

UNIVERSITY OF PITTSBURGH

DIVISION C

**ARCHITECTURAL DESIGN GUIDELINES FOR SUSTAINABILITY,
PRODUCTS AND MATERIALS**

Updates:

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ARCHITECTURAL DESIGN GUIDELINES FOR SUSTAINABILITY, PRODUCTS AND MATERIALS
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DIVISION C

ARCHITECTURAL DESIGN GUIDELINES FOR SUSTAINABILITY, PRODUCTS AND MATERIALS

1 PRODUCTS AND MATERIALS DIRECTIVES TO PROFESSIONAL

C.1. GENERAL PROCEDURES AND INSTRUCTIONS

- A. The Professional shall review the following list of items and shall incorporate those that apply to the project into the Contract Documents. These guidelines are for the Professional, and his/her consultants in the technical design of new buildings, additions to buildings and building renovations. They are minimum guidelines. Actual design should be consistent with the overall program, building quality, and scope of project.
1. The University does not represent or endorse any specific manufacturer, product or method referred to in these documents. These Guidelines are organized using the CSI 50 Division MasterFormat.
 2. The Owner's Project Requirements (OPR) in tandem with the University of Pittsburgh Design Manual, provide an explanation of the ideas, concepts and criteria that are considered to be very important to the University, coming out of the programming and conceptual design phases and which are desired to be tracked throughout design and construction. The OPR is developed by the University and provides the direction for the design team. The OPR document sets the functional goals that the design is judged against and establishes the basis of the criteria used during construction to verify actual performance. The OPR does not list items that are already required by code. The OPR is generally not a description of what specifically will be included in the project design, but is the more general feature and categorical performance criteria to be met by the design. Where practical and known, the OPR includes measurable indicators used to verify that the performance requirements were met.
 3. The OPR will be followed by the Basis of Design (BOD) or design narrative written by the Design Team and included with design package submissions. The BOD documents the primary thought processes and assumptions behind the design decisions and describes the design elements being incorporated to meet the OPR.
- B. The Professional shall review these guidelines with the University's Project Manager. If the Professional desires to make any exceptions to these guidelines, approval from the University's Project Manager through the Office of the University Architect must be obtained in writing.
- C. These Guidelines do not relieve the Professional of their responsibility to develop their own Project Manual as part of the Contract Documents, nor do they relieve the Professional of their professional liability as Registered Architects and Engineers for the design and specification of their Work. University expects the Professionals to design university buildings and projects that meet all applicable building codes and regulatory standards and also provide a safe and healthy environment for occupants and maintenance personnel.
- D. Division C shall be considered a living document for materials and process provided for the design Professional's use in developing and detailing projects at the University of Pittsburgh. The Professional shall review the guidelines included within this document at the commencement of the project to ensure the project design meets with current requirements.

- E. Specifications and submission requirements are subject to change, Division modification dates are as identified at the beginning of this document. Division C revisions shall be managed through a process which will include the Office of Campus Planning, Design and Real Estate, the University Architect, University Interior Designer and the Senior Manager for Construction.
- F. During the course of a project, if material and/or process substitutions are requested based on field conditions, budget constraints, modification of program requirements or material obsolescence, the Professional shall provide all necessary documents to the University's Project Manager for approval by the University Architect, University Interior Designer and the Senior Manager for Construction.
- G. Project Types:
 - 1. These Division C Architectural Design Guidelines for Sustainability, Products and Materials apply to all University projects whether or not University owned or maintained unless stated otherwise by the University's Project Manager.
 - 2. Projects fall into one of the following categories:
 - a) Tenant Improvement and University maintained.
 - b) Tenant Improvement and Developer/Private Owner maintained.
 - c) University owned and University maintained.
 - d) University owned and University Business and Auxiliary Departments (i.e. University's Student Housing, Foodservice, Parking, etc.) maintained.
 - e) University owned and UPMC maintained.
 - f) University owned and Tenant/Private maintained.

H. Residence Halls/Student Housing – General Procedures and Information:

- 1. As stated above, these Division C Architectural Design Guidelines for Sustainability, Products and Materials apply to all University Residence Hall/Student Housing projects. Professional shall be in constant contact with University's Project Manager and University's Auxiliary Departments (Student Housing) during all phases of the design process. Information pertaining to housing is contained within this division.

C.2. AUTHORITIES HAVING JURISDICTION

- A. The Professional shall comply with all codes, ordinances and inspections applicable to the particular project that include, but are not limited to, the following:
 - 1. Codes:
 - a) International Building Code latest version adopted by the Commonwealth of Pennsylvania.
 - b) International Existing Building Code latest version adopted by the Commonwealth of Pennsylvania.
 - c) International Residential Code.
 - d) International Energy Conservation Code.
 - e) International Fire Code.
 - f) International Fuel Gas Code.
 - g) International Mechanical Code.
 - h) International Plumbing Code/Allegheny County Plumbing Code.
 - i) National Electric Code (NEC)
 - j) Commonwealth of Pennsylvania Department of Labor and Industry: Elevator Code.
 - k) International Code Council - ICC/ANSI A117.1 Accessibility Code.
 - l) City of Pittsburgh Zoning Code.
 - 2. Inspection Agencies:
 - a) Pittsburgh Bureau of Permits, Licenses, and Inspection (PLI).

- b) Allegheny County Health Department (ACHD).
 - 3. Americans With Disabilities Act (ADA).
 - 4. National Fire Protection Association (NFPA).
- B. General: Most University of Pittsburgh buildings and projects are regulated by applicable codes of the Commonwealth of Pennsylvania and not City of Pittsburgh however, the City of Pittsburgh Zoning Code may apply also. The Professional shall verify which codes and authority having jurisdiction (AHJ) are applicable to the project.
- C. Historical Buildings and Projects: Many of the buildings on the University of Pittsburgh campus are of historical importance. Work on these buildings shall conform to all local, state and federal historical preservation requirements applicable to the project. Professional shall verify which historical preservation requirements are applicable to the project. Design building renovations to preserve the architectural character and institutional history of historic buildings.

C.3. PROJECT MATERIAL DESIGN BINDER AND COLOR SELECTIONS

- A. The color selections of materials for use on buildings' interior and exterior surfaces will be approved by the University's Project Manager through the Office of Campus Planning, Design and Real Estate and Facilities Management. During the design stages of the project, the Professional shall submit material finishes in accordance with the project RFP (Request for Proposal) submission milestone requirements culminating in project record color binders for review and approval. These binders will be reused during construction as may be required. Material samples will be approved by the University before ordering or fabrication.
- B. Submissions Guidelines:
1. Materials shall be submitted in binder format for each project. Binders are classified as the following types:
 - a) A Comprehensive Project Material Design Binder is to include all exterior and interior materials including but not limited to masonry, grout, railings, metal panels, sealants, metal finishes, millwork, doors, glass, flooring, base, wall, ceiling, toilet partitions, and window treatment material finishes.
 - b) Furniture, Fixtures and Equipment (FF&E) Binder shall include all metals, wood, upholstery, laminates, cut sheets of product and furniture plans as they align with the Professional's design contract. Material maintenance information for all finished surfaces shall be provided as part of the Close Out document submission.
 2. Binders are to include the following:
 - a) Table of Contents
 - b) Finish Plans and Schedules
 - c) Binder Pockets with mechanical fasteners
 - d) Loose finish samples
 - e) Printed Finish Boards inclusive of material identification information (style, model, color) – submitted within each pocket with the related loose material samples
 - f) Maintenance information: Cleaning instructions for all finished surfaces of each product, labeled to each FF&E item on the project for ease of Custodial reference and clarity.

3. Colors and materials samples shall be submitted to the University's Project Manager as part of the Comprehensive Project Material Design Binder. Professional shall not submit colors or materials samples directly to the End Users. It is the University's Project Manager's responsibility to submit the colors and materials samples to the End Users, after they have been reviewed and approved by the University Architect or his/her appointed representative. The Professional is discouraged from submitting individual color samples for approval at different times during the design or construction process.
4. The Professional is also required to submit catalog cuts, for items shown below, as well as any other items that are considered necessary by the Professional or the University's Project Manager for a proper depiction of the project.

<u>Materials</u>	<u>Samples</u>
	Sizes indicated are minimums required.
Polished Concrete with color additive	2 inch x 2 inch sample of each type and color
Polished Concrete with no color additive	2 inch x 2 inch sample of each type and color
Brick	2 inch x 2 inch sample of each type and color.
Decorative Block (ground face)	2 inch x 2 inch sample of each type and color.
Masonry Mortar Colors	3 inch long sample of each color.
Decorative Metal Railings	2 inch x 2 inch sample of each finish.
Exterior Metal Wall Panels	6 inch x 8 inch sample of each color and profile.
Metal Roof Panels	6 inch x 8 inch sample of each color and profile.
Roof Edge and Metal Coping Colors	2 inch x 2 inch sample of each color.
Cabinets	Color and material sample of each type of cabinet finish; if laminate, use submit manufacturer's standard sample size 3 inch x 5 inch.
Countertops, Counters, Wall Caps and Window Stools	Manufacturer's standard color and material sample of each type of countertop, counters and wall caps.
Wood Paneling	Material sample of wood species with finish.
Wood Doors – Factory Finished	Manufacturer's standard veneer finish sample.
Hardware Finish and Catalog Data Sheets	Catalog data sheets indicating lever trim, locksets, closers, exit devices and finish.
Glass	Initial Review: Product Data. After Data Approval, submit 12 inch x 12 inch sample. Final glass sample shall be an appendix item to the binder.
Ceramic Porcelain and Mosaic Tile	Manufacturer's standard sample size for all colors, patterns and textures to be used. Include intended installation drawing indicating pattern and note the drawing location within the document set.

Ceramic Tile Grout	3 inch sample of each color.
Ceiling Panels and Grid	Catalog cut and manufacturer's standard material sample in clear protective wrapping.
Wood Flooring	Manufacturer's standard sample for each wood species, grade and finish.
Vinyl or Rubber Base	2 inch wide sample.
Carpet	6 inch x 8 inch sample.
Resilient Flooring	2 inch x 2 inch sample.
Resinous Flooring	2 inch x 2 inch sample
Transitions	Cut sheet and flat material sample for extruded metal components, flat material sample for resilient product
Paint Colors	4 inch x 4 inch color chip.
Painted Doors and Frames	Paint chip and sheen finish sample.
Toilet Partitions	Catalog cut and 4 inch x 4 inch sample.
Corner Guards	Cut sheet and color sample; sample submission is per manufacturer's standard size flat chip.
Walk Off Mat	2 inch x 2 inch sample
Window Treatments	Fabric sample 6 inch x 8 inch.
Furniture	Catalogs cuts, fabric and other materials samples (veneers, metal finishes, etc.)
Laboratory Casework	Color and material sample of each type of cabinet finish.
Laboratory Countertops	Manufacturer's standard sample size not less than 2 inch x 2 inch
Elevators	Walls, Floors and Ceiling Finishes. Materials shall be submitted with the manufacturer's standard sample size
Diffusers, Electrical Boxes, etc.	Color chip if other than white.
Lighting Fixtures	Catalog cut and color of fixtures, except University standard.

- a) Once bids are awarded, the Professional shall obtain from the Contractor samples and catalog cuts of materials not specifically identified in the Contract Documents and shall update the Printed Finish Boards and Binders for approval. **The Contractor will not be instructed by the Professional to proceed ordering the interior materials until the University has approved all materials and color samples.**

C. Brief Guide to Colors and Materials Selection:

1. **General:** The following Guide has been developed in order to ensure that the colors and materials provided in University interiors are easy to maintain, promote energy conservation and do not become "obsolete" as Users of the spaces change.

- a) **Use of the University Colors and Seal:** There is no requirement for the Professional to use the University colors (blue and gold) in the building interiors, unless specifically requested by the End Users. If the University colors are to be applied in graphic form, the University standard colors must be used. If the University seal is used, modifications or omissions of any part of the seal are not acceptable. Use of the University's brand identity shall be reviewed with the Office of Campus Planning, Design and Real Estate.
- b) **Code Compliance:** Interiors shall meet applicable local, State and National Codes, including ADA standards. Buildings and facilities shall be designed and constructed to accessible in accordance with the IBC and ANSI/ICC A117.1. Note: When renovating existing restroom facilities, the Professional shall review the University's guidelines in Division X – Architectural Design Guidelines for Accessibility and verify with the University's Project Manager the project accessibility designs.
- c) **Public Corridors:** The materials, style and colors to be used in public corridors, shall be consistent with the architectural style of the building and also with the existing building colors. All accessories and large format graphics/signage identified for inclusion within public corridors shall be reviewed with the Office of Campus Planning, Design and Real Estate to review compliance with current and future public space standards in each building.
- d) **Exposed Utilities and Building Systems:** The Professional shall make a concerted effort to locate new pipes (including sprinkler piping), wires, raceways, outlets, ducts and miscellaneous utilities and systems in existing finished spaces, behind walls or above ceilings, so as not to detract from the architecture of the space. If this is not possible due to economics or building constraints, alternative exposed locations shall be agreed upon with the University's Project Manager. Professional must specify that utilities/systems components that are to remain exposed shall be painted the same color as the background wall/ceiling, so as to make them as inconspicuous as possible unless otherwise specified by applicable Codes. Exception exposed ceilings may be permitted based on the project program and intended aesthetics.
- e) **Lighting Fixtures – Division K:** University standard lighting fixtures shall be specified, unless otherwise specifically approved in writing by the University's Project Manager, for special conditions. When non-standard fixtures are used, the lighting fixtures shall have the following characteristics:
 - (i) Commercial or institutional quality.
 - (ii) Incandescent fixtures are not allowed. LED's are preferred.
 - (iii) Energy Star certified.
 - (iv) Standard bulbs and other replacement parts such as glass shades shall be readily available in the Pittsburgh market.
 - (v) Finishes shall be maintenance-free.
 - (vi) All pendant fixtures shall have a top lens to prevent debris from accumulating within the fixture and to prevent visual glare in multi-level installation locations, additional attention and detailing shall be required for pendant bowl fixtures.

C.4. SECTION 012500 SUBSTITUTION PROCEDURES

- A. Substitutions for Cause: In the event a product or material becomes discontinued or obsolete, a written request for substitution shall be submitted to the University's Project Manager for consideration.
- B. Substitutions for Convenience: After bids are received or after execution of the agreement, substitutions for convenience on public projects are not allowed.

C.5. SECTION 014000 QUALITY REQUIREMENTS

- A. Mockups: Professional shall discuss with the University's Project Manager requirements for types of mockups required for the project whether for aesthetics, performance or both.
1. Mockup Definition: Full-size physical assemblies that are constructed either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - a) Professional shall discuss with the University's Project Manager whether mockups may remain as part of the finished construction.
 2. Building Envelope Assembly Mockup: Professional shall detail in the Construction Documents a building envelope assembly mockup when required for type of project after discussions with University's Project Manager. The mockup panel shall be constructed by the appropriate contractor(s) for approval of workmanship and final building envelope material approval and shall be built on site after the beginning of construction and prior to beginning the building envelope work. The materials used shall be provided by the project suppliers and shall represent the final product in all aspects. The panel shall be protected from construction operations, but shall remain in place and exposed to the elements until all building envelope work has been approved.
 - a) Field Testing is required on mockup assemblies for all new Tier 1 construction projects. Professional shall specify testing required to meet project designed standards for energy. Testing shall be performed by a qualified testing firm.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.
 4. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 5. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- B. Sections With Mockup Guidelines: The following sections contain guidelines for mockups but shall not be considered all-inclusive of mockups required. Professional shall determine mockups required and discuss with University's Project Manager.
1. Section 033000 Cast-In-Place Concrete: For polished concrete floor finish.
 2. Section 040120 Masonry Restoration: For restoration and repair of existing masonry.
 3. Section 042000 Brick, Stone and Unit Masonry: For integrated exterior masonry wall mockup of exterior components.
 4. Section 071900 Water Repellents: For exterior masonry wall.
 5. Section 072000 Thermal Protection: Building Envelope Assembly Mockup; coordinate with Section 042000.
 6. Section 085000 Windows: For integration with building envelope assembly mockup and masonry wall mockup.
 7. Section 092900 Gypsum Board (Interior Partitions): For Level 5 wall finish.
 8. Section 122000 Window Treatments: For roller shades.

C.6. SECTION 016600 PRODUCT DELIVERY, STORAGE AND HANDLING REQUIREMENTS

- A. *Professional Note – The following paragraphs are to be used for renovations of existing buildings only.*
- B. **Material Storage Locations:** Equipment and materials delivered to work site shall be stored at locations approved by the University's Project Manager.
- C. **Loading Docks:** Contractor shall coordinate with University's Project Manager for use of building loading dock for delivery of construction materials. Contractor shall keep building loading dock unobstructed at all times.
- D. **Elevators:** Contractor shall coordinate with University's Project Manager for use of building elevators for movement of construction materials. Refer to Division B – Special Requirements for University Projects, Section 015000 Temporary Facilities and Controls.
- E. **Basis of Design:** Where product discovery is limited or information pertaining to a product or material becomes scarce, the professional shall endeavor to provide performance data to create alternative solutions. Brand name or comparable descriptions must include, in addition to the brand name, a general description of those salient physical, functional, or performance characteristics of the brand name item that a comparable item must meet to be acceptable for award. Use brand name or comparable descriptions when the salient characteristics are essential requirements.
- F. **Comparable Products:**
 - 1. **Conditions for Consideration:** Professional shall consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Professional shall return requests without action, except to record noncompliance with these requirements:
 - a) Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and shall produce the indicated results, and that it is compatible with other portions of the Work.
 - b) Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - c) Evidence that proposed product provides specified warranty.
 - d) List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - e) Samples.
- G. **Product and Manufacturers Listing:** To the best extent possible, the University of Pittsburgh intends to avoid developing proprietary items to facilitate a competitive delivery method. At least three (3) manufacturers per item shall be specified as part of a comparable list. Refer to the following example:
 - 1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a) Deribgum; APP.
 - b) Siplast; SBS.
 - c) Soprema; SBS.

C.7. SECTION 017419 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

A. *Professional Note – Professional shall develop and provide documentation to assure that the Contractor conducts construction waste management and disposal in accordance with University’s sustainability requirements. This section, 017419 shall be in all projects whether the project is or is not obtaining Sustainability certification requirements. Professional shall incorporate into the Construction Documents and expand upon the following paragraphs.*

B. Waste Management Plan:

1. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition, deconstruction, and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
 - a) Net Positive Waste: Project shall reduce environmental burdens from the extraction, processing and disposal of materials and turn the waste into a valuable resource through beneficial reuse.
2. Contractor shall reduce or eliminate the production of waste during construction to conserve natural resources and ways to integrate waste back into either an industrial loop or a natural nutrient loop through reuse or recycling.
3. Materials Diversion Requirements:

<u>Material</u>	<u>Minimum Diverted/Weight</u>
Metals	99%
Paper and cardboard	99%
Soil and biomass	100%
Rigid foam, carpet, and insulation	95%
All others – combined weighted average	90%

4. In addition to the above, provide a list of local sources to be used for recycling used material including, but not limited to carpet, ceiling panels, ceramic/porcelain finishes and fixtures, and drywall. Provide verification of material receipt and diversion from landfill.
 5. Waste Management Form: Professional shall include in the Project Manual, a form to track waste diversion.
- C. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by [General] Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.
- D. Chemical Water Treatment: Refer to Division B, Section 015000 “Temporary Facilities and Controls.”

C.8. SECTION 018100 PROJECT PERFORMANCE REQUIREMENTS - SUSTAINABILITY DESIGN

- A. The University of Pittsburgh has established a commitment to long-term sustainability through the PittSustainabilityPlan (<https://www.sustainable.pitt.edu/meet-the-pitt-sustainability-plan/>). Recognizing its stewardship and leadership roles, the University seeks to incorporate the environmental, equity, and economic concepts of sustainability into the design, construction, operations, and maintenance of its buildings and landscapes, while maintaining safety and preserving comfort.
- B. The University of Pittsburgh Project Design Sustainability Guidelines apply to all capital projects and are included in all Requests for Proposals issued for projects and referenced in contracts for professionals and construction managers.
- C. The sustainability goals identified in the Request for Proposal identify the minimum level of design and process requirements for construction and renovation projects. At the beginning of the project, the Professional and the University's Project Manager shall review the project scope, confirming the type of project, project estimated cost and the appropriate sustainability rating systems to apply. At minimum, the project will incorporate the sustainability goals outlined in the Request for Proposal and Owners Project Requirements (OPR). The Professional shall evaluate the feasibility of pursuing a higher level and/or complementary sustainability goals prior to meeting with the University's Project Manager including understanding anticipated life cycle costs, benefits, and/or savings that may be incurred in order to create a more sustainable project. The University is very interested in identifying economies of scale that may exceed the project scale; to that end, Professional shall work with Project Manager to understand campus and city systems before suggesting a solution.
 1. University will also set whole project site Energy Use Intensity (EUI in kBtu/square foot/year) and Water Use Intensity (WUI in gallons/square foot). EUI and WUI targets for the different types of spaces anticipated to be part of the project will be identified; final whole project site EUI and WUI targets will be determined based on weighted average of the final areas of each space type. Campus-wide site EUI and WUI targets align with the ideals and goals of the international 2030 Challenge, wherein:
 - a) New buildings are pursuing carbon neutral by 2030 (a target of minimum of 80% EUI reduction compared to the U.S. Energy Information Administration's (EIA) Commercial Buildings Energy Consumption Survey (CBECS) 2003 baseline, as specified by use type).
 - b) Existing buildings are striving to achieve a minimum of 50% EUI reduction compared to the U.S. EIA's CBECS 2003 baseline as specified by use type.
 - c) Interiors projects are pursuing a minimum of 35% EUI reduction compared to the U.S. EIA's CBECS 2003 baseline.
 - d) All projects must work to reduce all potable water consumption by 50% below regional Pittsburgh 2030 District water baselines, as specified by use type.
 2. Tier 1 and Tier 2 projects shall consider a third party Green Building Rating System or Certification. The Professional shall evaluate the following Sustainability Rating Systems and Certifications, and demonstrate to the University whether they are viable options:
 - a) LEED.
 - b) Passive House.
 - c) WELL.
 - d) Fitwel.
 - e) Zero Energy.
 - f) Zero Carbon.

- g) Living Building Challenge.
 - h) ParkSmart.
 - i) Other internationally relevant third-party sustainability rating systems to be determined.
- D. University's Rating Requirements: Project will fall into one of the following Tier Classifications as outlined in the Request for Proposal and Owners Project Requirements (OPR).
1. Tier 1 Projects: New buildings and full building renovations with a comprehensive scope that includes room configuration modifications, new HVAC systems, envelope modifications, and new lighting. Must achieve a minimum level as established by the EUI and WUI targets. Evaluate the feasibility of pursuing other Sustainability Certification listed above as an alternative to the LEED-NC v4 Certification.
 - a) Tier 1: Projects in excess of \$5 million in total costs, it is the University's preference that these projects achieve a minimum level of Certification Performance.
 2. Tier 2 Projects: Partial renovations or fit-outs of existing facilities in which systems within the renovated spaces are largely replaced (e.g. lighting, finishes, plumbing, and/or HVAC), but base building HVAC systems and the building envelope remain unaffected.
 - a) Tier 2: Projects between \$1 million and \$5 million in total costs. Could achieve a minimum level of Certification Performance.
 3. Tier 3: Projects less than \$1 million in total costs. Renovations to systems with an energy impact but are focused only on those systems (e.g. controls upgrades, AHU replacement, lighting replacement, etc.).
 4. Tier 4 Projects: Site improvement projects with a scope that includes green site infrastructure, landscaping, vegetative roofscapes, lighting, pervious paving, restoration of exterior environment, etc.
 5. Tier 5 Projects: Leased fit-out and joint venture projects will be on a case by case basis.
- E. To ensure that the University's Project Sustainability Design Guidelines are accomplished the Professional shall provide appropriate documents at the end of each phase of the design process to prove that the project design supports the University's sustainability goals, conforms to the requirements of the Sustainability Rating System and fully meets the University's Sustainability Certification requirements as outlined in the Request for Proposals or as otherwise agreed upon.
- F. Professional shall prepare sustainability documentation in the Contract Documents that provides direction to the Contractor to achieve the required Sustainability Certification.
- G. Professional shall have on staff or hire a consultant with a professional Sustainability Credential applicable to the Certification(s) being pursued.

C.9. SECTION 018113 SUSTAINABILITY DESIGN REQUIREMENTS

- A. Professional shall prepare this section to include general requirements and procedures for Construction Phase Sustainability Submittals, for compliance with the selected sustainability guidelines as stated in the Request for Proposals and amended during the Design Development Phase.
- B. Sustainability Project Checklist: Section shall include checklist addressing all credits project might pursue under selected Sustainability Rating System(s).

- C. Professional shall include language that all submittals and transmissions to the Sustainability Rating System shall be copied to University's Project Manager. At the end of the project, the Professional shall add designated University personnel to online submission portal for the project and deliver to University's Project Manager on electronic media, all documentation for Sustainability Certification and correspondence with the Sustainability Rating System.
- D. Water Management Goals:
1. Increase the harvesting and recycling of water resources in building and landscape projects.
 2. Reduce the consumption of potable water.
 3. Maintain the aesthetics of the campus landscape.
 4. Minimize impacts to natural resources from the discharge of storm water.
 5. Encourage prudent financial decisions associated with water use.
 6. Calculate life cycle costs of alternative system(s) for payback of investment.
 7. Eliminate the use of potable water for landscape.
 8. All project energy and water usage must be metered/sub-metered at the building level and any individual energy or water end use(s) that represent 10% or more of the total annual consumption of the building.
- E. Storage for the Collection of Recyclables and Compostables: All projects shall incorporate infrastructure for the storage and collection of recyclables and compostable food scraps upon occupancy.
- F. Product Requirements:
1. Regardless of the selected Sustainable Rating System, all materials and resources for every project shall meet the following goals:
 - a) Reduce consumption and depletion of material resources, especially nonrenewable resources.
 - b) Minimize the life-cycle impact of materials on the environment.
 - c) Enhance indoor environmental quality.
 - d) Minimize waste generated from construction, renovation, and demolition of buildings.
 - e) Encourage better management of and minimize waste generated during ongoing occupancy
 2. Use Materials with Low Life-Cycle Cost: Use a life-cycle methodology to evaluate materials. Choose materials, especially those used in large quantities, with the lowest environmental impact when possible.
 3. Explore use of Materials that provide reduced embodied carbon of primary materials compared to an equivalent baseline. Projects may select products with lower than industry average embodied carbon for the following product categories:
 - a) Ceiling tiles/acoustic treatments.
 - b) Flooring.
 - c) Gypsum wallboard.
 4. Production: In order to conserve embodied energy, which is the total amount of energy needed to create a material from raw extraction to finished life of the product, and reduce the consumption of natural resources, consider the following:
 - a) Salvaged materials (e.g., reuse furniture, wood flooring, light fixtures, other building materials).
 - b) Remanufactured materials, such as engineered wood products.
 - c) Recycled-content products and materials (post-consumer is preferred over pre-consumer).
 - d) Reusable, recyclable, and biodegradable materials.
 - e) Materials from rapidly renewable sources (e.g., wheat, cotton, cork, bamboo, etc.).
 - f) Wood certified by the Forest Stewardship Council (FSC).

5. Use Locally Manufactured Materials: Obtain materials and products from local sources and manufacturers, minimizing energy use and pollution associated with transporting from great distances.
 - a) Regional Material: To the maximum extent feasible and practicable, materials and products (by cost) shall be manufactured in the Commonwealth of Pennsylvania. It is the University's strong preference to begin with the closest local region first, and then move outward, and finally up to the 100 mile region beyond. 20% or more of the materials construction budget shall be from within 100 miles of the project site.
 6. Use Durable Materials: Use products or materials (including masonry, steel, glass, and timber products such as beams, columns, floorboards, etc.) that are durable (with a life cycle of at least 50 years), weather well, and last more than one building lifetime (i.e., through a reuse or remodel).
 7. Healthy Materials:
 - a) The Professional and Contractor shall strive to use products that provide healthy indoor environments; this includes using products that avoid chemicals of concern as designated by Health Product Declarations (HPDs), Declare labels, and Cradle to Cradle (C2C) Material Health Certificates.
 - b) Use No or Low Volatile Organic Compound (VOC)-emitting Materials: Professional and Contractor shall strive to use low or no Volatile Organic Compound (VOC)-emitting materials (including paints, coatings, adhesives, carpet, ceiling tiles, and furniture systems) to help ensure good indoor air quality.
 - c) All site installed, wet applied products shall meet the VOC emissions limits of CARB 2007 and SCAQMD Rule 1168.
 - d) All interior products with the potential to emit shall be chamber tested and shown to meet the emissions thresholds of CDPH Standard Method v1.1-2010.
- G. Close-Out Documentation:
1. Contractor shall collect and turn over documentation that shall assist with efficient operations of the space or shall be beneficial to the performance of future University projects. This process should be done in a consistent and thorough process and includes the following requirements:
 - a) Contractor shall prepare and turn over to the Facilities Department a Systems Manual following the requirements of ASHRAE Guideline. This is frequently delivered as part of the project's commissioning (Cx) efforts.
 - b) Official acceptance of O&M documentation must be approved by University's Project Manager.
 - c) Contractor shall submit documentation required by University's Project Manager, including as-built energy model with summary of inputs and outputs and electronic model file.
 - d) Provide electronic access to the selected Sustainability Rating Systems' online account and content to University's Project Manager for university tracking purposes.
 - e) Provide a final copy of the project's Deliverables and associated documentation to University's Project Manager.

DIVISION 020000 – EXISTING CONDITIONS

C.10. SECTION 024100 DEMOLITION

- A. *Professional Note – Professional shall coordinate, document and detail demolition requirements with information in University of Pittsburgh, Special Requirements Division B and information within this section.*
- B. Owner Occupancy, Hazardous Materials, and Salvaged Materials: Refer to Section 011000 - Summary.

- C. Sustainability: Execute work of this section in a manner that maximizes salvage and recycling of materials and includes the dismantling and removal of the materials listed below to support the University's goals for sustainability goals.
1. Concrete: May be crushed and graded for use as riprap, aggregate, sub-base material, or fill.
 2. Brick: May be re-used if whole and undamaged; crushed for use as landscape cover, sub-base material, or fill.
 3. Concrete Block: May be re-used if whole and undamaged; crushed for use as sub-base material or fill.
 4. Land Clearing Wood: May be chipped or shredded for use as ground cover, mulch, compost, pulp or process fuel.
 5. Wood: May be sorted by type and size for re-use or remanufacturing.
 6. Doors: May be salvaged. When a door is permanently removed, remove cylinder from door and return to University. Refer to "Salvage Materials to be Recycled" below.
 7. Metal: May be separated for recycling.
 8. Hardware: May be salvaged for reuse.
 9. Ceramic Tile: Tile manufacturers will take back tile for recycling.
 10. Acoustical Ceiling Panels: Manufacturer's will take back panels for recycling.
 11. Carpet: Contact carpet manufacturer for take back program for recycling of carpet.
 12. Disposal of Demolished Material: Remove demolished material from Project site and dispose in accordance with Section 017419 – Construction Waste Management and Disposal.
- D. Salvaged Materials to be Recycled: Contractor shall coordinate with University's Project Manager and University of Pittsburgh Surplus Department for items to be salvaged and turned over to the University. After the University's Project Manager and Surplus Department have determined items to be salvaged, Contractor shall contact local building material reuse entities including but not limited to Construction Junction and Doors Unhinged for recycling of materials. Provide verification of material receipt and diversion from landfill. On projects where there is a Construction Manager, the Construction Manager shall be responsible for coordination of salvaged materials to be recycled in accordance with the requirements listed in this paragraph.
1. Wood and Hollow Metal Doors: Remove hardware that would create imbalance or cause damage when doors are stacked, including but not limited to: hinges, levers/knobs, lock cylinders, closers, panic hardware, keyless entry systems, deadbolts, coat hooks, window treatments, misc. brackets and screws, and kickplates. Hardware that is attached to the door edge and doesn't extend beyond either face can remain installed, specifically mortise locks, latches, and flush bolts. If doors are palletized before loading onto truck, stack doors with cardboard on pallet surface and in between doors to prevent scratching of surface, especially on doors with vision lites.
 2. Hardware: Maintain hinges as complete units (i.e. don't remove pin and stow in pieces). Reassemble cylindrical locks so that small pieces aren't lost or separated. For mortise locks, reset set screws in levers to prevent loss. For panic hardware, "bag and tag" loose hardware components. Closers, arms and covers can remain on or be removed, but in either case, set screws shall be reset in closer body. Strike plates and latches can be stowed loose.
 3. Frames:
 - a) Knock-down Type: Remove screws on tabs holding to framing, and from top jamb into side jambs. Remove flooring as necessary to make jamb removable. Stack and bundle all three pieces with plastic wrap. Avoid using hammers and prybars directly on surface and edges of frame to prevent damage, use wood blocks instead.

