar to that required for this project.

C. Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of mechanical insulation. Submit schedule showing manufacturer's product number, k-value, thickness, performance and furnished accessories for each mechanical system requiring insulation or duct wrap.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver insulation, coverings, cements, adhesives, and coatings to site in in original unopened containers with manufacturer's stamp or label affixed, lot numbers and appropriate third-party classification listings, and showing fire hazard indexes of products.

B. Store in a covered, dry environment.

C. Protect insulation against dirt, water, and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. Knauf Fiber Glass GmbH.
4. Manville Products Corp.
5. Owens-Corning Fiberglas Corp.
6. Pamrod, Inc.
7. Calsitite.
8. Unifrax I LLC, Tonawanda, NY - FyreWrap® Elite® 1.5 Duct Insulation
9. Or approved equal.

2.02 PIPING INSULATION MATERIALS
A. Urethane Piping Insulation

1. Continuously molded rigid urethane equal to Armalok II shall be used for cold piping. It shall be furnished in 3 or 4-foot sections of a single layer thickness of 1-1/2" for chilled water, 1" for potable cold-water piping and 3/4" for A/C condensate. The insulation sections shall come with a laminated aluminum foil reinforced with fiberglass mesh and bonded to a white kraft paper to form a vapor barrier jacket.

2. The vapor barrier jacket laps and butt joint strips (fabricated of material similar to the jacket) shall be sealed with a contact type adhesive equal to Armstrong 520 Adhesive.

3. Elbows shall be insulated with molded urethane insulation halves and vapor sealed with 4-inch wide fiberglass tape embedded in Foster 30-35 Coating and covered with another layer of Foster 30-35.

4. Valves and tees may be insulated with job fabricated mitre-cut segments of the pipe insulation and vapor sealed similar to the elbows.

B. Fiberglass Piping Insulation - ASTM C 547, Class 1 unless otherwise indicated.

C. Jackets for Piping Insulation:
ASTM C 921, Type II for piping with temperatures above ambient.

D. Encase pipe fittings insulation with one-piece pre-molded PVC fitting covers, fastened as per manufacturer's recommendations.

E. Staples, Bands, Wires, and Cement: As recommended by insulation manufacturer for applications indicated.

F. Adhesives, Sealers, and Protective Finishes: As recommended by insulation manufacturer for applications indicated.

G. Flexible Unicellular: Type 1, tubular for temperature ranges - 40°F to 200°F.

H. Aluminum Jacket: 0.020 inch thick.

I. Duct wrap, fire-rated:

1. A flexible, fully encapsulated duct wrap material to provide 2-hour fire resistive enclosure assembly per ISO 6944 - 1985.

2. A lightweight, 1.5" thick, 6pcf, flexible, inorganic, non-asbestos, noncombustible, bio-soluble core insulation blanket.

3. Blanket insulation must maintain a 2012°F operating temperature

4. Blanket fiber materials must be tested per EU regulatory requirements, Directive 97/69/EC for bio-solubility, and verified by an independent laboratory.

5. Provide firestop sealants, tape, insulation pins, clips, banding and other components per manufacturer's instructions to ensure the installation complies with the complete tested system.
2.03 DUCTWORK INSULATION MATERIALS

A. Flexible Fiberglass Ductwork Insulation

A 1-1/2" thick fiberglass blanket insulation with a density of 1.5 pound per cubic foot and thermal conductivity (k value) of 0.29 @ 75° F mean temperature. The blanket shall have a vapor barrier facing of an aluminum foil and kraft paper lamination, sandwiching a fiberglass scrim for reinforcing.

B. Flexible Unicellular: A 1" thick flexible unicellular insulation blanket, protected by Armorflex finish protective coating.

C. Ductwork Insulation Accessories: Provide staples, bands, wires, tape, anchors, corner angles and similar accessories as recommended by insulation manufacturer for applications indicated.

D. Ductwork Insulation Compounds: Provide cements, adhesives, coatings, sealers, protective finishes and similar compounds as recommended by insulation manufacturer for applications indicated.

