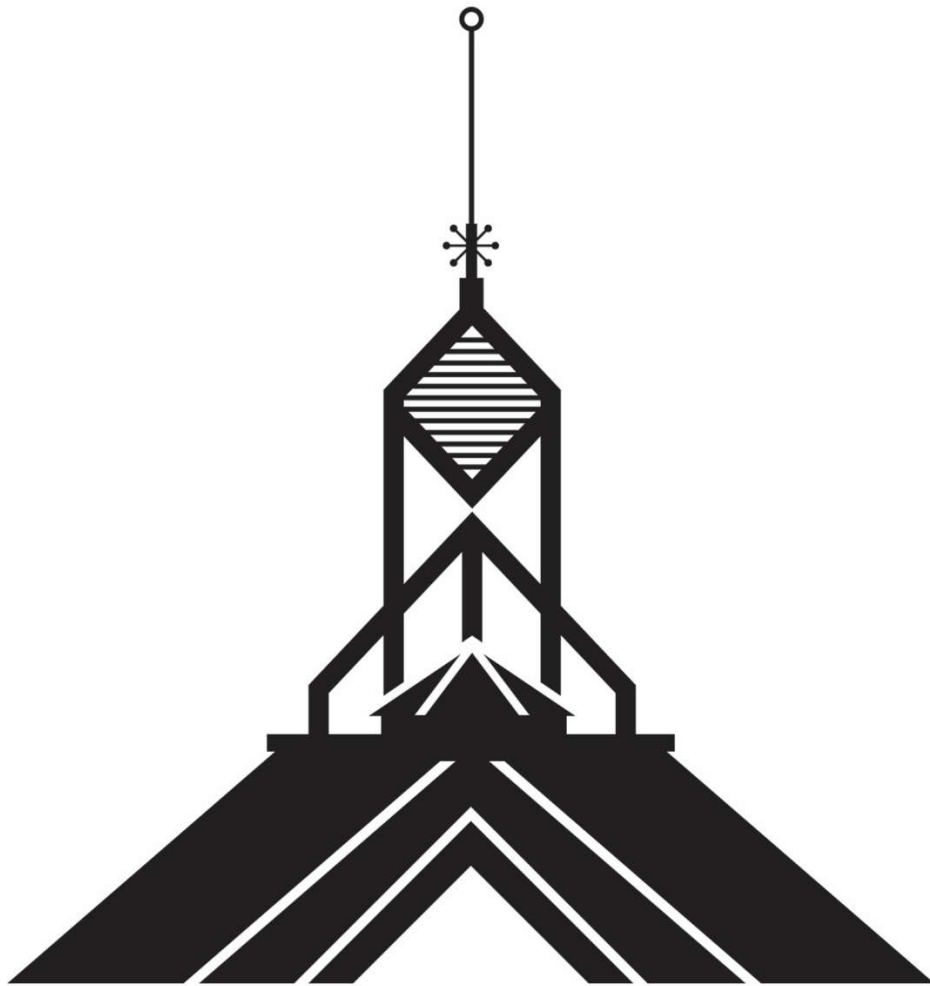


GEORGE MASON UNIVERSITY

Higher Education Capital Outlay Manual

2023



Vice President of Facilities

References: The Commonwealth of Virginia "Construction and Professional Services Manual" (CPSM) and the "Design & Construction Guidelines" are referenced extensively and should be readily available when using this Manual.

The most current version of these two documents are on the following websites:

<https://facilities.gmu.edu/> and www.dgs.virginia.gov

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CHAPTER 1: INTRODUCTION

SECTION 1.0 AUTHORITY FOR MANUAL:

1.0.1 Enabling Legislation:

1. Restructured Higher Education Financial and Administrative Operations Act (The Act), Virginia Code 23.1 1000 et al.
2. Management Agreement By and Between the Commonwealth of Virginia and George Mason University (Chapter 76 of the Virginia Acts of Assembly – 2021 Special Session I) Effective March 11, 2021

SECTION 1.1 GENERAL

The Manual consists of 16 Chapters and Appendices A through W and contains policies, procedures and guidance that George Mason University shall follow in the planning, design, and execution of both capital outlay and non-capital outlay projects

Appropriate portions of this manual apply to projects below the Capital Outlay threshold (also see Appendix O). These portions include, contracting procedures, approval levels, code requirements, building permits and project permits, safety requirements, and the forms as indicated.

Deviations from the policies and procedures outlined within shall be requested in writing and must have prior approval of Vice President for Facilities. The request shall justify and substantiate the need for the deviation.

The Manual is designed to present the capital outlay process from advertisement for A/E services to project completion (occupied building). The Manual is arranged in a sequence that parallels the capital outlay process.

A committee composed of the Office of University Building Official (OUBO), Capital Strategy and Planning (CSP), and Facilities are responsible for maintenance of the Manual. Suggestions for changes, notification of conflicting guidance, questions and requests for copies should be addressed to:

Contracts Department
George Mason University Facilities
4400 University Drive, MS 1E4
Fairfax, Virginia 22030

Or can be emailed to:

fcontrac@gmu.edu

The Manual including errata corrections will be posted on the Facilities Website and may be downloaded and printed by the users.

Revisions to the Manual will be issued electronically by posting on the Mason Facilities Website. The revision package will contain a summary sheet generally describing the major changes or revisions made. The summary sheet will be numbered and dated. The summary sheet will become a permanent part of the Manual and is to be placed in Appendix W (or the last Appendix in the Manual). Paper copies of the Revisions will not be issued.

SECTION 1.2 CAPITAL OUTLAY VERSES NON-CAPITAL OUTLAY

1.2.1 Capital Outlay Projects (*above the capital outlay threshold of \$3M*)

Capital Outlay Projects, as defined by the Department of Planning and Budget (DPB) Instructions, must be authorized by the General Assembly or by the Governor as provided for in the Acts of Assembly 4-4.00 Capital Projects (also called the Appropriations Act), and as further defined by The Restructured Higher Education Financial and Administrative Operations Act, Chapter 4.10. Capital Outlay Projects use an established authorization and approval sequence for the “Design Phase” of the Project to include:

1. Project Initiation (using the HECO-2 if locally authorized and CO-2 if legislative authorized)
2. Schematic Design Approval Phase (using a revised HECO-2 if locally authorized and CO-4 if legislative authorized)
3. Preliminary Design Approval Phase (using a revised HECO-2 if locally authorized and CO-5 if legislative authorized) and
4. Working Drawings Approval Phase (using a revised HECO-2 if locally authorized and CO-6 if legislative authorized).
5. After receiving Bids, Construction Contract Award approval is made using the using a revised HECO-2 if locally authorized and CO-8 if legislative authorized.