- b) Welded Type: Remove drywall to expose tabs attached to framing and floor, remove screws & bolts. To prevent twisting and warping, attach a 2x4 at the bottom of the frame by screwing to floor tabs. Glass sidelites and stops can remain in place.
- E. Salvaged Materials for Reuse: Inventory and record condition of items to be removed and salvaged. Inventory shall include company that salvaged the material, materials that were salvaged and weight of materials that were salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
- F. Safety Requirements: Refer to Section 013523 – Owner Safety Requirements.
- G. Haul Routes, Site Fencing and Barriers: Refer to Section 015000 – Temporary Facilities and Controls.
- H. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure University's on-site operations are uninterrupted by coordinating with University's Project Manager.
 - 2. Interruption of utility services. Include coordination for shut-off, capping and continuation of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Coordination of University's continuing occupancy of portions of existing building and of University's partial occupancy of completed Work.
- I. Existing Utilities: Refer to Section 015000 – Temporary Facilities and Controls for temporary use of existing utilities. Review with University's Project Manager extent of removal of utilities and location where utilities should be capped off.
- J. Existing Warranties: Professional shall verify with University's Project Manager if existing materials, installations and equipment are still under warranty. Selective demolition shall be conducted in such a manner that existing material and equipment warranties are still in effect after completion of selective demolition.
- K. Conditions of Structures: University assumes no responsibility for actual conditions of items or structures to be demolished. Conditions existing at the time of commencement of the Work will be maintained by the University insofar as is practical. However, variations within the structure may occur by the University's removal and salvage operations prior to start of demolition work.
- L. Clarification of Scope: Selective demolition related work often results in Change Orders because the scope of demolition is sometimes defined in several different portions of the Contract Documents (mechanical demolition on mechanical drawings, structural demolition on structural drawings, and so on). Professional shall coordinate demolition information in the Contract Documents to ensure that demolition is clearly indicated and to minimize "buy it twice" problems by having more than one subcontractor assume it is responsible for specific demolition items.
- M. Blasting and burning is not permitted on University property.
- N. Structure Removal: Where new structures will replace existing structures, normally, existing foundations shall be removed in their entirety. Professional shall review this guideline with University's Project Manager. Use of crushed, clean concrete as fill or drainage material is acceptable. If not reused on-site, salvage concrete and transport to be recycled diverting from landfill.

DIVISION 030000 - CONCRETE

C.11. SECTION 033000 CAST-IN-PLACE CONCRETE

- A. Concrete is a structural material. Therefore, exterior and interior concrete exposed to public view shall be coated with a finish material. The University strongly favors the use of light colored concrete (gray or white) because of its high reflectance which assists in reduction of heat island effect.
- B. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration for 90% by volume for all concrete mixes used in the project in the "Concrete Mix Specification Table" within the Concrete section of the structural general notes.
 - 2. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 - 3. Steel reinforcement shall have a recycled of at least 50 percent.
- C. Use of chloride-containing admixtures is prohibited because it can cause detrimental effects on embedded metals and degradation of concrete structures.
- D. Pre-Installation Conference: Conduct conference at Project Site.
- E. Sample Panel:
 - 1. Vertical Components: A sample panel of exposed concrete is required for vertical components prior to the beginning of construction. The panels shall show all of the various finishing techniques that are required in the structure, such as finishes, joints, texture of formed material, and sandblasting. Concrete used shall be provided from project concrete supplier and shall represent the approved project mix in strength, color, and texture.
 - 2. Polished Concrete Floor Finish: Build mockup panel to verify selections made under Sample submittals and to demonstrate typical joints, surface finish, tolerances, and standard of workmanship. Build panel approximately 15 feet by 15 feet.
 - a) Color Sample: Professional shall submit a color sample of the polished concrete floor proposed for use on the project with the Design Binder.
 - b) Residence/Student Housing: Polished concrete may be considered for restrooms and back of house areas.
 - 3. Concrete Restoration - Concrete Removal and Patching: Remove and repair an approximately 50 sq. ft. of deteriorated concrete wall and concrete deck/slab.
- F. Floor Flatness: In accordance with ACI 301 and as required for type of installation to meet project requirements. Professional shall specify Floor Flatness and Floor Levelness requirements to meet project design requirements. Professional shall discuss requirements with the University's Project Manager.
- G. Earth Forming: Is permitted.
- H. Reinforcement: Concrete reinforcement shall be new and of proper grade and strength to meet design.
 - 1. Galvanized or epoxy coated rebar shall be used in corrosive environments such as areas where de-icing agents may be used.

- a) Professional shall review with University's Project Manager where use of epoxy-coated reinforcing steel in severely exposed concrete is required.
- 2. Synthetic Fiber Reinforcement: 100 percent virgin homopolymer polypropylene fibrillated fibers containing no reprocessed olefin materials; complying with ASTM C 1116.
- I. Sheet Vapor Retarder: ASTM E1745, Class A; with maximum perm rating of 0.01 with a minimum thickness of 15 mil. Polyethylene sheet is not acceptable.
- J. Exposed to View Concrete Slabs: A hard trowel finish. A chemical or dry-shake hardener shall be applied to interior concrete floors at back of house areas.
 - 1. Control, Construction, Isolation and Expansion Joint Locations: Review locations with University's Project Manager.
- K. Exterior Concrete: A non-slip light broom finish shall be applied to exterior concrete platform, steps, and ramps and in other areas as required. (Refer to Division R of the Professional Design Manual for guidelines for concrete sidewalk patterns.)
 - 1. Air-entrain exterior concrete and concrete exposed to weather elements.
- L. Professional Note: Exposed Aggregate Concrete – Refer to Division R of the Professional Design Manual. Professional shall meet with University's Project Manager to determine the type and appearance of the exposed aggregate concrete to be incorporated into the project.
- M. Curing: University recommends wet curing instead of curing compounds for structural members, where practical. Do not use membrane-curing compounds on surfaces that are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials.
- N. Chamfer Corners: Chamfer exterior corners and edges of cast-in-place architectural concrete.

C.12. SECTION 035400 CAST UNDERLAYMENT

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration for 90% by volume for all concrete mixes used in the project in the "Concrete Mix Specification Table" within the Concrete section of the structural general notes.
 - 2. Product Data:
 - a) Provide for materials, adhesives, sealants, and membranes, indicating low to no VOC content (including compliance with South Coast AQMD Rule 1168).
 - b) Provide Healthy Product Declaration, if available.
 - 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
- B. General:
 - 1. Cast underlayment is often required for leveling existing floors.
 - 2. Hydraulic cement underlayment shall be used on concrete substrates and where moisture may be present.
 - 3. Gypsum-cement-based underlayment should not be used where moisture may be present. Gypsum-cement based underlayment may be used in housing projects where sound transmission characteristics are required.

4. Primers: Primers must be specified and shall be approved for use with cast underlayment by the manufacturer.
- C. Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/4 inch (6 mm) and that can be feathered at edges to match adjacent floor elevations. Compressive Strength according to ASTM C 109/C 109M but not less than 4000 psi. Gypsum based products shall be not be used unless approved by University's Project Manager.
 - D. Gypsum-Cement-Based Underlayment: Gypsum-cement-based, self-leveling product that can be applied in minimum uniform thickness of 1/8 inch and that can be feathered at edges to match adjacent floor elevations. Compressive Strength according to ASTM C 109/C 109M but not less than 2,500 to 3,000 psi.
 1. Sound Mat: Provide sound controlling mats to meet Sound Transmission Characteristics required by project design requirements.

DIVISION 040000 - MASONRY

C.13. SECTION 040120 MASONRY RESTORATION

- A. All masonry construction and repair on historic structures shall be accomplished only upon the advice and direction of the University Architect. Work shall comply with the Preservation Briefs prepared by the National Park Service. When the Preservation Brief provides options, method shall be per direction from the University Architect.
- B. For all historic structures, mortar joint removal techniques and new mortar joint profiles are critical. Removal of failed mortar, if possible, must be accomplished gently so that bricks or stone are not damaged. Hand chiseling is the only acceptable removal technique. Air hammers and masonry saws are prohibited.
 1. Mortar Mixes and Colors: Professional shall specify mortar mixes, colors and proportions to match existing and in conformance with historical preservation requirements.
- C. Brick, Terra-Cotta and Stone Removal and Replacement:
 1. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
 2. Install replacement units into bonding and coursing pattern (tooth-in) of existing installation. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
 - a) Replacement units shall match existing and be in conformance with historical preservation requirements.
 3. Tool exposed mortar joints in repaired areas to match joints of surrounding existing work.
- D. Mockups: Along with mortar content, mortar color and masonry unit type, pointing techniques must be presented in advance in sample panels no smaller than 4 feet x 4 feet, located at the building site (or transportable to the site) for approval by the University's Project Manager and University Architect.
- E. Sealants for Expansion and Control Joints: Review color of sealant with University's Project Manager and University Architect. Coordinate color of sealant with unit masonry mock-up.

C.14. SECTION 042000 BRICK, STONE, AND UNIT MASONRY

Professional Note -- Professional shall show on the contract documents, the locations of expansion and control joints, and their construction details.

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 - 3. Steel reinforcement shall have a recycled content of at least 80 percent.
- B. Pre-Construction Conference: Specify pre-construction conferences prior to commencing masonry work including restoration and cleaning work. Discuss proposed materials, methods, sequence schedule, project conditions, and other relevant items.
- C. Samples: During project design, actual samples of the brick units shall be submitted to the University for approval and acceptance of the materials for appearance, color and characteristics.
- D. Mortar Samples: For exposed masonry, samples shall be submitted for mortar materials, including cement for each aggregate. The University standard for mortar mix is ready-mixed or premixed bagged mortar composed of portland cement and hydraulic hydrated lime.
- E. Mock-ups: Prior to installation of masonry work, at a minimum, an 8 feet wide x 4 feet high mock-up wall shall be erected to further verify selection made for color and textural characteristics with the selected samples of masonry, mortar and sealant, and to represent completed masonry work for quality and appearance, materials and construction. Masonry materials shall not be ordered by Contractor until the mock-up panel has been approved by University's Project Manager and Professional.
 - 1. Include a sealant-filled joint at least 16 inches (400 mm) long.
 - 2. Include lower corner of window opening at upper corner of exterior wall mockup complete with flashing and sealant. Make opening approximately 12 inches (300 mm) wide by 16 inches (400mm) high.
 - 3. Include through-wall flashing with weep vent, installed for a 24-inch (600 mm) length in corner of exterior wall mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
 - 4. Coordinate masonry wall mockup with Section 072000 Thermal Protection for requirements for integrated building enclosure mockup and testing.
- F. Face Brick and Stone Units: It is of the utmost importance that the Professional reviews brick selection for new and renovation buildings with the University's Project Manager and University Architect in order to insure a proper match.
 - 1. BRADFORD CAMPUS – Predominantly Brown Modular Brick (Belden - Venetian Blend A), Precast (Advance Cast Stone, Inc. - Sandstone), Red Modular Brick, and Natural Fieldstone (Rolling Rock Building, Inc. - Chester Brook Blend).
 - 2. GREENSBURG CAMPUS – Predominantly Wire-Cut Modular Red Brick.

3. JOHNSTOWN CAMPUS– Predominant material is Natural Pennsylvania Fieldstone (Valley Forge Rubble Stone) from a local quarry Chester County, Honey Brook, PA. Should this material be selected for a new building, the stone must be obtained from Valley Forge. The University has a large amount of stone reserved in this quarry
 4. OAKLAND CAMPUS– Blend of Indiana Limestone, modular face brick: multi-color (buff to brown to grey).
 5. TITUSVILLE CAMPUS – Predominant material is Modular Brick: Red Blend, Grey, and Limestone.
- G. For DGS projects, Professional shall select and obtain University approval of three (3) comparable brick samples from different manufacturers, all of which shall match the University brick standard for the particular location.
 - H. *Professional Note -- Professional shall specify efflorescence testing of all brick used in exterior locations.*
 - I. Brick Units: In accordance with the Brick Institute of America and in compliance with ASTM Standards. Minimum Grade SW.
 - J. Masonry Units: Provide uniform in texture and color, or a uniform blend within the ranges accepted for these characteristics.
 - K. Mortar: University's standard for mortar mix is ready-mixed or premixed bagged mortar composed of portland cement and hydraulic hydrated lime.
 1. Masonry Cement: Not allowed.
 - L. Admixtures: Setting accelerators or antifreeze compounds are not permitted.
 - M. Thru-Wall Flashings, Construction and Control Joints: Provide as may be required for the work, and properly detailed in the Contract Documents. Contract Drawings shall indicate control and expansion joints in accordance with recommendations of the Brick Institute of America (BIA). Through-wall flashing shall be installed beneath all coping stone installations.
 1. Thru-Wall Flashings:
 - a) University preferred:
 - (i) Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and the Brick Institute of America Tech Note Standards.
 - (ii) Stainless steel Type 304 and stainless steel sheet laminated to polymer fabric with non-asphaltic adhesive; dull finish.
 - (iii) Copper Temper H00, 16 ounces, tin-coated copper and copper sheet laminated to polymer fabric with non-asphaltic adhesive.
 - b) Not Acceptable:
 - (i) Asphalt coated copper, rubberized asphalt, EPDM, and elastomeric thermoplastic type flashings. Avoid the use of metal flashing that may be susceptible to corrosion when adjacent to masonry construction, such as aluminum.
 - c) Special Conditions (i.e.: Historical Projects): Where masonry walls require specialized consideration, review conditions with University's Project Manager and University Architect.
 - d) Sheet Metal Copings and Trim: Refer to Division 07, Section 076200.

2. Sealants for Expansion and Control Joints: Review color of sealant with University's Project Manager and University Architect. Coordinate color of sealant with unit masonry mock-up.
- N. Veneer Ties: Brick veneer shall be designed, detailed, and tied to the supporting construction so that positive and negative wind loads are transferred to the supporting construction and not resisted by the veneer. Veneer ties shall be designed to decrease thermal transfer. Veneer ties, wire ties, and all other anchors for masonry work shall be hot dip galvanized or stainless steel; mill galvanized is not acceptable.
1. Stone Masonry: Set with stainless steel fasteners and anchors and comply with the recommendations of the Indiana Limestone Institute of America, Marble Institute of America, or the National Building Granite Quarries Association as appropriate.
 2. Design Analysis: Where required by design of exterior wall, Contractor shall furnish with an engineer seal, engineered wall tie analysis, for each width of insulation plus cavity; for each wall composition present in the project. This may require multiple analyses be submitted. Analysis must be in reference to MSJC/ACI 530 Code for Masonry Anchored Veneer, and width of insulation and cavity.
- O. Cavity Walls: Contractor shall keep cavities clean of mortar droppings and other materials during construction. Provide not less than 2 inch (50 mm) of airspace behind masonry veneers.
- P. Cavity Drainage Material: Drainage material shall be provided to prevent mortar droppings clogging weeps and other cavity drainage components.
- Q. Weeps and Vents: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, honeycomb design to restrict ingress of insects and debris; color to match mortar. Weeps shall be located at the top and bottom of each cavity section, i.e. window heads, relieving angles, etc., no more than 24" on center horizontally and in accordance with the BIA.
- R. Masonry Reinforcing: Masonry reinforcing shall be hot-dipped galvanized.
- S. Coursing:
1. Existing Buildings: Match existing masonry coursing, bonding and appearance as approved by the University's Project Manager and University Architect.
 2. New Buildings: Pattern, coursing and appearance as approved by the University's Project Manager and University Architect.
 3. Mock-Up: Coordinate sealant selection with masonry mockup.
- T. Tothing: Stop work by racking back units in each course from those in course below. As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items. If items are not ready to be installed, items are be installed into bonding and coursing pattern (tothing-in) of existing installation. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
- U. Environmental Limitations: Unless adequate protection against freezing is provided, no masonry work shall be performed when the temperature is below 36°F or predicted to be 36°F degrees overnight.
1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

DIVISION 050000 – METALS

C.15. SECTION 051200 STRUCTURAL STEEL

- A. Structural steel work is defined in the American Institute of Steel Construction (AISC) “Code of Standard Practice.”
- B. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 - 4. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- C. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- D. Coordinate factory applied steel primers and coatings with scheduled fireproofing coatings and painted finishes.
- E. Architectural Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.
 - 1. Welds: AESS 4; Welds to be ground contoured or blended to provide a smooth transition.

C.16. SECTION 053000 METAL DECKING

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
- B. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- C. Floor Decking: University prefers hot-dip galvanized steel, minimum G60 zinc coating. Coordinate use of fireproofing applied to painted decking.
- D. Roof Decking: Use only hot dip galvanized steel, minimum G90 zinc coating and minimum 20 gauge (0.0358 inch) (0.91 mm) thickness.
 - 1. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class I-120 windstorm ratings.
- E. Coordinate factory applied steel primers and coatings with scheduled fireproofing coatings and painted finishes.

C.17. SECTION 055000 MISCELLANEOUS METAL FABRICATIONS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 - 4. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent
- B. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- C. Wherever dissimilar metals may come in contact with each other in exterior conditions, they must be separated with an approved layer of bituminous coating or other anti-galvanic coating products. In areas exposed to exterior conditions, galvanized metal or zinc plated fasteners shall not be used to anchor aluminum or copper; use stainless steel, aluminum or copper fasteners.
- D. Lintels and Shelf Angles: Hot-dip galvanize loose steel lintels and shelf angles located in exterior walls and interior corrosive and high humidity area walls. Factory prime loose carbon steel lintels in non-corrosive and non-high humidity area interior walls. Coordinate factory applied primers with scheduled painted finishes of lintels.
 - 1. Follow the Brick Industry Association recommendations for lintels and shelf angles.
- E. Exterior Uses: All miscellaneous metal fabrications exposed to elements and/or road salts must be either Stainless Steel Type 316 or hot dip galvanized after fabrication. No ferrous metal sleeves into concrete slabs are allowed.
- F. Exterior Roof Ladders: Access ladders for exterior use shall be hot dip galvanized steel, stainless steel or aluminum. Ladders exposed to potential public access must have integrally designed anticlimbing protection to provide a deterrent for unauthorized usage. Refer to University of Pittsburgh's Fall Protection guidelines attached to the end of this document.
 - 1. Mounting hardware, fasteners, and anchors shall be Type 316 stainless steel.
- G. Interior Ladders:
 - 1. Roof Access Ladders: Provide lockable covers to deter unauthorized use. Whenever possible, locate ladders to roof areas in locked, non-public spaces.
 - 2. Ladders in Corrosive Areas: Use hot-dip galvanized steel or stainless steel assemblies. Mounting hardware, fasteners, and anchors shall be stainless steel.
- H. Coordinate factory applied primers and coatings with scheduled painted finishes.
- I. Medical Treatment Areas, Laboratory Areas: In projects that incorporate areas where equipment produces high magnetized fields or attraction, use non-ferromagnetic materials for trench covers, ladders and other products within the area.

C.18. SECTION 055100 METAL STAIRS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 - 4. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
- B. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- C. Interior Utilitarian Metal Stairs (Back-of-House): Interior stair construction standards allow for the use of flat steel plate, MC shapes or HSS shapes for stringers where acoustic concerns for adjacent spaces do not exist or are otherwise mitigated. HSS sections are preferred for appearance and maintenance reasons but are not required. Concrete-filled steel pan stairs are preferred for interior construction. Checker plate steel treads and landings are only allowed in lightly used mechanical spaces, not public stairs.
 - 1. Metal Nosings: Nosing shall be two-piece, extruded aluminum with slip resistant, abrasive design. Abrasive inserts shall be durable and easily replaced. Provide photoluminescent or contrast stair nosings or strips to meet accessibility and egress codes. Provide cast-in-placed at new projects and mechanically attached at renovation projects. Professional shall review with and submit product data and picture to the University's Project Manager.
- D. Interior Ornamental Metal Stairs: Higher-quality treads and risers are appropriate for exposed monumental interior stairs. Wood treads are not suitable for public stairs. Slip-resistant tread surfaces are required.
- E. Exterior Metal Stairs (covered or uncovered): Exterior stair construction requires all ferrous metal components to be hot-dipped galvanized after fabrication. Concrete-filled steel pan stair treads are not allowed due to internal rusting issues and maintenance concerns. All exterior steel stairs must be designed for safe use in snow and icing conditions. Industrial-style open grate treads are not suitable for public stairs. The use of stainless steel or more corrosion-resistant materials is encouraged.
 - 1. Mounting hardware, fasteners, and anchors shall be Type 316 stainless steel.
- F. Coordinate factory applied steel primers and coatings with scheduled painted finishes.

C.19. SECTION 055200 METAL RAILINGS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.

4. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
- B. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
 - C. Fall Protection: Refer to University of Pittsburgh's Fall Protection guidelines attached to the end of this document. Professional shall review guidelines with University's Project Manager.
 - D. Exterior Railings:
 1. Roof Areas: Hot-dip galvanized assemblies.
 2. High Traffic Public Areas – Non-Decorative: Stainless steel type 316, aluminum or coated galvanized steel assemblies; design and material must be approved by the University's Project Manager and University Architect.
 3. Historical Public Areas: Design to be in concert with existing conditions; design and material must be approved by the University's Project Manager, University Architect, and historical preservation requirements.
 4. Utilitarian Railings – Non-Public Areas: Hot-dip galvanized steel railings.
 - E. Interior Railings:
 1. Corrosive Areas: Stainless steel type 316 or hot-dip galvanized assemblies; type as required for conditions encountered.
 2. High Traffic Public Areas – Non-Decorative: Stainless steel type 316, aluminum or coated galvanized steel assemblies; design and material must be approved by the University's Project Manager and University Architect.
 3. Historical Public Areas: Design to be in concert with existing conditions; design and material must be approved by the University's Project Manager, University Architect, and historical preservation requirements.
 4. Utilitarian Railings – Non-Public Areas: Painted steel railings.
 - F. Manufacturers: Provide products from manufacturers with multiple years of successful experience or approved local fabricating company meeting requirements of the metal railing section.
 - G. Weld corners and seams continuously. Finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
 - H. Mounting hardware, fasteners, and anchors shall be Type 316 stainless steel.
 - I. Coordinate factory applied steel primers and coatings with scheduled painted finishes.

C.20. SECTION 057300 DECORATIVE METAL RAILINGS

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.

3. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
- B. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- C. Exterior and Interior Decorative Railings and Balusters:
1. Stainless steel type 316, aluminum or coated galvanized steel assemblies; design and material must be approved by the University's Project Manager and University Architect. Baluster infill panels can be perforated stainless steel plate or mesh. Structural safety glazing rails and/or balusters are permissible. Laminated safety tempered glass shall be rated for exterior use and edge difference between planes of glass shall not be more than 1/16 inch.
 2. Exotic materials and all designs must be approved by the University's Project Manager and University Architect.
- D. Weld corners and seams continuously. Finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- E. Mounting hardware, fasteners, and anchors shall be Type 316 stainless steel.

DIVISION 060000 – WOOD, PLASTIC AND COMPOSITES

C.21. SECTION 061000 ROUGH CARPENTRY

- A. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 4. Chain-of-Custody Certificates: Provide for certified wood products including statement of costs.
 5. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
 6. Product Data: Provide for installation adhesives, indicating low to no VOC content and for overall carpentry, indicating no added urea formaldehyde.
 7. Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.
- B. Use fire treated 3/4" plywood for backboards in electrical, voice and data rooms.
- C. Use pressure treated wood for blocking where moisture may be encountered, such as below grade locations and roof locations. Recycled composite materials are also acceptable. Use fire-retardant treated wood blocking where required by code.

C.22. SECTION 064000 ARCHITECTURAL WOODWORK

- A. Comply with Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program last adopted Edition.
 - 1. Fabricators Qualifications: Certified participant in AWI's Quality Certifications Program.
 - 2. Interior Woodwork Grade: Provide Premium-grade for interior woodwork and casework.
 - 3. Related Work: Work of this section applies to casework fabricated by local architectural millwork fabricators. Refer to Division 12 of this document for guidelines related to manufactured casework and casework for laboratories.

- B. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 - 4. Chain-of-Custody Certificates: Provide for certified wood products including statement of costs.
 - 5. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
 - 6. Product Data: Provide for installation adhesives, indicating low to no VOC content and for overall woodwork, indicating no added urea formaldehyde.
 - 7. Recycled Content of Medium-Density Fiberboard and Particleboard: Postconsumer plus one-half of pre-consumer recycled content not less than 50 percent.
 - 8. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 9. Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.

- C. Wood Species: As determined by project design between Professional and University's Project Manager.
 - 1. The Professional shall strive to select wood that meets the "Legal Wood" definition as determined by ASTM D7612 and to select wood from regional and domestic legal wood species.

- D. Cabinet Construction: AWI - Premium Grade; door and drawer construction (flush overlay, reveal overlay, etc.), shall be determined by project design between Professional and University's Project Manager.
 - 1. Wood Cabinets: Door, drawer, cases and shelves shall have solid hardwood edges.
 - 2. Plastic Laminate Cabinets: Door, drawer, cases and shelves shall have a 3 mm solid PVC or ABS (Acrylonitrile Butadiene Styrene) edge banding matching plastic laminate color.

3. Food Service Areas: Base cabinets shall have a solid surface or solid phenolic material at toe-kick base. Professional shall discuss alternative options with University's Project Manager.
- E. Cabinet Hardware: Since the AWI reference standard requires only "hardware standard with woodworker," the casework hardware must be specified in detail to control quality and shall be determined by project design between Professional and University's Project Manager.
1. Hinges: Concealed hinges (European Type).
 2. Pulls: Drawer and door pulls shall be barrier-free but shall not protrude in a manner that suggests the pull could be used as a step. Mount horizontally on drawers and vertically on doors. Brushed or anodized aluminum, or satin finish stainless steel
 3. Shelf Standards and Supports: Adjustable metal standards and clips in load capacity appropriate for intended use.
 4. Drawer Slides: High quality ball-bearing, full-extension, slides with load capacity appropriate for the intended use (minimum Grade 1) and soft close.
 5. Door and Drawer Locks: To accept Best cores; confirm with University's Project Manager.
 6. Finish: As determined by project design between Professional and University's Project Manager.
 7. Hardware used on casework must be readily and commonly available.
- F. Countertops, Wall Caps and Window Stools:
1. High Use Public Areas: Quartz or large format Porcelain.
 2. Restrooms and Other Areas Where Scratches are Not Expected: Solid surfacing materials. Material shall be tested for wear.
 3. Non-Wet Areas (Offices and Classrooms): Plastic laminate countertops shall be constructed with backer sheets or balancing sheets on concealed surfaces to reduce warping. All parts of the core shall be completely covered with laminate or thoroughly sealed against moisture to reduce the likelihood of the core swelling and causing the laminate to come loose; this is especially important at loose splashes.
 4. Professional Notes:
 - a) Professional shall review and discuss with University's Project Manager locations of the above materials for countertops, wall caps, window stools and other areas scheduled to receive millwork.
 - b) Quartz and Solid Surfacing Materials: University is concerned with chip mixture and resin formula to prevent visual scratching and translucent chips occurring along the edge of the material which provide the appearance of a damaged edge. Materials shall be discussed with University's Project Manager.
- G. Radiator and Fin Tube Enclosures:
1. Panel: Plastic laminate or wood panel, as required to meet project design requirements, secured Star Hanger Systems Plastic Clips with Omnia 9588_60 pulls. Insulation shall be adhered to back of panel.
 2. Valve access: Enclosures shall provide access to valves and fittings within the system. Furniture plans shall be incorporated to prevent access limitations for future maintenance.
 3. Louvers: Aluminum grills, non-flange type sized to meet free-area requirements of mechanical equipment. Finish of louvers to match project interior hardware standard.

H. Finishes:

1. Finishing Closed-Grain Woods: Apply a two-coat, baked, clear finish consisting of a thermosetting catalyzed sealer and a thermosetting catalyzed conversion varnish. Sand and wipe clean between applications of sealer and topcoat. Topcoat may be omitted on concealed surfaces.
2. Finishing Open-Grain Woods: Apply a three-coat, baked, clear finish consisting of a thermosetting catalyzed sealer and two coats of a thermosetting catalyzed conversion varnish. Sand and wipe clean between applications of sealer and topcoat and between topcoats. Topcoats may be omitted on concealed surfaces.

C.23. SECTION 064200 WOOD PANELING

- A. Comply with Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program last adopted Edition.
 1. Fabricators Qualifications: Certified participant in AWI's Quality Certifications Program.
 2. Woodwork Grade: Provide Premium-grade for interior woodwork and casework.
- B. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 4. Chain-of-Custody Certificates: Provide for certified wood products including statement of costs.
 5. Laboratory Test Reports: Provide for composite wood products, indicating compliance with requirements for low-emitting materials.
 6. Product Data: Provide for installation adhesives, indicating low to no VOC content and for overall wood paneling, indicating no added urea formaldehyde.
 7. Recycled Content of Medium-Density Fiberboard and Particleboard: Use and document postconsumer plus one-half of pre-consumer recycled content not less than 50 percent.
 8. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 9. Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.
- C. Wood Species: As determined by project design between Professional and University's Project Manager.
 1. The Professional shall strive to select wood that meets the "Legal Wood" definition as determined by ASTM D7612 and to select wood from regional and domestic legal wood species.
- D. Trim Accessories: Provide designed trim to retain, cover edges and trim out paneling.

E. Wood Display Paneling:

1. Panels shall be constructed utilizing a 48# density medium density fiberboard (MDF) substrate, having internal bond strength of 110# per square inch minimum. Panels shall have formaldehyde emissions of .3 PPM or less and shall comply with HUD 24 CFR Part 3280 Standards set fourth for particleboard panels.
2. Panels shall have engineered "T" grooves factory machined into ¾ inch (19 mm) thick substrate reinforced with aluminum insert, mill finished. Space grooves 3 inches (76 mm) on center.
3. Panel Finish: Wood veneer or high pressure laminate; as determined by project design between Professional and University's Project Manager.
 - a) Wood Veneer: Architectural grade rotary cut veneer, 0.035 inch (0.89 mm) thick, applied to substrate by cold press with balancing veneer backer sheet; factory finished.
 - b) High Pressure Laminate: Vertical grade 0 .030" (0.762mm) thick high pressure plastic laminate adhered to wood fiber substrate by cold pressing polyvinyl acetate (PVA) type II, water resistant adhesives with balancing backer sheet.
4. Trim: Provide edge and corner trim units.

DIVISION 070000 – THERMAL AND MOISTURE PROTECTION

C.24. SECTION 071000 DAMPPROOFING AND WATERPROOFING

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. Below-grade foundation walls and masonry work must be damp-proofed and/or waterproofed to meet the design requirements and site conditions. Sheet membrane waterproofing systems are preferred, however it is the Professional's responsibility for selecting the appropriate waterproofing system to solve specific situations.
1. Waterproof Warranty: Contractor shall provide a minimum 10-year warranty for waterproofing systems and adjacent work disturbed during repairs and/or replacement.
 2. Perimeter Drainage: Provide for perimeter drainage of footings.
 3. Provide dedicated protection course/drainage medium at waterproofing and dampproofing locations approved by waterproofing manufacturer.
- C. Provide waterproofing membrane on suspended interior slabs where restrooms, toilets, showers and similar wet-type facilities are located.

C.25. SECTION 071800 TRAFFIC COATINGS

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Test Reports: Document for roof materials indicating that roof materials comply with Solar Reflectance Index requirements.

3. Product Data: Provide for coatings, indicating low to no VOC content.
 4. Laboratory Test Reports: Provide for coatings, indicating compliance with requirements for low-emitting materials.
 5. ENERGY STAR Listing: Provide traffic coating that is listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
 6. Low-Emitting Materials: Interior coatings shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Traffic Coatings - Concrete Horizontal Surfaces: Traffic-bearing, seamless, high-solids-content, cold liquid-applied, elastomeric, waterproofing membrane system with integral wearing surface for vehicular traffic; according to ASTM C 957.
- C. Warranty: Contractor shall provide a minimum five-year warranty for material and installation as well as repair of adjacent improvements.

C.26. SECTION 071900 WATER REPELLENTS

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for coatings, indicating low to no VOC content.
 3. Laboratory Test Reports: Provide for coatings, indicating compliance with requirements for low-emitting materials.
- B. Exterior Concrete Masonry Surfaces: University prefers a water-based, penetrating siloxane of percentage required to properly seal the surface of the masonry units. Coordinate mockup with Section 042000 Unit Masonry mockup.

C.27. SECTION 072000 THERMAL PROTECTION

- A. Product Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for adhesives, indicating low to no VOC content.
 3. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
 4. Low-Emitting Materials: Insulation, coatings, and adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Building Envelope: The building envelope, sometimes referred to as the "building enclosure", is comprised of the various components, assemblies and systems that separate the interior environment of a building from the exterior environment. In establishing a boundary between the interior and exterior, the building envelope sets the conditions for the building mechanical and other environmental control systems to regulate the interior climate of the building. Aesthetics are important, but of equal importance are constructability, maintenance, component replacement, and long term performance of the building envelope assemblies.