E. Ductwork Insulation Sealing: Blanket insulation with a thermal conductivity of 0.27 or less similar in construction to Owens-Corning Fiberglass Series on pound per cubic foot minimum density with foil reinforced Kraft (FRK) vapor barrier facing. Insulation shall be wrapped tightly on the ductwork with all circumferential joints butted and longitudinal joints overlapped a minimum of 2”. Adhere insulation to metal with 4” strips of insulation bonding adhesive at 8” on center. On circumferential and longitudinal joints, the 2” flange of the facing shall be secured using 9/16” flare door staples applied 6” on center and taped with 4” wide fiberglass tape embedded in Childers CP-10 white vapor barrier emulation and covered with Childers CP-10 until the tape is completely covered. All pin penetrations or punctures in facing shall also be taped. Vapor sealing of joints is not required on hot duct application where concealed.

2.04 HAZARDOUS DUCT INSULATION

A. DESCRIPTION

A lightweight (6 pcf maximum), non-asbestos, bio-soluble, high temperature, inorganic, noncombustible, foil encapsulated insulation blanket. The duct wrap system shall be a tested and listed system evaluated for a 2-hour fire resistance rating on an air distribution duct assembly. Testing to be conducted by a nationally recognized testing laboratory.

B. PERFORMANCE REQUIREMENTS

1. Single layer system for two-hour fire rating.
2. 2-hour fire resistive enclosure assembly tested per ISO 6944 - 1985 Edition
3. Firestop system, tested per ASTM E-814, 2-hour F and T Ratings
PART 3: EXECUTION

3.01 HVAC PIPING SYSTEM INSULATION

A. Insulation Omitted: Omit insulation on chrome-plated exposed piping (except for handicapped fixtures), air chambers, unions, strainers, check valves, balance cocks, flow regulators, drain lines from water coolers, drainage piping located in crawl spaces or tunnels, buried piping, fire protection piping, and pre-insulated equipment.

B. Hot Water Piping (To 250° F)

1. Application Requirements: Insulate the following HVAC piping systems.

   a. HVAC hot water supply and return piping.

2. Insulate each piping system specified above with one of the following types and thickness of insulation:

   a. Fiberglass: 1" thick for pipe sizes up to and including 1", 1-1/2" thick for pipe sizes 1-1/4" through 4.

3.03 INSTALLATION OF PIPING INSULATION

A. General: Install insulation products in accordance with manufacturer’s written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

B. Install insulation on pipe systems subsequent to installation of testing and acceptance of tests.

C. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other.

D. Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.

E. Maintain integrity of vapor-barrier jackets on pipe insulation and protect to prevent puncture or other damage.

F. Cover valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded, precut units.

G. Extend piping insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.
H. Install aluminum jackets on all exterior applications and include metal jacket bands of 3/8” wide; .020” thick aluminum or stainless steel and adhesives compatible with insulation. Locate seams on bottom side of horizontal pipe.

3.04 DUCT SYSTEM INSULATION

A. Supply Ductwork

1. Application Requirements: Insulate the following:

   a. New HVAC supply ductwork from mains to reheat coils, and extending to all branch supply diffusers.

   b. Insulate neck and bells of supply diffusers.

2. Insulate each ductwork system specified above with the following type of insulation:

   a. Flexible Fiberglass

B. Hazardous Exhaust ductwork

1.

3.05 INSTALLATION OF DUCTWORK INSULATION

A. General: Install insulation products in accordance with manufacturer’s written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

B. Inspect and verify that ductwork has been tested and installed properly before applying insulation and duct wrap material.

C. Inspect and verify that all surfaces are smooth, dry, clean and free from dust, debris, or other loose materials. Surfaces must be dry before the application of insulation and duct wrap materials.

D. Install insulation materials with smooth and even surfaces.

E. Overlap insulation joints to ensure complete and tight fit over surfaces to be covered.

F. Maintain integrity of vapor-barrier on ductwork insulation, and protect it to prevent puncture and other damage.

G. Extend ductwork insulation without interruption through walls, floors and similar ductwork penetrations, except where otherwise indicated.

H. Seal joints and seams of the cold duct insulation as recommended by manufacturer.
I. Duct Wrap System - Install duct wrap system in accordance with manufacturer's installation instructions.

3.06 EXISTING INSULATION REPAIR

A. Repair damaged sections of existing mechanical insulation, both previously damaged or damaged during this construction period. Use insulation of same thickness as existing insulation. Install new jacket lapping and seal over existing.

B. Protection and Replacement: Replace damaged insulation, which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture-saturated units.