These forms are also used to track the cost of the project, the commitment of funds and the infusion or transfer of funds for the project. The approval authority for the forms is described in Chapter 14 of this Manual.

1.2.2 Non-Capital Outlay Projects (*below the threshold of \$3M*):

Non-Capital Outlay Projects, are usually defined as small construction, renovation, repair or replacement projects which are funded by Agency resources and do not require authorization by the Legislature or Governor. However, Non-Capital Outlay Projects, in most cases, typically involve work regulated by the Virginia Uniform Statewide Building Code (USBC) and require a Building Permit from the Building Official. Non-Capital Outlay Projects greater than \$1 Million but less than \$3 Million in cost are procured, reviewed and permitted in accordance with the requirements of this Manual pursuant to the Rules Governing Procurement of Goods, Services, Insurance and Construction by a Public Institution of Higher Education of the Commonwealth of Virginia Governed by Subchapter 3 of the Restructured Higher Education Financial

Administrative Operations Act, Chapter 4.10 of Title 23 of the Code of Virginia, and Chapters 824 and 829 of the 2008 Acts of Assembly of Virginia.

1.2.3 Construction:

The Construction Phase is similar for both Capital Outlay and Non-Capital Outlay Projects (depending on the project scope) for Building Permits, Change Orders, Project Substantial Completion, and Certificate of Occupancy. See Chapter 8 for more specific guidance on form submission requirements.

SECTION 1.3 DESIGN PHILOSOPHY

The design goal is to create a capital investment that meets the user's functional requirements and provides the most economical life cycle cost. The University's design philosophy envisions a long and useful life for projects. These projects will often be used for periods exceeding 50 years and, consequently, should be designed for durability, economy of operation and ease of maintenance. Projects shall be developed to meet University functional and space requirements within a cost range comparable to similar public and private sector projects. Achievement of this goal should incorporate good architectural and engineering practice and design solutions should be consistent with industry standards, Mason Design Manual, and must be designed by the A/E to meet the functional and space requirements within the "Design Not to Exceed" budget for the project.

Project system components should be selected on the basis of life cycle costs. If an increased first or initial cost can be documented to show a reduced life cycle cost for the University, particularly for operating and personnel costs, then the design should incorporate the more expensive first cost feature or system.

Architects and engineers must exercise discipline in their designs to avoid inefficient use of space in terms of floor area and building volume. Exterior design features and materials should be consistent with the architectural character set forth in the Mason Design Standards. Excessive or grandiose features which are not related to the function or the intended use of the facility shall be avoided. Projects must be designed by the A/E to meet the functional and space requirements within the 'Design not to exceed' budget for the project.

SECTION 1.4 FORMS

George Mason University Higher Education Capital Outlay (HECO) Forms, Formats and Samples are referenced in Appendices B, C and J to the Manual. Electronic copies of many of these forms, formats and samples are available on the George Mason University Facilities Website or upon request to:

Contracts
George Mason University Facilities
4400 University Drive, MS 1E4
Fairfax, Virginia 22030

Or by email to:

fcontrac@gmu.edu

SECTION 1.5 INDEX

This Manual is posted on the Website. There is no index provided for the Manual.

CHAPTER 2:

TERMS & DEFINITIONS

This chapter is designed to acquaint Mason Personnel, Contractors, and A/Es with terminology, symbols, acronyms and abbreviations customarily used in the procurement of construction and professional services and in the execution of the George Mason University's Capital Outlay Program. Definitions are taken from the *Code of Virginia*; the General Conditions of the Construction Contract; and general customs and practices associated with the construction industry and professional service contracts.

Whenever used in the Manual, including the appendices and the standard forms, the following terms have the meanings indicated, which apply to both the singular and plural and the male and female gender thereof:

ADDENDUM: Written or graphic instruments issued prior to the receipt of bids that clarify, correct or change the bidding documents.

ADDITIONAL SERVICES: A service that the University includes in the A/E's Scope of Work as part of the Work under the A/E Contract but which service is not included in the A/E Basic Services as described in the Manual. Compensation for the additional services is included in the fee negotiations prior to signing the contract and is, therefore, included in the A/E Contract.

ADVERTISEMENT: The term commonly used to describe the public announcement or "Notice" of the availability of the Invitation For Bids (i.e. bid document or IFB) or Request for Proposal (RFP) made by publishing a notice in the public Internet procurement Web site designated by the Department of General Services [i.e. eVA] and by "Posting the Notice."

A/E CHANGE ORDER: A document (HECO- 11A/E) issued on or after the effective date of the Contract (HECO-3) agreed to by the A/E and approved by the University that authorizes an addition, deletion or revision in the Work, including any adjustment in the Contract price and/or the Contract time. A Change Order, once signed by all parties, is incorporated into and becomes part of the Contract.

A/E CONTRACT: The Form of Agreement (HECO-3, HECO-3.1) and any document expressly incorporated therein. Such incorporated documents customarily, include Chapter 3 of this Manual, the Memorandum of Understanding and all modifications, including subsequent Change Orders.

A/E MANUAL: This reference to portions of the manual is no longer applicable. The A/E Manual, when printed in any document or manual shall refer to the Higher Education Capital Outlay Manual (HECO Manual), all Chapters and Appendices A thru Z, and all revisions thereto, and which shall be incorporated into the Contract in their entirety except as amended or superseded in the Contract or an addendum thereto.

ARCHITECT: An individual licensed to practice in the Commonwealth of Virginia as an architect by the Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects (APELSCIDLA) Board of the Department of Professional and Occupational Regulation. “Architect” may also be used to refer to a firm of such individuals which is properly licensed in Virginia.