1. Professional shall review performance criteria with the established project sustainability objectives and energy codes, design and present to the University the building envelope design options and specify the appropriate materials and products. The Professional shall identify each of the layers in the building envelope during the design process starting at Schematic Design Phase, and clearly communicate them by means of building sections and details in the project documentation. Clearly indicate when a layer is intended to serve more than one function.
 - a) Water Barrier: Indicate type (membrane, rain screen, etc.). Design each component of the building enclosure system to prevent water penetration.
 - b) Thermal Barrier: Indicate type (rigid, semi-rigid, spray-applied, rockwool, etc.) Perform a dewpoint analysis for each type of building envelope assembly for typical heating and cooling design conditions. Note the anticipated duration of condensation events and drying potential. In areas where insulation is within a drainage cavity or may be in contact with water, provide insulation of adequate density and water resistance for such application.
 - c) Air/Vapor Barrier: Indicate type and vapor permeability. The building envelope shall be designed to limit vapor transmission as required to avoid undesirable moisture accumulation within the building envelope assembly, and to achieve the project objectives for energy conservation and sustainability. Professional to determine where in the assembly the barrier shall be placed, and its appropriate permeability.
 - (i) Indicate type and the location of planned openings in the building envelope, how these openings are intended to interact with the building ventilation systems, and what mechanisms shall be provided to regulate air migration through the openings
 - d) Continuity of Barriers: As required code, the Professional shall, by means of building envelope sections and details, demonstrate the location and continuity of each required barriers (thermal, air and vapor).
 - e) Fire and Smoke: Use of combustible materials in exterior envelope components is not allowed.
 - f) Exterior Sound/Vibration Barrier:
 - (i) The building envelope shall be designed to limit sound and vibration transmission as required to achieve the programmatic requirements for interior noise and vibration levels.
 - (ii) Indicate the appropriate outdoor/indoor transmission class (OITC) necessary for the building envelope to attenuate exterior airborne sound to acceptable interior levels.
 - (iii) Windows in the exterior wall of auditoriums, lecture rooms, conference rooms, classrooms and other similar spaces shall have a minimum rating of STC 35, unless otherwise recommended by the acoustical consultant and as coordinated with University's Project Manager.
2. Performance Criteria: These standards are intended for buildings that enclose a controlled environment.
 - a) Reduce uncontrolled air movement through the building envelope.
 - b) Heating climate. Limit interior moisture-laden air exfiltration through the building envelope.

- c) Cooling climate. Limit exterior moisture-laden air infiltration through the building envelope.
 - d) Avoid negative affects to indoor air quality (IAQ) and occupant comfort resulting from air leakage through the building envelope.
 - e) The design of building enclosure components shall incorporate elements to meet the air/water infiltration requirements through details that utilize a redundant system concept. Examples of this include, but are not limited to masonry cavity walls, rainscreen facades, and pressure-equalized curtainwalls.
 - f) Details: Envelope performance problems are the result of inadequate coordination or detailing of the transitions between various building envelope systems. The Professional is responsible to ensure coordinated detailing at each connection and transition between these component parts and assemblies, starting in the Schematic Design phase.
3. Contractor Responsibilities: Contractor shall provide coordination of the trades, and the sequence of construction to ensure continuity of the air/vapor barrier system joints, junctures and transitions between materials and assemblies of materials and products, from substructure to walls to roof. Provide quality assurance procedures, testing and verification.
- a) Organize preconstruction meetings between the trades involved in the whole building's air barrier system to discuss where each trade begins and ends and the responsibility and sequence of installation of all the air-tight joints, junctures, and transitions between materials, products and assemblies of products specified in the different sections, to be installed by the different trades.
 - b) Build a mock-up before proceeding with the work, satisfactory to the University's Project Manager and University Architect, of each air-tight joint type, juncture, and transition between products, materials and assemblies. In rain screen applications (including masonry) test the air/vapor barrier of the mock up with all clips, penetrations, and attachments, but before the installation of insulation and cladding materials.
 - c) Coordinate University approval of the aesthetics of the exterior mockup and performance testing on the mockup including commissioning. Coordinate with Project Sustainability Design and Tier 1 requirements.
4. Field Observation: Retain an independent Building Envelope Consultant and/or Testing Agency to perform the field observations. To the extent practicable, they should be retained directly by the University.
- C. Thermal Barrier:
- 1. Performance: Building envelope shall be designed to limit thermal transmission as required to achieve the project objectives for energy conservation and sustainability.
- D. Air/Vapor Barriers: Fluid-applied membrane air barriers meeting the following performance requirements:
- 1. Materials: Obtain primary ABAA evaluated materials and air/vapor-barrier accessories from single source ABAA evaluated manufacturer. Additional accessory products are acceptable for use provided they are approved by the primary air/vapor barrier manufacturer.

2. Material Performance: Provide air/vapor barrier materials which have an air permeance not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.004 cfm/ft² @ 1.57 psf), [0.02 liters per square meter per second under a pressure differential of 75 Pa (0.02 L/(s·m²) @ 75 Pa)] when tested in accordance with ASTM E2178 (unmodified).
 - a) Material: Fluid applied air/vapor barriers materials are preferred however Professional shall to determine the required barrier and where in the assembly the barrier shall be placed and the appropriate permeability.
3. Assembly Performance: Provide a continuous air/vapor barrier in the form of an assembly that has an air leakage not to exceed 0.04 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.04 cfm/ft² @ 1.57 psf) [0.2 liters per square meter per second under a pressure differential of 75 Pa (0.2 L/(s·m²) @ 75 Pa)] when tested in accordance with ASTM E2357. The assembly shall accommodate movements of building materials by providing expansion and control joints as required. Expansion / control joints, changes in substrate and perimeter conditions shall have appropriate accessory materials at such locations.
4. Whole Building Performance: Air infiltration resistance for the whole building envelope shall not exceed 0.25 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.25 cfm/ft² @ 1.57 psf) when tested in accordance with ASTM E779.
5. Review building envelope materials for vapor permeability. Avoid conditions where moisture can be trapped between vapor barriers with no potential for drying.
6. Permeability Resistance: 0.01 perms per ASTM E96.

C.28. SECTION 072400 EXTERIOR INSULATION AND FINISH SYSTEMS

- A. Use of an exterior finish and insulation system (EFIS) as an exterior building material requires specific approval by the University's Project Manager and University Architect. In any case, EFIS shall not be used at grade, within ten (10) feet above grade, or in other locations which may be susceptible to damage. EIFS systems that incorporate traditional exterior plaster systems as the exterior is preferred.
- B. EIFS systems should be installed with dedicated air/water barrier installed interior of the insulation and dedicated drainage cavity to be provided by system manufacturer.
- C. Pre- panelized EIFS not recommended.

C.29. SECTION 074113 METAL ROOF PANELS

Professional Note – Professional shall incorporate into the Specifications, the requirement for a roofing conference before roof work is to begin. This roofing conference shall have all parties involved in attendance.

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for adhesives, indicating low to no VOC content.
 3. Laboratory Test Reports: Provide for adhesives, indicating compliance with requirements for low-emitting materials.

4. Low-Emitting Materials: Insulation, coatings and adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 5. Recycled Content: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
- B. Performance: Following minimal levels of roof performance shall be provided:
1. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 - a) Fire/Windstorm Classification: Class 1A-120.
 - (i) Roofing installations shall be reviewed with the University's Project Manager, University Architect and Insurance Carrier during the design stages of the Project. University's insurance carrier is Factory Mutual (FM); all roofing systems shall meet FM Global criteria for wind loss prevention.
 2. Hail Resistance: MH
 3. Slope: New roofs shall have a minimum of 6 in 12 pitch.
 4. Cool Roof Design: Cool roof design is a top priority of the University and the Professional shall strive to provide the highest level and shall conform with selected Sustainable Design requirements for project. Cool Roof design is measured by two properties; Solar Reflectance and Thermal Emittance. Solar Reflectance Index (SRI) is a calculated metric that combines solar reflectance and thermal emittance into one value.
 - a) Solar Reflectance Index: Use roofing materials with a solar reflectance index (SRI) equal to or greater than 29 for roofs with a slope greater than 2:12 for 75% of the roof per ASTM E1980.
 - b) Energy Performance: Provide roof panels that are listed on the EPA/DOE's ENERGY STAR "Roof Product List" for steep-slope roof products
 5. Building Envelope Performance: Refer to Section 072000 Thermal Protection for requirements.
 - a) Thermal Performance: As required to meet sustainability design requirements, energy code requirements, and building envelope requirements but not less than R-value of 40.
 - b) Vapor Barrier: Must tie into wall vapor barrier for a continuous plane. Provide type recommended to meet sustainable design requirements, energy code requirements, and building envelope requirements.
- C. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- D. Panel systems shall be reviewed with the University's Project Manager and University Architect for compliance with design, appearance and intent of the work.
1. University's preferred metal roof system is concealed fastener, watertight systems.
- E. Materials: Provide thickness and profiles to minimize or eliminate oil canning.
1. Aluminum Sheet: Coil-coated sheet, ASTM B209 (ASTM B209M), alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance specified. Preferred thickness shall be 0.040 inch (1.02 mm).
 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 (Class AZM150) coating designation; structural quality. Pre-painted by the coil-coating process to comply with ASTM A755/A755M. Minimum thickness shall be 0.034 inch (0.86 mm) (22 gage).

3. Copper Sheet: ASTM B370, cold-rolled copper sheet, H00 temper. Minimum thickness of 16 oz./sq. ft. (0.55 mm thick).
 - a) Copper Sheet for Flat Seam Historical Preservation Projects: ASTM B370, cold-rolled copper sheet, H00 temper; minimum thickness of 20 oz./sq. ft. (0.68 mm thick).
 4. Zinc-Tin Alloy-Coated Copper Sheet: ASTM B370 cold-rolled copper sheet, H00 temper, coated on both sides with zinc-tin alloy (50 percent zinc, 50 percent tin). Minimum thickness of 16 oz./sq. ft. (0.55 mm thick) with 0.787-mil (0.020-mm) coating thickness applied to each side.
- F. Finishes: At minimum, provide a two-coat fluoropolymer with the addition of mica pearlescent flakes, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight. Provide a 20 year standard manufacturer's warranty.
- G. Color and profile of the panels shall be as selected by the University's Project Manager and Professional.
- H. Underlayment: Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils (0.76 mm) thick, specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer when recommended by underlayment manufacturer.
- I. Shop drawings for the exterior metal panels system shall be prepared and stamped by the panel manufacturer. Panel manufacturer shall submit written warranties in accordance with the Contract Documents requirements.
- J. Warranty:
1. Installer Warranty: Panel installer shall provide written warranty for two (2) years from the date of final completion and acceptance, guaranteeing materials and workmanship for water-tightness and weathertightness. During the two-year period, the installer shall repair all leaks at no cost to the University.
 2. Manufacturer's Finish Warranty: 20 years from date of Substantial Completion.

C.30. SECTION 074213 METAL WALL PANELS

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for adhesives, indicating low to no VOC content.
 3. Laboratory Test Reports: Provide for adhesives, indicating compliance with requirements for low-emitting materials.
 4. Low-Emitting Materials: Insulation, adhesives and coatings shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 5. Recycled Content: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
- B. Exterior metal panel systems shall comply with applicable provisions of the "Metal Curtain Wall, Window, Storefront and Entrance Guide Specifications Manual" by AAMA.
- C. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.

- D. Panel systems shall be reviewed with the University's Project Manager and University Architect for compliance with design, appearance and intent of the work.
 - 1. University's preferred metal wall system is concealed fastener, watertight systems.
 - 2. Wet-seal systems are not permitted.
- E. Materials: Provide thickness and profiles to minimize or eliminate oil canning.
 - 1. Aluminum Sheet: Coil-coated sheet, ASTM B209 (ASTM B209M), alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance specified. Minimum thickness shall be 0.040 inch (1.02 mm).
 - 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 (Class AZM150) coating designation; structural quality. Pre-painted by the coil-coating process to comply with ASTM A755/A755M. Minimum thickness shall be 0.034 inch (0.86 mm) (22 gage).
 - 3. Metal Composite Material Wall Panels: Factory-formed and -assembled, aluminum, copper, or stainless steel composite material wall panels fabricated from two metal facings that are bonded to a fire-resistant, solid, extruded thermoplastic core; minimum thickness of 0.157 inch (4 mm).
- F. Finishes: At minimum, provide a two-coat fluoropolymer with the addition of mica pearlescent flakes, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight. Provide a 20 year standard manufacturer's warranty.
 - 1. Color and profile of the panels shall be as selected by the University's Project Manager and Professional.
- G. Shop drawings for the exterior metal panels system shall be prepared and stamped by the panel manufacturer. Panel manufacturer shall submit written warranties in accordance with the Contract Documents requirements.
- H. Warranty:
 - 1. Installer Warranty: Panel installer shall provide written warranty for two (2) years from the date of final completion and acceptance, guaranteeing materials and workmanship for water-tightness and weathertightness. During the two-year period, the installer shall repair all leaks at no cost to the University.
 - 2. Manufacturer's Finish Warranty: 20 years from date of Substantial Completion.

C.31. SECTION 075000 MEMBRANE ROOFING

Professional Note – Professional shall incorporate into the Specifications, the requirement for a roofing conference before roof work is to begin. This roofing conference shall have all parties involved in attendance.

Professional Note – Professional must devote particular attention to the design of plazas and other accessible roof areas. These are very expensive areas for the University to maintain, and they must be properly detailed and specified in order to insure a first quality installation.

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for adhesives, sealants and coatings, indicating low to no VOC content.
 3. Laboratory Test Reports: Provide for adhesives, sealants, and coatings, indicating compliance with requirements for low-emitting materials.
 4. Low-Emitting Materials: Insulation, adhesives and coatings shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. University requires proper design, material selection, and inspection for maximum performance of roofing systems. Professional shall review and discuss roofing system's design, cost impact, warranty, and sustainable design requirements with the University's Project Manager and University Architect and University's Project Manager on a project-by-project basis. Utilize materials and systems that are time-proven.
- C. Final Roof Inspection and Closeout Submittals: At completion of roof work, Contractor shall arrange for roofing system manufacturer's technical personnel to inspect the roofing installation along with University's Project Manager. Roofing manufacturer's technical personnel shall submit a written report listing correction of deficiencies and final approval by roofing manufacturer of the installation.
- D. Performance: Following minimal levels of roof performance shall be provided:
1. Wind Uplift: FM Class I-120.
 - a) Roofing installations shall be reviewed with the University's Project Manager and Insurance Carrier during the design stages of the Project. University's insurance carrier is Factory Mutual (FM); all roofing systems shall meet FM Global criteria for wind loss prevention.
 2. External Fire Performance: UL Class A.
 3. Internal Fire Performance: Roof ceiling assembly to comply with all building codes and UL assembly ratings.
 4. Slope: New roofs shall have a minimum of ¼ inch per foot slope. Existing roof require positive drainage.
 5. Cool Roof Design: Cool roof design is a top priority of the University and the Professional shall strive to provide the highest level possible and conform with selected Project Sustainable Design requirements. Cool Roof design is measured by two properties; Solar Reflectance and Thermal Emittance. Solar Reflectance Index (SRI) is a calculated metric that combines solar reflectance and thermal emittance into one value.
 - a) Solar Reflectance Index (SRI): Use roofing materials with an initial solar reflectance index equal to or greater than 82 for roofs with a slope less than or equal to 2:12 and 39 for roofs with a slope greater than 2:12 for 75% of the roof.
 - b) Energy Performance: Provide roof panels that are listed on the EPA/DOE's ENERGY STAR "Roof Product List" for low- and steep-slope roof products
 6. Building Envelope Performance: Refer to Section 072000 Thermal Protection for requirements.
 - a) Thermal Performance: As required to meet sustainable design requirements, energy code requirements, and building envelope requirements but not less than R-value of 40 independent of tapered insulation.
 - b) Vapor Barrier: Must tie into wall vapor barrier for a continuous plane. Provide type recommended to meet sustainable design requirements, energy code requirements, and building envelope requirements. Roof membranes installed above the insulation shall not be considered the vapor barrier of the roof system.

- E. Roofing shall be provided in strict accordance with the manufacturer's recommendations.
- F. Provide proper access to roof levels by means of scuttles and ladders; refer to Section 055000 Miscellaneous Metal Fabrications.
- G. Provide walking pads leading to rooftop equipment, exit ways and penthouses.
- H. Warranty: Provide a two-year installer warranty in the project specifications. Manufacturer's warranty shall be on a project by project basis.
- I. Vegetated Roofing:
 - 1. Types:
 - a) Extensive: Lower weight, tolerant plants only and no regular traffic.
 - b) Intensive: Heavier weight, wider variety of plants and support recreational traffic.
 - 2. Decisions to implement vegetated roofing in pursuit of sustainable design objectives shall be decided between University's Project Manager, University Architect, and Professional.
 - 3. System:
 - a) Specify a system assembly from a single source manufacturer with documented history of more than 10 years of successful vegetated roof installations.
 - b) Systems and materials shall provide long-term protection from puncture, constant dampness, ponding water, root growth, heavy overburden, algae, and insects.
 - c) Leak Detection and Moisture Monitoring System: Specify for all vegetative roofing systems. System shall detect moisture at vapor barrier level.
 - 4. Electronic Leak-Detection Testing: Test areas of vegetative roof areas prior to installing topping materials by Electric Field Vector Mapping (EFVM).
 - 5. Water Requirements: Professional shall coordinate with plumbing professional for location of a frost proof hose bib for watering of vegetation at roof level.
- J. Fall Protection: Refer to University of Pittsburgh's Fall Protection guidelines attached to the end of this document. Professional shall review guidelines with University's Project Manager.

C.32. SECTION 076000 FLASHING AND SHEET METAL

- A. Sustainability:
 - 1. Recycled Content: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
 - 4. Adhesives: Use sealants that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- C. Flashing and sheet metal work shall comply with Architectural Sheet Metal Manual of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA). Specific metals such as copper should also comply with specific trade standards such as publications of the Copper Development Association and the National Roof Contractors Association.
 - 1. This section applies to formed roof-drainage and wall sheet metal fabrications including counter-flashings, base flashings, crickets, valley flashings, and scuppers.
 - 2. Refer to Section 042000 Brick, Stone and Unit Masonry for requirements for thru-wall flashings associated with masonry work.

3. Refer to Section 077100 Roof Specialties for manufactured wall copings and roof edge systems.

D. Guidelines for Metal Thickness:

1. Copper: ASTM B 370; temper H00 (cold rolled); 20 oz. when not fully supported.
2. Lead-Coated Copper: 16 and 20 oz. copper as stated above with minimum 1.92-oz lead coating (total weight of lead on both sides). SMACNA recommends 3.2 oz. of lead coating in industrial applications and polluted urban environments; this recommendation would likely apply to work immediately adjacent to chimneys, flues, fume hood exhausts, and other localized polluted environments.
3. Sheet Aluminum: ASTM B 209; alloy 3003, temper H14. For highly visible work such as fascias, 0.050 in. is minimum with 0.063 in. preferred. For concealed work, 0.040 in. is minimum with 0.050 in. preferred. Joints shall be specified and detailed that are visually acceptable and offer long-term protection against weather.
4. Stainless-Steel Sheet: Type 304 or Type 316 dead soft, fully annealed with smooth 2D dull finish., preferred thickness is 0.016 inch.
5. Galvanized Steel Flashings: University prefers to avoid galvanized steel flashings because of problems with corrosion and painting.
6. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 (Class AZM150) coating designation; structural quality. Pre-painted by the coil-coating process to comply with ASTM A755/A755M. Minimum thickness shall be 0.028 inch (24 gage).
7. Zinc-Tin Alloy-Coated Copper Sheet: ASTM B370 cold-rolled copper sheet, H00 temper, coated on both sides with zinc-tin alloy (50 percent zinc, 50 percent tin). Minimum thickness of 16 oz./sq. ft. (0.55 mm thick) with 0.787-mil (0.020-mm) coating thickness applied to each side.

C.33. SECTION 077100 ROOF SPECIALTIES

A. Sustainability:

1. Recycled Content: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent
2. Product Data: Provide for sealants, indicating low to no VOC content.
3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
4. Adhesives: Use sealants that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Approvals and Performance Requirements:

1. Manufactured and install copings and roof-edge flashings shall be listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-120. Identify materials with FM Approvals' markings.
2. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the specified design pressure.

3. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown. Specific metals such as copper should also comply with specific trade standards such as publications of the Copper Development Association.
- C. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.
- D. Materials:
1. Sheet Aluminum: ASTM B 209; alloy 3003, temper H14. For highly visible work such as fascias, 0.050 in. is minimum with 0.063 in. preferred. For concealed work, 0.040 in. is minimum with 0.050 in. preferred. Joints shall be specified and detailed that are visually acceptable and offer long-term protection against weather.
- E. Manufactured Copings: Aluminum copings shall be a manufactured coping system consisting of formed-metal coping cap, concealed anchorage, corner units, end caps and concealed splice plates.
- F. Roof-Edge Flashings and Drainage Systems: Manufactured, two-piece, aluminum roof-edge fascia consisting of snap-on metal fascia cover in minimum 96 inch long section lengths but not exceeding 12 feet. Provide matching corner units.
1. Gutters and Downspouts: Of aluminum profile and size as determined by design requirements, discussed and approved with University's Project Manager and University Architect. Use copper for historical projects where required.
 2. Scuppers: Fabricate scuppers of aluminum to dimensions required, with closure flange trim to exterior, 4-inch-wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.
- G. Historical Projects: Of metal and profiles to match existing and as approved by University's Project Manager, University Architect and historical preservation requirements.
- H. Finishes: Clear or color anodic finishes AAMA 611 Class I, 0.018 mm or a two-coat fluoropolymer with the addition of mica pearlescent flakes, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight. Provide a 20 year standard manufacturer's warranty.
1. Color shall be as selected by the University's Project Manager and Professional.
- I. Roof Access Hatches and Heat and Smoke Vents: Professional shall coordinate with University's Project Manager to verify need for security alarm protection. Hatches are to be weather sealed and constructed to limit thermal transfer and reduce risk of condensation.
- J. Fall Protection: Refer to University of Pittsburgh's Fall Protection guidelines attached to the end of this document. Professional shall review guidelines with University's Project Manager.
- K. Pitch Pockets: Not permitted.

C.34. SECTION 078000 FIRE AND SMOKE PROTECTION

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for coatings, indicating low to no VOC content.

3. Laboratory Test Reports: Provide for coatings, indicating compliance with requirements for low-emitting materials.
- B. Coordination: Coordinate with structural steel, steel joists, steel decking and other materials to receive fireproofing coatings. Verify that manufacturer, through its own laboratory testing or field experience, attests that primers or coatings are compatible with fireproofing.
- C. Preconstruction Adhesion and Compatibility Testing: Test for bond strength and compatibility with primers.
- D. Cementitious Fireproofing: University prefers sprayed-applied cementitious fireproofing over sprayed-applied mineral fiber fireproofing at all areas, concealed and exposed.
- E. Intumescent Mastic Fireproofing: Used in highly visible, public areas where architecturally pleasing fireproofing is needed. Specify coating as a highly durable fireproofing system.
- F. Firestopping: Contract Documents shall require detailed submittals and information on similar UL or FM listed assemblies for each type of firestopping system used. Strict review and inspection procedures shall be written into project specifications to help ensure that firestopping work is done properly. Contractors shall obtain the approval of the University's Project Manager prior to enclosing and concealing firestopping work.
 1. All wall, floor, and ceiling penetrations passing through material with fire-rated assemblies shall be firestopped with approved fire-rated materials that maintain or exceed the fire-rated and/or smoke-rated assembly.
- G. Asbestos: No asbestos-containing products are permitted on University projects.

C.35. SECTION 079200 JOINT SEALANTS

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for sealants, indicating low to no VOC content.
 3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
- B. Professional shall specify field adhesion testing of joint sealers by joint sealant manufacturer's technical representative. Professional shall request documentation from the manufacture that states that sealants are compatible with adjacent materials.
- C. University prefers the following types of sealants for the applications listed below:
 1. Typical Vertical Exterior Building Joints: Single-Component, Nonsag, Neutral-Curing Silicone or Acrylic Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
 2. Typical Horizontal Exterior Building Joints: Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone or Acrylic Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use T.
 3. Typical Interior Joints at Toilet Rooms, Plumbing Fixtures, and Wet Areas: Mildew-Resistant, Single-Component, Neutral-Curing or Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT. Color to be clear.
 4. Typical Interior Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

5. Acoustical Sealant: Nonsag, paintable, non-staining latex sealant complying with ASTM C 834.
 6. Exterior joint sealants shall be UV stable.
- D. Colors: Colors shall be as selected by the University's Project Manager and Professional.

DIVISION 080000 - OPENINGS

C.36. SECTION 081000 DOORS – GENERAL

- A. Doors and door hardware shall be considered as a system and are to provide security and comply with life safety and ADA requirements.
1. Clear Width: Typically, doors installed in standard frames must be a minimum of 36" wide to comply with the requirements for accessibility. Non-standard conditions must be carefully reviewed based on the ADA, other code requirements and with University's Project Manager.
 - a) Provide wide openings for dock areas and for laboratories to accommodate moving of oversize equipment.
- B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C.
1. The use of fire-rated ceramic glazing with the associated frames shall be limited: review with University's Project Manager. Installation is very costly and difficult to maintain.
- C. At primary entries to Academic and large Residential Life buildings, use electrically operated sliding or swinging automatic entrance doors. Sliding doors shall be considered where the wind exposure is severe. Entries shall have electronic latches, monitoring and security card access. The Professional shall coordinate and clearly indicate all electrical and other interfaces required for the door operation. Review applications and locations with University's Project Manager.
- D. Work associated with historical buildings must be reviewed and approved by the University's Project Manager, University Architect and historical preservation requirements.
- E. Refer to Section 087100 Door Hardware for incorporation of automatic door opener systems.

C.37. SECTION 081113 HOLLOW METAL DOORS AND FRAMES

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Recycled Content of Metal Products: Provide postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent
- B. Metal doors shall comply with American National Standards Institute/Steel Door Institute, "Nomenclature for Steel Doors and Steel Door Frames". Doors shall be in accordance with ANSI standards, latest edition, for handicap accessibility.
- C. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.

D. Exterior Steel Doors and Frames:

1. Doors: 1-3/4" thick ANSI/Steel Door Institute Level 3, Extra Heavy Duty, Model 1 - Full Flush or Model 2 - Seamless, 0.053 inch (1.3 mm) (16 gauge) minimum face sheets, seamless construction fabricated from galvanized sheet steel with closed, seamless tops and no places to catch and hold water. When heated space is on one side, provide thermally insulated doors with fully weatherstripped doors including head, jambs, and door bottom seal.
2. Frames: Provide minimum 0.067 inch, (1.7 mm) (14 gauge) frames with fully welded seamless construction fabricated from galvanized sheet steel. Frames installed in concrete or masonry construction shall be full-grouted.

E. Interior Steel Doors and Frames:

1. Doors: 1-3/4" thick ANSI/Steel Door Institute Grade II - Heavy Duty, Level 2, Model 1 - Full Flush, 0.042 inch (1.0 mm) (18 gauge) minimum face sheets, seamless construction with seamless tops.
 - a) Acoustical Steel Doors: In addition to above, for doors to noisy rooms such as machine rooms and elsewhere noise control is needed, provide acoustical insulated doors with perimeter soundstripping and minimum STC of 45. Special applications may require even higher STC performance as determined by project design parameters.
 - b) Interior Wet Areas: Use galvanized "exterior" frames. Examples: Animal holding rooms, cage wash rooms, and similar wet areas.
2. Frames: Provide minimum 0.053 inch (1.3 mm) (16 gauge) frames with fully welded seamless construction to the greatest extent possible. KD frames may be used only with approval.
 - a) Frame Stops: Provide stops made to subfloor, except at laboratories and other spaces needing extensive cleaning, consider using hospital stops held about 3" above floor.

C.38. SECTION 081400 WOOD DOORS

Professional Note – University will only accept staved core wood doors to be used in its buildings. Hollow core wood doors are not acceptable except for within interior of student housing dwelling units.

- A. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 4. Chain-of-Custody Certificates: Provide for certified wood products, including statement of costs.
 5. Laboratory Test Reports: Provide for composite wood products, indicating compliance with requirements for low-emitting materials.

6. Product Data: Provide for installation adhesives, indicating low to no VOC content and for overall wood doors, indicating no added urea formaldehyde.
 7. Recycled Content of Medium-Density Fiberboard and Particleboard: Use and document postconsumer plus one-half of pre-consumer recycled content not less than 50 percent.
 8. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 9. Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.
- B. Wood Veneer Species and Cut: As determined by project design between Professional and University's Project Manager.
1. Plastic Laminate Faced: Not acceptable unless approved by University's Project Manager.
- C. Wood Doors: In addition to complying with pertinent codes and regulations, doors shall comply with the "Architectural Woodwork Quality Standards and Guide Specifications" published by the Architectural Woodwork Institute.
1. Performance Grade: Heavy Duty, 5 ply with hardwood edges and glued wood stave core.
 2. Architectural Woodwork Standards Grade: Premium.
 3. Fire Rated Wood Doors: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings and temperature-rise limits where applicable, based on testing at positive pressure in accordance with UL 10C or NFPA 252.
 - a) Fire-Rated Core: Mineral Core with blocking for hardware attachment.
 4. Sound Rated Wood Doors: Provide acoustical insulated doors with perimeter soundstripping and minimum STC of 45. Sound Transmission Class (STC) specified shall be certified by the manufacturer to be based on tests conducted at an independent testing agency in accordance with ASTM E90-90 and E413-87. Acoustical Doors with lites to be factory glazed to maintain STC rating. Special applications may require even higher STC performance as determined by project design parameters.
 - a) Acoustical Core: Provide wood blocking for hardware attachment.
 5. Residence/Student Housing:
 - a) Corridor to Suite and Each Bedroom Unit: AWI Premium Grade; Solid-core, molded panel doors with MDO or MDF faces; rated and non-rated; sound rated. Three-ply construction with stiles and rails bonded to core; exposed vertical and top edges closed-grain hardwood.
 - b) Within Units – Closet and Bathroom Doors: AWI Premium Grade; hollow-core doors with hardboard or MDF faces. Exposed vertical and top edges closed-grain hardwood.
- D. In existing buildings, door finish shall match existing. Do not specify pre-finished doors (unless existing) since it is difficult to match finishes already existing with factory finishes. Refer to Section 099100 Painting and Coating.

- E. Warranty: Lifetime of installation.

C.39. SECTION 083000 SPECIALTY DOORS AND FRAMES

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
 - 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 5. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent
- B. Overhead doors, coiling doors, coiling grilles and other specialty doors: provide where required by Project Design Requirements; use stainless steel, pre-finished galvanized steel or aluminum, heavy duty construction; avoid wood.
- C. Multipanel Folding or Sliding Doors: Multipanel folding or sliding, aluminum-framed or wood-framed glass doors as required to meet Project Design Requirements. Doors shall be of heavy-duty design and conform to University's door hardware requirements.
 - 1. Refer to Section 102239 Folding Panel Partitions for acoustical single panel, pair-panel and continuous panel room divider type partitions.
- D. Sound Control Door Assemblies: Specialty packaged sound control door assemblies of either wood or steel doors with sound control frames designed to meet higher sound transmission values than standard hollow metal and flush wood doors. Provide packaged sound control door assemblies identical to those of assemblies tested as sound-retardant units by an acoustical testing agency. Provide sound ratings to meet Project Design Requirements.
- E. Impact Doors: Packaged units complete with metal frames and double-acting heavy duty spring hinges. Doors shall be designed to project requirements for impacts anticipated.

C.40. SECTION 083100 ACCESS DOORS AND PANELS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
 - 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 5. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent
- B. Access panels shall be provided for accessibility to devices and controls requiring service by the University that will not be readily accessible after completion of the project.
- C. Coordination: Professional is required to coordinate access doors locations and ownership responsibilities with mechanical, plumbing, fire protection and electrical disciplines.
- D. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80.
- E. Department of General Services (DGS) Project: Coordinate requirements of domestic made steel products with DGS requirements.

- F. Interior Access Doors and Frames: Preference is frameless or concealed wallboard flange and flush panels. Minimum 0.066 inch (1.63 mm) (16 gauge) thickness
 - 1. Interior Wet Areas: Use factory primed aluminum or stainless steel “exterior” doors and frames.
 - 2. Interior High Traffic Areas: Use vandal resistance or heavy gage doors and frames; minimum 0.078 inch (1.98 mm), (14 gauge).
 - 3. Ceiling Areas: Preference is to conceal access panels as much as possible. Recessed door face panels for gypsum board, acoustical tile or other materials is acceptable.
 - 4. Special Access Doors in Accent Walls: Provide access doors that can receive wall or ceiling finish so access door blends in with surface.
- G. Exterior Access Doors and Frames: Use galvanized, aluminum, or stainless steel doors; exposed frames flange and flush panels. Minimum 0.078 inch (1.98 mm) (14 gauge) thickness.
- H. Coordinate lock mechanism and keying preference for access doors through the University’s Project Manager and Section 087100 Door Hardware.

C.41. SECTION 084100 ENTRANCES AND STOREFRONTS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
 - 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 5. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Energy Performance: Professional shall design exterior fenestra systems to meet energy code requirements and University of Pittsburgh EUI targets.
- C. Aluminum Doors:
 - 1. Standard Usage: University prefers wide stile doors with 5 inch side rails, ADA bottom rail and top rail to conceal closure mounting brackets. Exterior doors shall have thermally broken frames and insulated glazing. Vestibule doors need not be thermally broken frames and insulated glass.
 - 2. High-Use Doors: Heavy duty, wide stile doors are preferred. Coordinate locations with University’s Project Manager.
- D. Aluminum Frames: Energy conservation through insulation and thermal isolation is required. Thermal-rated assemblies shall be provided. Coordinate with Building Envelope and Project Sustainable Design Requirements. Use non-thermal frames at interior locations including vestibules. No visible condensation is to form under design conditions.
 - 1. Thermal plane of all fenestration systems shall align with thermal plane of adjacent systems.
 - 2. Receptors: Provide head and sill receptor system with shear blocks at intermediate horizontal members.