C. Final Protection: Insulation installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General, Special and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. All materials and installation shall comply with University construction standards. These standards are available at: http://www.uky.edu/EVPFA/Facilities/CPMD/standards/div00/div00.htm. Special attention shall be given to Divisions 02, 16 and 17. In the event of a conflict between these standards and the Contract Documents the most stringent requirement shall be met.
C. The Contractor is directed to examine each and every section of these specifications, all drawings relating to the Contract Documents, any and all Addenda, etc., for work described elsewhere that may relate to the provision of the work described herein. Materials and performance requirements are specified elsewhere herein that relate to these systems.
D. Each Electrical Contractor's attention is directed to Section 260501 - General Provisions, Electrical, and all other Contract Documents as they apply to his work.

1.2 SUMMARY
A. Section Includes:
   1. Identification for raceways.
   2. Identification of power and control cables.
   3. Identification for conductors.
   5. Warning labels and signs.
   6. Instruction signs.
   7. Equipment identification labels.
   8. Miscellaneous identification products.

1.3 DEFINITIONS AND ABBREVIATIONS
A. T - Transformer
B. SWGR – Switchgear. Electrical switching gear which consists of cam operated knife switches that can be operated either manually or electrically or both with amperage capacities greater than 1000 amps.
C. SWBD – Switchboard. Electrical distribution boards which contain 3 phase, stored-energy breakers which distribute power to other distribution panels or directly to large loads.
D. ATS - Automatic Transfer Switch. Stand-alone electrical transfer switches which maintain power to critical building loads. In the event of a loss of normal power, these switches will start the associated emergency generator and switch its load's power feed to the generator.
E. MCC - Motor Control Center. Electrical distribution boards which house the electrical controllers for the loads which they feed. Example loads are usually fans and pumps.
F. DP - Distribution Panel. Electrical distribution panel which is an integral part of a switchboard or switchgear but has its own isolation circuit breaker.
G. P – Panel. Electrical distribution panels with manually operated circuit breakers which feed other distribution panels or directly to loads. These are generally the last distribution panel before the load.
H. N - Normal power system. Annotates that the associated component is part of the Normal
Power distribution system and receives no backup power from the Emergency Power distribution system.

I. E - Emergency power system. Annotates that the associated component is part of the Normal Power and Emergency Power distribution systems. In the event of a loss of the supply from the normal power system, the component will receive power from the emergency power system.

J. BKR – Breaker. Switch which interrupts or establishes power flow to its associated load.

K. DISC - Disconnect Switch. Manually operated knife switch which interrupts or establishes power flow to its associated load.

1.4 ACTION SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 WARNING LABELS AND SIGNS


B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:
   1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
   2. 1/4-inch grommets in corners for mounting.
   3. Nominal size, 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:
   1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
   2. 1/4-inch grommets in corners for mounting.
   3. Nominal size, 10 by 14 inches.

E. Warning label and sign shall include, but are not limited to, the following legends:
1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE power SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA regulation - area in front of electrical equipment must be kept clear for 36 inches"

2.2 INSTRUCTION SIGNS
A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
   1. Engraved legend with black letters on white face.
   2. Punched or drilled for mechanical fasteners.
   3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.
C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.3 EQUIPMENT IDENTIFICATION LABELS
A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
C. Retain paragraph below to specify type of label for identifying outdoor equipment if specified in "Identification Schedule" Article.
D. Stenciled Legend: In nonfading, waterproof, [black] <Insert color> ink or paint. Minimum letter height shall be [1 inch (25 mm)] <Insert dimension>.

2.4 CABLE TIES
A. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
   2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.
B. Plenum-Rated Cable Ties: Self-extinguishing, UV-stabilized, one piece, self-locking.
   2. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
   3. UL 94 Flame Rating: 94V-0.
   4. Temperature Range: Minus 50 to plus 284 deg F.
   5. Color: Black.

2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS
A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. Cable Ties: For attaching tags.
   1. Plenum rated.
   2. Outdoors: UV-stabilized nylon.

G. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

3.2 SCOPE OF WORK

A. Equipment, disconnect switches, switchgear, switchboards, panelboards, transformers, motor starters, variable frequency drives, special device plates, and similar materials shall be clearly marked as to their function and use. Markings shall be applied neatly and conspicuously to the front of each item of equipment with 1/2" black lamacoid plate (or equivalent) with white letters 1/4" high unless otherwise specified.