ARCHITECT/ENGINEER (A/E): The term used to refer to the architect and/or engineer who contracts with the University to provide the architectural and/or engineering services for a Project. The A/E is a separate contractor and is not an agent of the University. This term also includes any associates or consultants employed by the A/E to assist the A/E in providing services.

ART AND ARCHITECTURAL REVIEW BOARD (AARB): The Review Board appointed by the Governor to advise and provide counsel to the Governor as to the artistic merit of fixtures, structures, construction on state property, and works of art.

ASSOCIATION: As applied to architects or engineers, this term shall mean a legal entity formed by several architects and/or engineers who have associated together for the purposes of working as a unit on a specific project. The Association may take the form of a partnership, joint venture, corporation, etc.

BENEFICIAL OCCUPANCY: The condition after substantial completion but prior to final completion of the project at which time the Project, or portion thereof, is sufficiently complete and systems operational such that the University could, after obtaining necessary approvals and certificates, occupy and utilize the space for its intended use.

BID: The offer provided by the bidder submitted on the prescribed form and setting forth the bidder’s price(s) for the Work to be performed.

BOARD OF VISITORS: Created in April 1972 by an act of the General Assembly when the university became an independent institution. The board is a corporate body serving under the leadership of a rector, vice rector, and secretary. The 16 members of the board are appointed by the governor of Virginia on a rotating basis to serve four-year terms. The Faculty Senate Chair and the Staff Senate Chair sit on the Board as nonvoting representatives. As a result of their respective elections to the positions of president of the Student Government and president of the Graduate and Professional Student Association, two non-voting student representatives are appointed by the Board of Visitors each year at the May meeting to serve a one-year term.

BUILDING: Any roofed or occupiable structure.

BUILDING OFFICIAL: See University Building Official

BUILDING PERMIT: All Work on University buildings and structures will be done in accordance with the [USBC](#) and other applicable Codes and standards. Accordingly, all Projects will be reviewed and permits issued in accordance with Building Permits and Project Permits Policy, Procedures, and Forms

CAPITAL STRATEGY & PLANNING: Division of George Mason University responsible for oversight of the Master Plan, Six-Year Capital Plan, pre-planning studies and space management.

CAPITAL PROJECT: As used in the Manual, “Capital Project” means the acquisition or proposed acquisition of property, including any improvements thereto, a new construction project or improvements to state-owned property, a renovation, maintenance or repair project, an equipment acquisition or improvements to state-leased property that are financed by public funds. (For the purposes of this manual, a capital project is defined as a project involving any acquisition or exceeding \$3,000,000 or exceeding new construction of 5,000 square feet. Projects less than the above are considered non-capital.

CHANGE ORDER: A document (HECO-11) issued on or after the effective date of the Contract (HECO-9) agreed to by the Contractor and approved by the University that authorizes an addition, deletion or revision in the Work, including any adjustment in the Contract price and/or the Contract time. The term “Change Order” shall also include written orders to proceed issued pursuant to Section 38 (a) (3) of the General Conditions of the Construction Contract, (CO-7). A Change Order, once signed by all parties, is incorporated into and becomes part of the Contract.

CODE: See Section 7.2 for description of applicable design and building Codes.

CODE OFFICIAL: See definition for University Building Official.

COMPETITIVE NEGOTIATIONS: A method of Contractor selection that includes the following two elements (*See Chapter 4 and 9 for further procedures*):

1. Issuance of a written Request for Proposal (RFP) indicating in general terms that which is sought to be procured, specifying the factors which will be used in evaluating the proposal and containing or incorporating by reference the other applicable contractual terms and conditions, including any unique capabilities or qualifications which will be required of the Contractor.
2. Public notice of the RFP at least ten (10) days prior to the date set for receipt of the proposal by posting in a public area normally used for posting of public notices and by publication on the public Internet e-procurement Web site designated by the Department of General Services.

COMPETITIVE SEALED BIDDING: A method of Contractor selection that includes the following elements. (*See Chapter 9 for further descriptions*):

1. Issuance of a written Invitation for Bid (IFB) containing or incorporating by reference the Specifications and contractual terms and conditions applicable to the procurement.
2. Public Notice of the IFB at least ten (10) days prior to the date set for receipt of the Bids, by posting in a designated public area normally used for posting of public announcements or “Notices”, on the OCAS website, and by publication on the public Internet e-procurement website designated by DGS [VBO/ eVA] and in a newspaper(s) of general circulation.

3. Public opening and announcement of all Bids received.
4. Evaluation of Bids based upon the requirements set forth in the invitation.
5. Award to the lowest responsive and responsible Bidder.
6. Competitive sealed bidding shall not be used for procurement of Professional Services as defined in HECO.

CONSTRUCTION: As used in this Manual, includes new construction, reconstruction, renovation, restoration, major repair, demolition and all similar work upon buildings and ancillary facilities owned or to be acquired by the Commonwealth, including any draining, dredging, excavation, grading or similar work upon real property.

CONSTRUCTION FIELD REPRESENTATIVE (CFR): One or more persons employed by the University to inspect the Work for the University and/or to document and maintain records of activities at the worksite to the extent required by the University. The University shall notify the Contractor in writing of the appointment of such Project Inspector(s). The CFR checks all materials delivered to the site for conformance with the approved submittals. The CFR shall also check the installation for proper materials, methods, clearances, etc., as described in the plans and specifications and in the approved submittals. CFR may also be used interchangeably with Project Inspector.

CONSTRUCTION MANAGEMENT (CM): Also called the CM at Risk, CM/CG, or the Contractor for the CM Project, or CM-Agent (CMA) when used only for administering the project. As used in this Manual, this term means services provided under contract with the University, which generally include coordinating and administering construction contracts for the benefit of the University, but may also include, if provided in the contract, furnishing construction services to the University. See Chapter 10, Section 10.3, of the Manual for further descriptions. The Construction Manager has direct responsibility and liability to the University for performing the Work as described by the Contract Documents.

CONSTRUCTION PROJECT MANAGER: The University employee or agent designated as the University's on-site representative during the construction phase of a project.

CONSULTANT: An individual or firm with professional expertise engaged to render a specific service in connection with a project.