- E. Finishes: Clear or color anodic finishes AAMA 611 Class I, 0.018 mm or a two-coat fluoropolymer with the addition of mica pearlescent flakes, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight. Provide a 20 year standard manufacturer's warranty.
 - 1. Color shall be as selected by the University's Project Manager and Professional.
- F. Hardware: University prefers continuous hinges; pivot type hinges are not recommended. Closers shall be surface mounted cast iron body type closers; floor closers are not recommended. Exit devices shall heavy duty, Grade 1 extending full width of door. Removable center mullions are allowed as determined by project design requirements. Provide thermally broken thresholds set in full bead of sealant. Doors and frames shall receive full manufacturer's weatherstripping.
- G. Revolving Doors: Allowed as determined by project design requirements. Coordinate floor drains and overhead canopy construction.
- H. Full All Glass Entrances: Tempered safety glass with heavy-duty patch type hardware. Concealed floor closers are not recommended. Provide dust-proof floor strikes. Include distraction bands and markings as required.

C.42. SECTION 084400 CURTAIN WALL AND GLAZED ASSEMBLIES

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
 - 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 5. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Energy Performance: Professional shall design exterior fenestra systems to meet energy code requirements and University of Pittsburgh EUI targets.
- C. Aluminum Frames: Energy conservation through insulation and thermal isolation is required. Thermal-rated assemblies shall be provided. Coordinate with Building Envelope and Project Sustainability Design Requirements. Four sided, fully captured systems are preferred; avoid use of structural butt glazing systems. No visible condensation is to form under design conditions.
 - 1. Thermal plane of all fenestration systems shall align with thermal plane of adjacent systems.
- D. Finishes: Clear or color anodic finishes AAMA 611 Class I, 0.018 mm or a two-coat fluoropolymer with the addition of mica pearlescent flakes, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight. Provide a 20 year standard manufacturer's warranty.
 - 1. Color shall be as selected by the University's Project Manager and Professional.

C.43. SECTION 085000 WINDOWS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Laboratory Test Reports: Provide for sealants, indicating compliance with requirements for low-emitting materials.
 - 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 5. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent
 - 6. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
 - a) Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.
- B. Energy Performance: Professional shall design exterior fenestra systems to meet energy code requirements and University of Pittsburgh EUI targets.
- C. General:
 - 1. Operation: As determined by project design requirements; awning windows are preferred. Limit operation as determined by project design requirements. Operable windows shall have manufacturer's standard screens with aluminum frames and aluminum mesh screens.
 - 2. Windows at grade level shall have exterior metal security screens; confirm location with University's Project Manager.
 - 3. Mock-Ups: Where window systems are specified for new buildings, a full size mock-up should be specified. Coordinate this with the Unit Masonry Section.
 - 4. Testing: For all buildings, the Professional shall include the requirement for laboratory testing of windows, curtain walls and window walls.
 - 5. Thermal plane of all fenestration systems shall align with thermal plane of adjacent systems
- D. Aluminum Windows:
 - 1. Energy conservation through insulation and thermal isolation is required. Thermal-rated assemblies shall be provided. Coordinate with Building Envelope and Sustainable Design requirements for project. No visible condensation is to form under design conditions.
 - 2. Performance Class and Grade: AW, Grade 40.
 - 3. Thermal Transmittance: NFRC 100 maximum whole-window U-factor to be based on Energy Requirements based on the selected Project Sustainability Design Requirements but not less than 0.30 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K).
 - 4. Frames and Sash: Extruded aluminum, thermally improved.

5. Finishes: Clear or color anodic finishes AAMA 611 Class I, 0.018 mm or a two-coat fluoropolymer with the addition of mica pearlescent flakes, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight. Provide a 20 year standard manufacturer's warranty.
 - a) Color shall be as selected by the University's Project Manager and Professional.
- E. Vinyl Windows: Not allowed.
- F. Aluminum Clad Wood Windows: Comply with AAMA/WDMA/CSA 101/I.S.2/A440
 1. Performance Class and Grade: CW, Grade 30 minimum.
 - a) Frames and Sashes: Fine-grained wood lumber complying with AAMA/WDMA/CSA 101/I.S.2/A440; kiln dried to a moisture content of not more than 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch (0.8 mm) deep by 2 inches (51 mm) wide; water-repellent preservative treated.
 2. Thermal Transmittance: NFRC 100 maximum whole-window U-factor to be based on Energy Requirements based on the selected Project Sustainability Design Requirements but not less than 0.30 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K).
 3. Exterior Finishes: Clear or color anodic finishes AAMA 611 Class I, 0.018 mm or a two-coat fluoropolymer, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight with a 20 year manufacturer's warranty.
 - a) Color shall be as selected by the University's Project Manager and Professional.
 4. Interior Finishes: Stain or painted as determined by project design requirements. May be factory applied or field applied.
- G. Fiberglass Windows: Comply with AAMA/WDMA/CSA 101/I.S.2/A440.
 1. Performance Class and Grade: CW, Grade 30 minimum.
 2. Thermal Transmittance: NFRC 100 maximum whole-window U-factor to be based on Energy Requirements based on the selected Project Sustainability Design Requirements but not less than 0.30 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K).
 3. Frames and Sashes: Pultruded fiberglass complying with AAMA/WDMA/CSA 101/I.S.2/A440 and with exposed exterior fiberglass surfaces finished with manufacturer's standard high performance enamel coating.
 4. Finish: Color shall be as selected by the University's Project Manager and Professional.

C.44. SECTION 087100 DOOR HARDWARE

- A. Hardware:
 1. New hardware being provided for University buildings shall be Architectural grade in accordance with governing bodies and Code requirements. In existing buildings, hardware shall match existing in quality, manufacture, finish and keying. Hardware on fire doors shall be approved and listed for fire door service.

2. Availability: Hardware products must be serviceable. Parts must be available at a local distribution center after installation is completed. Product manufacturer's representatives must be locally available for consultation at the University during the preparation of the construction documents.
3. University standard cylinder is "BEST". No substitution shall be allowed, except in DGS projects in which only hardware that is compatible shall be specified. Refer to Keying information below.
4. Before delivery of the hardware, the Contractor shall discuss with the University and obtain approval of the keying system to be supplied.
5. Hardware suppliers shall be required to have in their employ, a member of the AHC (American Hardware Consultants) during the course of construction at no cost to the University for consultation.
6. Closers:
 - a) Door closers shall be of the heavy-duty or cast iron type. The use of concealed overhead closers must be approved by the University's Project Manager case by case. The use of floor closers is discouraged.
 - b) Overhead closers shall be mounted so that they are not exposed to the weather and so that they do not strike walls or other surfaces when doors are opened to full swing. (A minimum full swing is 90°.) Closers shall be mounted to doors with through-bolts. Closers on exterior doors shall be cast iron cylinder bodies with cover.
7. Hinges: Butt-mounted hinges shall be used. The use of pivot hinges is unacceptable. All doors shall have a minimum of one and a half pairs of hinges. Doors wider than 3 ft or have closers shall have ball-bearing hinges. Use Non-Removable Pin (NRP) hinges where security is a concern and for all exterior out-swinging doors.
8. Locksets: Locksets shall be ANSI/BHMA A156.13 Series 1000, Grade 1 Operational, Grade 1 Security heavy duty mortise lockset in most instances with levers to comply with barrier-free accessibility requirements. Locksets shall have interchangeable cores and be able to receive Best Lock cylinder core.
 - a) Lever Handles - Lever handles shall be wrought brass, bronze or stainless steel of simple design, heavy duty. Preferred design is simple curve to prevent loose items getting caught such as fire hoses, purses and backpack straps. Lever design shall be ADA compliant. Review with and submit to the University's Project Manager proposed lever handles.
 - b) Tactile Warning: Levers for doors opening into hazardous areas including radiation and isotope areas shall have knurled or roughened surfaces to serve as a tactile warning for visually impaired persons.
9. Exit/Panic Devices: Shall be ANSI/BHMA A156.3 Grade 1, heavy-duty, and UL listed for Panic Exit or Fire Exit Hardware. For pair of doors, concealed rod devices are preferred. Cylinder dogging is preferred. End caps shall be metal. Lever handles shall match locksets.
10. Automated Door Openers:
 - a) All new door actuators shall be the bar type. Standard of Design is the BEA LPR-36 Vertical Actuation Bar, which shall be used for interior doors and exterior doors. BEA USA 100 Enterprise Drive, Pittsburgh, PA 15275.

- b) Exterior door actuators are typically mounted on a metal bollard, and coordinated with a security swipe or proxy mechanism. The security mechanism and the actuator bar shall be positioned on perpendicular faces of the bollard. Professional shall coordinate work with University's Project Manager and University's Integrated Security Department (ISD).
- c) Professional shall verify with University's Project Manager when specifying exterior wall-mounted actuators.
- d) Exterior actuator bars shall be located so as to avoid snow accumulation above the bar height.
- e) Interior bar actuators are typically wall mounted, and may require additional metal tubing or stand-off to conceal wiring and hardware where concealment within the existing wall is not feasible. No exposed wall-mounted wiring shall be permitted.
- f) Metal color and finish, interior and exterior, are to be coordinated with University's Project Manager and exterior door framing.
- g) All existing button actuators within the extended limit of work shall be replaced with bar actuators as part of the renovation project.
- h) Where applicable, a laser actuated opener system may be used in lieu of push bar actuators.
- i) Determining the proper application for opener devices shall be coordinated with Automated Entrance Systems Co., Inc. 313 Archie Street, Oakmont, PA 15139. 412 828-4287. Mark Sadler.

11. Finish:

- a) New Projects: Hardware finishes shall be as selected by the University's Project Manager, University Architect and Professional. Preferred finish is US26D/BHMA 626 Satin Chrome.
- b) Existing Buildings: Professional shall match the existing building hardware within the building or area being renovated, in type and finish.

B. Keying:

1. The purpose of this Procedure is to ensure that the University's Lock Shop, University Police and the Users are properly involved in each stage of the project since they have the responsibility, working together, for determining the keying of all spaces. The University's Lock Shop and University Police have the responsibility for the issuance of keys to the Users when they move into the completed project. The University's Project Manager must ensure that the Users properly understand Facilities Management, University's Lock Shop and the University Police's division of responsibilities during design and construction of the project.
2. Procedures – Oakland Campus:
 - a) New Buildings:
 - (i) Design:

1. At the beginning of the Schematic Design Phase, the University's Project Manager shall schedule a meeting with the University's Lock Shop and the Users to inform them of the project scope, budget and schedule and to review security issues, including their responsibilities in this process.
2. During the Design Development Phase of the project, the University's Project Manager must schedule meeting(s) with the University's Lock Shop, the Professional and the Users, as required to review and resolve the overall security issues in the building, such as the need for a Security Desk, electric door locks and alarms, grilles to keep people from certain areas of the building, etc. The University's Project Manager must make sure that the Professional incorporates these security issues into the Contract Documents.
3. Early in the Construction Document Phase of the project, the University's Project Manager shall forward to the University's Lock Shop, the building floor plans and shall notify them to set up meetings with the Users and the lock provider (Best), as required for them to establish the final keying of the building before the Construction Documents are finalized.
 - a. During this phase, the University's Lock Shop shall determine if the permanent cores shall be furnished by the University's Lock Shop or through Best. Up to 150 cores, the University's Lock Shop may furnish the cores. Amounts over 150 cores may be furnished by Best. University's Project Manager, Professional and University's Lock Shop shall discuss and determine method of delivery of permanent cores.
4. Professional shall specify Best cores for hardware in the project and includes the following paragraph in the Contract Specifications:
 - a. "University's Lock Shop shall provide two (2) keys per core with appropriate sub-master and master keys. A key cabinet shall be provided and installed in a location as directed by the University. The cabinet shall be arranged and marked to accept all keys at the completion of the project."
 - b. University's Lock Shop is responsible for construction cores and keys, and will distribute to the Contractor.

(ii) Construction:

1. At the beginning of the Construction Administration Phase, the University's Project Manager must request from the Contractor that the Construction Schedule for the building specifically include dates for the installation of the cores.
2. The University's Project Manager must inform University's Lock Shop when the project is ready to be permanently keyed, so that the University's Lock Shop can schedule the installation of the permanent cores with the core provider. The University's Lock Shop will install the permanent cores. This will ensure accuracy of the key control records.
3. Keying Meeting: At beginning of Construction Document Phase, conduct a meeting between University's Project Manager, University's Lock Shop, Professional and End User to discuss keying requirements.

b) Renovated Spaces and Buildings:

(i) Projects built by outside Contractors:

1. Keying procedure for renovation projects in which outside contractors are involved is similar to that described above for new buildings, except that the University's Project Manager must give the Professional the manufacturer's name for the building hardware and the keyway, so that the Professional can include this information into the project specifications.
2. Professional Note – The Professional shall be responsible for reviewing existing key way systems and coordinating how lock systems are to match in renovation and addition projects. These need to be verified with the University's Project Manager.

(ii) Projects built by the Facilities Management Trades:

1. For projects to be built by our Trades, the University's Lock Shop must provide the cores. The University's Project Manager must send a Work Order request, for the University's Lock Shop to re-key the cores per the University Police's instructions. The University's Project Manager will also inform the Users that they must request keys from the University Police Department.

3. Procedures – Regional Campus:

- a) At the beginning of the Schematic Design Phase, Professional shall meet with the Regional Campus Facilities Department Manager to determine door hardware, keying and security requirements. Each regional campus has its own security requirements.

- C. Combination Locks: Use of combination locks is discourage and shall only be used with permission by the University.

Professional Note – The Professional shall be required to review the installation policies as established by the University regarding combination locks with the University's Project Manager, the University's Lock Shop, University's Integrated Security Department (ISD) and the Users.

1. The University standard for combination locks is as manufactured by Simplex Security Systems, Inc., and is master keyed to "BEST" removable core cylinders, and to specific zones on the Oakland Campus. Only combination locks with key overrides may be specified. Simplex models 1000 and 100 / 200 series DL-M and NL-M are standards.

- D. Related Work: Professional shall coordinate Work under this section with Work described in Section 280500 "Common Work Results for Electronic Safety and Security."

C.45. SECTION 088000 GLAZING

A. Sustainability:

1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
2. Product Data: Provide for sealants, indicating low to no VOC content.
3. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.

4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent
- B. Meet or exceed applicable Code and Energy requirements. Coordinate with Building Envelope and Sustainable Design requirements for project. Glazing selection is integral to the thermal performance of a building and shall be carefully selected and specified. Where appropriate to meet project performance and sustainability objectives, select glass and glazing materials and coatings that contribute to natural daylighting and exterior views while limiting undesirable radiant heat transmission. Provide insulated units with warm edge technology.
- C. Exterior glazing shall be in insulated glazing units with a warranty period of not less than ten years.
- D. Specify Low-E glass. Avoid highly reflective glass and glazing. Professional shall review glass selections for coloration of interior and exterior reflection in both interior and exterior conditions.
- E. Professional shall review, during the design process, high performance glazing, exterior shading, and daylighting devices with University's Project Manager to verify these devices fall within the design and budget constraints, these design features are desirable. Coordinate with Project's Building Envelope and Project Sustainability Design Requirements.
- F. Door Vision Panels: Provide safety and fire-rated glass. No wire glass. Provide insulated units at exterior locations.
- G. Bird-Friendly Design: The University of Pittsburgh places special importance on bird safety. The lower levels of a building (first 40 feet) and levels next to a green lawn and roof areas are places where bird-friendly design is most critical.
- H. Specialty Glass: Bullet resistant, impact resistant and explosion resistant as determined by project design requirements.

C.46. SECTION 088900 LOUVERS AND VENTS

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Recycled Content of Steel Products: Provide postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. When louvers are design elements, Architectural grade products with drainable blade design shall be specified. Provide bird screens.
- C. Mechanical Requirements: Coordinate size, free air and other requirements with HVAC design requirements.
- D. Projects Occurring in Historic Districts: Projects that are required to comply with historical preservation requirements and/or occur within historic districts, coordinate louvers with historical preservation requirements and University's Project Manager.
- E. Aluminum Frames: Extruded aluminum frames; not less than 0.080 inch (2.03 mm) thickness.

- F. Finishes: Clear or color anodic finishes AAMA 611 Class I, 0.018 mm or a two-coat fluoropolymer with the addition of mica pearlescent flakes, AAMA 2605 finish containing not less than 70 percent PVDF resin (Kynar) by weight. Provide a 20 year standard manufacturer's warranty.

1. Colors shall be as selected by the University's Project Manager and Professional.

DIVISION 090000 - FINISHES

C.47. SECTION 091000 FINISHES – GENERAL

- A. General: Finish materials shall be determined based on the use of the programmed space and found acceptable to University's Project Manager, University Architect, University Interior Designer, project funding source and department/end user. Materials shall meet applicable buildings codes for flame spread and smoke developed requirements and shall provide a barrier free interior environment
- B. Wall Finishes: Specialty wall treatments and accents shall be on a project by project basis. Suggested materials shall be durable, cost effective, and easily maintained.
- C. Ceilings: Ceiling materials shall be durable, attractive, enhance energy efficiency and provide comfortable interiors. Materials shall allow access to plenum spaces, light fixtures, mechanical equipment, etc.
- D. Flooring:
1. Kitchens and wet utility (custodial) areas to be finished with porcelain textured surface tiles, heavy duty seamless flooring or high performance architectural coating (epoxy resin).
 - a) Kitchen flooring shall meet applicable federal, state and local health codes for food service areas.
 - b) Note: Breakrooms with kitchenettes are not considered kitchens.
 2. Mechanical rooms to be finished with high performance architectural coating, and may be a lower cost alternative for some wet utility areas where porcelain tile flooring is specified. Data communication rooms shall be finished with static dissipative tile (SDT) and must comply with requirements noted in Division L for telecommunications rooms. Electrical rooms may be sealed concrete.
 3. Toilet and rest rooms to be finished with porcelain or ceramic tile on the floor, base and wet walls. Layout and detailing of tile to be determined by project. Provide, at minimum, one floor drain in each room.
 4. Laboratories: The University has many different laboratory disciplines. Each is unique. The Professional shall design laboratory finishes to meet project design requirements. Laboratories' floors may be finished with heavy duty high quality seamless flooring, integral base is preferred if applicable. Base to be continuous roll 4" cove base.
 - a) Refer to Division P – Laboratory Standards for flooring requirements.
 5. Dry utility areas (closets, store rooms, file rooms, etc.) to be finished with LVT, carpet tile, or sealed concrete with resilient base; coordinate with University's Project Manager.
 6. Hard flooring systems (such as terrazzo) or high quality seamless flooring may be considered for main lobbies, atriums or where appropriate. Prior approval by the University's Project Manager and University Architect is required.

7. Polished Concrete: Refer to Section 033000; polished concrete surfaces may be considered for high visibility areas such as lobbies and atriums. Prior approval by the University's Project Manager and University Architect is required.
8. Back of house stairs, including fire exit stairs, may be finished with exposed concrete or premium grade rubber treads. Compatible sheet rubber flooring may be used on landings. All nosings shall include contrasting color inserts, minimum.. Provide photoluminescent stair nosings or strips to meet accessibility and egress codes in high rise stair towers. Risers may be resilient or painted as determined by project design between Professional and University's Project Manager. Product should be easily maintained with a dry cloth/mop.
9. Nosing: Provide nosing accessories at edges and stairs. The University has had problems with resilient nosing installed without mechanical fasteners. Professional shall devote particular attention to properly detail nosing, inclusive of contrast and photo luminescent inserts as required. Refer to Division 05, Section 055100 for cast-in-place stair nosing.

C.48. SECTION 092900 GYPSUM BOARD (INTERIOR PARTITIONS)

A. Sustainability:

1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Greenguard certification is particularly applicable for gypsum board.
2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
3. Recycled Content of Gypsum Products: Use synthetic gypsum board products and recycled content.
4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.

B. Interior Wall Partitions:

1. Framing: Construct of minimum 0.0329 inch (0.836 mm) (20 gage) galvanized metal stud frame work spaced at 16" o.c. as may be required by code is preferred.
2. Gypsum Board: Shall be minimum thickness of 5/8".
 - a) Fire-rated where required and moisture/mold resistant at wet areas. Gypsum board should not be used in areas such as wash rooms, large shower rooms and other high wet areas.
 - b) At tile areas, provide glass mat faced, moisture/mold resistant board or cement board.
 - c) High Traffic and High Use Areas: Use abuse resistant board (resistant to abrasions, indentations and soft-body impact). Professional shall review locations with University's Project Manager. Board shall be installed from finish floor to 8 feet minimum above finished floor.
 - (i) Residence/Student Housing: Use abuse resistant board at corridors and high traffic public use areas.
 - d) Synthetic Gypsum Board Products: Give preference to locally manufactured synthetic gypsum board products reclaimed from coal fired power plants.
3. Corridor walls shall be extended to deck above as required by governing codes.

4. Accessories: University prefers galvanized steel accessories. Vinyl and plastic accessories should be avoided. Reveals shall be aluminum or stainless steel.
 - a) Control Joints: Professional shall locate control joints on the drawings and review locations with University's Project Manager. Professional shall obtain University's Project Manager approval of control joint locations.
 - b) High Profile Spaces: Professional shall review locations of control joints with University's Project Manager and University Interior Designer's for high profile public spaces. Finish material application shall be included within the review.

5. Levels of Finishing: In accordance with Gypsum Association (GA-214) Recommended Levels for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels. Professional shall discuss locations with University's Project Manager.
 - a) Level 1:
 - (i) Description: Joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Fastener heads need not be covered.
 - (ii) Location: Ceiling plenum areas and concealed areas, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
 - b) Level 2:
 - (i) Description: Joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
 - (ii) Panels that are substrate for tile.
 - c) Level 3:
 - (i) Description: Joints and interior angles shall have taped embedded in joint compound and shall be immediately wiped with a knife leaving a thin coating of joint compound over joints and interior angles. One additional coat of joint compound shall be applied over joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. Joint compound shall be smooth and free of tool marks and ridges. Surface should receive a coat of drywall primer prior to application of final finishes.
 - (ii) Locations: For areas to receive heavy-grade wallcovering (fabric or rigid plastic or wood) and wainscoting (rigid plastic) and heavy or medium-texture finishes. This level is not recommended for smooth paint surfaces or light to medium wallcoverings.
 - d) Level 4:
 - (i) Description: Joints and interior angles shall have taped embedded in joint compound and shall be immediately wiped with a knife leaving a thin coating of joint compound over joints and interior angles. Two separate coats of joint compound shall be applied over flat joints and one separate coat of joint compound over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. Joint compound shall be smooth and free of tool marks and ridges. Surface should receive a coat of drywall primer prior to application of final finishes.
 - (ii) Locations: For areas where flat and eggshell sheen level paints, light textures or wallcoverings are to be applied. Paints with sheen levels other than flat, eggshell and enamels paints are not recommended over this level of finish. The weight, texture, and sheen level of wallcoverings applied over this level of finish should be carefully evaluated.

- e) Level 5:
 - (i) Description: Joints and interior angles shall have taped embedded in joint compound and shall be immediately wiped with a knife leaving a thin coating of joint compound over joints and interior angles. Two separate coats of joint compound shall be applied over flat joints and one separate coat of joint compound over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound trowel applied or a material manufactured especially for this purpose and applied in one coat accordance with manufacturer's recommendations, applied to entire surface. Surface shall be smooth and free of tool marks and ridges. Surface should receive a coat of drywall primer prior to application of final finishes
 - (ii) Locations: Highly recommended where satin or gloss paint is specified or where severe lighting conditions occur. Typically specified in appearance areas where smooth wall designs are decorated with paint gloss levels above eggshell sheen (i.e. satin/semi-gloss/gloss) or other glossy decorative finishes, dark/deep tone paints are applied, or critical lighting conditions occur. This level of finish is the most effective method to provide a uniform surface and minimize the possibility of joint photographing and/or fasteners showing through the final decoration.
 - 1. Should be provided at areas to receive dry-erase wall type covering.
 - 2. In projects incorporating large scale graphics, confirm with the University's Project Manager for coordination with related 3rd party vendor field finishing requirements.
- f) Mockups: For Level 5, jobsite mock-up(s) shall be used to determine acceptance of the finish within the building. The Professional shall specify the mockup procedure and mock-up construction details within the project documents, unless waived in writing The final decoration specification (e.g. painting specification) should include the application of a priming material prior to the decoration. The mock-ups shall be placed on the job site in a location which includes adequate lighting that represents actual final conditions to ensure the finish can be properly reviewed and evaluated.
 - (i) Level 5: Professional shall include in the project specifications, a mockup for Level 5 finish, a minimum of 8 feet by 8 feet (4 feet by 4 feet for smaller projects) to include one seam and multiple fasteners.
 - (ii) Small Projects: Coordinate with the University's Project Manager the location and sizing of mock-ups for Level 5. 4 feet by 4 feet may be an adequate mock-up.

C. Noise Control:

- 1. General: Use design features and strategies to control sources of noise from mechanical and electrical equipment and from sources exterior to the building. Select wall assemblies with appropriate Sound Transmission Class (STC) ratings based on the conditions of the site, building program and activities. Noise elimination, control, or isolation from equipment should be addressed through acoustic zoning, equipment selection, construction, and appropriately designed ducts, piping, and electrical systems.
 - a) Professional shall review and design to local Pittsburgh City sound ordinances for exterior applications. Professional shall develop an extensive environmental sound control study to meet Project Design Requirements and local code requirements.
- 2. Acoustic Design: Acoustic requirements of a space are impacted by the intended use of the space and the building construction and the completed finishes. Each shall be incorporated to achieve appropriate levels of design within the project spaces. Professional shall incorporate noise control information as part of all project documentation and building detailing.

3. Sound transmission class basis of design:

STC	Desired Speech Blocking Effect	Space
20 – 25	Quite speech is audible.	
25 – 30	Ordinary speech is audible and intelligible.	
30 – 35	Loud speech is audible and intelligible.	
35 – 40	Loud speech is heard but is rarely intelligible.	
40 – 50	Loud speech can be heard, faintly.	Corridors, Classrooms, Lecture Halls, Offices
50 – 60	Loud sounds can barely be heard.	Classrooms, Offices, Lecture Halls, Conference Rooms.

4. Mechanical Equipment Rooms: Isolate mechanical equipment rooms from occupied areas and spaces (floor, ceilings and walls). Professional and professional's MEP consultants shall discuss with University's Project Manager.
 5. Occupied Areas: Adjacent spaces to occupied areas such as toilet rooms, mechanical rooms, elevators, elevator machine rooms, and other spaces with loud noises, shall be isolated from occupied areas (floor, ceilings and walls). Professional and professional's MEP consultants shall discuss with University's Project Manager.
 6. HIPAA: Address all HIPAA, OSHA and other requirements for the operations of clinical spaces. This may include but not limited to privacy, acoustical performance, records security, quality of finishes (ability to clean and disinfect), and other considerations relative to specialty function and requirements for clinical spaces.
 7. Residence/Student Housing:
 - a) Walls: Wall construction between apartments shall have a minimum sound transmission class (STC) rating of 50. An STC rating of 50 is also required between suites and individual bedrooms. Use of resilient channels to achieve STC ratings is discouraged due to residents hang pictures and short-circuit the effectiveness of the channel.
 - b) Floor/Ceilings: an STC rating of 50 and an IIC (Impact Insulation Class) rating of 50 are required for floor construction separating apartments from each other and from public areas of the building.
 8. Noise Barrier Batts and Sealants: In stud cavity at sound and office walls for compliance with STC established ratings. Seal perimeters of sound partitions.
- D. Penetrations: Penetrations through drywall assemblies and items recessed into the assembly need to be detailed or specified to ensure that fire and acoustical performance of the assembly is not compromised. Electrical and telephone outlets should not be back-to-back in the same framed space. Locate devices in separate stud spaces a minimum 16 inches on center measured horizontally.

C.49. SECTION 093000 TILING

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle and Declare certifications are particularly applicable for tiling.
 - 2. Product Data: Provide for adhesives, sealants and membranes, indicating low to no VOC content.
 - 3. Recycled Content: Provide for Tile and Setting Materials include tile take-back program information.
 - 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.

- B. Reference Standards: Comply with the Tile Council of North America (TCNA) "Handbook for Ceramic Tile Installation" latest version.
 - 1. Professional shall list each TCNA numbered (FXXX or WXXX) installation method used including membranes and setting materials, and locations indicated on Drawings.
 - 2. Tile: Provide tile that complies with ANSI A137.1 and TCNA Tile Classifications.
 - a) Porcelain Tile: Shall be certified by the Porcelain Tile Certification Agency.
 - 3. Setting Materials: University prefers improved modified Portland cement dry-set mortar meeting ANSI A118.15.
 - a) Warranties: Warranty requirements must match setting materials' manufacturer's requirements.
 - 4. Grout: University prefers polymer-modified tile grout meeting ANSI A118.7. Use of epoxy grout must be discussed with University's Project Manager.
 - a) Color of grout shall be medium tone and approved by University's Project Manager. Grout color shall be reviewed with Business and Auxiliary Services if the project site is maintained by their maintenance teams.
 - (i) White floor grout is prohibited.
 - b) Minimize joints.

- C. Membranes:
 - 1. Waterproofing membrane shall be specified for all suspended slab wet areas such as but not limited to toilet rooms, showers, and janitor's closets. Preferred material is a fluid applied, fabric reinforced which cures into a continuous membrane.
 - 2. Crack isolation membrane shall be specified for all suspended slab non-wet areas.
 - 3. Other Types: Cleavage, waterproof, crack isolation, uncoupling and sound reduction membranes may be required for project design requirements. Review locations of each type of membrane with University's Project Manager.

- D. Metal Edge Strips: Professional shall specify and detail appropriate edge trims and transitions strips at all tile edges and comply with accessibility requirements.

- E. Restrooms Porcelain Tile and Mosaic Tile: Porcelain tile and mosaic tile shall be specified for restroom floors and base, mosaic format where required. Floor tile shall be color body, neutral surface color with a visual or tactile texture. The use of color accents is optional. Walls shall be either tile or epoxy-like paint. Colors to be also light and neutral, with optional color accents. It is acceptable to use the same colors and materials in both male, female and single user restrooms. Marble thresholds may be used at restroom entrances, review and discuss with University Project Manager.
 - 1. Wall Tile: Glazed ceramic or porcelain tile, minimum of 4 inches by 4 inches. At top of wainscot areas and at corners, provide bullnose trim; if bullnose trim is not available use finishing accessories as approved by University's Project Manager. Wall tile installations may include the use of Accent Tile.
 - 2. Floor Tile: Porcelain and Porcelain Mosaic: Wall base shall be covered with bullnose top; if bullnose top is not available use metal edge strip as approved by University's Project Manager. Coordinate size of tile at floor drain areas.
 - 3. Accent Tile: Glass, glazed porcelain, dimensional, contrasting, mosaic, listello tile used at feature locations and interior interest. Illustrate location and layout of tile within project documents.
 - 4. Porcelain Tile Panels: Porcelain tile panels may be utilized at high traffic, high wear and feature interior locations. Due to the large format of the tile product, this material shall minimize grout joints on a project.
- F. Quarry tile should be avoided except at renovation areas to match existing.
- G. Specialty Tiles: Glass tiles, non-slip tiles, porcelain textured surface tiles (similar to Crossville Tile Cross Colors with Cross-tread Texture), shall be on an as required basis to meet project design requirements and shall be reviewed with University's Project Manager and University's Interior Designer. Consider glass tile that has a high recycle content.
- H. Control and Expansion Joints: Locations of control and expansion joints shall be shown on Drawings. Coordinate location of tile control joints with substrate control and expansion joints.
- I. Stairs: Coordinate size of tile and location of coordinating nosings. Use modular tile and align grout joints.
- J. Exterior Tile: Tile used in exterior applications shall be rated and certified for exterior use.
- K. Colors, Selections and Patterns: Shall be as selected by the Professional, University's Project Manager, University Architect and University Interior Designer.
- L. Installation: Installer shall employ only Ceramic Tile Education Foundation Certified Installers and at least one installer for the Project that has completed the Advanced Certification for Tile Installers (ACT) certification for membranes, gauged porcelain tile and large format tile.

C.50. SECTION 095113 ACOUSTICAL PANEL CEILINGS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle and Declare certifications are particularly applicable for ceilings.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Recycled Content: Provide for acoustical panels. Include acoustical material take-back program information.