B. All receptacle cover plates shall be marked with their panel and circuit number with clear, machine, printed adhesive labels. Circuit number shall also be hand written inside outlet box with black permanent marker.

C. The Contractor shall provide clearly legible typewritten directories in each electrical panel indicating the area, item of equipment, etc. controlled by each switch, breaker, fuse, etc. These directories are to be inserted into plastic cardholders on back door in each panel. Descriptions to be approved by the Owner.
   1. EXAMPLE:
      a. LIGHTS, ROOM 100
      b. RECEPTION, ROOM 200

D. Branch circuit panelboards and switch gear shall be provided with a black lamacoid plastic plate with 1/2" white letters for panel designation and 1/4" white letters showing voltage and feeder information. Branch circuit switches shall be designated as to function. Panelboard and switchgear labels shall indicate the source they are fed from, and the circuit number at that source. Clearly indicate the exact label legend to be furnished with each panelboard and switchgear on the shop drawings for each item of equipment prior to submission of shop drawings. Refer to drawings for details.

E. Where branch circuit panelboards and switchgear are connected to an emergency source, the lamacoid plate shall be red, and the word "emergency" shall be incorporated into the legend. In health care applications, the NEC - designated branch (life safety, critical or equipment branch) shall also be incorporated into the legend, all in ¼" letters. Also provide similar plates and legends for automatic transfer switches, as appropriate. Refer to drawings for details.

F. Lamacoid plates shall be located at center of top of trim for branch circuit panels, switch gear, and centered at side for branch circuit switches. Fasten with self-tapping stainless steel...
screws or other approved method.

G. Verify identity of each item before installing identification products.

H. Identification shall consist of all UPPER CASE LETTERS.

I. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

J. Apply identification devices to surfaces that require finish after completing finish work.

K. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification devices.

L. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

M. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

N. Fire alarm system: Install a nameplate on the fire alarm panel to indicate the panelboard and circuit number supplying the fire alarm system.
O. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil 4-inch wide black stripes on 10-inch centers over orange background that extends full length of raceway or duct and is 12 inches wide. Stencil legend “DANGER CONCEALED HIGH VOLTAGE WIRING” with 3-inch high black letters on 20-inch centers. Stop stripes at legends. Apply to the following finished surfaces:

1. Floor surface directly above conduits running beneath and within 12 inches (300 mm) of a floor that is in contact with earth or is framed above unexcavated space.
2. Wall surfaces directly external to raceways concealed within wall.
3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.

P. Accessible Raceways, More Than 600 V: Self-adhesive vinyl labels. Install labels at 10-foot maximum intervals.

Q. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

2. Power.
3. UPS.

R. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

S. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

T. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

U. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels

2. Identify system voltage with black letters on an orange background.
3. Apply to exterior of door, cover, or other access.
4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
   a. Power transfer switches.
   b. Controls with external control power connections.

V. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

W. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch high letters for emergency instructions at equipment used for power transfer and load shedding.

X. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

Y. Labeling Instructions:

1. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise
indicated, provide a single line of text with 1/2-inch high letters on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high.

2. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
3. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
4. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

Z. All nomenclature on lamacoid labeling shall be per University of Kentucky Standards as shown below:

1. Any label that belongs to equipment within the emergency power subsystem shall be RED with white lettering. All other labels shall be BLACK with white lettering. Additionally, all labels will have at least two lines—one designating the component name and the other designating the component's power source. In the case of a component with multiple feeds, there shall be separate line for each power source component name.

2. UK Equipment Naming Convention:

Format:
The components will be labeled using the following format:

\[
\text{ID: Building/Floor/Room/System/Subsystem/Component} \\
\text{Fed from: Building/Floor/Room/System/Subsystem/Component/}
\]

Each field has a specified number of characters and is defined as follows:

- **Building** (4 numeric characters) => the building number, as defined by the university, in which the system is in.
- **Floor** (2 characters) => the floor on which the component is located; use "0G" for the ground floor and "SB" for the sub-basement.
- **Room** (up to 5 capitalized characters) => the room in which the component is located; if component is in a corridor use "CORR".
- **System** (up to 3 capitalized characters) => the system to which the component belongs (in this case it will be EDS for electrical distribution system).
- **Subsystem** (up to 3 capitalized characters) => the subsystem to which the component belongs (in this case it will be Normal (N) or Emergency (E)).
- **Component** (up to 5 capitalized alpha and/or numeric characters) => the component sequence number given to the component to distinguish it from other components in the system.