CONTRACT ADMINISTRATION: As used in this Manual, this term means non-professional services provided under a contract with the University which generally includes inspection of the work, coordinating testing services contracts procured by the University, reviewing change orders and schedule submittals from the Contractor, and providing other construction period services for the benefit of the University. The Contract Administrator is the entity responsible to the University for providing these services to assure compliance with the Contract Documents but is not responsible under the CA Contract for providing the Work. The University may use an employee to perform construction administration services.

CONTRACT COMPLETION DATE: The date by which the construction Work must be Substantially Complete. The Contract Completion Date is customarily set forth in the Contract (HECO-9) based on Notice to Proceed and the Time for Completion. In some instances, however, the Contract contains a mandatory Contract Completion Date, which date shall have been stated in the Request for Proposal (RFP) or Invitation for Bid (IFB).

CONTRACT DOCUMENTS: As used in this Manual and General Conditions of the Construction Contract (CO-7), this term shall mean the Contract (HECO-9) and any documents expressly incorporated therein. Such incorporated documents customarily include the bid submitted by the Contractor, the General Conditions of the Construction Contract, any Supplemental General Conditions, any Special Conditions, the plans and specifications, and all modifications, including addenda and subsequent change orders.

CONTRACT PRICE: The total compensation stated in the Contract, as subsequently modified by any Change Orders, payable to Contractor for performing the work set forth in the Contract Documents.

CONTRACTOR: A generic term used to indicate a person, firm or corporation with whom the University has entered into a contract agreement to perform work or provide a professional or nonprofessional service. As used in the Manuals with respect to a capital outlay project, the contractor for the professional services is referred to as the Architect/Engineer or A/E. The contractor for the construction-related work is referred to as the Contractor. As used in the Manuals and the Standard Forms, "Contractor" means the specific person or firm with whom the University has contracted to do the Work described in the Contract Documents for that undertaking. On a Construction Management project, the CM, CM at Risk or CM/GC is the 'Contractor'.

CURE NOTICE: A notice, either oral or in writing, that informs the contractor that he or she is in default and states what the contractor has to do to correct the deficiency. If the initial notice is oral it shall be confirmed in writing.

DAY(S): Calendar day(s), unless otherwise noted.

DEFECTIVE: An adjective which, when modifying the word Work, refers to Work that is unsatisfactory, faulty, deficient, does not otherwise conform to the Contract Documents, does not meet the requirements of applicable inspections, standards, tests or approvals referred to in the Contract Documents, or has been damaged prior to the A/E's recommendation of final payment (unless responsibility for the protection thereof has been assumed by University at Substantial Completion or Beneficial Occupancy).

DELEGATED DESIGN: services, where a contractor must employ, or otherwise retain, a design professional to fulfill the design responsibilities delegated to it.

DEPARTMENT OF PLANNING AND BUDGET (DPB): Commonwealth of Virginia Department of Planning and Budget

DESIGN-BUILD (DB): A contract between the University and another party in which the other party agrees to both design and build the structure, roadway or other item specified in the Contract. See Chapter 10 of the Manual for further descriptions.

“DESIGN-NOT-TO-EXCEED” COST: The Project construction cost established in the A/E’s contract and accepted by the A/E as the ceiling for the estimated construction cost of the Project the A/E is engaged to design.

DIVISION OF ENGINEERING AND BUILDINGS (DEB): Formally the Bureau of Capital Outlay Management (BCOM). Part of the Virginia Department of General Services

DISADVANTAGED BUSINESS ENTERPRISE: A small business concern which is at least 51 percent owned by one or more socially and economically disadvantaged individuals, or, in the case of any corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more socially and economically disadvantaged individuals and whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged who own it.

DRAWING: A page or sheet of the Plans which presents a graphic representation, usually to scale, showing technical information, design, location, and dimensions of the various elements of the Work in sufficient detail for the Building Official or his or her designee to determine code compliance. Graphic representations include, but are not limited to, plan views, elevations, transverse and longitudinal sections, large- and small-scale sections and details, isometrics, diagrams, schedules, tables and/or pictures.

e-BUILDER: The University’s project information database and budget accounting tool maintained by University Project team members.

EMERGENCY: Any unforeseen situation, combination of circumstances or a sudden occurrence or state resulting therefrom that poses imminent danger to health, life or property and which usually demands immediate action.

ENGINEER: A person who is qualified and licensed to practice engineering in Virginia as a Professional Engineer by the Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects (APELSCIDLA) Board of the Department of Professional and Occupational Regulation, also referred to as the A/E. “Engineer” may also be used to refer to a firm of such individuals which is properly licensed in the Commonwealth of Virginia.

EQUAL: Any other brand, make or manufacturer of a product, assembly or equipment that, in the opinion of the A/E, is equivalent to that specified, considering quality, capabilities, workmanship, configuration, economy of operation, useful life, compatibility with design of the work and suitability for the intended purpose, and which is accepted as such by the University.

EQUIPMENT: A tangible resource, such as machinery, articles or apparatus, of a permanent or long-term nature, used in an operation or activity.

eVA: A web-based purchasing system used by the University and the Commonwealth of Virginia Agencies. Commonwealth agencies, colleges, universities, and many local governments use eVA to announce RFP/IFB opportunities, invite Offerors, receive proposals/quotes, and place orders for Goods and Services. The eVA home page address is www.eva.state.va.us.

EXTRA SERVICE (BY A/E): A service which the University tasks the A/E to provide after the Contract has been signed and which was not included in the Basic Services or in the additional services as described in the A/E Contract. Extra services, and the compensation therefor, are authorized by a modification to the A/E Contract using the A/E Change Order, (HECO-11A/E).

FAACS: The Fixed Asset Accounting and Control System of the Virginia Department of Accounts. As used herein, the real estate subsystem of FAACS.

FACILITIES: Division of George Mason University responsible for providing cost-effective and efficient planning, design, construction and maintenance services.

FACILITY: A structure or group of structures, including all buildings and other improvements thereto, which is built, installed or established to serve a particular purpose.

FIELD ORDER: A written order issued by the A/E which clarifies or explains the Plans, the Specifications, or any portion or detail therein, without changing the design, the Contract Price, the Time for Completion or the Contract Completion Date.