4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. General: Suspended ceiling panel systems should be the removable and accessible type. Lighting fixtures and devices shall have additional support hangers added to the suspension system for proper reinforcement as required by code. Do not suspend ceiling from ductwork or existing piping above ceiling. Provide access areas to serviceable equipment located above ceilings without the need to remove major portions of the ceiling support system.
1. Balance System: Establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders.
- C. Suspension System: University prefers heavy-duty, 15/16 grid for general use. For unconditioned spaces use hot dipped galvanized or aluminum grid suspension systems. Concealed spline type systems shall be considered based on building design requirements but should not be used where access to above ceiling is required. Decorative specialty grids (i.e. wood look) shall be based on building program requirements. Coordinate trim and accessories with systems specified.
- D. Panels:
1. Standard General Purpose Areas: University prefers 24 inch by 24 inch visual format (24 inch x 48 inch second look or 24" x 24"), fine fissured or lightly textured, with revealed type edge and a minimum light reflectance of 0.75. If panels are being specified for a partial floor renovation, consider coordinating material selection to the remainder of the floor that is existing to remain. Perimeter tiles to be reveal cut with the edges finished to be considered a complete installation.
 2. Decorative Panels: Type and style shall be determined by the programmatic need of the spaces such as the need for fire-rating and high acoustics.
 3. Humidity Control: All tile shall have humidity resistant and anti-sag characteristics to maximize the longevity of the material's dimensional stability as the University employs energy efficiency measures such as economizer settings on building mechanical systems during periods of non-peak usage.
 4. Professional Note for Fire-Rated Ceilings: When using fire-rated acoustical ceilings, remember that electrical and mechanical ceiling penetrations must be limited and constructed to comply with the requirements of the listed fire-rated assembly. Special coordination of the mechanical and electrical contract documents is required. This is commonly forgotten, resulting in Change Orders. Hold-down clips make access above the ceiling difficult and the clips may not be properly reinstalled.
 5. Long Range Maintenance Issues: University does not have storage space for maintenance stocks of ceiling tiles. Since acoustical ceilings always need repair and since repair material may need to be purchased many years after the ceiling is completed, the long term availability of the ceiling panel pattern should be checked. Use acoustical ceiling products which are not "trendy", which are likely to be available far in the future, and which are common throughout the industry.

6. Acoustics: Ceiling product Noise Reduction Coefficient should be considered when selecting acoustical ceiling products. When moving, vibrating, or noisy mechanical equipment is located above suspended acoustical ceilings, the acoustical ceiling alone is often inadequate and cannot provide an adequate sound environment in the office, lab, or classroom below. Additional acoustical insulation placed above the ceiling and other effective sound isolation and attenuating materials shall likely be needed. Do not enclose noisy mechanical equipment above suspended ceilings with rigid assemblies or other construction which restricts access to the equipment or which requires major demolition and reconstruction each time the equipment is serviced. The University utilizes demountable stick built and panelized wall systems on campus for interior fit-outs, the Professional shall review the CAC rating for ceiling systems in these locations to provide increased acoustical separation between spaces.
- E. Mechanical and Electrical Coordination: Locate light fixtures, mechanical devices, sprinkler heads and other items penetrating panels in center of panels. Contractors shall submit ceiling coordination drawings. Color of fixture shall match ceiling finish color.
 - F. Specialty Ceilings: Metal panel, wood panel, linear metal and linear wood ceilings shall be determined on project by project basis with the University's Project Manager, University Architect and University Interior Designer. These types of ceilings where access to above ceilings is required shall be limited in use. Consult with University's Project Manager for use of specialty ceilings.
 1. Maintenance Tools and University Training: Contractor shall furnish a complete set of specialized tools and maintenance instructions for University's removal and replacement of specialty ceilings. Contractor shall instruct University's personnel on removal and replacement.
 2. Access Panels: Provide specialty ceiling manufacturer's access panels. Professional shall review locations with University's Project Manager and coordinate with MEP consultants.
 - G. Colors, Selections and Patterns: Shall be as selected by the Professional, University's Project Manager, University Architect and University Interior Designer.

C.51. SECTION 096400 WOOD FLOORING

- A. Comply with Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program last adopted Edition.
 1. Fabricators Qualifications: Certified participant in AWI's Quality Certifications Program.
 2. Interior Woodwork Grade: Provide Premium-grade for interior woodwork and casework.
- B. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle, Declare, FloorScore, and Greenguard certifications are particularly applicable for flooring.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Regional Materials: Include information for use of regional materials. Refer to Section 018113 Sustainability Design Requirements, Regional Material statement included within this Division C.
 4. Chain-of-Custody Certificates: Provide for certified wood products including statement of costs.

5. Laboratory Test Reports: Provide for composite wood products, indicating compliance with requirements for low-emitting materials.
 6. Product Data: Provide for installation adhesives and finishes, indicating low to no VOC content and for flooring, indicating no added urea formaldehyde.
 7. Recycled Content of Medium-Density Fiberboard and Particleboard: Use and document postconsumer plus one-half of pre-consumer recycled content not less than 50 percent.
 8. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 9. Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.
- C. Wood Species and Grade: As determined by project design between Professional and University's Project Manager.
1. The Professional shall strive to select wood that meets the "Legal Wood" definition as determined by ASTM D7612 and to select wood from regional and domestic legal wood species.
 2. Hardwood Flooring: Comply with NWFA A500 for species, grade and cut.
 - a) Maple Flooring: Comply with MFMA grading rules for species, grade, and cut. Pre-finish is preferred.
 3. Engineered Wood Flooring: Professional shall review with University's Project Manager.
 4. Bamboo Flooring: Professional shall review with University's Project Manager.
 5. Athletic Wood Flooring: Professional shall review with University's Project Manager for type of resiliency required to meet project design requirements and NCAA/Conference performance requirements. Professional shall review NCAA/Conference performance requirements and regulations for type of sport and athletic competition being performed on the floor.
- D. Installation: Store wood products in areas to receive flooring, prepare substrates and install flooring in accordance with manufacturer's published instructions.
1. Concrete Slabs: Contractor shall test for moisture levels and be responsible for providing moisture mitigation measures for slabs that exceed maximum moisture-emission levels (penetrating-sealer or moisture-barrier products) as recommended by manufacturers for use with flooring products and adhesives selected.
 2. Substrate Preparation: Contractor shall properly prepare substrate prior to installation of materials, provide latex modified, Portland cement base leveling for uneven surfaces and depressions.
 3. Finish: Flooring shall be sealed with penetrating, pliable sealers compatible with the stain and finish used and as recommended by the flooring manufacturer. Provide low to no VOC finishes.

C.52. SECTION 096500 RESILIENT FLOORING

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle, Declare, FloorScore, and Greenguard certifications are particularly applicable for flooring
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 - 4. Recycled Content: Document for resilient flooring, base and accessories.

- B. Resilient flooring and base includes the following materials – Static Dissipative Tile (SDT), Luxury Vinyl Tile (LVT), Biobased Flooring, Rubber Flooring, Cork Flooring and Linoleum Flooring. The University discourages the use of VCT on campus.
 - 1. Refer to Division P – Laboratory Standards for flooring requirements.

- C. Resilient Flooring and Adhesives: Shall be free of asbestos. Install flooring in accordance with manufacturer's recommendations.
 - 1. Static Dissipative Tile (SDT): SDT must comply with requirements noted in Division L for telecommunications rooms.
 - 2. Luxury Vinyl Tile (LVT): LVT must have a minimum 20 mil wear layer.
 - 3. Biobased Tile: Shall provide durability equal to the minimum LVT 20 mil wear layer.
 - 4. Cork Flooring: May be cork, cork rubber or engineered cork, 34 lb/cu.ft. minimum density; nominal thickness 0.180 inch. Review size, thickness and density with University's Project Manager.
 - 5. Linoleum Flooring: May be tile or sheet and meet ASTM standards. When considering sheet linoleum flooring, provide integral base and heat welded seams. Linoleum flooring shall not be used at student housing projects.
 - 6. Resilient Sheet Flooring: At student housing projects, use resilient sheet flooring with heat welded seams and integral base.
 - 7. Resilient Sport Flooring: May be used for intramural sports, training, and exercise rooms.
 - 8. Warranties: Warranty requirements must match adhesive materials' manufacturer's requirements.

- D. Resilient Base: ASTM F1861, Type TP (rubber, thermoplastic) or Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous). Coils in manufacturer's standard length to minimize joints; 8 foot lengths for materials that are not packaged by the roll.
 - 1. Base shall be topset rubber cove or vinyl, the University prefers to have a Millwork style resilient base for high visibility areas and front of house areas.

E. Stairs:

1. Resilient Stair Treads—Provide rubber stair tread units complying with ASTM F2169, Type TS (rubber, vulcanized thermoset) or Type TP (rubber, thermoplastic), sanded backs; nose design: Class 1 smooth, Class 2 pattern, embossed, grooved or ribbed, square, or round nose. Group 2 (with contrasting color for the visually impaired) where required by code. Provide integral photoluminescent stair nosings to meet accessibility and egress codes in high rise structures; nosings shall be easily replaceable.
2. Resilient Risers—Provide single-piece riser for height and width of stair risers of equal-sized units if riser width exceeds available manufactured lengths where required. In locations where integrated tread and riser material is specified, the tread nosings must overlap the riser to conceal connection points for longevity of wear. Provide rubber risers for stairs where indicated. Coordinate riser color with stair tread color. Discuss project requirements for resilient risers with the University's Project Manager and the building Facility Manager.

F. Accessories: Provide rubber resilient edge and transition strips for resilient flooring and carpet (refer to carpet for alternate nosing materials). Transition strips are not required where flooring is of equal thicknesses; the Professional may specify an edge accessory to protect the *raw* edge of the *adjacent* materials in either resilient or extruded metal.

1. At tier flooring areas, provide extruded nosings with mechanical fasteners. The University has had problems with set-on resilient nosing. Professional shall devote particular attention to properly detail nosing for a fully integrated flooring solution. Set-on resilient nosings are not permitted.

G. Installation: Prepare substrates and install flooring in accordance with manufacturer's published instructions.

1. Concrete Slabs: Contractor shall test for moisture levels and be responsible for providing moisture mitigation measures for slabs that exceed maximum moisture-emission levels (penetrating-sealer or moisture-barrier products) as recommended by manufacturers for use with flooring products and adhesives selected.
2. Substrate Preparation: Contractor shall properly prepare substrate prior to installation of materials, provide latex modified, Portland cement base leveling for uneven surfaces and depressions.

H. Protection: Installed surfaces shall be protected during construction.

I. Cleaning: At the completion of work, surfaces shall be cleaned. Professional shall specify for Contractor to coordinate surface cleaning with University's Project Manager and Custodial Department.

C.53. SECTION 096600 TERRAZZO

A. Sustainability:

1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle, Declare, FloorScore, and Greenguard certifications are particularly applicable for flooring.
2. Product Data: Provide for sealants, indicating low to no VOC content.
3. Recycled Content: Document for terrazzo materials.
4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.

- B. Reference Standards: Comply with NTMA's "Terrazzo Specifications and Design Guide".
- C. Types:
 - 1. University prefers thin-set, epoxy-resinous matrix terrazzo.
 - 2. Terrazzo Tile: Portland cement terrazzo tile units and epoxy resin terrazzo units.
- D. Divider Strips: White-zinc alloy or brass; minimum width 1/8 inch. Match existing at renovation projects.
- E. Colors, Selections and Patterns: Shall be as selected by the Professional, University's Project Manager, University Architect and University Interior Designer.

C.54. SECTION 096700 FLUID APPLIED FLOORING

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Product Data: Provide for flooring and sealants, indicating low to no VOC content.
 - 3. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. Resinous Flooring: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base as determined by project design requirements. Review with University's Project Manager.
 - 1. Waterproof Equipment Rooms: For equipment rooms which are located adjacent to or over sensitive areas which could be damaged by leaking water, use a waterproof seamless floor.
 - a) Waterproofing Details: If a waterproofing system is used, waterproofing is required at slab penetrations. Floor penetrations shall be sleeved, waterproofing turned up sleeves and room walls, and sealed to form a completely watertight assembly.
 - 2. Integral Base: Provide metal cap strip at top of integral base per manufacturer's installation details.
- C. Colors, Selections and Patterns: Shall be as selected by the Professional, University's Project Manager, University Architect and University Interior Designer.
- D. Installation: Prepare substrates and install flooring in accordance with manufacturer's published instructions.
 - 1. Concrete Slabs: Contractor shall test for moisture levels and be responsible for providing moisture mitigation measures for slabs that exceed maximum moisture-emission levels (penetrating-sealer or moisture-barrier products) as recommended by manufacturers for use with flooring products and adhesives selected.
 - 2. Substrate Preparation: Contractor shall properly prepare substrate prior to installation of materials, provide latex modified, Portland cement base leveling for uneven surfaces and depressions.

C.55. SECTION 096800 CARPETING

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. CRI Green Label Plus, Cradle to Cradle, and NSF/ANSI 140 certification are particularly applicable for carpeting, underlayment, and adhesives.
 - 2. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 - 3. Recycled Content: Provide for carpeting and padding. Include carpet takeback program information for recycling.
 - 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. General: Professionals are highly discouraged from using plush pile carpets, colors that are too dark or too light and also single color carpets, as they are extremely difficult to maintain.
 - 1. Student Housing Projects:
 - a) Corridors: Provide carpet tile; coordinate with project design requirements.
 - b) Living Spaces: Provide broadloom sheet carpeting with minimal visible seams. Evaluate the opportunity for modular tile with the University Project Manager and Business and Auxiliary Services. Carpet tile shall include a medium range of colors and patterning which will provide the appearance of a broadloom installation. Fiber systems shall be reviewed for maintenance and longevity of appearance in high usage locations such as Living Spaces.
- C. Carpet: Best performing carpets are those that have a loop weave in a combination of at least two (2) colors in a medium range. The University's preference is to use modular carpet tile format unless a broadloom is required by space function and/or aesthetic.
 - 1. Yarn: At minimum, provide solution-dyed or yarn dyed, nylon fiber type 6 or 6.6.
 - 2. Performance Characteristics:
 - a) Electrostatic Propensity – Static Control: Less than 3.5 kV according to AATCC 134.
 - b) Emissions: Provide carpet tile that complies with testing and product requirements of CRI's "Green Label Plus" program.
 - c) Surface Flammability: Passes CPSC FF 1-70, ASTM E-648.
 - d) Smoke Generation: Less than 450, ASTM E-662.
 - e) Soil-Resistance Treatment: Manufacturer's standard treatment.
 - f) Sustainability:
 - (i) Pre-Consumer Recycled Content: Face fibers and backing.
 - 3. Backing systems shall be reviewed with the University's Project Manager, University Architect and University Interior Designer to determine if the project scope requires attached cushion or other backing alternative systems.
- D. Substrate Preparation:
 - 1. Concrete Slabs: Contractor shall test for moisture levels and be responsible for providing moisture mitigation measures for slabs that exceed maximum moisture-emission levels (penetrating-sealer or moisture-barrier products) as recommended by manufacturers for use with flooring products and adhesives selected.
 - 2. Substrate Preparation: Contractor shall properly prepare substrate prior to installation of materials, provide latex modified, Portland cement base leveling for uneven surfaces and depressions.

- E. Installation: Contractor shall comply with the manufacturer's recommendations for installation of carpet, recommendations for seam locations, and shall maintain uniformity of carpet direction and lay of pile.
 - 1. At doorways, seams shall be centered under door in closed position and seams placed perpendicular to door frames.
 - 2. Adhesives:
 - a) Liquid: Use water-resistant or water-proof, non-staining carpet adhesive as recommended and approved by the carpet manufacturer to comply with low or no VOC requirements and warranties. Tiles shall be installed in full spread adhesive.
 - b) Floating or Direct Adhesive Solutions: Use manufacturer's approved and coordinating product for installations where wet adhesives will not be included for project preference or field conditions. Adhesives are typically provided in a modular format for direct application to the subfloor or product.
- F. Accessories: Resilient or extruded aluminum edge strips shall be rubber reducer strips or material finish as specified for resilient flooring, joiner for tile and carpet and transition strips. Transition strips are not required where flooring is of equal thicknesses, the Professional shall review the material transitions with the University's Project Manager.

C.56. SECTION 096900 ACCESS FLOORING

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle, Declare, FloorScore, and Greenguard certifications are particularly applicable for flooring
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. Pedestal floors are frequently needed in spaces where computer or other concentrated areas of electrical or electronic equipment is used. Type and quality shall be discussed with University's Project Manager. University prefers cementitious-core steel panel access flooring.
- C. Minimum Design Loads: Provide access flooring capable of complying with the following performance requirements according to testing procedures in Cisca's "Recommended Test Procedures for Access Floors:"
 - 1. Concentrated Load: 1250 lbf.
 - 2. Ultimate Load: 2500 lbf.
 - 3. Rolling Loads: With local or overall deformation not to exceed 0.040 inch (1.02 mm).
 - a) 10 passes at 1000 lbf.
 - b) 100 passes at 800 lbf.
 - 4. Uniform Load: 300 lbf/sq.ft.
- D. Low-Profile, Fixed-Height Access Flooring: Manufacturer's standard, modular, steel or polymer components, designed to interconnect and provide channels for installation of wiring; with manufacturer's standard factory-applied:
 - 1. Loading Capacity: 100-lbf/sq. ft. (4.8-kN/sq. m).

- E. Electrical Resistance: Professional shall specify electrical resistance (static control) with installed floor coverings for surface-to-ground tested according to ASTM F 150 with 100-V applied voltage as required to meet project design requirements. Professional shall review requirements with University's Project Manager.
- F. Accessories: Provide access flooring manufacturer's standard components for ramps, stairs, handrails and fascia assemble.
 - 1. Electrical: Provide liquid proof, UL listed, electrical boxes; side mounted.
 - 2. Nosing: Provide resilient nosing at edges and stairs. The University has had problems with resilient nosing. Professional shall devote particular attention to properly detail nosing

C.57. SECTION 097000 WALL FINISHES

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle, Declare, and Greenguard certifications are particularly applicable for wall finishes.
 - 2. Product Data: Provide for sealants, indicating low to no VOC content.
 - 3. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. Special wall treatments and accents shall be considered on a case by case basis. Suggested materials must be durable, cost effective, easily maintained and meet the University's goals for sustainable design. Materials may be natural fiber, wood veneer, cork, etc. Specialty wall finish shall carry a Class A fire rating. Review with University's Project Manager.
- C. Vinyl Wall Covering: Provide integral pigmented, opaque virgin vinyl calendared film vinyl wall covering material treated with mildew and antimicrobial additives and laminated to suitable backing complying with FS CCC-W-408A and CFFA –W-101-A for types.
 - 1. Type 1 – Light Duty: Are prohibited unless requested specifically by the University.
 - 2. Type 2 – Medium Duty: For use in high traffic areas, such as corridors, public spaces, schools, etc.
 - 3. Type 3 – Heavy Duty: For use in most heavily traffic areas where greater wall protection is needed areas.
 - 4. Colors, Textures, and Patterns: Professional shall review with University's Project Manager.
 - 5. Wall covering material shall be mildew resistant and meet Class A – Flame Spread index of 25 or less and Smoke Development of 50 or less per NFPA E-84.
- D. Refer to Section 102600 for high impact wall covering.
- E. Refer to Section 101000 for dry-erase wall covering.

C.58. SECTION 098000 ACOUSTIC TREATMENT

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.

2. Product Data: Provide for sealants, indicating low to no VOC content.
 3. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. Design specialized treatment areas such as assembly areas as determined by project design requirements. Review with University's Project Manager and Custodial Staff for durability and maintenance expectations.

C.59. SECTION 099000 PAINTING AND COATING

- A. Sustainability:
1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. Cradle to Cradle, Declare, and Greenguard certifications are particularly applicable for paints and coatings.
 2. Product Data: Provide for paints, coatings and sealants, indicating low to no VOC content.
 3. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. Materials:
1. Provide best-quality grade of various types of coatings as regularly manufactured by acceptable manufacturers of paint materials.
 2. Materials for use within each paint system shall be compatible with one another and substrates indicated including primers provide under other sections, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 3. At minimum, provide one primer coat and two finish coats of each type of paint and coating. All products (sealer, prime coat(s), stain, block filler, finish coat(s), etc.) within a specified paint system shall be the product of one manufacturer. If specifying dark colors, three to four coats may be required to achieve a consistent appearance.
 4. Provide paint and coating materials with low or no VOCs.
 5. Single Manufacturer: All products (sealer, prime coat(s), stain, block filler, finish coat(s), etc.) within a specified paint system shall be the product of a single manufacturer.
 6. Markerboard paints and coatings are not permitted based on product lifetime durability and maintenance.
- C. Applicator: Installation must be performed by a qualified applicator with skilled mechanics having not less than ten (10) years satisfactory experience in commercial or institutional paint applications. Furnish a list of at least five (5) commercial or institutional projects using the specified materials (or equivalent) of a similar size and scope of work to this project that have installed during the last three (3) years. Information shall include: project name, square footage, owner contact name with owner's address and phone number.
- D. Wall Paint: Wall paint colors shall have a minimum reflectance rating of LRV 75, except for accent walls, for which this reflectance rate does not apply. Accent walls shall be limited to a maximum of 25% of the total wall surface of the room.
1. Gloss Levels - Exterior:
 - a) Concrete Masonry Walls: Satin.
 - b) Dimension Lumber: Flat.
 - c) Siding (wood, cementitious, aluminum): Satin.
 - d) Trim (wood, cementitious, aluminum): Satin.

- e) Metal Lintels: Semi-Gloss.
 - f) Decorative Metals: Gloss.
 - g) Handrails: Gloss.
2. Gloss Levels - Interior:
- a) Walls: Eggshell.
 - b) Toilet Room Walls: Eggshell.
 - c) Kitchen (Food Prep) Walls: Semi-Gloss.
 - d) Mechanical Rooms: Semi-Gloss.
 - e) Storage Rooms: Semi-Gloss.
 - f) Garage and Maintenance Rooms: Semi-Gloss.
 - g) Ceilings: Flat.
 - h) Wood Trim (Opaque): Semi-Gloss.
 - i) Wood Trim (Transparent): Satin.
 - j) Metal Doors and Frames: Semi-Gloss.
- E. Ceiling Paint – General Interiors: Ceiling paint color shall have a minimum reflectance rating of LRV 85. Use of dark colors on ceilings is not acceptable for energy conservation reasons.
- F. Ceiling Paint - Accent Locations: Saturated/dark ceiling paint colors are acceptable for use as accent conditions for adjacent building materials (i.e. perimeter bulkhead), to camouflage open ceilings behind a cloud or to call attention to a structural or system element as required by the design. Finishes shall be reviewed with the University's Project Manager, University Architect, and University Interior Designer. Finishes are to be included in the photometric study included in the contract document submission.
- G. Door Frames and Doors Paint Color: Paint color or veneer to match interior color scheme. Doors leading from the renovated area to a public corridor shall be painted or finished to match existing corridor doors on the corridor side.
- H. Interior Wood Doors: Interior wood doors shall be stained and finished with premium quality waterborne polyurethane, satin finish.
- I. Steel – High Performance Coatings (Industrial Coatings): Provide modified polyamidoamine epoxy primer and aliphatic acrylic urethane top coats. Professional to determine location and type based on project requirements and discussions with University's Project Manager.
- J. MEP Painting: Items to be painted in the field include, but are not specifically limited to, factory-primed items such as radiators, convectors, enclosures, steel bases, housings, louvers, grilles, heat exchangers, piping, conduit, insulated piping, ductwork, hangers, rooftop fans, gravity ventilators, stacks, exposed steel and iron work and panelboards exposed in finished areas.
- 1. Refer to Division J – Mechanical Design Standards for color coding of mechanical devices, equipment and appurtenances.
- K. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.
- L. Application: Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

1. Contractor shall be responsible to protect adjacent areas from paint dripping during work. Contractor is responsible to remove immediately paint spilled onto floors or adjacent unpainted areas; to remove paint from glass, door hardware, etc.; and to clean glass and glazing at the completion of work.
2. Contractor shall avoid painting existing unpainted metal items of brass, chrome, aluminum, or anodized finish and shall protect these from paint splatters and clean paint residue if spillage occurs.
3. Contractor shall re-paint previously painted items to match the new color scheme. Exposed pipes and conduits shall be painted to match adjacent surfaces unless otherwise noted.
4. Ventilation: Contractor shall comply with the manufacturer's recommendations to provide proper ventilation in areas where work is being performed.

DIVISION 100000 - SPECIALTIES

C.60. SECTION 101000 VISUAL DISPLAY UNITS

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 3. Certified Cradle to Cradle Silver certification or better; submit certification..
 4. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
- B. Chalkboards: Provide porcelain on steel chalkboards with 25 year warranty on writing performance. In general, chalk board surfaces shall be black. Coordinate chalk board locations and finishes with the University's Project Manager and Classroom Management Team for classroom/teaching environments. Magnetic substrates may be included in specified chalk board systems.
- C. Markerboards: Minimum of 0.0025 inch vitreous porcelain enamel (99% recyclable content) on minimum 24 gage enameled steel mounted on 0.5 inch particleboard with a Class A flame rating. Minimum 50 year manufacturer warranty on porcelain finish. Provide matt finish. Markerboards may or may not include frame systems; if frameless, the markerboard must include a finished edge. Coordinate markerboard locations with University's Project Manager and the Classroom Management Team for classroom environments.
- D. Frames: Extruded aluminum not less than 0.062 inch thick or thin profile wood; provide one inch high by full width of unit display rail. Chalk rail shall be attached to bottom frame or coordinated as an accessory unit to be considered a complete installation; length, size and location determined by project design requirements and discussions with University's Project Manager.
- E. Operable Boards, Chalk and Marker: Review product specifications with the University's Project Manager and Classroom Management Team. Systems are generally specified for classrooms that require additional writing space as part of the project program.
- F. Tackboards: Minimum Class A flame rating. Professional shall review finish with University's Project Manager. Review tackboard locations within public space with the University's Project Manager, University Architect and University Interior Designer.

- G. Glass Markerboards: Fabricated of minimum 6 mm tempered glass. Magnetic units to have steel backing for use with rare earth magnets. Edge treatment to be smooth/beveled polished edge. Provide manufacturer's standard accessories, rare earth magnets and magnetic chalk rails. Professional shall review with University's Project Manager locations and finish sheen.
- H. Dry-Erase Wall Covering: Intended for use with dry-erase markers and as a projection surface and consisting of low-gloss plastic film bonded to fabric backing
 - 1. Wall covering material shall be mildew resistant and meet Class A – Flame Spread index of 25 or less and Smoke Development of 50 or less per NFPA E-84.
 - 2. Adhesives for Field Application: Strippable, mildew-resistant, low or no VOC, nonstaining adhesive for use with dry-erase wall coverings; and for substrate application; as recommended in writing by dry-erase wall covering manufacturer.
 - 3. Installation: Install dry-erase wall covering horizontally with trim as recommended by manufacturer. Attach one removable cleaning instructions label to dry-erase wall covering in each room.
- I. Specialized graphics: Review graphic requirements for Chalk and Markerboards on the project with University's Project Manager. Graphics may include specialized markings such as athletic courts, music bars or watermark images. Watermark images and other imagery are considered large scale graphics and shall be reviewed by the Office of Campus Planning, Design and Real Estate. Instructional markings shall be reviewed by the Classroom Management Team.
- J. Cleaning Instructions: Provide cleaning instructions to University's Custodial Staff. It is best practice to include accessory packages with a soft cloth for marker and glass boards.

C.61. SECTION 101400 SIGNAGE

- A. Interior Signage: To be University standard interior signage, unless otherwise authorized by the University's Project Manager in writing. Refer to University's Division M - Signage.

C.62. SECTION 102113 TOILET COMPARTMENTS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 - 4. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent
- B. Toilet Compartments:
 - 1. Mounting: Where possible, toilet partitions are to be ceiling hung, exceptions are to be reviewed by the University's Project Manager and Custodial Services for alternate means of installation such as floor-mounted.
 - 2. No-Sight Line: Design Professionals shall specify systems with a continuous hinge and ship lap detail along the latch side for the length of the door panel for a "no-sight line" installation.
 - 3. Materials: Preferred material is phenolic resin, the University will accept stainless steel, baked enamel, high density polyethylene (HDPE), and plastic laminate.
 - a) Colors to be selected from manufacturers' standards.
- C. Mounting hardware, fasteners, and anchors shall be Type 316 stainless steel.

- D. Refer to Division Y - Architectural Design Guidelines for Restrooms, Shower and Locker Facilities, and Lactation Rooms.

C.63. SECTION 102219 DEMOUNTABLE PARTITIONS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Product Data: Provide for adhesives and sealants, indicating low and no VOC content.
 - 4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. The University has established standards for suppliers of demountable and pre-fabricated wall systems. Demountable and pre-fabricated panels are to be reviewed at the commencement of the project as construction details for demountable and traditional construction are not equal. Systems installed on campus are fabricated in unitized panels or stick-built and may include a variety of finished skin surfaces.
 - 1. Glazing: Include glazing consistent with the intent of the project scope and program, review privacy requirements at the commencement of the project to detail the amount of glass to be included, finish of the glass (clear, frosted, frit, color, patterned, applied film for future modification) and the coordination of signage and hardware.
 - 2. Painted surfaces: Include painted skins, finish to be reviewed with the University's Project Manager. It is appropriate to include at least a 75 LRV finish to 75% of the office interior.
 - 3. Tackboard panels: May be specified for wall system skins to provide integrated services for the office occupant. Locations are to be reviewed against FFE plans for proper coordination.
 - 4. Writeable panels: Skins may include writable film, glassboard, or markerboard finishes. Review the gloss level, locations and additional field elements (switches, outlets and thermostats) during design. Include accessory components to fit on system rails or attachment by magnetic components.
 - 5. Graphic skins: Review custom graphics with the University's Project Manager, if the graphics occur in high-profile areas or the use of University brand identity marks, review these elements with the University Architect.
 - 6. System insulation: Include STC data for glazed and non-glazed wall systems to review with University's Project Manager to ensure final installation meets with end user and program expectations.
 - 7. MEP Coordination: Coordinate locations of all switches, outlets, infeeds, cable routing, termination, mechanical controls, plumbing chases during design to minimize issues in the field during final installation.
 - 8. Audio Visual: Coordinate AV elements with the Center for Teaching and Learning and AV consultants on the team. Review serviceability for embedded monitors and computer locations, speakers and final placement of video camera devices that would need to stand proud of the wall system.
 - 9. Coordinate wall module seaming with FFE to provide a coordinated and integrated interior.

10. To the greatest extent possible, coordinate module sizes for best re-use and reconfiguration strategies.
 11. Confirm door style, room occupancies, door hardware and locking details throughout project to ensure all elements meet building codes for egress, clearances and University Standards for hardware.
 12. System finishes are considered part of the interior finishes and shall be included within the material binder with full review of all system elements with the University's Project Manager.
- C. Coordinate ceiling, bulkhead and perimeter heating details to ensure sound transmission goals are achieved on the project. Include sound batting and additional insulation to surrounding building elements as required.
 - D. Utilize a high CAC rated acoustical ceiling system where demountable systems are planned.
 - E. Investigate the use of sound masking systems and incorporate into projects utilizing demountable systems to the greatest extent possible. Systems may be zoned for tighter control over office environments where assembly and office adjacencies occur.
 - F. Demountable wall systems are procured through FFE dealer partners: Franklin, Workscape and BurkeMichael+. Systems installed to date on campus include the following:
 1. Steelcase VIA, Litescale.
 2. DIRTT.
 3. Haworth Enclose.
 4. NxtWall.
 - G. Construction Managers or the General Contractor shall be responsible for purchasing the demountable wall systems from the FFE dealer. Pricing will be considered a pass-through with mark-up as expected for all trades coordination for the order. The University will not review and sign off on cut sheets for the wall systems unless expressly noted.
 - H. The University has established purchasing agreements with the following suppliers of landscape partitions, wall systems, and furnishings: Steelcase (Franklin Interiors), Knoll (Workspace, Inc.) and Haworth (BurkeMichael+). Open line systems may be sourced through the dealerships as included above to compliment proprietary product. The University's Project Manager will coordinate with dealer and University's Interior Designer; Professional shall coordinate and verify panel system layout meets all accessibility and egress codes and is planned in a manner that accounts for and mechanical and electrical project requirements and elements.
 - I. General:
 1. Performance Requirements:
 - a) Surface Burning Characteristics: ASTM E84, Class A; Flame Spread Index of 25 or less and Smoke Developed Index of 450 or less.
 - b) Structural Performance:
 - (i) Load-Bearing Capacity: Not less than 300-lb (136-kg) concentrated.
 - c) Acoustical Performance: Minimum STC 35 per ASTM E90.
 - d) Accessibility: In accordance with International Code Council - ICC/ANSI A117.1 Accessibility Code and Americans With Disabilities Act (ADA).
 2. Panels:
 - a) Panels shall be a system solution capable of stacking, working off-module and bearing loads.