Examples:

A typical distribution panel on the second floor of the main hospital in room H-201 might be labeled 0293/02/H201/EDS/N/P-1.

A motor control center in the penthouse of the Combs building might be labeled 0096/04/PH/EDS/N/MCC-1.

A breaker on the main switchboard in N-19 might be labeled as 0293/07/PH/EDS/N/MCC2 for the load designation and 0293/0G/N19/EDS/N/SWBD3/BKR-3 for the source designation.

NOTE: The component identification number, or sequence number, is just a simple numbering of similar equipment on the same floor numbered from left to right as seen on the electrical distribution riser diagram provided by the architects. Therefore, it is important to note the building and floor when referring to a component to determine its location. If the components
to be labeled are existing equipment or new equipment in an existing building, the component sequence number should be obtained from the appropriate electrical systems supervisor. If the equipment is being installed as part of a new building construction project, then the contractor may determine the sequence numbers.

END OF SECTION 260553
ENVIRONMENTAL QUALITY MANAGEMENT BUILDING

ENVIRONMENTAL QUALITY MANAGEMENT BLDG ADDITION

UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

DESIGN AND CONSTRUCTION ADMINISTRATION PROVIDED BY:
UK PLANNING DESIGN AND CONSTRUCTION GROUP
211 PETERSON SERVICE BUILDING
LEXINGTON, KY 40506

THIS PROJECT RENOVATES A PORTION OF THE ENVIRONMENTAL QUALITY MANAGEMENT BUILDING. AT THE EAST END OF THE EXISTING BUILDING, A NEW ADDITION WILL BE CONSTRUCTED. WITHIN THE EXISTING OFFICE AREA, TWO NEW OFFICES WILL BE CONSTRUCTED. THE NEW AND RENOVATED SPACES WILL RECEIVE NEW LIGHTING, NEW CEILINGS, NEW WALLS & FLOORING, NEW PAINT, NEW ELECTRICAL POWER & DATA, AND NEW HVAC SYSTEMS. FIRE ALARM A/V DEVICES WILL ALSO BE INSTALLED AND UPGRADED WHERE APPLICABLE.
1. REMOVE EXISTING STOREFRONT AND DOOR. CONSTRUCT TEMPORARY CONSTRUCTION BARRIER BEFORE STARTING DEMOLITION. LOCKABLE MAN DOOR IN BARRIER WALL REQUIRED FOR CONTRACTOR ACCESS TO BUILDING.

2. REMOVE EXISTING LIGHT FIXTURES AND PATCH EXISTING WALL PENETRATIONS TO MATCH EXISTING WALL SURFACE (CONCRETE). SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
1. **APPLY ROOFING SYSTEMS, KWICK-PLY VAPOR BARRIER**
   - Directly to the roof deck. Run KWICK-PLY membrane up the back of the parapet and over the top of the wood cap to completely cover the wood.

2. **INSTALL A SPRAY POLYURETHANE FOAM-BASED (SPF) INSULATION LAYER.**
   - This will be a sprayed in place, two component, rigid-class polyurethane foam having a nominal density of 3.0 lbs. per cubic foot. It shall have a thermal conductance ("K" factor) of 0.15 BTU/HR/SQ. FT./°F/IN. at 70 degrees Fahrenheit. Foam shall be type and manufacturer required in order to meet the terms of and quality for the specific roof warranty.

3. **INSTALL ELASTOMERIC COATINGS.**
   - The elastomeric coating is the PEMATHANE III system polyurethane coatings, product numbers 70620 for base coat and 70630 for top coat manufactured by NEOGUARD INC.

4. **INSTALL GRANULES TO TOP COAT.**
   - Granules shall be supplied by 3M INDUSTRIAL MINERAL PRODUCTS DIVISION and shall be #11, gauge, grey roofing granules.

5. **ROOFING SYSTEM SHALL BE INSTALLED TO DRAIN TO SCUPPERS WITH A MINIMUM 1/4" SLOPE PER FT.**
   - Note: Down spouts to be tied in to existing catch basin in landscape area. See AD-110 for existing location.