FIELD CHANGE ORDER: A written order issued by the University directs changes to an establish contract.

FINAL COMPLETION DATE: The date of the University's acceptance of the Project from the Contractor upon confirmation from the A/E by a HECO-13.1 and the Contractor by a HECO-13.2 that the Project is totally completed in accordance with the Contract Documents. Procedures for determining Final Completion are set forth in Section 44 of the General Conditions of the Construction Contract (CO-7).

FLOAT: The excess time included in a construction schedule to accommodate such items as inclement weather and associated delays, equipment failures, and other such unscheduled events. It is the contingency time associated with a path or chain of activities and represents the amount of time by which the early finish date of an activity may be delayed without impacting the critical path and delaying the overall completion of the project. Any difference in time between the Contractors' approved early completion date and the Contract Completion Date shall be considered a part of the project float.

FLOAT, FREE: "Free float" is defined as the time by which an activity may be delayed or lengthened without impacting upon the start day of any activity following in the chain.

FLOAT, TOTAL: "Total float" is defined as the difference (in days) between the maximum time available within which to perform an activity and the duration of an activity. It represents the time

by which an activity may be delayed or lengthened without impacting the Time for Completion or the Contract Completion Date and HECO-7CM for use with Construction management contracts.

GENERAL CONDITIONS (GC): The General Conditions of the Construction Contract, CO-7, latest edition. Also, the General Conditions of the Design Build Contract, CO-7DB for use with design build contracts and General Conditions of the Construction Manager at Risk Contract, CO-7CM for use with CM contracts.

GOODS: Material, equipment, supplies, printing, and automated data processing hardware and software.

HECO MANUAL: Shall refer to the University Higher Education Capital Outlay Manual, all Chapters and Appendices, and all revisions thereto, and which shall be incorporated into the Contract in their entirety except as amended or superseded in the Contract or an Addendum thereto.

IMPROVEMENTS: Work necessary to accomplish a specific purpose and produce a complete and usable improvement to an existing facility or structure, including the associated architectural and other technical services and fixed equipment installed and made part of the facility or structure, as well as any site development. Improvements include:

1. alteration of interior space arrangement and other physical characteristics, such as utilities, so that it may be more effectively used for its present designated functional purpose;
2. conversion of interior arrangement and other physical characteristics, such as utilities and fixed equipment installed on and made a part of the facility or structure so that it may be effectively utilized for a new functional purpose;
3. renovation of most or all of a facility or structure, or an existing mechanical system for the purpose of modernizing the use or capability of such asset in order that it may be effectively utilized for its designated functional purpose or to comply with current code requirements;
4. restoration of a facility or structure to the maximum extent possible to its former or original state (historic property);
5. relocation from one site to another of a facility or structure either intact or by disassembly and subsequent reassembly;
6. major repair to restore a facility, mechanical system or utility system to such a condition that it may continue to be appropriately and effectively utilized for its designated purpose by overhaul, reprocessing or replacement of parts or materials which have deteriorated by action of the elements or wear and tear in use; and
7. demolition to remove a building or facility either for land clearance or to make land available for new capital use.

INFORMALITY: A minor defect or variation of a bid or proposal from the exact requirements of the Invitation to Bid or Request for Proposal that does not affect the price, quality, quantity or delivery schedule for the goods, services or construction being procured.

INVITATION FOR BIDS (IFB): A formal solicitation to the public including the Notice, Instructions To Bidders, Bid Form, General Conditions, Supplemental General Conditions, Special Conditions, Forms to be used, the Plans and Specifications, and any other documents listed in the Specifications, all of which request qualified bidders to submit competitive prices or bids for providing the described work on a project.

LANDSCAPE ARCHITECT: An individual certified by the Commonwealth of Virginia as a ‘Certified Landscape Architect’ by the APELSCIDLA Board of the Department of Professional and Occupational Regulation. The Certified Landscape Architect may function as a project manager and may be the prime professional on those projects where the preponderance of the work is represented by the application of the principles and methodology of landscape architecture in consultation, evaluation, planning (including the preparation and filing of sketches, drawings, plans and specifications) and responsible supervision or administration of contracts relative to projects principally directed at the functional and aesthetic use of land.

LEADERSHIP TEAM: Committee comprised of senior administrative staff responsible for guiding project direction consistent with the overall goals and objectives of the University. They make decisions that cannot be made by the Steering Committee either for reasons of disagreement among steering committee members or because the decision is more properly handled at a higher level. This committee should be briefed regularly during the planning process so they are informed of its evolution.

LIQUIDATED DAMAGES: *See General Conditions of the Construction Contract (CO-7).* As used in this Manual, the term “Liquidated Damages” generally means a predetermined and fixed amount of money per period of time as stated in the Contract Documents and which will be charged to the Contractor as a measure of damages for delay suffered by the University due to failure of the Contractor to substantially complete, or finally complete, the Project/Work by the date or time established in the Contract Documents.

MAINTENANCE PREVENTION: A technique embracing reliability engineering and maintenance experience and directed at preventing potential design defects that would ultimately inhibit proper operation and maintenance of new equipment, buildings, and property components. Design deficiencies are identified, mitigated or eliminated through careful maintenance-oriented review of the design document prior to purchase, construction, or installation. “Maintenance Prevention” is influenced heavily by life cycle cost considerations.

MAINTENANCE RESERVE PROJECT: A single effort undertaking which involves major repair or replacement to plant, property or equipment, normally costing more than \$25,000 and less than \$2,000,000. A roof replacement project may cost up to \$4.0 million. However, a project costing under \$25,000 or over the \$2.0 or \$4.0 million limits that meets the criteria may also qualify as a maintenance reserve project if authorized by DPB. Contact your DPB analyst with requests for

authority to proceed on projects costing under \$25,000 or over the relevant maximum limit. Examples of such projects include:

1. repair or replacement of damaged or inoperable equipment such as elevators, furnaces, plumbing fixtures, air conditioning and ventilation equipment.
2. repair or replacement of components of a plant such as masonry, ceilings, floor, floor coverings, roofs, sidewalks, parking lots, exterior lighting, boilers, and air conditioners.
3. repair or replacement of existing utility systems, such as electrical, water and sewer, heating and cooling. When replacement of components of utility systems is required (e.g. transformers, distributions panels, cables, etc.), new components should be sized to account for future growth if the existing components are operating at or near capacity.
4. correction of deficiencies in property and plant that are required to conform with building and safety codes or those regulations associated with hazard corrections, including asbestos hazards when incidental to repair/maintenance.
5. correction of problems resulting from erosion and drainage.