- b) Panel system shall include wire management features which conceal visible accessory wiring and provide access to divided wireways for telecommunications wiring. Refer to Division L – CSSD Specifications for current telecommunications wiring specifications to ensure bend radii can be accommodated.
 - c) Framing shall include field replaceable end panels and top caps which connect to the system in a secure manner.
 - d) Frames must be painted with environmentally friendly powder coat paint.
 - e) System solutions shall include field replaceable panels or tiles which minimize downtime and disruption to occupants
 - f) Consider metal tool rails as accessory pieces, review accessories with the University’s Project Manager to ensure the accessories are approved by the project funding source and are supportive of the project program.
 - g) Full furniture solutions shall include components capable of being installed and interchanged between open plan and private offices for an integrated office interior.
 - h) Tiles shall be available in tackable acoustic, glass, wood, storage, fold-down, marker-board, slat, and power/data tiles. System shall allow for selective placement of surface finish options.
 - i) Fabric tile shall not engage the floor.
 - j) Include grommet locations on plan to ensure cable management coordinates with the project electrical and data services.
 - k) Durable edge banding at all worksurface components.
3. Doors: Doors on panel systems are rarely used and should be avoided, doors do not provide secure environments within an open plan setting.
 4. Door Hardware: Hardware shall meet guidelines stated under Division 08 of this document.
 5. Electrical and Lighting:
 - a) Power entry shall be capable of being entered from the wall or floor at the base. Power poles shall be provided if there are no other means available to electrify the furniture, all power pole locations are to be reviewed with the University’s Project Manager.
 - b) Shall have electrical/data capabilities at the wireway or at work surface height.
 - c) **Wiring for landscape furniture must comply with University standards, shared neutrals are not permitted.** Professional shall coordinate this requirement with the electrical design engineer.
 6. Overhead Storage:
 - a) Shall attach to either the panels or the walls (using wall track system).
 - b) Provide an anti-dislodgment mechanism on all overhead units.
 - c) Include task lighting below overhead storage.
 7. The selected project dealer is responsible for specifications. The workstation is to include all miscellaneous connector’s brackets, electrical components, etc. to make it a complete furniture system.
 8. The selected project dealer is responsible for stability of systems furniture installation (panel run lengths, sagging long work surfaces, etc.). Follow manufacturer’s written installation instructions for maximum height restrictions and maximum run lengths.
 9. All components shall be from designated system family. No product substitutions from other manufacturers or lines will be allowed.

C.64. SECTION 102239 FOLDING PANEL PARTITIONS

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Product Data: Provide for adhesives and sealants, indicating low or no VOC content.

4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Operable panel partitions shall be manually operated; individual, paired or continuous acoustical panel shall be constructed with an aluminum frame; top hung. Electrically operated partitions shall be continuously hinge, acoustical panels. Finish material shall be as required to meet Project Design Requirements and approved by the University's Project Manager.
 - C. Minimum Performance Requirements:
 1. Sound Transmission and Noise Reduction Requirements: As required to meet Project Design Requirements and approved by the University's Project Manager.
 - D. Areas above the ceiling line and below the floor line shall be insulated as required to achieve the above ratings. Sound transmission above and around operable partitions must be addressed by the Professional. Sound rated drapes, acoustical insulation, framed walls, and other materials are needed to create effective acoustical barriers above operable partitions and ceilings.

C.65. SECTION 102600 WALL AND DOOR PROTECTION

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Corner Guards:
 1. Provide corner guards in public areas, maintenance areas, housekeeping areas and service areas subject to impact by cart traffic. Corner guards are to be installed by mechanical fasteners.
 2. Public Areas: High impact, extruded rigid plastic, minimum 0.078 inch (2.0 mm) wall thickness.
 3. Service Areas and Housekeeping Areas: Stainless steel corner guards minimum height of 48 inches above finished floor.
 4. Professional shall review type and location with the University's Project Manager and University's Interior Designer.
- C. High Impact Wall Covering: Plastic material or vinyl coated wood core panels. Type, color and locations as determined by project design between Professional, University's Project Manager and University's Interior Designer.

C.66. SECTION 102813 TOILET ACCESSORIES

Professional Note -- Professional shall review with the University's Project Manager and University's Auxiliary Department requirements for toilet accessories in existing and new buildings. Toilet accessories shall comply with ADA Requirements. The University has established standards for type and style of products being used for new University buildings in toilet room facilities.

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.

3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Paper products for towels and tissue shall be in the roll form. Soap dispensers shall be of the liquid type. Napkin holders will be dual dispensing and be coin operated. Mirrors shall be set in metal frames. Grab bars shall have non-slip finish.
- C. Refer to Division Y - Architectural Design Guidelines For Restrooms, Shower And Locker Facilities, And Lactation Rooms.
- D. Standard Toilet Accessory Schedule: *Professional shall review accessories with University's Project Manager and Building Custodial Services.*

Designation	Description	Manufacturer	Model
TA-1	Surface-Mounted, Jumbo Single Toilet Roll Dispenser w/ Stainless Steel Body+	ASI GAMCO	0042 TTD-13
TA-2	Surface-Mounted, Single Toilet Roll Dispenser w/ Theft-Resistant, Cast Alum. Body	Bobrick Bradley ASI	B-2730 5071-50 0263-12
TA-3	Recessed-Mount, Single Toilet Roll Dispenser w/ Theft-Resistant Spindle, Stainless Steel Body	Bobrick Bradley ASI	B-667.60 5102-5255 7402
TA-4	Surface-Mounted, Jumbo Single Toilet Roll w/ ABS Plastic Body*+	Bobrick Kimberly-Clark Georgia Pacific	B-52891 KCC09071 GPC58050
TA-5	Sanitary Napkin/Tampon Dispenser**	By Others (University Vendor)	Accessible compliant and no coin (free)
TA-6	Partition-Mounted, Sanitary Napkin Disposal Unit w/ Stainless Steel. Body (Two Toilet Compartments)	Bobrick Bradley ASI	B-4354 4721-15 472
TA-7	Surface-Mounted, Sanitary Napkin Disposal Unit w/ Stainless Steel. Body	Bobrick Bradley ASI	B-270 4781-15 0852
TA-8	Surface-Mounted Liquid Soap Dispenser (Mounting Plate)	By Others (University Vendor)	
TA-9	Recessed-Mount, Roll Towel Dispenser/ Waste Receptacle; Stainless Steel	Bobrick Bradley ASI	B-39601 227 2277 045224
TA-10	Semi-Recessed Mount, Roll Towel Dispenser/Waste Receptacle; Stainless Steel	Bobrick Bradley ASI	B-396034 2277-10 045224
TA-11	Surface-Mounted, Roll Towel Dispenser; Stainless Steel Body	Bobrick Bradley ASI	B-2860 2483 U169AJ
TA-12	Surface-Mounted, Roll Towel Dispenser;	Bobrick Bradley ASI	B-52860 U199FL
TA-13	Recessed-Mounted Warm Air Hand Dryer w/ Touchless	Dyson Bobrick	Airblade V HU02-N B-750

	Operation, 208V	Bradley ASI	2902-280000 NR246
TA-14	Over-Sink Mirror Unit w/ Stainless Steel Frame & Integral Shelf; 24"w x 36"h	Bobrick Bradley ASI	B-292 24x36 7805 24x36 0625 24x36
TA-15	Full-Length Mirror Unit w/ Stainless Steel Frame & Tempered Glass; 24"w x 48"h	Bobrick Bradley ASI	B-290 2448 780-2 24x48 06208 24x36
TA-16	Stainless Steel Shelf, Tamper-Proof; 8" d x length	Bobrick Bradley ASI	B-298 Series 758 0692
TA-17	Folding Stainless Steel Utility Shelf (ADA toilets only)	Bobrick Bradley ASI	B-287 790 0698
TA-18	Reversible ADA-Compliant Shower Seat	Bobrick Bradley ASI	B-5181 9569 8205
TA-19	Single Robe Hook	Bobrick Bradley ASI	B-6717 9114 7340
TA-20	2-Prong Robe Hook	Bobrick Bradley ASI	B-6727 9124 7345
TA-21	Shower Curtain Rod; 20 gauge Stainless Steel, 1" Diameter; Hooks to be stainless steel, heavy duty – one hook per curtain grommet.	Bobrick Bradley ASI	B-6107 953 1214
TA-22	Broom Stow; 18 gauge Stainless Steel w/ Shelf, 3 Grips	Bobrick Bradley ASI	B-239 x 34 9933 1306
TA-23	Grab Bars 18 gauge, 1.5" Diameter Stainless Steel	Bobrick Bradley ASI	B-6806 Series 8120 Series 3500 Series

C.67. SECTION 102900 CUSTODIAL FACILITIES

- A. New Buildings: Professional shall size areas to accommodate service of waste including recyclables, compostables, and other waste diversion requirements. Provisions shall be made for custodial services areas in new buildings. Areas to be provided shall consist of: a central receiving/storage area at the service entrance to the building, custodial office, custodial closets to be provided on each floor of the building with a floor level mop receptor - shelf - mop holder, and floor space for a cleaning cart and sweeper. Additional storage areas shall be provided as may be required to accommodate servicing and cleaning equipment shall be housed in the building. Provide for trash and recycling areas at each floor and at loading docks. (Professional shall verify final requirements with the University's Project Manager.)
- B. Existing Buildings: Existing custodial areas shall not be deleted unless other similar areas are provided as part of the project. Existing sinks shall not be used by the contractors to dispose of materials and cleaning of tools and equipment used to perform the construction work, i.e.: plaster, paints, thinners, etc. Contractors shall make other provisions for this cleanup since they shall be held responsible for costs resulting from damages to the facilities.

C.68. SECTION 104000 SAFETY SPECIALTIES

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 - 4. Recycled Content of Steel Products: Use and documents postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Emergency Key Cabinets: Fireman's vault box coordinated with University's Integrated Security Department (ISD).
- C. Defibrillator Cabinets: Professional shall indicate location of defibrillators and University will provide. Professional shall coordinate locations with University's Project Manager.
- D. Fire Protection Specialties:
 - 1. Cabinets: Provide rated and non-rated where required by building design.
 - a) Back of House Areas: Fully recessed or semi-recessed, white enamel on steel with flat door rolled-edge trim projection; accessible (ADA) compliant.
 - b) High Traffic, High Visibility, Public Areas: Fully recessed or semi-recessed, pre-finished aluminum or stainless steel with flat door rolled-edge trim projection; accessible (ADA) compliant. Professional shall coordinate finish with project design requirements and verify with University's Project Manager.
 - c) Renovation Work: Style to match existing cabinets in the area being renovated.
 - 2. Fire Extinguishers: Provide appropriately UL rated for the type of fire area in which they are placed. Extinguisher placement shall be in accordance with National Fire Protection Association, NFPA-10.
 - 3. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing and location.

C.69. SECTION 105000 LOCKERS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 - 4. Recycled Content of Steel Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Locker Types: Provide type and size required by the project design requirements. Professional shall review with University's Project Manager.
 - 1. Wardrobe: Solid wall wardrobe lockers with vents.
 - 2. Athletic: Open mesh or stamped diamond pattern athletic type lockers; heavy gage or wood customized for type of athletic discipline and sport in accordance with architectural woodwork guidelines in Section 064000. Consider high-density plastic type for wet areas such as aquatics.
 - 3. Tops: Lockers which are not recessed into walls should have heavy-gage sloping tops.

- C. Locker Bases: Concrete platforms with resilient base are preferred for most permanent applications and required in wet areas. Metal locker bases are too easily damaged and are discouraged. Wooden platforms are sometimes used in renovation work and for temporary installations. Wooden bases should not be used in wet areas.
- D. Locker Accessories: Electrical accessories shall be reviewed with the University's Project Manager to comply with Facilities Management Engineering standards.
- E. Locking Mechanisms: Professional shall coordinate with University's Project Manager and End Users. Lock methods are to be reviewed with the University's Project Manager and those responsible for the ongoing maintenance for locks where installed to verify the use of electronic or manual locks.

C.70. SECTION 105500 POSTAL SPECIALTIES

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Professional shall comply with U.S. Postal Service Publication 17 requirements for contraction and installation.
- C. Professional shall coordinate with University's Project Manager and University's Auxiliary Departments (Housing).

C.71. SECTION 108200 GRILLES AND SCREENS

- A. Exterior mechanical and electrical equipment shall be screened from view unless waived by the University's Project Manager. This includes rooftop equipment and ground-level equipment. Screening shall be reviewed and acceptable by applicable utility provider and equipment manufacturer.
- B. Trash, recycling, and waste diversion enclosures shall also be screened from public areas, campus view corridors and building entries unless waived by the University's Project Manager.
- C. Professional shall coordinate screens with the City of Pittsburgh Zoning codes and requirements.

DIVISION 110000 - EQUIPMENT

C.72. SECTION 111200 PARKING CONTROL EQUIPMENT

- A. Professional shall contact the University Parking and University's Project Manager to coordinate the current requirements for this section.

C.73. SECTION 111300 LOADING DOCK EQUIPMENT

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.

3. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. General:
1. Service Access: Professional shall identify service entry for buildings. Consider campus deliveries including mail delivery, general commercial deliveries, and trash, recycling and waste management pick-ups. Determine if a loading dock is appropriate with required equipment. Service access should be located, designed and screened so as to be discrete and non-disruptive to non-service campus activity and avoid pedestrian and vehicle conflicts.
 2. Loading dock equipment must be provided to accommodate the type of truck and cargo expected. Some docks may need to accommodate large tractor trailers and others may need to accommodate small parcel vans.
- C. Dock Bumpers: Loading docks should have dock bumpers to cushion the impact of the truck against the dock. The bumper height, width, thickness, type, and mounting location must be clearly indicated. Use industrial quality bumpers made from recycled truck tires.
- D. Dock Edge Angles: Concrete loading docks shall have a steel angle cast into the dock edge to protect the concrete from impact and damage. Edge angle shall be hot dip galvanized structural steel angles with welded anchor lugs.
- E. Dock Seals and Shelters: At major loading docks, provide adjustable dock seals to close the gaps between the truck and the building for energy conservation and interior comfort.
- F. Dock Levelers: Dock levelers shall be used at loading docks where several different types of trucks are expected. Size, capacity, and type of mechanism must be specified and discussed with University's Project Manager. Every possible safety device and safety option shall be required and specified including but limited to locks, restraints, signs, and lights. Key operated mechanisms are required to control and restrict operation.

C.74. SECTION 112423 WINDOW WASHING SYSTEMS

- A. Window Washing: Discuss window washing early in Design Development. Window washing is often forgotten during design causing problems and expense. Professional shall coordinate design of window washing systems with exterior specialty façade components such as sunshades, overhangs and balconies.
- B. Fall Protection: Refer to University of Pittsburgh's Fall Protection guidelines attached to the end of this document. Professional shall review guidelines with University's Project Manager.

C.75. SECTION 114000 FOODSERVICE EQUIPMENT

- A. Food Service Equipment: Professional shall work closely with University's Project Manager and University's Auxiliary Department (Business and Auxiliary Services - Housing and Food Services). Specialist food service equipment consultants may be needed to determine the type and size of equipment needed. Energy and water efficient food service equipment should be selected when available.
- B. Standards: Food service equipment must comply with National Sanitation Foundation standards and bear the NSF seal of approval. Electrically powered work must be UL listed. The following NFPA standards must be followed:
 1. NFPA 70: National Electrical Code.
 2. NFPA 96: Removal of Smoke and Grease Laden Vapors from Cooking Equipment.
 3. NFPA 54: National Fuel Gas Code.

- C. Energy Performance, ENERGY STAR: Equipment that qualify for the EPA/DOE ENERGY STAR product labeling program is preferred.

C.76. SECTION 115200 AUDIO-VISUAL EQUIPMENT

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. EnergyStar certification is of special relevance for audiovisual equipment.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. For classrooms, refer to Division N - Classroom and Lecture Hall Design and coordinate all Audio-Visual with the University Center for Teaching and Learning for standard classroom details.

C.77. SECTION 115300 LABORATORY EQUIPMENT

- A. General: If the user or University requests specialized laboratory equipment including but not limited to autoclaves, cage washers, hard-ducted biosafety cabinets, and/or exhausted gas cabinets, the Professional shall collaborate with the University's Project Manager, user group, and Pitt EH&S to specify the selected laboratory equipment.
- B. Fume Hoods: Fume hoods are special enclosed mechanical devices to permit working with hazardous or toxic substances in a controlled air flow which directs air away from the user and exhausts the air outside the building. The Professional must have a clear understanding of the types of fume hoods and options required for the project. Professional shall review fume hood selection with University's Project Manager and End User.
 - 1. Fume hoods shall be selected based on the needs and use by laboratory personnel and the department(s) associated with the laboratory. Future laboratory needs should be taken into consideration when making a fume hood selection.
 - 2. Hood selection shall be based on chemicals and processes to be used which may dictate specific type of hood design.
 - 3. Chemical fume hoods that remove 100% of exhaust air out of building must be specified. The University does not accept chemical fume hoods that recirculate air into the room. Air flow rate exhausted from the chemical fume hood must be sufficient to achieve acceptance testing using the ASHRAE 110 method post-installation; and must be based on the manufacturer's specifications of the selected chemical fume hood.
 - 4. Variable air volume fume hoods are preferred.
- C. Fume Hood Locations: Fume hood performance is affected by room drafts, air movement within the room, and by people circulation. Review fume hood locations with University's Project Manager and Environmental Health & Safety early in the design phase.

- D. Exhausted Gas Cabinet are enclosed mechanical devices that direct air away from the user and out of the building to permit working with highly hazardous or toxic gases that are contained within pressurized cylinders. The Professional must have a clear understanding of the types of gas cabinets and options required for the project. Professional shall review gas cabinet selection with University's Project Manager, Pitt EH&S and End User. Gas Cabinets shall be selected based on the gas in use, as determined by laboratory personnel and the department(s) associated with the project. Proposed gas use dictates specific gas cabinet design and required monitoring equipment, which automatically interfaces with building emergency notification systems in most cases.
- E. Appliances - Energy Performance, ENERGY STAR: Equipment that qualify for the EPA/DOE ENERGY STAR product labeling program is preferred.
- F. Refer to Division P – Laboratory Standards.

C.78. SECTION 116600 ATHLETIC EQUIPMENT

- A. Professional shall coordinate selection of fixed athletic equipment with Athletics and Recreation Departments and with University's Project Manager.

C.79. SECTION 118129 FACILITY FALL PROTECTION

- A. Fall Protection: Refer to University of Pittsburgh's Fall Protection guidelines attached to the end of this document as Appendix II - PERMANENT FALL PROTECTION GUIDELINES FOR ALL CAPITAL CONSTRUCTION RENOVATION AND NEW CONSTRUCTION PROJECTS AND RE-ROOF PROJECTS. Professional shall review guidelines with University's Project Manager.

DIVISION 120000 - FURNISHINGS

C.80. SECTION 122000 WINDOW TREATMENTS

- A. Sustainability:
 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Window Treatments:
 1. General: To match building standard. If the building does not have a standard, window shades shall be utilized.
 2. Roller Shades: University prefers roller shades. Minimum opacity shall be 5% for offices, 1-3% for conference rooms and classrooms. Colors shall be coordinated with University's Project Manager and University Interior Designer. For high profile projects and areas that are receiving window shades as part of a new building standard, the shade material shall be reviewed by the University's Project Manager and University Architect. A mock-up may be required for viewing the shade cloth from the exterior.
 - a) Valances: Coordinate valance types required with other work. Valances provided by shade manufacturer shall match color of shade cloth. Provide light-proof shades with side and sill closure channels where required to meet project design requirements.

- b) Control Mechanism: Motor operated and manually operated shades; provide types as required to meet project design requirements. Coordinate with building automation system and sustainable design requirements. For proper coordination, include the typical window shade control location on finish and furniture plans to show ease of control access.
- 3. Horizontal Blinds: Are prohibited unless requested specifically by the University.
- 4. Vertical Louver Blinds: For University's Auxiliary Department (Housing) shall be as required to meet Project Design Requirements.

C.81. SECTION 12200 CURTAINS AND DRAPES

- A. Use of curtains and drapes is discouraged, except when the style of the interior absolutely requires it. If fabric window drapes are specified, the fabric must be inherently flame-resistant, or flame-resistant treated.

C.82. SECTION 123000 GENERAL CASEWORK.

- A. Comply with Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program last adopted Edition.
 - 1. Fabricators Qualifications: Certified participant in AWI's Quality Certifications Program.
 - 2. Interior Woodwork Grade: Provide Premium-grade for interior woodwork and casework.
 - 3. Related Work: Work of this section applies to manufactured casework fabricated in large manufacturing facilities. Refer to Division 6 of this document for guidelines related to shop fabricated casework.
- B. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Regional Materials: Wood products shall be manufactured with 100 mile of project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles of project site.
 - 4. Chain-of-Custody Certificates: Provide for certified wood products including statement of costs.
 - 5. Laboratory Test Reports: Provide for composite wood products, indicating compliance with requirements for low-emitting materials.
 - 6. Product Data: Provide for installation adhesives, indicating low to no VOC content and for overall casework, indicating no added urea formaldehyde.
 - 7. Recycled Content of Medium-Density Fiberboard and Particleboard: Use and document postconsumer plus one-half of pre-consumer recycled content not less than 50 percent.
 - 8. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 9. Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.

- C. General Casework:
1. Cabinet Construction: AWI - Premium Grade; door and drawer construction (flush overlay, reveal overlay, etc., shall be determined by project design between Professional and University's Project Manager.
 2. Wood Species: As determined by project design between Professional and University's Project Manager.
 - a) The Professional shall strive to select wood that meets the "Legal Wood" definition as determined by ASTM D7612 and to select wood from regional and domestic legal wood species.
 3. Plastic-Laminate Grade: NEMA-LD3, HGS for countertops and VGS for cabinet cases. Color and patterns as determined by project design between Professional and University's Project Manager.
 4. Hardwood Plywood: HPVA HP-1, veneer core.
 5. Particleboard: ANSI A208.1, Grade M-2.
 6. Particleboard: Straw-based particleboard complying with ANSI A208.1, Grade M-2, except for density.
 7. MDF: Medium-density fiberboard, ANSI A208.2, Grade 130.
 8. Edgebanding for Plastic Laminate: Rigid PVC or ABS (Acrylonitrile Butadiene Styrene) extrusions, through color with satin finish, 3.0 mm thick at doors and drawer fronts, 1.0 mm thick elsewhere.
 9. Glass for Glazed Doors: Clear tempered glass complying with ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality-Q3; not less than 5.0 mm thick.
- D. Shelving: 1 inch thick AA plywood Oak veneer with hardwood edge banding.
- E. Hardware: Casework hardware shall be specified in detail to control quality and shall be determined by project design between Professional and University's Project Manager
1. Pulls: Drawer and door pulls shall be barrier-free but shall not protrude in a manner that suggests the pull could be used as a step. Mount horizontally on drawers and vertically on doors. Brushed or anodized aluminum, or satin finish stainless steel.
 2. Hinges: Five knuckle institutional hinges, satin finish stainless steel.
 3. Drawer Slides: Rated at 100 pounds minimum; consist of two steel epoxy coated sections providing a quiet, smooth operation on nylon rollers; slides shall wrap under drawer sides for additional support. Provide 150 lb. capacity drawer slides for file drawers.
 4. Catches: Provide roller catches on swinging doors.
 5. Door and Drawer Locks: To accept Best cores; confirm with University's Project Manager.
- F. Stainless-Steel Sinks: Fabricate from Type 304 stainless-steel sheet, not less than 0.050-inch (1.27-mm) (18 gage) nominal thickness. Fabricate with corners rounded and coved to at least 5/8-inch (16-mm) radius. Slope the sink bottoms to outlet without channeling or grooving. Provide continuous butt-welded joints.
1. Finish: Direction satin finish ASTM A480/480M, No. 4.
- G. Finishes:
1. Finishing Closed-Grain Woods: Apply a two-coat, baked, clear finish consisting of a thermosetting catalyzed sealer and a thermosetting catalyzed conversion varnish. Sand and wipe clean between applications of sealer and topcoat. Topcoat may be omitted on concealed surfaces.
 2. Finishing Open-Grain Woods: Apply a three-coat, baked, clear finish consisting of a thermosetting catalyzed sealer and two coats of a thermosetting catalyzed conversion varnish. Sand and wipe clean between applications of sealer and topcoat and between topcoats. Topcoats may be omitted on concealed surfaces.

C.83. SECTION 123553 LABORATORY CASEWORK.

- A. Comply with Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program last adopted Edition.
 - 1. Fabricators Qualifications: Certified participant in AWI's Quality Certifications Program.
 - 2. Interior Woodwork Grade: Provide Premium-grade for interior woodwork and casework.

- B. Sustainability: Wood products criteria shall be in accordance with the requirements of the Sustainable Design Tiers determined for the project. For projects not pursuing a Sustainability Rating Systems or Certification, the Professional shall strive to meet the following requirements for wood products following consultation with University's Project Manager.
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Regional Materials: Wood products shall be manufactured with 100 mile of project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles of project site.
 - 4. Chain-of-Custody Certificates: Provide for certified wood products. Include statement of costs.
 - 5. Laboratory Test Reports: Provide for composite wood products, indicating compliance with requirements for low-emitting materials.
 - 6. Product Data: Provide for installation adhesives, indicating low to no VOC content and for overall casework, indicating no added urea formaldehyde.
 - 7. Recycled Content of Medium-Density Fiberboard and Particleboard: Use and document postconsumer plus one-half of pre-consumer recycled content not less than 50 percent.
 - 8. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 9. Wood products shall be Forest Stewardship Council (FSC) certified and made from trees grown and harvested under the FSC certified wood products. Provide manufacturer's and vendor qualifications for chain of custody by an FSC accredited certification body. Certified wood to be FSC 100%.

- C. Refer to Division P – Laboratory Standards.

- D. Laboratory Casework:
 - 1. Provide Laboratory casework and fixtures to meet the guidelines of Scientific Equipment and Furniture Association (SEFA).
 - a) The University has many different laboratory disciplines. Each is unique. The Professional shall design laboratory casework to meet project design requirements.
 - 2. Materials:
 - a) Metal Cabinets with Wood Fronts: This is the University's preferred cabinet.
 - (i) Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A1008/A1008M; matte finish; suitable for exposed applications.
 - (ii) Metal thicknesses and gages in accordance with SEFA 8 M.
 - (iii) Wood: Door and drawer fronts shall be ¾ inch thick, square edge, composite core, hardwood veneer plywood (HPVA HP-1) with 1/8 inch hardwood edging. Wood species as determined by project design between Professional and University's Project Manager.
 - b) Stainless Steel Cabinets:
 - (i) Stainless Steel: Type 304.
 - (ii) Metal thicknesses and gages in accordance with SEFA 8 M.
 - c) Wood Cabinets: AWI Premium Grade and SEFA 8-W.

- (i) Wood Species: As determined by project design between Professional and University's Project Manager.
 - (ii) Hardwood Plywood: HPVA HP-1, veneer or particleboard core with face veneer of species indicated. Grade A exposed faces at least 1/50 inch (0.5 mm) thick, and Grade J crossbands. Provide backs of same species as faces.
- d) Plastic Laminate Cabinets: AWI Premium Grade and SEFA 8PL.
 - (i) Plastic-Laminate Grade: Chemical resistant; NEMA-LD3, HGS for countertops and VGS for cabinet cases. Color and patterns as determined by project design between Professional and University's Project Manager.
 - (ii) Hardwood Plywood: HPVA HP-1, veneer core.
 - (iii) Particleboard: ANSI A208.1, Grade M-2.
 - (iv) Particleboard: Straw-based particleboard complying with ANSI A208.1, Grade M-2, except for density.
 - (v) MDF: Medium-density fiberboard, ANSI A208.2, Grade 130.
 - (vi) Edgebanding for Plastic Laminate: Rigid PVC or ABS (Acrylonitrile Butadiene Styrene) extrusions, through color with satin finish, 3.0 mm thick at doors and drawer fronts, 1.0 mm thick elsewhere.
- 3. Glass:
 - (i) Glass for Glazed Doors: Clear tempered glass complying with ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality-Q3; not less than 5.0 mm thick.
 - (ii) Glass for Glazed Doors: Clear laminated annealed glass complying with ASTM C1172, Kind LA, Condition A, Type I, Class I, Quality-Q3; with two plies not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer.
- 4. Cabinet Construction:
 - a) Metal Cabinets: Casework Product Standard: Comply with SEFA 8 M, "Laboratory Grade Metal Casework."
 - b) Wood Cabinets: AWI - Premium Grade; door and drawer construction flush overlay is preferred; shall be determined by project design between Professional and University's Project Manager.
 - c) Plastic Laminate Casework Product Standard: Comply with SEFA 8 PL, "Recommended Practices for Plastic Laminate Laboratory Grade Furniture, Casework, Shelving and Tables."
- 5. Storage Cabinets:
 - a) Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide units that are listed and labeled as complying with requirements in NFPA 30 by FM Approvals.
 - b) Volatile and Corrosive Chemical Storage: Refer to Section 115300 "Laboratory Equipment."
- 6. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Hardware: Laboratory casework hardware shall be specified in detail to control quality and shall be determined by project design between Professional and University's Project Manager; provide corrosion resistant where required by design.
 - 1. Pulls: Drawer and door pulls shall be barrier-free but shall not protrude in a manner that suggests the pull could be used as a step. Mount horizontally on drawers and vertically on doors. Brushed or anodized aluminum, or satin finish stainless steel.
 - 2. Hinges: Five knuckle institutional hinges, satin finish stainless steel.
 - 3. Drawer Slides: Rated at 100 pounds minimum; consist of two steel epoxy coated sections providing a quiet, smooth operation on nylon rollers; slides shall wrap under drawer sides for additional support. Provide 150 lb. capacity drawer slides for file drawers.
 - 4. Catches: Provide roller catches on swinging doors.
 - 5. Door and Drawer Locks: To accept Best cores; confirm with University's Project Manager.

- F. Lab Tops: Several working surfaces are available and each has its appropriate use. Do not use any material containing asbestos.
 - 1. Chemical Labs: Epoxy resin, 1 inch thick.
 - a) Chemical Resistance: Epoxy-resin material, NEMA LD 3
 - 2. Biology and Clinical Labs: Phenolic Composite: Solid, high-pressure decorative laminate, complying with NEMA LD 3, Grade CGS; chemical resistant.
 - 3. Stainless Steel Sheet: ASTM A240/A240M, Type 304.
 - 4. Office and Non-Lab Classroom Areas: Plastic laminate countertops shall be constructed with backer sheets or balancing sheets on concealed surfaces to reduce warping. All parts of the core shall be completely covered with laminate or thoroughly sealed against moisture to reduce the likelihood of the core swelling and causing the laminate to come loose; this is especially important at loose splashes.
- G. Stainless-Steel Sinks: Fabricate from Type 304 stainless-steel sheet, not less than 0.050-inch (1.27-mm) (18 gage) nominal thickness. Provide Type 316L for acids. Fabricate with corners rounded and coved to at least 5/8-inch (16-mm) radius. Slope the sink bottoms to outlet without channeling or grooving. Provide continuous butt-welded joints.
 - 1. Finish: Direction satin finish ASTM A480/480M, No. 4.
- H. Epoxy Resin Sinks: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish that has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - 1. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
 - 2. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
- I. Laboratory Casework Finishes:
 - 1. Wood: Exterior and interior surfaces of cabinets receive the full finishing process consisting of highly chemical-resistant transparent finish consisting of two coats of protective moisture resistant sealer and two applications of a topcoat of clear catalyzed chemical resistant lacquer.
 - a) Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8 W. Acceptance level for chemical spot test shall be no more than for Level 3 conditions.
 - 2. Metal: Highly chemical resistant electrostatically applied urethane powder coat, baked in controlled high temperature oven.
 - 3. Stainless Steel: Directional satin finish ASTM A480/A480M, No. 4.
- J. Laboratory Service Fixtures Finishes:
 - 1. Options: Satin chrome plated and epoxy powder coated (preferred).

C.84. SECTION 124000 FURNISHINGS AND ACCESSORIES

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. LEVEL by BIFMA, Greenguard, and Cradle to Cradle are particularly certifications relevant for furnishings and accessories.

2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. The University has purchasing agreements with the following three FFE dealers in Pittsburgh that service all of the University's campuses:
1. Franklin Interiors (Proprietary line: Steelcase)
 2. Workscape (Proprietary line: Knoll)
 3. BurkeMichael+ (Proprietary line: Haworth)
- C. University's Project Manager shall coordinate with vendor and University's Interior Designer; Professional shall verify with University's Project Manager panel locations, along with mechanical and electrical requirements.
- D. The University's Project Manager shall review and select the dealer partner for the project in association with the Office of Campus Planning, Design and Real Estate and the project funding source. It is important to clarify the FFE dealer partner as early as possible within the design process to ensure the team is completed in regard to space planning efforts. This is of the utmost importance when dealing with demountable wall systems.
- E. FFE dealer partners have Open furniture lines that can be sourced from in addition to the proprietary lines as noted above. Discount structures for both open and proprietary lines have been negotiated, discounts are available for use and reference when developing FFE budgets.
- F. Project submissions for FFE, inclusive of all material finishes and furniture plans, are to be reviewed by the University's Project Manager and the University Architect and/or University Interior Designer prior to being reviewed by the funding source and department end user to ensure the submissions meet the quality and aesthetic of the project as included in the project program and scope.
- G. FFE specified for use on the University campus shall be contract grade and must comply with applicable Business and Institutional Furniture Manufacturer's Standards (BIFMA), approved by ANSI. Furniture package solutions must take into effect the end user's needs and usage as detailed within the programming phase and shall be compatible with all building elements which are in contact with the piece. Specification of the correct chair caster or glide is of the utmost importance.
- H. FFE specified for the project shall take into account accessibility and provide a barrier free learning environment.
- I. For specialized installations requiring safety review, the University Project Manager shall engage the offices of Risk Management and Environmental Health & Safety (EHS). At this time, treadmill desks are not preferred on campus and would need to be reviewed and approved by EHS.
- J. Provide ergonomic worktool accessories as required by the project program.
- K. Furniture finishes and upholstery specified on the project shall be of contract grade for durability and safety. Project fabrics must meet the minimum requirements as identified under the Association for Contract Textiles (ACT) Guidelines for Woven, Coated and Knit fabrics. The University maintains a FFE failure log which notes furniture and applied finish issues; early generation/non-polycarbonate polyurethanes are to be avoided. Refer to the minimum hydrolysis ratings as identified by ACT. Material sample submissions shall include applicable testing information for review during the design process.