6. **ALLOWANCE NO. 2, $5,000.00 FOR EARTHWORK ASSOCIATED WITH SITE GRAVING FOR BUILDING MIN. 2% SLOPE AWAY FROM BUILDING AND ADJUSTMENTS TO EXISTING CATCH BASIN.**
GENERAL NOTES

A. SEE SHEET A-001 AND AD-120 FOR ARCHITECTURAL GENERAL NOTES AND LEGEND.
B. SEE SHEET E-001 FOR ELECTRICAL GENERAL NOTES AND LEGEND.
C. SEE SHEET F-100 FOR PLUMBING GENERAL NOTES AND LEGEND.
D. SEE SHEET M-001 FOR MECHANICAL GENERAL NOTES AND LEGEND.
E. THE USE OF FLEXIBLE DROPS IS PERMITTED, BUT ALL SUCH DROPS MUST BE INSTALLED IN ACCORDANCE WITH THEIR UL LISTINGS WHEREAPPROVALS. FLEXIBLE DROPS SHALL BE OF THE BRANDED STAINLESS STEEL HOSE STYLE. FLEXIBLE DROPS EMPLOYING CORRUGATED STEEL TUBING WILL NOT BE PERMITTED. INCLUDE MOUNTING BRACKET FOR CONNECTION TO CEILING GRID.  SIZE MUST BE EQUAL TO PIPE SIZE FOR SPRINKLER HEAD.
F. SPRINKLER CONTRACTOR WILL PROVIDE HYDRAULICALLY-DESIGNED PIPING SYSTEM AND WILL MODIFY LOCATION OF SPRINKLER HEADS ONLY AS REQUIRED TO CONFORM WITH CODE AND PREVENT BLOCKAGE OF PATTERN. PROVIDE HEADS AS SHOWN IN DRAWING.
G. PROVIDE ALL WORK NECESSARY FOR THE COMPLETE FIRE PROTECTION SYSTEM AS INDICATED AND NOTED. ALL CONNECTIONS TO EXISTING WORK, NEW PIPING AND ACCESSORIES AND FINAL FINISH MOUNTING OF SPRINKLERS IN LOCATIONS INDICATED AND TESTING. ALL AS REQUIRED TO MEET ALL PROVISIONS OF NFPA-13, NFPA-14, NFPA-20 AND THE STATE BUILDING CODE. WORK WILL BE PERFORMED BY A LICENSED SPRINKLER CONTRACTOR.
H. FLEXIBLE SPRINKLER, NEW OR REUSED, BE INSTALLED ON THIS PROJECT. NO SCREWED PIPING LARGER THAN 2 INCHES. PITCH ALL PIPING TO DRAIN.
I. EXPOSED TO VIEW; SHADE TO BE APPROVED BY ARCHITECT.
J. DO NOT INSTALL IN ACCORDANCE WITH 099100 WHERE LISTED FOR FIRE SERVICE, WHERE SUCH LISTING EXISTS.
K. PROVIDE LISTED AIR RELEASE FOR ALL TRAPPED RUNS OF FIRE PROTECTION PIPING.
L. PIPE＆FITTINGS, CONTROL SYSTEMS AND TRIM WILL BE UL AND/OR FM TESTED AND LISTED FOR FIRE SERVICE, WHERE SUCH LISTING EXISTS.
M. COMPUTERIZED SPRINKLER CONTRACTOR.
N. PROVIDE FITTINGS, PIPE & FITTINGS, CONTROL SYSTEMS AND TRIM WILL BE UL AND/OR FM TESTED AND LISTED FOR FIRE SERVICE, WHERE SUCH LISTING EXISTS.
O. ALL FERROUS FIRE PROTECTION PIPING WILL BE PAINTED.
P. PROVIDE CHROMED SPRINKLER HEADS AND PIPES AS SHOWN IN THE DRAWING.
Q. NEW DRY TYPE SIDEWALL SPRINKLER.
R. RELACED EXISTING PENDENT SPRINKLER.
S. FIRE PROTECTION DESIGN AND CONSTRUCTION TO BE PROVIDED BY UNIVERSITY UNIT-PRICE SPRINKLER CONTRACTOR. GENERAL CONTRACTOR TO COORDINATE WORK WITH SPRINKLER CONTRACTOR.
T. ENLARGED NEW WORK PLAN - FIRE PROTECTION.

Additional notes and details as per the diagram.