MANAGEMENT AGREEMENT: The Management Agreement By and Between The Commonwealth of Virginia and George Mason University approved March 11, 2021 as required by the Restructuring Act and containing further defining controlling policy and rules governing the additional autonomy granted by the Restructuring Act.

MEMORANDUM OF UNDERSTANDING (MOU) (A/E): A document signed by both the A/E and the University that formalizes the details of the fee negotiations, the scope of work, the A/E schedule, and other items agreed to during negotiations. The terms of the MOU are more project-specific, supplementing and/or clarifying the requirements of the A/E Contract in terms of the particular project. However, the MOU does not supersede nor take precedence over the requirements of the Manual.

MEMORANDUM OF UNDERSTANDING (MOU) (DEPARTMENTAL): A document signed by the Department outlining their scope, schedule and funding for the project.

MICRO BUSINESS: A small business certified as such by the Virginia Department of Small Business and Supplier Diversity (DSBSD). For purposes of DSBSD micro certification, the business must have no more than 25 employees and has no more than \$3 million in average annual revenue over the three-year period prior to certification.

MINORITY-OWNED/CONTROLLED BUSINESS: Minority-owned business" means a business that is at least 51% owned by one or more minority individuals who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more minority individuals who are U.S. citizens or

legal resident aliens, and both the management and daily business operations are controlled by one or more minority individuals.

NEW CONSTRUCTION: The building of a new structure, facility or improvement (including utilities) on a site. A new construction project is a single undertaking involving construction applicable to one or more facilities, including all work necessary to accomplish a specific purpose and produce a complete and usable new facility, all associated architectural and other technical services, all installed equipment, site development and any improvements. New construction includes:

1. construction of a new plant including the erection, installation, assembly of a new facility or structure, utility system, or site work;
2. addition, expansion, or extension to a structure which adds to the overall exterior dimension of the plant; and
3. complete replacement of a structure or facility that, because of age, hazardous conditions, obsolescence, structural and building safety conditions or other causes is beyond the point where it may be economically repaired/renovated and can no longer be used for its designated purpose.

NONPROFESSIONAL SERVICES: Any services not specifically identified as “professional services” in the definition of “professional services.

NOTICE: All written notices, including demands, instructions, claims, approvals and disapprovals, required or authorized under the Contract Documents. Written notice by either party to the Contract shall be sufficiently given by any one or combination of the following: (1) delivered in hand at the last known business address of the person to whom the notice is due; (2) delivered in hand to the person’s authorized agent, representative or officer wherever they may be found; or (3) enclosed in a postage prepaid envelope addressed to such last known business address and delivered to a U.S. Postal Service official or mailbox. Email Notice or notice via e-Builder, the University’s project management software, may be employed by the University. Notice is effective upon such delivery. Notice shall also mean the Notice of Invitation for Bids included in the IFB/RFP.

NOTICE OF AWARD: The written notification by the University to the apparent successful firm notifying the firm that it has been awarded the contract, pending the submittal and execution of all documents required in the IFB/RFP.

NOTICE OF INTENT TO AWARD: The written public posting by the Facilities Contracts Office announcing the apparent successful firm and notifying all firms that the University intends to award the contract to the apparent successful firm pending completion of the verification that it is a responsible Bidder/ and the receipt and acceptance of all executed documents required in the IFB/RFP.

NOTICE TO PROCEED: A written notice by the University to the Contractor (with a copy to the A/E) fixing the date on which the Contract time will commence for the Contractor to begin the

prosecution of the Work in accordance with the requirements of the contract Documents. The Notice to Proceed will customarily identify a Contract Completion Date.

OFFEROR: A person or firm who responds to a Request for Proposal (RFP) also known as a Proposer.

PERFORMANCE SPECIFICATION: A specification which generally describes the characteristics of the article required, e.g. the style, type, quality, character, economy of operation and purpose to be served by the article and the results required of the article provided. It does not restrict bidders to the specific brand, make, or manufacturer, nor does it tell the Contractor how to achieve the required result.

PERSON: Any individual, corporation, partnership, association, company business, trust, joint venture or other legal entity.

PLANS: The group or set of project-specific drawings included in the Contract Documents.

PRE-BID/PRE-PROPOSAL CONFERENCE: A meeting of interested, prospective bidders held by the University, usually with the assistance of the A/E, prior to the receipt of bids or proposals in which comments or questions concerning specifications or other provisions in the IFB or RFP can be received and considered. Any response shall be in writing and distributed to all who requested/received the IFB and RFP.

PREPLANNING: A process meant to obtain a more detailed definition and cost estimate of a project.

PREQUALIFICATION OF BIDDERS: The process by which the qualifications and credentials of potential bidders may be evaluated for particular types of services or construction in accordance with criteria established in writing and sufficiently in advance of their implementation to allow interested persons or firms a fair opportunity to complete the process. See Chapter 10 of the Manual for further descriptions.

PROFESSIONAL SERVICES: For the purposes of the manual, services provided by a licensed professional within the scope of the practice of accounting, architecture, land surveying, landscape architecture, or professional engineering.

PROJECT: The term used to represent the specific or proper assigned title of the entire undertaking which includes, but is not limited to, the design services by the A/E and the construction “Work” performed by the contractor pursuant to the Contract documents.

FACILITIES PLANNING, DESIGN, & CONSTRUCTION DEPARTMENT: That department in Facilities at George Mason University responsible for managing the design and construction of projects.

PROJECT MANAGER: The designated representative of the A/E, the Contractor, or the University through whom written decisions and notices are generally conveyed.

PROJECT MANUAL: The front-end documents that establish the contract requirements for construction, and the specifications which establish the technical requirements for the materials and installation of construction.