- L. The Professional shall be responsible for all close out documents which would include the furniture layout for the project, material specifications and maintenance information for the University's custodial staff.
- M. Residence Hall furniture shall be coordinated through the University Auxiliary Department (Student Housing) and meet Project Sustainability Requirements.

C.85. SECTION 124600 ENTRANCE MATS, FRAMES, GRILLES AND GRATINGS

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 - 4. Recycled Content: Provide for mats, frame, and accessories.
- B. The Professional shall verify with the University's Project Manager type of entrance mat required for the project. Items for discussion include recessed grilles, surface mounted mats or grilles, pit with or without drain and whether the building has a mat replacement service from an outside maintenance source. Incorporate into the Project, Sustainable Design Requirements for walk-off mats and grilles.
- C. Locations: Recessed entrance mats shall be at least 4 feet in length and be provided in vestibules for indoor contaminant control. For renovation projects, evaluate recessed opportunities; specify a set-on unit if site conditions restrict all other options; surface applied entrance mats shall be at least 10 feet in length.
- D. Mat Types: Use mats which can be easily washed, cleaned or replaced at a component level. Use reasonably long-wearing mats, inserts shall include scrubber elements. Avoid use of cocoa fiber mats since they must be replaced frequently. The recess shall be designed to either contain water (from melting snow, etc.) or be sloped to a drain.
- E. The Professional shall detail metal-framed mats so as to reduce noise and clatter that occurs from walking on the mat.
- F. The Professional shall include a matting system which complies with sustainability goals of the project and where possible, include a 3-part system to ensure the walk off mat provides appropriate protection.

C.86. SECTION 126000 MULTIPLE SEATING

- A. Sustainability:
 - 1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, please provide documentation of other relevant third-party sustainability certifications. LEVEL by BIFMA, Greenguard, and Cradle to Cradle are particularly certifications relevant for furnishings and accessories.
 - 2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
 - 3. Product Data: Provide for adhesives and sealants, indicating low to no VOC content.
 - 4. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Fixed Audience Seating.
 - 1. Classroom Settings:
 - a) Tablet Arms:
 - b) Weight Ratings/Specialty Sizes:

2. Performance Settings:
 - a) Weight Ratings/Specialty Sizes:
 - b) Upholstery Requirements:
 - c) Aisle Lighting:
 3. Accessibility Requirements:
 4. Electrical Components:
 - a) Aisle/emergency lighting
 - b) Convenience outlets
- C. Booths and Tables.
1. May be specified through an FFE package rather than fabricated as custom millwork. Review the scope of work, project schedule and compare pricing for best solution for each project. Maintenance and replaceability of product components extends the working life of booth product solutions.
 2. Include standard receptacle and USB connections within all booth installations, install standard receptacles and USB connections on tables where determined with the University's Project Manager, funding source and end user.
 3. Include accessible locations throughout the design so that the installation is considered universal and welcoming across campus.
- D. Telescoping Stands and Platforms.

C.87. SECTION 129300 SITE FURNISHINGS

- A. Bicycle Racks: Provide secure bicycle racks and/or storage within 200 yards of the building entrance for 5% or more of building users, measured at peak periods. Coordinate types with Bike Pittsburgh.
- B. Trash/Recycling/Compost Receptacles: Plaza style receptacles designed to meet the University's commitment for sustainability requirements and project design requirements. Coordinate types and styles with University's Project Manager.
- C. Benches: Plaza style benches selected to meet project design requirements. Coordinate types and styles with University's Project Manager.
- D. Mounting: Mounting hardware, fasteners, and anchors for all Site Furnishing items shall be Type 316 stainless steel.

DIVISION 130000 – SPECIAL CONSTRUCTION

C.88. SECTION 132000 SPECIAL PURPOSE ROOMS

- A. General: Environmental rooms are often used in laboratory work and are simply special pre-manufactured, panelized, insulated rooms with special interior temperatures and conditions. Professional shall review type required and locations with the University's Project Manager and End Users.

C.89. SECTION 134900 RADIATION PROTECTION

- A. Shielding: Provide shielding from radiation producing equipment including walls, doors and specialty glazing.

DIVISION 140000 – CONVEYING EQUIPMENT

C.90. SECTION 142000 ELEVATORS – NEW AND MODERNIZATION

A. Sustainability:

1. Submit a product-specific Environmental Product Declaration (EPD) and Health Product Declaration (HPD) for each product specified; if EPDs and HPDs are not available, provide documentation of other relevant third-party sustainability certifications.
2. Sourcing of Raw Materials: Provide corporate sustainability report for each manufacturer.
3. Recycled Content of Metal Products: Use and document postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.

B. INTRODUCTION

1. Professionals shall incorporate the following vertical transportation guidelines as applicable to the project's requirements. Verify with the University's Project Manager the final Scope of Work.
2. Professional shall verify with the University's Project Manager that the University's Director of Work Control has reviewed the elevator specifications and drawings.
3. Housing Projects: Professional shall verify with University's Project Manager type and sizes required and the University's Auxiliary Department (Housing) has reviewed elevator specifications and drawings.
4. Fire Curtains: Fire curtains are prohibited on University of Pittsburgh projects. Fire curtain shall not be used at elevator doors.
5. Professionals shall consult with the University's Project Manager to determine appropriate configuration of elevator system including number of elevators, type (traction is preferred; hydraulic only if less than 25 feet of travel), capacity, rating (combination passenger/freight or freight only), speed, type doors, control system, the location of the machine room, security & emergency systems requirements, and other relevant parameters. This applies to both new installations and modernization of existing systems.
 - a) When total travel is less than 25 feet the Professional in conjunction with the University's Project Manager shall determine the type of elevator to be utilized.
6. For Modernization Projects the following Guidelines shall be the framework for the Professional and University's Project Manager to define the scope of the Modernization. Since each modernization project shall have different requirements and scope, the Professional and University's Project Manager shall identify the improvements and goals to be achieved, the elevator components to be retained, replaced or repaired, and other work requirements such as Work By Others. The following constitute the overall goals and general specifications for Modernization projects.

C. GENERAL

1. STANDARDS: Elevator equipment specified shall follow the design and manufacturing procedures in accordance with the International Organization for Standardization (ISO 9000 family of standards) to meet product and service requirements for quality assurance for new products.

2. **CODES:** Designs, unless specifically excepted, shall be in accordance with the requirements of the ASME American Safety Code for Elevators and Escalators (ANSI A17.1), also referred to as the ASME Elevator Code A17.1 as adopted by the Commonwealth of Pennsylvania under the UCC code, the Commonwealth of Pennsylvania's L&I Elevator Code, the Federal ADA Regulations and Design Standards, and Codes having legal jurisdiction in effect at the date of design completion.
3. **PAINTING:** Exposed metal work furnished under this specification shall be, except where otherwise specified, properly painted, in accordance with the National Paint and Coatings Association by the Elevator Contractor. Existing metal parts, equipment, and concrete pit and maintenance room floors shall be properly prepared and painted in accordance with paint manufacturer's recommendations.
4. **TEMPORARY USE:** For modernization projects, a minimum of one (1) elevator shall be fully operational at all times unless prior approval has been granted by the University.
5. **MAINTENANCE:** Elevators included in any new installation or major modernization project shall receive regular full maintenance on each unit in accordance with the University's current service/maintenance agreement/specification from the date of warranty start. For major modernization projects, the Elevator Contractor shall also provide maintenance from the date construction begins. The Work to be performed consists of furnishing all material, labor, supervision, tools, and equipment necessary to provide full maintenance services and repairs of every description.
 - a) Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of twelve months (12) after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided. Service shall include 24/7 response to trouble callbacks. The cost of the premium portion shall be billable at standard rates for the University.
6. **WARRANTY:** Elevator Contractor shall warrant that the work supplied complies with the specifications and that there are no defects in materials and workmanship for one year after the elevator inspector turns over all elevators in the project for use by the University. Elevator Contractor assumes complete responsibility under the warranty to provide a full service maintenance contract for all elevators in the project from the date construction begins until the end of the one year warranty period.
7. **TESTS:**
 - a) Elevator Contractor shall perform tests specified and/or required by laws, rules, and regulations of all Departments having jurisdiction.
 - b) All parts of the work and associated equipment shall be tested and adjusted to work properly and be left in perfect operating condition. Correct defects disclosed by these tests without any additional cost to the University. Repeat tests on repaired or replaced work if deemed necessary by the University.

- c) Elevator Contractor shall notify the University at least 72 hours in advance of tests. Furnish necessary instruments, gauges, and other equipment required for tests. Do not include expenses of Owner or his/her authorized representatives required to be present at such tests unless tests cannot be completed as scheduled. In the event of delay of tests after 72 hour notice had been given, or when such tests must be repeated, pay additional expenses incurred by Owner or his/her representatives, including cost of traveling, lodging, and meals. To avoid such occurrences, make preliminary tests prior to giving notice of final tests.
8. AS-BUILT DRAWINGS: Three (3) sets of mechanical, electrical, architectural, structural, fire protection, and control as-built drawings shall be provided to the University's Facilities Management Division by the Professional. One (1) set of drawings shall be provided in electronic format.
9. SHOP DRAWINGS AND O&M MANUALS: Three (3) sets of as-built shop drawings and installation, operations, maintenance, and adjustment (O&M) manuals and service tools/devices shall be provided to the University's Facilities Management Division by the Elevator Contractor. One (1) set shall be provided in an electronic format. As-built shop drawings shall show the complete elevator system and components, including project specific details of assembly, erection, anchorage, controls, wiring, and dimensions of hoistway and machine room. O&M manuals shall include project specific control schematics, wiring diagrams, software user manuals, maintenance and error code manuals, equipment user manuals, equipment catalog cuts, and spare part lists.
10. CONSTRUCTION SCHEDULE: For installations in new buildings, Elevator Contractor shall supply elevators, escalators, mechanical and electrical equipment, hoistways, pits, and associated equipment or systems in a "punch ready" condition 30 days prior to the scheduled building completion date. Elevator Contractor shall schedule a final inspection by the Commonwealth of Pennsylvania's Department of Labor and Industry Elevator Division and the Local Fire Department ten (10) days prior to the scheduled building completion date.
11. CERTIFICATION OF ELEVATOR: During construction, when required, the Elevator Contractor shall certify through the Commonwealth of Pennsylvania a change in designation (e.g., passenger to passenger/freight) of an elevator during that period, and when construction is completed, the Elevator Contractor shall recertify the elevator back to its original use. All elevators shall be designed as combined passenger/freight (CPF), unless it is already identified as a freight only, then it shall remain as a freight only.

D. PRODUCTS

1. Accepted Materials:
 - a) Materials and equipment shall be new, of makes and kinds specified, or as indicated on the drawings, without exception. Where one brand, make of material, device, or equipment is specified or shown, the products of the manufacturers listed in "Accepted Manufacturers" shall be regarded as acceptable when, in the opinion of the University, it is a recognized equal considering quality, workmanship, economy of operation, and suitability for the purpose intended.
 - b) Should bidders/contractors desire to install equipment and materials other than those included under "Accepted Manufacturers," they shall submit with their bid a rider listing the deductions or additions to the Contract for these substitutions. Said substitutions must be accepted in writing by the University, otherwise all materials and equipment must be according to plans and specifications.

- c) Specifications shall be based on the equipment and materials specifically designated. If it is elected to install material and equipment included under "Approved Materials", or it is permitted to substitute other equipment, drawings shall be submitted for approval showing changes required by this equipment or material and be responsible for its installation in the allotted space with proper clearances for servicing and repairing said equipment.
 - d) Where such accepted substitution or deviation requires a different quantity or arrangement of structural supports, wiring, or other equipment or accessories normal to this equipment, Elevator Contractor shall provide said changes and additions and pay all costs for changes to the work and the work of others affected by this substitution or deviation.
2. Accepted Manufacturers:
- a) Materials shall be in strict accordance with the quality, style, performance, and sizes specified. Manufacturer's name or catalog numbers given in the specifications shall be only for the purpose of establishing a standard of quality, style, size, and type and shall not be construed to exclude equipment or material of other manufacturers. OEM proprietary equipment shall be considered only if it meets or exceeds the quality, style, performance, and sizes specified of listed accepted manufacturers.
 - b) If OEM proprietary systems are submitted for approval, the OEM shall provide all diagnostic tools (including those considered proprietary), software, hardware keys, SIM cards, prints, parts, wiring diagrams, manuals, etc. for the operation and maintenance of the systems to the University's Project Manager at the time of shop drawing submission. Final payment shall not be made until OEM provides all such items. The University agrees to sign a non-disclosure agreement for any proprietary software tools. The University also reserves the right to share with all maintenance companies the proprietary software tools and shall require them to sign non-disclosure agreements also.
 - c) When materials and equipment are purchased from the manufacturer specified or listed, Elevator Contractor shall submit a complete verification specification with each copy of the shop drawings.
 - d) The periodic lubrication of elevator components shall not be required, including: Sheaves, Rails, Belts, Ropes, Car and CWT guides, etc.
3. Elevator Control System Shall:
- a) Provide in the controller the necessary devices to run the elevator on inspection operation.
 - b) Provide on top of the car the necessary devices to run the elevator in inspection operation.
 - c) Provide in the controller an emergency stop switch. This emergency stop switch when opened disconnects power from the brake and prevents the motor from running.
 - d) Provide in the event of a power outage, means from the controller to electrically lift and control the elevator brake to safely bring the elevator to the nearest available landing.
 - e) Provide the means from the controller to reset the governor over speed switch and also trip the governor.
 - f) Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.
 - g) Provide system capabilities to enable a remote expert to create a live, interactive connection with the elevator system to enable the following functions:
 - (i) Remotely diagnose elevator issues with a remote team of experts.
 - (ii) Remotely return an elevator to service.
 - h) Provide real-time status updates via email.
 - i) Remotely make changes to selected elevator functions including, but not limited to:

- (i) Control building traffic: Restrict floor access, remove car from group operation, shut down elevator, select up peak/down peak mode, and activate independent service.
- (ii) Conserve energy: Activate cab light energy save mode, activate fan energy save mode, shut down car(s).
- (iii) Improve passenger experience/safety/efficiency: Extend door open times, change parking floor, activate auto car full, add e-Call capabilities when Destination Dispatching is present, Rapid Response when EMS and cameras are present, activate anti-nuisance, advance door opening, door nudging, Access Alert, extend specific floor opening time, and release trapped passengers.
- j) Controller Location: A Machine-Space for Remote Controller may be necessary where the Regenerative Drive is too large for the hoistway or the circumstances of the landing make it undesirable or infeasible to locate the controller in the wall. The option to use a control space or machine room is a less preferable option but is often necessary for large service duties 4000#, 4500#, and 5000# cars, for high rise, for high speed duties using overhead bedplate design, for freight only type, and for hydraulic type elevators.
 - (i) University's Project Manager and Professional in consultation with Elevator Provider is to determine during design phase if a Control Space/Machine Room is needed.
 - (ii) When total travel is less than 25 feet and with maximum 3 stops, the Professional in conjunction with the University's Project Manager shall determine if hydraulic type elevator is to be utilized.
 - (iii) a. Controllers – Machine Room Less (MRL) or Machine Room type
 - 1. Otis Elevator Elevonic
 - 2. Motion Control Engineering, Inc. (MCE, Inc.)
 - 3. Smart-Rise
 - (iv) Door Operating Equipment
 - 1. Otis Elevator – Model Glide-A or Glide-P or I-Motion
 - 2. G.A.L. Manufacturing Corporation
 - (v) Door Detectors
 - 1. Otis Elevator – Opti-Guard
 - 2. Janus Elevator Products, Inc.
 - 3. Adams Elevator Equipment Company
 - (vi) Hoisting Motors (A.C.)
 - 1. Otis Elevator
 - 2. The Imperial Electric Company
 - 3. Baldor Electric Company
 - 4. Reuland Electric Company
 - 5. Approved equal.

E. COMBINATION PASSENGER/FREIGHT ELEVATORS

1. Capacity Rating: All elevators (excluding Freight Only, Class C-1) shall be rated for Passenger/Freight Duty with Class A-rated platforms.
2. In general, provide a minimum of one (1) service duty (4000#, 4500# or 5000#) elevator with combination passenger/freight rating Class A, irrespective of building size.

3. Number: Sufficient to handle 12-15% of the total building population for office/library/garage/laboratory/dormitory and 25-40% of the total building population for classroom in a five minute "balanced up-down peak" period. Lobby waiting time shall be designed to range between 0-25 seconds for classroom buildings, 25-35 seconds for office/library/laboratory/dormitory buildings, and 30-40 seconds for garage buildings with 80% of hall calls answered within the design interval and no greater than 2% of wait times exceeding 1.33 times the maximum interval for the specific building type. Where Destination Dispatch Control is utilized the ATTD shall be 80 to 90 seconds. Projected occupancy shall be verified with University's Project Manager. Professional shall provide detailed calculations determining the quantity, speed, and capacity of elevators to be included in a building for University's Project Manager's review.
4. Performance:
 - a) Car Speed: $\pm 3\%$ of contract speed under any loading condition or direction of travel.
 - b) Car Capacity: Safely lower, stop and hold up to 120% of rated load (code required).
 - c) Ride Quality:
 - (i) Vertical Vibration (maximum): 20 milli-g
 - (ii) Horizontal Vibration (maximum): 12 milli-g
 - (iii) Vertical Jerk (maximum): $4.59 \pm 1.0 \text{ ft./ sec}^3$ ($1.4 \pm 0.3 \text{ m/ sec}^3$)
 - (iv) Acceleration/Deceleration (maximum): 2.62 ft./ sec^2 (0.8 m/ sec^2)
 - (v) In Car Noise: 55 – 60 dB(A)
 - (vi) Stopping Accuracy: $\pm 0.375 \text{ in.}$ ($\pm 10 \text{ mm}$) max, $\pm 0.25 \text{ in.}$ ($\pm 6 \text{ mm}$) Typical
 - (vii) Re-leveling Distance: $\pm 0.5 \text{ in.}$ ($\pm 12 \text{ mm}$)
5. Operation:
 - a) Furnish a group supervisory operation that is representative of the manufacturer's most current "state of the art" technology. Gearless electric traction elevators shall be used along with regenerative VVVF drives. Speed to be not less than 200 fpm. For hydraulic elevators, the minimum speed is 125 fpm. Rope compensation may be provided as needed for speeds over 200 fpm. Encapsulated chain is acceptable. When total travel is less than 25 feet the Professional shall determine the type of elevator to be utilized. For group supervisory features, include the following:
 - (i) Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
 - (ii) Duplex Collective Operation: Using a microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons. In the absence of system activity, one car can be made to park at the pre-selected main landing. The other (free) car shall remain at the last landing served. Only one car shall respond to a hall call. If either car is removed from service, the other car shall immediately answer all hall calls, as well as its own car calls. University does not allow door to remain in open function when car is in parked position.
 - (iii) Multi-Car (3 to 4 cars) Operation: Using a microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons. In the absence of system activity, one car can be made to park at the pre-selected main landing. The other (free) cars shall park in multiple zones, changing their location with traffic demands.
 - (iv) Destination Dispatch: For buildings with two or more traction elevator system shall be evaluated by University's Project Manager and Professional to determine if Destination Dispatch Control System (Compass) is needed or beneficial to the building and occupant operations.

F. Design and Specifications

1. Provide machine-roomless traction or hydraulic passenger/freight elevators. The control system and car design shall consist of the following components:

- a) Controller located entirely inside the hoistway. An optional machine-room or control closet space may be selected.
- b) An AC gearless machine using embedded permanent magnets mounted at the top of the hoistway.
- c) Polyurethane Coated-Steel Belts for elevator hoisting purposes.
- d) Regenerative drive that captures normally wasted energy and feeds clean power back into the building's power grid.
- e) LED lighting standard in ceiling lights and elevator fixtures.
- f) Sleep mode operation (5 minutes maximum) for LED ceiling lights and car fan.

G. Equipment: Controller Components

1. Controller: A microcomputer based control system shall be provided to perform all of the functions of safe elevator operation. The system shall also perform car and group operational control.
 - a) All high voltage (110V or above) contact points inside the controller shall be protected from accidental contact when the controller doors are open.
 - b) Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed so as to be physically segregated from the rest of the controller.
 - c) Field conductor terminations points shall be segregated; high voltage (>30 volts DC and 110 VAC,) and low voltage (< 30 volts DC)
 - d) Controllers shall be designed and tested for Electromagnetic Interference (EMI) immunity according to the EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 – immunity"
 - e) Controller shall be located inside the wall next to the top landing entrance frame. Emergency access shall be provided through an access panel in the entrance frame secured by a key lock.
 - f) A separate control room or closet is an option.
2. Drive: A Variable Voltage Variable Frequency AC drive system shall be provided. The drive shall be set up for regeneration of AC power back to the building grid.

H. Equipment: Hoistway Components

1. Machine: AC gearless machine, with a synchronous permanent-magnet motor, dual solenoid service and emergency disc brakes, mounted at the top of the hoistway.
2. Governor: The governor shall be a tension type car-mounted governor.
3. Buffers, Car, and Counterweight: Polyurethane type buffers shall be used for speeds of 150 and 200 feet per minute. Oil buffers shall be used for a speed of 350 feet per minute.
4. Hoistway Operating Devices:
 - a) Emergency stop switch in the pit.
 - b) Terminal stopping switches.
5. Positioning System: Consists of an encoder, reader box, and door zone vanes.
6. Guide Rails and Attachments: Guide rails shall be Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual-purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.

7. Coated-Steel Belts: Polyurethane coated belts with high-tensile-grade, zinc-plated steel cords and a flat profile on the running surface and the backside of the belt. All driving sheaves and deflector sheaves should have a crowned profile to ensure center tracking of the belts. A continuous 24/7 monitoring system using resistance based technology has to be installed to continuously monitor the integrity of the coated steel belts and provide advanced notice of belt wear.
8. Governor Rope: Governor rope shall be steel and shall consist of at least eight strands wound about a sisal core center.
9. Fascia: Galvanized sheet steel shall be provided at the front of the hoistway.
10. Hoistway Entrances:
 - a) Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.
 - b) Sills shall be extruded:
 - (i) Aluminum
 - (ii) Nickel Silver Finish
 - c) Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
 - d) Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour
 - (i) Entrance Finish:
 1. Paint
 2. Satin Stainless Steel
 - (ii) Color to be selected from the manufacturer's color chart.
 - e) Entrance Marking Plates: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
 - f) Sight Guards: Sight guards shall be furnished with all doors painted to match with painted doors, painted black for stainless steel doors.

I. Equipment: Car Components

1. Car Frame and Safety: A car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosures. The car safety shall be integral to the car frame and shall be Type "B", flexible guide clamp type.
2. Cab: Professional shall review finishes with the University's Project Manager and University Interior Designer.
 - a) Standard Cab Options:
 - (i) Steel Shell Cab with painted wall panels
 - (ii) Steel Shell Cab with laminated wall panels
 - (iii) Steel Shell Cab with stainless steel wall panels

Note: Paints and laminate to be selected from manufacturer's catalog of choices. Brushed Stainless Steel finished base plate located at top and bottom. Brushed Stainless Steel finished vertical trim pieces are optional.

- b) Premium Cab Options: Professional shall review finishes with the University's Project Manager and University Interior Designer.
 - (i) Steel Shell Cab with raised laminate wall panels; graphics may be required.
 - (ii) Steel Shell Cab with raised stainless steel wall panels

Note: Laminate to be selected from manufacturer's catalog of choices. Brushed Stainless Steel finished base plate located at top and bottom.

3. Car Front Finish: Satin Stainless Steel.
 4. Car Door Finish: Satin Stainless Steel.
 5. Ceiling Type: Professional shall review finishes with the University's Project Manager and University Interior Designer.
 - a) Flat Steel Ceiling with 4 LED Lights
 - b) Drop Ceiling – Dropped Flat Steel Ceiling with 6 LED Lights
 6. Ceiling Finish: Professional shall review finishes with the University's Project Manager and University Interior Designer.
 - a) Real White (EWO)
 - b) Black (EW5)
 - c) Brushed Steel Finish
 7. Emergency Car Lighting: An emergency power unit employing a 6-volt sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car in the event of building power failure.
 8. Fan: A one-speed 120 VAC fan shall be mounted to the ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and shall include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan.
 9. Handrail: shall be provided on the side and rear walls of the car enclosure. Handrails shall be: (Select)
 - a) 3/8" x 2" (9.5 mm x 51 mm) Flat Tubular Handrail with a Brushed Steel Finish
 - b) 1 1/2" diameter (38.1 mm) Round Bar Handrail with a Brushed Steel Finish
 10. Threshold: Professional shall review finishes with the University's Project Manager and University Interior Designer.
 - a) Extruded Aluminum
 - b) Nickel-Silver Finish
 11. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
 12. Guides: The car shall have 3" diameter roller guides at top and bottom and the counterweight shall have slide type guides at the top and the bottom. Optional counterweight guides available.
 13. Platform: The car platform shall be constructed of metal. Load weighing device shall be mounted on the belts at the top of the hoistway.
 14. The LED ceiling lights and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.
 15. Certificate frame: Provide a Certificate frame with a satin stainless steel finish.
- J. Equipment: Signal Devices and Fixtures
1. Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a satin stainless steel finish.
 - a) A car operating panel shall be furnished. It shall contain a bank of round stainless steel, mechanical LED illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served. All buttons to have raised numerals and Braille markings with: (Select)

- (i) Flat Flush Mounted or 1/8" (3mm) satin stainless steel button with blue or white LED illuminating halo, or
 - (ii) Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel
 - b) The car operating panel shall be equipped with the following features:
 - (i) Raised markings and Braille to the left hand side of each push-button.
 - (ii) Car Position Indicator at the top of and integral to the car operating panel.
 - (iii) Door open and door close buttons.
 - (iv) Inspection key-switch.
 - (v) Elevator Data Plate marked with elevator capacity and car number.
 - (vi) Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
 - (vii) Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.
 - (viii) In car stop switch (toggle or key unless local code prohibits use)
 - (ix) Firefighter's hat (standard USA)
 - (x) Firefighter's Phase II Key-switch (standard USA)
 - (xi) Call Cancel Button (standard USA)
 - (xii) Firefighter's Phase II Emergency In-Car Operating Instructions: worded according to A17.1 2000, Article 2.27.7.2.
2. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
 3. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation.
 - a) Integral Hall fixtures shall feature round stainless steel, mechanical buttons marked to correspond to the landings. Hall fixtures to be located in the entrance frame face or the wall. Buttons shall be in vertically mounted fixture. Fixture shall be satin stainless steel finish.
 - b) Button Options: Professional shall review finishes with the University's Project Manager and University Interior Designer.
 - (i) Flat Flush Mounted or 1/8" (3mm) satin stainless steel button with blue or white LED illuminating halo.
 - (ii) Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel.
 4. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime shall sound.
 5. Hall Lantern: A hall lantern visible from the corridor shall be provided for each car when there are two or more cars in a group.
 6. Position Indicator: A position indicator shall be provided at the main/ground/lobby landing only, or at all floors at the discretion of the Professional and University's Project Manager.
 7. Access key-switch at top floor in entrance jamb.
 8. Access key-switch at lowest floor in entrance jamb.
 9. Card Reader Provision as required; Professional shall review with the University's Project Manager.

10. Emergency (standby) Power Provisions including key-switch and indicator for manual selection of each elevator in normal operation after automatic return in standby power operation has been initiated.
11. Emergency Fire Service Phase I and II
 - a) Keyed Switch to be FEO1-K for all installations
12. The following features/functions shall be included:
 - a) Anti-nuisance feature
 - b) Automatic by-pass (set at 60-70% of capacity)
 - c) Door detector including door nudging feature
 - d) Independent service feature
 - e) Automatic self-leveling device
 - f) Automatic Light & Fan Shut off
 - g) Top of Car Inspection
 - h) Unintended car movement protection device
 - i) Overspeed protection device
 - j) Counterweight safety where there is occupied space below the pit.
 - k) Load weighing device with alarm
 - l) ADA approved accessories
 - m) Fire Command Center Panel (use when required by AHJ – high-rise classification) – includes in-service switches, position and direction indicators, fire service recall switches, emergency communication, and emergency power override switches
 - n) Destination Dispatch for buildings with three or more traction elevators and 6 or more floors shall be considered by the Professional to meet the traffic/service handling capacity, wait times, and/or time-to-destination criteria.
 - o) Automatic emergency power provisions with manual override switches (note: emergency generators shall have capacity to operate one elevator at a time--either passenger, freight, or combination passenger/freight-with the capability to operate any car at any given time; harmonic filters shall be used on all motors with VFD or SCR drives; and generator sizing calculations shall be done by the Professional and be provided to the University's Project Manager for review)
 - p) Located within the car operating panel (COP) at ADA height, an emergency phone with pushbutton and speaker operation programmed to call the University of Pittsburgh Police Department and identify building and car
 - q) Fire Fighter's Service Phases I and II
 - (i) FEO1-K key switch is required.
 - r) Fire alarm tie-in and programming (identify make and model of the existing fire alarm system)
 - s) Raceway for teledata lines from nearest CSSD closet to the machine room for emergency phones and future elevator monitoring communications
 - t) All keying consistent throughout an individual building and coordinated with the University
 - u) Alternate pricing for Lift-Net Micro Controller Machine Room Scanners tied into the existing Lift-Net monitoring system
13. System for elevators shall be arranged so that a passenger pressing the proper button in the car shall register a call at the floor where a stop is desired. When a car is ready to leave a floor, automatic timing shall cause the doors to close. When the interlock circuit is established and after the doors are closed, the elevator shall accelerate to full speed; and when the car is at the proper distance from the first floor in sequence of stories for which either hall or car buttons have been pressed, the car shall automatically decelerate and stop at the level of the floor landing.

14. Any corridor push buttons that have been operated shall be connected so that calls from these buttons shall be registered in all cars of the bank approaching the floor in the desired direction, and without any action whatever on the part of the passengers, the first car approaching the floor shall automatically slow down and stop level with the floor and the doors shall open, same as calls originating in the car.
15. A decentralized, multi-microcomputer based control system shall be provided to perform all the functions of elevator group supervisory. The supervisory system for the passenger elevators shall use the latest technology and traffic control algorithms to most efficiently respond to as the basis for all car-to-floor assignments under all traffic conditions. Cars shall continuously "bid" for potential assignments to any hall call except during preset clock period. Microcomputers shall be properly shielded from line pollution and shall be designed to accept software reprogramming.
16. Provide a closed-loop, high-performance door operator with encoderless VVVF drive with the following features:
 - a) Minimum ½ HP motor and heavy duty sprocket, chain, belt, and sheaves
 - b) Closed loop regulated speed performance
 - c) Hand-held keypad programming
 - d) Adjustments can be stored in the keypad and downloaded to another operator
 - e) Adjustable door obstruction reversal
 - f) Optical cams with LED indicators
 - g) Test switches for open, close, and nudging.
17. Provide each elevator with an accepted car leveling device provided by the control manufacturer that shall automatically bring the car to a position level $\pm\frac{1}{4}$ " with any floor, regardless of the load in the car or its direction of motion. The device shall correct over-travel and under-travel as well as rope stretch due to variations of load. Correction shall be in small steps without surges to eliminate tripping hazard.
18. Provide car door detector (door re-opening device). Provide sight guards as required.
 - a) The device shall utilize infrared or ultrasonic beams to detect people or objects in the path of the closing doors. The device shall be able to sense the presence of people or objects without physical contact.
 - b) The device shall generate a curtain of beams, the full height of the opening.
19. Traveling cables shall be new and be of the best grade for the service with adequate capacity for the functions and devices proposed and an additional 5% of spares. Provide one new shielded cable dedicated to communications which shall include a coaxial cable for each elevator. In addition, provide three, one pair shielded #18 AWG cables (one (1) for power, one (1) for data, and one (1) spare) for card readers. Traveling cable wiring for future security shall be run from elevator controller/machine room and terminated in the phone/intercom box(es) in each of the cabs and shall be properly tagged at each end. Traveling cables shall be hung so that the proper size loop may be obtained and have a fire-resistant outer braid which shall meet the underwriter's standard tests.
20. Access limited to all or selected floors shall be controlled through the use of a card swipe or proximity card reader installed within the cab's COP. Should a passenger desire access to a controlled/secured floor, the elevator controller shall sequence the following events:
 - a) Card is swiped
 - b) Floor selection is made by pushing floor button on COP (COP floor button shall light indicating selected floor)
 - c) A dry contact closure signal is sent from the COP to the University's security system (RS2 Technologies, LLC) for card and floor request verification (go/no-go)

- d) If the security system denies the requested floor selection (no-go), the car remains at the floor landing with the elevator doors closed
- e) If the security system accepts the requested floor selection, a dry contact closure signal is sent back to the COP (go to selected floor), the COP locks the selected floor request, the request is registered, and the car travels to that floor only with normal arrival and arrival sequencing.

21. Configuration:

- a) Arrange elevators in a common lobby with not more than four (4) in a line. Preferred arrangement: two (2) or more opposite each other to a maximum of four (4) on a side. Other arrangements may be dictated by the aesthetics of the building design. Where more than three (3) elevators are in a group, an additional pushbutton riser should be provided.
- b) For buildings with 20 or more floors, consideration should be given to high-rise and low-rise banks of elevators. Minimum acceptable speed 350 fpm (4-10 floors), 500 fpm (11-19 floors), and 700 fpm (20 floors plus).
- c) Design hoistways for elevator cars of "standard" industry dimensions, with width greater than depth and with center-opening doors, minimum of 3' 6" clear opening.

22. Cab Finishes: Cab interiors shall be designed to minimize the effects of vandalism. Provide operating panels with "hands-free" telephone console in compliance with the Federal ADA guidelines. Paint steel doors and frames. Provide stainless steel bar stock handrails to cab sides and back using concealed fastening.

- a) Operating Panel and Telephone Console: Each car shall have a stainless steel cab station containing a bank of vandal-proof illuminated stainless steel buttons marked to indicated floors served, emergency stop behind a secure panel, call buttons, door open and close buttons, other keyed controls, etc. mounted accessible and marked in raised letters and Braille per ADA. ADA telephone/intercom console shall be mounted integral to the operating panel/station. Each car station shall have engraved fire service directions.

K. Lighting: Luminaires shall be LED type consistent with University Standards and shall be vandal-proof construction. Minimum illumination level shall be 10 foot candles on interior of cab. Lighting controls shall be provided that turn off all car lighting when the car is not in use. For modernization projects, cut and patch ceiling/top of cab as required. Provide an emergency luminaire in the front return with a 6"x2-1/2" high lens located approximately 70" above the finished floor.

- a) Fans: Fans shall be vandal-proof construction. For modernization projects, cut and patch ceiling/top of cab as required.
- b) Emergency Stop Switch: Provide an emergency stop switch with audible alarm to meet ANSI A17.1 Code requirements.
- c) LED light fixtures shall be 4000k.

2. Submissions and Approvals: The following are items to be submitted to University's Project Manager:

- a) Copy of the "two-way balanced" traffic analysis.
- b) A recommendation (include capacity, speed, and type) of supervisory system to be use in the project.
- c) Hall and car call button design – catalog and drawings.
- d) Cab interior design drawings.
- e) By the Professional, demand load analysis for the normal power source(s) and generator sizing calculations for the emergency power source(s) to confirm that the electrical systems are adequate for the non-linear elevator controller loads.

L. FREIGHT DUTY – CLASS C-1

1. Number: In general, provide a minimum of one (1) freight or combination passenger/freight hospital size elevator irrespective of building size. Following applies to Freight elevators with bi-parting freight gates & landing doors.
2. Operation:
 - a) Motors and drives shall be sized to ensure that they handle specified capacity and are not at the marginal cut-off point of the intended application. Hydraulic or electric traction machines shall be applied for all travel with a rated speed of at least 100 fpm depending upon the travel and traffic requirements. The Professional and University's Project Manager shall determine the type of elevator to be utilized. Include the following:
 - b) For freight-only elevators, power bi-parting doors and gate shall be utilized, unless exposed to extreme temperature conditions or the total landings served do not exceed three (3).
 - c) Provide each elevator with an accepted car leveling device provided by the control manufacturer that shall automatically bring the car to a position level $\pm\frac{1}{4}$ " with any floor, regardless of the load in the car or its direction of motion. The device shall correct over-travel and under-travel as well as rope stretch due to variations of load.
3. Generally, freight enclosures shall conform to the manufacturer's "standard" design.
4. Freight elevators shall be evaluated based upon intended load capacity. Except in special applications and then only with University approval, utilize Class C-1 loading. Floors shall be heavily reinforced and over-clad with diamond check plate sheet steel material.
5. Supply an emergency phone with pushbutton and speaker operation located within COP at ADA height. Phone shall be programmed to call the University of Pittsburgh Police Department and identify building and car.
6. Provide Fire Service Recall capability.
7. Cab Finishes
 - a) Wall surfaces, entrance returns, and car door surfaces shall be "rigidized" type or equal. Entrance frames shall be clad 7'0" up from the floor with a stainless steel mop strip. Cabs shall be equipped with a double "cart crash" railing with a minimum height of 6" for lower railing and 33" for upper railing securely fastened to side and rear walls. Wall panels below the lower railing shall be easily replaceable without removing the railing.
 - b) Flooring shall be 1/8" diamond plate stainless steel or approved equal material. Professionals shall coordinate finished floor surface with University's Project Manager.
 - c) Luminaires shall be LED type consistent with University Standards and shall be vandal-proof construction. Minimum illumination level shall be 5 foot candles. Lighting controls shall be provided that turn off all car lighting when the car is not in use.
8. Submissions and Approvals: The following items are to be submitted to University's Project Manager.
 - a) Hall and car call button design – catalog
 - b) Corridor signal fixture design
 - c) Cab interior design drawings
 - d) By the Professional, demand load analysis for the normal power source(s) and generator sizing calculations for the emergency power source(s) to confirm that the electrical systems are adequate for the non-linear elevator controller loads.

C.91. SECTION 143100 ESCALATORS

- A. Escalators are prohibited unless requested specifically by the University.
- B. Sizing of escalator units shall be based upon projected peak traffic movement – typically use 48” unit from lobby to second floor level and reduce to 32” unit as successive floors typically yield less traffic.
- C. Escalators consume huge amount of energy. Design of escalators shall include limiting use or shutting down of escalators during off-peak hours. When escalators are in all day operation, only one unit shall stay operational during off-peak hours.
- D. Escalators with opaque balustrade and rounded newel design shall be used in open visible spaces. Decks, skirts, and other finishes shall match lobby area.
- E. Equip escalators with under-step lighting and controlled stop braking.

C.92. SECTION 144200 WHEELCHAIR LIFTS

- A. Wheelchairs are prohibited unless requested by the University or required to meet project design requirements. Professional shall discuss with University’s Project Manager.
- B. Sizing of wheelchair lifts shall accommodate companion.

DIVISION 210000 – FIRE SUPPRESSION

C.93. SECTION 210500 COMMON WORK RESULTS FOR FIRE SUPPRESSION

- A. Refer to Division J – Mechanical Design Standards; Section 210100 – FIRE PROTECTION SYSTEMS.

DIVISION 260000 - ELECTRICAL

C.94. SECTION 260500 COMMON WORK RESULTS FOR ELECTRICAL.

- A. Refer to Division K – Electrical Standards.

DIVISION 270000 - COMMUNICATIONS

C.95. SECTION 272000 DATA COMMUNICATIONS

- A. Refer to Division L – CSSD Specifications.

DIVISION 280000 – ELECTRONIC SAFETY AND SECURITY

C.96. SECTION 280500 COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

- A. SECURITY SYSTEMS – OAKLAND AND REGIONAL CAMPUSES:
 - 1. Professional Note – The Professional shall review with the University’s Project Manager and University’s Integrated Security Department (ISD), security standards presently in use on the Oakland and Branch Campuses. The University ISD will review with City officials the use of electric locking devices when required for the project, other security devices and systems shall be compatible with those in place. Refer to Division K for interface requirements and Division 08 for coordination with hardware.
 - 2. University’s Integrated Security Department will prepare electronic security drawings.

3. Special locking arrangements on means of egress doors shall be in accordance with latest Building Code. The University will apply for variances to these provisions on a project-by-project basis. The existing electric locking devices will be reviewed with the University's Project Manager and University's Integrated Security Department.
4. Security standards are a guideline for security systems and devices that are supplied, installed and/or modified that shall be monitored by the University's Integrated Security Department.
5. Locking devices for Regional Campuses projects shall be compatible with present locking and monitoring systems, and shall be in accordance with governing codes having jurisdiction. Alarms shall be battery or hardwired as required by project design requirements.
6. Alarm locks shall be capable of providing an audible or monitored signaling alarm 24 hours a day. Special devices and alarms shall be provided only with the approval of the University's Project Manager and University's Integrated Security Department.
7. Responsibilities:
 - a) General (Electrical on multi-prime projects) Contractor shall provide raceways and pull boxes for security systems as indicated on University's Integrated Security Department's drawings.
 - b) University's Integrated Security Department will provide cabling and devices.
 - (i) REFER TO APPENDIX I ATTACHED TO THE END OF THIS DOCUMENT FOR THE APPROVED HARDWARE FOR ACCESS CONTROL AND CAMERA SYSTEM.
 - c) General Contractor shall provide electrified hardware in accordance with Section 087100 Door Hardware.

B. SECURITY STANDARD:

1. Intent: The intent of the University's security standard will be to provide a guideline for security systems or devices that are designed, supplied, installed, or modified that will be monitored by the University's Integrated Security Department and/or maintained by the University. The security systems/devices covered in this standard must have the capability of being tied into the University-wide system. The University will be responsible for determining whether an existing security panel is available or if a new security panel is necessary. The University will be responsible for having/making final connections at the security panels and perform software and program modifications to the Tracer system to incorporate the new security devices/systems. Refer to Division K – Electrical Standards for interface requirements.
2. Professional shall discuss with the University's Project Manager the need to use any of the security systems described below in a specific project.
3. Wi-Fi Locks:
 - a) Limited use as determined by the University's Project Manager, University's Integrated Security Department and User. WiFi locks use CSSD WAPs for connection to security system.
 - b) Limited use as determined by the University's Project Manager, University's Integrated Security Department and User. University's Integrated Security Department will provide hub.

4. Controlled Areas: Coordinate with University's Project Manager and University's Integrated Security Department. All areas are to be determined during Design Development Phase, along with hardware for each area.
 - a) Mechanical, Electrical and Data Areas: Wi-Fi Locks.
 - b) Classrooms: Wireless.
 - c) Laboratories and Athletic Areas: Biometrics.
 - d) Housing: Wi-Fi or Power over Ethernet.
5. General Requirements:
 - a) Documentation: During Design Development Phase, the Professional shall require suppliers to pre-qualify their product and submit requested information to assure compatibility with present University system.
 - b) Submit three (3) sets of documentation which includes but is not limited to the following:
 - (i) Operations manual: Detailed description of how the device or system operates, including how to make programming changes, if applicable, to the particular unit.
 - (ii) Installation drawings: Details showing exact wiring, wiring numbers, junction boxes etc. (if Contractor installs).
 - (iii) Installation manuals: Details describing how to install, listing materials and equipment needed for installation, and a description of any setup, testing or calibration necessary for operation (if Contractor or University installs).
 - (iv) Maintenance manuals: Listing of potential problems and solutions; wiring schematics (board level layouts if electronics are involved) description of preventative maintenance functions and recommended schedules; spare parts and replacement parts listings and prices. This manual will include the information necessary such that the University can maintain all systems and devices without having to rely on the manufacturer for service if the University so desires. ISD maintains all equipment once installed. There is some equipment that shall be adjusted by contractors if needed. Battery replacement may fall on Dept. (WiFi and Wireless devices).
 - (v) As-built drawings: Drawings used for installation purposes shall be marked in red to show the as-built installation and submitted to the Professional for revising originals. (If by Contractor or University, they shall provide the as-builts). Only one (1) set of marked-up drawings need be submitted per job to the University's Project Manager.
 - c) Training: If necessary (at the University's discretion), provide in the specification a minimum of four (4) hours of operation training and four (4) hours of maintenance training by the Contractor installing the system. It is the University's intention to have the ability to do maintenance required in-house after the warranty period has expired.
 - d) Testing: Contractor shall demonstrate acceptable system performance during actual operation prior to University acceptance of the system.

- e) Service and Warranty: Contractor shall maintain a local service organization. Service personnel shall be factory-trained. Warranty period shall be for twelve (12) months after acceptance. Warranty shall include material and labor to repair or replace defective devices or systems. A 24-hour response to a service request is required.
- f) Installation: Contractor shall employ first-class workmen who shall work in harmony with other trades and crafts at the site of the work or adjacent thereto. If the installation is included, the Contractor shall furnish and install conduit, wire mold, junction boxes, etc. necessary for a complete system as required. The installation shall meet applicable code requirements. The Contractor shall also be responsible for obtaining applicable permits. If the installation is performed by the University, the Contractor shall supply completed installation supervision by a factory-trained representative as required by the University.
- g) Approvals: Before any system or device is purchased for the purpose of providing security, written approval must be obtained from the University's Project Manager. The Professional is hereby advised that, any department, person or contractor planning an installation, alteration, addition, or deletion to the security system, which affects the University of Pittsburgh, must receive a written approval from the University.

END OF DIVISION C

APPENDIX INDEX

APPENDIX I - APPROVED HARDWARE FOR ACCESS CONTROL AND CAMERA SYSTEM

APPENDIX II - PERMANENT FALL PROTECTION GUIDELINES FOR ALL CAPITAL CONSTRUCTION RENOVATION AND NEW CONSTRUCTION PROJECTS AND RE-ROOF PROJECTS

APPENDIX I

University of Pittsburgh – Integrated Security Department

Approved Hardware for Access Control and Camera System

Approved Hardware for Access Control – As Technology changes ISD reserves the right to update hardware specs as needed. The Box link below shows door/Frame preps for hardware. The link also contains ISD door elevation details for the hardware.

<https://pitt.box.com/s/vhjffvlfbrmq4demq40s7jgpsc vota0>

I. ISD Hardwired hardware section

Electric Strikes – ISD will order for the project

HES 1600 – recessed strike

HES 1500 – recessed strike

HES 9600 – surface mounted strike

HES 9400 – surface mounted strike

Maglocks – ISD will order for the project

Securitron M32 – standard maglock

Securitron M380BD/M380BDX – eco-friendly maglock with DPS or REX built in

Securitron SAM/SAM2-24 – flush mounted maglocks

Electrified Mortise – ISD will spec the part number for the door, but GC will order. Requires EL-CEPT 10

Sargent 8200 series – Mortise lock with DPS and REX built into handset

Electrified Panic Hardware – ISD will Spec the part number, but GC will order Requires CEPT-10

Sargent 8600 series - Electrified Panic Hardware (EPHW)

Sargent SE-LP10 – ISD new preferred hardware for doors that require new frames and new doors. ISD will order equipment. Requires EL-CEPT 10

Mortise Lock, Fail Safe – 70 IDP M1-82270-24V-BIPS LNNJ

Mortise Lock, Fail Secure – 70 IDP M1-82271-24V-BIPS-LNNJ

Mortise Exit Device, Fail Safe – 70 M1-8975-24V-BIPS ETNJ

Mortise Exit Device, Fail Secure – 70 M1-8976-24V-BIPS ETNJ

Sargent P1 POE series locks – **ISD will order equipment. Requires EL-CEPT C5E**

Sargent IN220 – **ISD will order Equipment. Requires EL-CEPT-10**

II. ISD Wireless Hardware Section

Sargent IN100 series – This comes in Mortise and Cylindrical, new installs ISD would prefer the mortise version of the locks

Mortise - **ISD will order for the project**

Cylindrical - **ISD will order for the project**

III. ISD WiFi Hardware Section

Sargent IN120 - **ISD will order for the project**

Sargent P2 - **ISD will order for the project**

IV. ISD Reader and Peripherals Provided by ISD

HID Multiclass readers, ISD will spec reader (900, 910, 920, or 922)

Bosch DS150 – PIR Request to Exit device

GE Interlogix 1078CWM – Door Position Switch

SDC Glass Break – Door release for Emergencies

Cores – ISD will provide Medeco cores for all security doors. These cores fit into BEST cylinders for SFIC

V. Camera Equipment

Interior Cameras - **ISD will order for the project**

Avigilon 3.0 H4A D1 – Interior Dome with fixed position

Avigilon 12.0 H4F – Interior Fisheye dome for 360-degree coverage

Exterior Cameras - **ISD will order for the project**

Avigilon Bullet cameras – come in 3, 5, and 8 Megapixel

Avigilon Multisensor – used for coverage of areas – sidewalks and streets

Avigilon LPR (license plate recognition) – custom ordered

END OF APPENDIX I

APPENDIX II

UNIVERSITY OF PITTSBURGH PERMANENT FALL PROTECTION GUIDELINES FOR ALL CAPITAL CONSTRUCTION RENOVATION AND NEW CONSTRUCTION PROJECTS AND REROOF PROJECTS. INSTRUCTION TO DESIGN PROFESSIONALS November 2018

A. SUMMARY

This guideline sets a framework for establishing permanent fall protection systems on the facilities at the University of Pittsburgh (Pitt). The intent of this document is to protect personnel exposed to fall hazards at Pitt.

Permanent fall prevention/protection measures must be included as an integral part of the design phase for all Capital Construction renovation, new construction projects and roof renovation/repair projects at Pitt. All walking/working surfaces where employees are exposed to fall hazards (i.e. roof systems and floor openings) shall be permanently guarded or have qualified anchorages for personal fall arrest systems. Buildings that utilize powered platforms for exterior maintenance shall be provided with qualified anchorages and tie-in guides as necessary. **The Design Professional Team shall include a qualified person to address Permanent Fall Protection for a specific Project with a roofing component.** *Please note a Rooftop Fall Hazard Survey was conducted in 2018 for the majority of the University of Pittsburgh's Oakland Campus buildings documenting existing fall protection conditions. Attached as Appendix C to this document is a list of buildings supporting window washing anchors. Consultants shall ask the University project manager assigned to the project for a copy of this Survey Document.*

B. DEFINITIONS

Shall: To have to; must.

Should: Recommended, but may not be required.

Competent Person: "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." 29 CFR 1926.32(f)

Qualified Person: "one who by possession of a recognized degree, certificate or professional standing or who by extensive knowledge, training, and experience, successfully demonstrate the ability to solve problems related to the subject matter, the work, or the project." 29CFR 1926.32(m)

Low-Slope Roof: A roof having a slope less than or equal to 4 in 12 (vertical to horizontal). 29 CFR 1926.500(b)

C. DESIGN REQUIREMENTS

All new construction projects and renovations, alterations, or repairs to existing roof systems or roof mounted equipment must comply with all applicable building codes, OSHA Standards, ANSI Z359.1 Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components and ANSI I14.1 Window Cleaning Safety Standard. Any installations or renovations of equipment that subject personnel to fall hazards must incorporate fall protection solutions into the project design phase.

For new building construction, in order to minimize the frequency of rooftop access all serviceable equipment should be located inside the building or outside the building at ground level. Roof access options, in order of preference are:

- Elevator
- Interior stairs to mandoor
- Roof hatch with stair access
- Roof hatch with fixed ladder access
- Exterior fixed ladder.

Hatches and manddoors leading to roof, and pathways to serviceable equipment shall be located 15 feet or further from the roof edge. Passive fall protection systems such as parapet walls and/or guardrails shall be installed along all rooftop edges.

A Qualified Person with extensive experience in fall protection is required to plan, evaluate, design, and select the most appropriate fall prevention/protection solution. Building anchorages, tie-downs, and any other affected parts of the building shall be designed and certified by a Qualified Person with expertise in fall protection systems.

It is important to design and/or select a fall protection system based on the specific building type, roof system, or work application. It is imperative that the designers consider the building maintenance and/or equipment service activities to be conducted throughout the life of the building

All fall protection systems shall be designed and installed similarly with compatible components to reduce variability in fall protection systems on campus.

1. Considerations should include the following:

- a) Safe access to or egress from any potential work area
- b) Provisions for permanent guardrail systems or edge protection such as parapets that meet the 42" height criteria established for guardrails by OSHA
- c) Selection of materials that can withstand harsh environments
- d) Location of and safe access to equipment for maintenance purposes.
- e) Identification and location of utilities that service the buildings (e.g., location of power lines)
- f) Use of fall-arrest systems and devices, including the provision of suitably located permanent rooftop anchorages and field identification of all required anchorage point locations.
- g) Serviceable equipment shall be placed only in areas where employees are protected by a parapet wall, guardrail or fall arrest system
- h) See Appendices A & B

D. HIERARCHY OF CONTROLS

Control measures are not intended to be used independently and in many cases a combination of controls should be implemented to reduce exposure to fall hazards.

1. Engineering Controls

Engineering Controls that are designed to eliminate hazards are the preferred method for protecting employees from or controlling exposure to fall hazards. Examples of engineering controls used to eliminate or reduce exposure are listed below:

- a) Changing equipment or processes to control hazard. Such as relocating equipment at least fifteen (15) from the building edge or relocating it inside the building
- b) Installing screens/gutter guards to reduce frequency of exposure

2. Passive Fall Protection Systems

Passive Fall Protection Systems do not require operational involvement from the employee in order to be protected while performing work at elevated heights. Examples of passive systems are listed below:

- a) Installation of guardrail systems
- b) Construction of parapet walls meeting height criteria for guardrails

Parapet walls and guardrails shall measure forty-two (42) inches from the top of the finished roof grade and comply with IBC, OSHA and all applicable design standards.

Fall protection (guardrails) shall extend six (6) feet past serviceable equipment and roof access hatches that are within fifteen (15) of roof edge.

Fixed roof access ladders must have guardrails that extend a minimum of six (6) feet on both sides.

Perimeter guardrails must be painted/powder coated in a color that blends with the building and its surroundings. Color must be approved by Facilities Management (FM). For guardrails set back from the roof edge galvanized steel, stainless steel or aluminum are acceptable.

3. Active Fall Protection Systems

Active Fall Protection Systems require that employees understand when they are exposed to fall hazards and have a working knowledge of the fall protection system available for their protection. Active systems begin with a qualified anchorage point and have components connected to the worker (body harness, lanyard, self-retracting lifeline, rope grab). Proper employee training in the use of active systems is the responsibility of the employer. All installed anchor points or horizontal lifelines must be compatible with Honeywell-Miller attachment hardware.

4. Personal Fall Arrest Systems (PFAS)

Personal Fall Arrest Systems (PFAS) are considered active systems and shall be incorporated into the building design when elimination of the fall hazard or a passive system is not feasible. Personal fall arrest system means a system used to arrest an employee in a fall from a working

level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

- PFAS shall provide secure anchorages to arrest a fall while preventing the users from free falling more than six (6) feet.
- Anchorages must be easily accessible from the roof access in order to avoid fall hazards during connection to the fall protection system.
- Systems shall provide uninterrupted access to the entire length of the structure without having to disconnect from the system to pass through intermediate support points.
- All PFAS shall be capable of supporting at least two (2) workers at a time. All essential components shall be designed and tested as part of the system in order to provide a complete and fully operational fall arrest system.
- The anchorage connectors and all components of fall arrest systems must be made of stainless steel or other corrosion resistant materials and comply with all sections of ANSI Z359.1

Examples of PFAS are listed below:

- a) Fixed point anchors certified as an attachment point for workers that work locally
- b) Horizontal Lifeline Systems to serve as an anchorage attachment for continuous fall protection.

5. Active Fall Protection Systems:

Anchor point design criteria:

- Anchor points must comply with OSHA design standards found in 1910.140.
- Anchor point quantity, spacing and load rating shall be designed to ensure two workers can work concurrently at the same location. It is the responsibility of the design professional to provide supporting calculations regarding load ratings.

Horizontal Lifeline design criteria:

- Shall be designed in accordance with all applicable codes, regulations and manufacturers' specifications.
- Horizontal Lifelines shall be designed to allow for "pass through" system, and not designed for use with a Y-lanyard.
- Lifeline shuttles or trolleys must be non-detachable type.

Considerations for visibility of lifeline for trip hazards due to snow fall, equipment nearby, darkness...

E. SPECIFIC REQUIREMENTS

Fall protection must be provided for each employee working on elevated surfaces 4 feet above a lower level or whenever there is a possibility of falling onto dangerous equipment or into a hazardous environment, or where there are impalement hazards present. The listed examples are not all inclusive.

1. Skylights

Every skylight shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides. Skylight screens must be capable of withstanding a load of at least 200 lbs. applied perpendicularly at any one point on the screen. In addition, screens must be constructed and mounted such that when subjected to ordinary loads they will not deflect downward and break the glass below the screen.

2. Flat or Low Slope Roof Systems

Employees engaged in work on low slope roofs (<4:12) shall be protected from unprotected edges of the roof by one or more of the following methods:

- a) Approved Guardrail System or parapet wall meeting OSHA height criteria
- b) Employee use of a fall-restraint or fall-arrest system

3. Steep Slope Roof Systems

Employees engaged in work on steep slope roof shall be protected from unprotected edges of the roof by one or more of the following methods: Employee use of a positioning device, fall restraint, or personal fall protection system.

Warning lines and safety monitors are prohibited on steep slope surfaces exceeding a 4 to 12 pitch

FALL PROTECTION GUIDELINES APPENDIX A

1. Requirements for Anchorage Design, Certification, and Identification

- a) Anchorages shall be designed and certified by a Qualified Person with expertise in fall protection systems and in strict accordance with the manufacturer's instructions. If there is a need to devise an anchor point from existing structural members such as beams, rafters, or columns, a PE shall be used to evaluate these anchorages. It is recommended that a structural engineer independent of the fall protection company evaluate and certify the structural integrity of the building.
- b) Qualified anchorages used for personal fall arrest shall be: 1) independent of any anchorage used to support or suspend equipment or platforms, and 2) capable of supporting 5,000 pounds per employee attached **or** designed, installed, and used under the supervision of a qualified person as part of a complete fall-arrest system which maintains a safety factor of at least two.
- c) The forces generated by arresting a fall; total loading; and impact on the structural members should be calculated in order to determine the optimal safe location and how to properly tie-off to qualified anchorages.
- d) Only a P.E. shall certify the structural integrity of the anchorages. Anchorage conditions should be field-verified by a qualified person.
- e) Before initial use, the anchorage assemblies and fall arrest equipment shall be successfully load tested at the twice the calculated, anticipated load and documentation provided to Pitt. The load test shall be prescribed, defined, and certified by a registered PE. Elastic deformation of the test anchorage or anchorage connector may be determined by theoretical calculations performed and certified by a PE. Approved anchorage assemblies shall be marked with a permanent tag identifying its building specific number, installation date, and rating (including the maximum number of people allowed to tie off.)

FALL PROTECTION GUIDELINES APPENDIX B

1. Fall Protection Post Job Submittals

- a) The qualified person/contract designer and the installation contractor shall ensure that documentation of anchorage certification and annual recertification requirements are provided to Pitt prior to the system being put into use.
- b) Detailed user instructions for the fall arrest system must be printed and provided to Pitt. User instructions shall include at least the following:
 - o Manufacturer's name, address, and telephone number
 - o Manufacturer's user instructions for part and model number
 - o Statement of manufacturer's intended use and purpose
 - o Description of proper methods and limitations on use
 - o Printed information or illustrations of fixed equipment markings
 - o Description of detailed inspection/recertification procedures for fall arrest system
 - i) criteria for failing inspections and determining unusable equipment
 - o Procedures for maintenance and repair requirements (who is authorized to make adjustments and repair to equipment)
 - o Appropriate warnings regarding altering, misusing, and limitations of equipment
- c) Submit shop drawings illustrating the fall protection system affixed at all roof accesses.
- d) Submit manufacturer's warranty information and documentation that the system was installed in accordance with manufacturer's instructions.
- e) The certified fall arrest system must be marked on the as-built drawings with the PE seal.

FALL PROTECTION GUIDELINES APPENDIX B

See attached list of University of Pittsburgh Buildings having existing window washing anchors.

September 6, 2018

University of Pittsburgh
Facilities Management
3400 Forbes Avenue
Pittsburgh, PA 15260

RE: List of University of Pittsburgh Buildings having existing Window Washing Anchors.

The following is a list of buildings of which there are existing window washing anchors and/or fall protection anchors. The list is of building that have anchors but is in no way an identification of sufficient number of anchors or proper anchorage. The Final report discusses in more detail the recommendations of each area.

Most of the existing anchors have no documentation or labeling to determine the capacities of the anchors or the permitted use of the anchors (ex. Fall Arrest, Fall Restraint, or Window Washing Equipment Anchors).

It is recommended that a more thorough inspection, under a separate contract, be done on these existing anchors and systems by a certified and qualified person to determine if they are suitable for fall arrest attachment. This would include a review of engineering documentation on the anchors as well as potential field testing for strength requirements. If no documentation exists, it may not be possible to properly evaluate the anchors.

Any system designed for fall arrest should be thoroughly inspected, repaired and serviced on an annual basis. An annual certification will ensure that the system continues to meet all OSHA standards and that workers are safe using the system.

University of Pittsburgh Facility Management Oakland Campus Buildings having existing Anchors

Building Name/Description	Specific Location on Building	Description of System	System Certified as Fall Protection / Fall Arrest
Allen Hall	Main Roof Level	Miller Xenon HLL Kit on post anchors along the entire ridge.	Miller Xenon kit is a pre-engineered kit and is acceptable as Fall Arrest when used according to Manufactures instructions. Posts are Unknown - no documentation
Benedum Hall	Upper Green Roof	Window Washing Fall Protection Cable HLL on U anchors	System appears to be a temporary style fall protection system
BST3	Area 3	Cable HLL through U anchor posts. Cable is kinked as it passes through the U anchors. Some posts appear to be damaged.	Unknown - no documentation
BST3	West Roof	Anchors (through roof) installed throughout. Anchor spacing is such that 100% tie-off could be difficult.	Unknown - no documentation
BST3	Area 7	Anchors (wall mount) for window washing. Cable HLL through U anchor posts (through roof).	Unknown - no documentation

Building Name/Description	Specific Location on Building	Description of System	System Certified as Fall Protection / Fall Arrest
BST3	Area 8	Anchors installed (through roof) in some sections of Area 8. Not all fall hazards are addressed.	Unknown - no documentation
BST3	Area 9	Anchors installed (through roof) in some sections of Area 9. Not all fall hazards are addressed.	Unknown - no documentation
BST3	Bridge	Cable HLL through U anchor posts. Cable is kinked as it passes through some U anchors.	Unknown - no documentation
Chevron Annex	Main Roof	Anchors installed (through roof and around cooling tower on posts).	Unknown - no documentation
David Lawrence	Upper Roof Level	Anchors around the perimeter (through roof). May not be designed for fall protection but for work positioning.	Unknown - no documentation
Frick Fine Arts	Sloped Tiled Roofs - Gutter Area	Cable HLL systems through U anchor posts 4' +/- from roof gutters/edge.	Cable HLL systems are Guardian HLL kits and are acceptable as Fall Arrest when used according to Manufactures instructions. Posts are Unknown - no documentation
GSPH - PUBHL	Parren Hall Main Area	Anchors installed (through the roof) throughout the roof.	Unknown - no documentation
GSPH - PUBHL	Parren Hall Lower Area - 5th Avenue	Anchors installed (through roof).	Unknown - no documentation
GSPH - PUBHL	Crabtree Hall	Wall mounted anchors. Most likely not designed for fall arrest.	Unknown - no documentation
GSPH - PUBHL	Lab Pavilion Main Roof	Anchors installed (through roof). Most likely not engineered for fall arrest.	Unknown - no documentation
GSPH - PUBHL	Lab Pavilion Lower Roof	Anchors installed (through roof). Most likely not engineered for fall arrest.	Unknown - no documentation
LIS Information Science	Main Roof	Anchors around the perimeter (through roof). Most likely not designed for fall protection but for work positioning.	Unknown - no documentation
Music	Roof Area 1	Anchors installed (through roof).	Unknown - no documentation
Posvar Hall - WWPH (Skylights)	Main Low Roof Level	Anchors installed (wall mounted) at each light location (10 total locations – 20 total anchors)	Dee Anchors are Miller and are acceptable as fixed point anchors as long as installed and used per Manufacturer's instructions - no documentation
Posvar Hall - WWPH (Skylights)	Main High Roof Level at Cooling Towers	Anchors installed (wall mounted) at each opening to roof. Appears to be used as temporary HLL cable fall protection anchors.	Dee Anchors are Miller and are acceptable as fixed point anchors as long as installed and used per Manufacturer's instructions - no documentation
Salk Hall	Pavilion Penthouse	Anchors installed (through roof).	Unknown - no documentation

Building Name/Description	Specific Location on Building	Description of System	System Certified as Fall Protection / Fall Arrest
SRCC - Space Research Coordination Center	Main Roof	Anchors installed (through roof). Not all fall hazards are addressed.	Unknown - no documentation

University of Pittsburgh Housing Buildings having existing Anchors

Building Name/Description	Specific Location on Building	Description of System	System Certified as Fall Protection / Fall Arrest
Bouquet Garden J	Main Roofs	Anchors installed (through roof). One location still in need of protection.	Unknown - no documentation
Bruce Hall	Main Roof Level	Existing (2) wall mounted Miller fall protection anchors. More required.	Anchors are Miller Grip Portable/Reusable Anchorage Connectors and are acceptable as fixed point anchors as long as installed and used per Manufacturer's instructions - no documentation
Nordenberg Hall	Main Roof	Anchors installed (through roof). 44' section of roof not protected.	Unknown - no documentation
Panther Hall	Main Upper Roof	Anchors installed (through roof).	Unknown - no documentation
Pennsylvania Hall	Irvis Hall Upper Roof Area	Anchors installed (through roof).	Unknown - no documentation
Pennsylvania Hall	South End Roof / North End Roof	Anchors installed (through roof and wall mount).	Unknown - no documentation