PROPOSAL: The offer provided by the Offeror submitted on the prescribed form and setting forth the firm's price(s) for the Work to be performed.

PROPRIETARY: An adjective used to describe a product or piece of equipment which is manufactured under some exclusive right but which is available to subcontractors from multiple vendors or suppliers; (e.g. a product or piece of equipment which is specified by a single brand name and model number and which is available to bidders from more than one source, but for which no "Equal" is permitted.)

PROVIDE: As used herein and in the Contract Documents, "Provide" shall mean to supply, to furnish and to install complete with all accessories, parts and/or services to be ready for its intended use.

REAL ESTATE: Any land and improvements including all rights and interest (i.e., leasehold, easements, permission, licenses, allotments, minerals, remainder or any other interest).

REQUEST FOR PROPOSAL (RFP): A written public notification by the University soliciting proposals for professional, nonprofessional, or contractor services. The RFP generally describes the services sought, the unique capabilities or qualifications needed to perform the work, factors to be used to evaluate proposals and the conditions for negotiating prices and terms with the offerors.

RESPONSIBLE BIDDER: A Bidder who has the capability, in all respects, to perform fully the Contract requirements and the moral and business integrity and reliability that will assure good faith performance, and who has been prequalified, if required.

RESPONSIVE BIDDER: A person or firm who has submitted a bid which conforms in all material respects to the Invitation to Bid (IFB).

RESTRUCTURING ACT: The Restructuring Higher Education Financial and Administrative Operations Act, Chapter 4.10, §23-38.88 et seq. of the Code of Virginia, and in particular §23-38.110 of the Act.

SEALED BID: A bid which has been submitted in a sealed envelope to prevent its contents from being revealed or known before the deadline for the submission and opening of all bids.

EXECUTIVE VICE PRESIDENT FOR ADMINISTRATION AND FINANCE: This person is responsible for the financial and administrative operations of the University, and must approve initiation of non-general funded capital projects.

SERVICES: Any work performed by an independent contractor wherein the service rendered does not consist primarily of acquisition of equipment or materials, or the rental of equipment, materials, or supplies.

SHOP DRAWINGS: The drawings, diagrams, illustrations, schedules, installation descriptions and other data prepared by or for the Contractor to provide detailed information for the fabrication, location, erection, installation, connection and methodology associated with the Work. Shop drawings are intended to aid in the preparation and installation of materials and to ascertain that the materials proposed by the Contractor conform to the requirements of the Contract Documents.

SMALL BUSINESS: Small business means a business that is at least 51% independently owned and controlled by one or more individuals who are U.S. citizens or legal resident aliens, and together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years. One or more of the individual owners shall control both the management and daily business operations of the small business

SOLE SOURCE: A product, item of equipment, service or combination of these which is available from only one manufacturer, vendor or provider in an area to the exclusion of others (e.g. within the constraints of the particular Project, whether geographic, time, material or other). If products, equipment or services are franchised to only one vendor in an area, the vendor would be considered a Sole Source for such products, equipment or services specified for this project.) Approval of Sole Source procurements is made by the Vice President of Facilities.

SPECIAL CONDITIONS: That part of the Contract Documents which describes special or additional requirements or procedures applicable to the particular project. The Special Conditions do not amend or supersede the General Conditions.

SPECIFICATIONS: Those portions of the Contract Documents containing the General Conditions as well as written technical descriptions of materials, equipment, construction systems, standards and workmanship describing the proposed Work in sufficient detail for the Contractor to perform the Work and providing sufficient information for the Building Official or his or her designee to determine Code Compliance.

STEERING COMMITTEE: The group constituted by the University in accordance with the requirements of Chapter 12 of the Manual.

SUBCONTRACTOR: An individual, partnership or corporation having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work. The Subcontractor may include any person who provides on-site labor but does not include any person who only furnishes or supplies materials for the project.

SUBMITTALS: As used in the construction Contract Documents, shall mean all shop drawings, illustrations, brochures standard schedules, performance charts, and other data required by the Contract Documents which are specifically prepared by or for the Contractor to illustrate some portion of the Work and which are submitted to the A/E for review to assure conformance with the requirements of the Contract Documents. As used in the Professional Services Contract, shall

mean the drawings, specifications, cost estimates, schemes and other documents required by Chapter 8 of the Manual to be submitted by the A/E to the University for review and/or approval.

SUBSTANTIAL COMPLETION: The date on which the project (or a specific part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the project (or the specific part thereof) can be utilized by the University for the purposes for which it is intended. The University, at its sole discretion, may take Beneficial Occupancy at this time or may choose to wait until final completion to occupy. Guarantees and warranties applicable to that portion of the work begin on the date the University accepts the Project, or a portion thereof, for such Substantial Completion, unless otherwise specified in the Supplemental General Conditions or by separate agreement.

SUBSTITUTE: A material, product, equipment, or assembly that deviates from the requirements of the Contract Documents but which the Contractor deems will perform the same function and have equal capabilities, service life, economy of operation, and suitability for the intended purpose. The proposal must include any cost differentials proposed. Any such proposed substitute must be submitted to the A/E for review and, if acceptable to the A/E and the University, incorporated into the Contract by Change Order.

SUPPLEMENTAL GENERAL CONDITIONS: The part of the Contract Documents which amends or supplements the General Conditions of the Construction Contract, CO-7.

SWAM: The acronym used to refer to Small Business and Women-Owned and Minority-Owned Businesses.

SUPPLIER: A manufacturer, fabricator, distributor, material provider or vendor who provides material for the project but does not provide on-site labor.

TAX EXEMPT: Construction is not tax exempt per Title 23 VAC 10-210-410 A. The sales tax exemption does not extend to tangible personal property sold to a construction Contractor for its use or consumption in the performance of a real property construction contract. However, when materials are purchased directly by the Commonwealth and provided to the Contractor for use on a project, the Commonwealth is Tax Exempt on that purchase. When an estimate is provided for a Guaranteed Maximum Price, Change Order, or other similar item requiring a detailed itemization of the costs of a project, the itemized sales tax is considered a part of the cost of the work. The itemized sales tax is valid for inclusion in these estimates and demonstrates that the Contractor has complied with Title 23 VAC 10-210-410 by taking the amount of the tax into consideration when submitting its price.

TECHNICAL PROPOSAL: Evaluation document submitted to the University in response to the RFP criteria separate from the Price Proposal. Firms are typically asked to provide information on items such as proposed project team, the firm, management, comments on the specific project, SWaM history & project plan, and VM suggestions.

TIME FOR COMPLETION: That number of consecutive calendar days following receipt of a Notice to Proceed that the Contractor has in which to substantially complete everything required of it by

the Contract. The time for completion is usually set out in the IFB. When the Notice to Proceed is issued, it states a Contract Completion Date which has been set by the University based on the Time for Completion.

UNIT PRICE WORK: Work to be paid for on the basis of established unit prices for the quantity of material provided or work done. No additional percentage markup for overhead or profit shall be added to the unit prices.

UNSEALED BID: An unsealed written offer conveyed by U.S. Mail, commercial courier service, facsimile, email, or other means. The bids are normally opened and recorded when received.

UNIVERSITY: For purposes of the Manual, “University” shall mean the President and Board of Visitors of or other entity represented by with whom the Contractor or the A/E has entered into a contractual agreement and for whom the Work or services will be provided.

UNIVERSITY BUILDING OFFICIAL (BUILDING OFFICIAL/CODE OFFICIAL) The person delegated authority by the University, and approved by the BOV, to issue Building Permits and Certificates of Use and Occupancy for construction Work regulated by the VUSBC for University buildings on Commonwealth property

UNIVERSITY CONTRACTING OFFICER: The person designated in writing by the University who is delegated authority to approve, award and execute contracts, change orders and other documents related to a capital outlay project for the University. The Executive Vice President for Administration and Finance has been delegated this authority and consistent with existing board policies may sub-delegate this further.

UNIVERSITY PROJECT MANAGER (UNIVERSITY PM): Shall be the University’s designated representative for the Project.

VIRGINIA UNIFORM STATEWIDE BUILDING CODE (VUSBC): The Uniform Statewide Building Code adopted by the Virginia Department of Housing and Community Development (DHCD) in conformance with the *Code of Virginia*, § 36-98 (Also referred to as the USBC).

VCCO: The acronym used to refer to a University employee who has completed the necessary training and testing by the Division of Engineering and Buildings in state procurement law, policy and procedures and who has been awarded the designation of Virginia Construction Contracting Offer (VCCO). Where used in this Manual, the VCCO functions are related to the following: receipt of bids, opening of bids, review of the bids, and signing the HECO-8 recommending award of the contract to the successful bidder.

VCO: A state employee who has been certified by the Division of Purchases and Supply as a Virginia Contracting Officer (VCO)

VEES: The Virginia Energy Conservation and Environmental Standards

VEES BUILDING VALUE: The value for the building as it stands in its current configuration including the cost of all repairs needed to provide a safe and functional building for its intended use and occupancy. Depending upon the source of the building value (VAPS, FICAS, other) it may be necessary to add the cost of General conditions, overhead and profit of the Contractor as well as the cost of said repairs.

VICE PRESIDENT OF FACILITIES: This person is responsible for Facilities Management activities at the University, and is responsible for approving preliminary drawings and specifications, schematic designs, and must be kept abreast of the status of all projects.

WOMAN-OWNED/CONTROLLED BUSINESS: Business enterprise at least 51 percent of which is owned by females or in the case of publicly owned business at least 51 percent of the stock of which is owned by females.

WORK: All labor, materials, equipment and other services necessary to perform the complete services, or any separate identifiable part thereof, or to provide the complete product required by the Contract. In construction, Work includes, but is not limited to, performing services, furnishing labor, and furnishing and incorporating materials and equipment into the construction to provide the entire completed construction, or the various separately identifiable parts thereof, as required by the Contract Documents.

CHAPTER 3:

GENERAL TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

SECTION 3.1 GENERAL TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

This Chapter contains the General Terms and Conditions for Professional Services. They shall be made a part of all Contracts for Professional Services and shall not be modified without written approval from the Vice President of Facilities.

SECTION 3.2 GENERAL POLICIES ON ARCHITECTURAL AND ENGINEERING SERVICES

3.2.1 License/Registration: Entities (e.g. individual, partnership, or corporation) offering to provide architectural and/or engineering services shall be properly registered and licensed in Virginia as required by the Department of Professional and Occupational Regulation (DPOR), Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects (APELSCIDLA) board, and, if incorporated, the State Corporation Commission. Professional Corporations must obtain a Certificate of Authority as required by §54.1-411., Code of Virginia, as amended.

The Architect or Engineer (i.e. the person) “in responsible charge” for each discipline shall be currently licensed in the Commonwealth of Virginia and shall affix his or her seal, signature, and date to those documents for which he or she is responsible.

3.2.2 Prime Design Professional: The University will normally contract with a single entity as “Prime Design Professional” to provide the project architectural and/or engineering services. Such Prime Design Professional may have all necessary disciplines in-house or it may subcontract with consultants to provide services in some disciplines. The Prime Design Professional may be an Architect, an Engineer, or an A/E entity. The University shall determine which entity best satisfies the Universities’ requirements for providing the services, meeting the time schedule and budget limitations, and managing the services to be provided on the particular project.

3.2.3 Associations: Contracting with an association of firms, such as joint ventures or associated A/E’s, involves additional business and legal considerations. Factors to be considered include whether the Association is a registered or licensed entity authorized to offer the Services in Virginia, the nature of each party’s responsibilities to the other and to the University, the Professional liability insurance coverage of the Association, its organization and management structure, each firm’s financial condition and stability with respect to fulfilling its obligations under the Contract, and whether the parties to the Association are jointly and severally liable for the Work. Prior to selecting an Association fee negotiation for a possible Contract award, the University shall request a review of the Association’s legal documents, by the University’s legal counsel. Associations not legally constituted and authorized to offer the requested Services in Virginia at the time of the closing date of the RFP will be deemed ‘not responsive’.

3.2.4 Disadvantaged Businesses: It is the policy of the University to contribute to the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities and to encourage their participation in State procurement activities. The University encourages contractors to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, or other contractual opportunities. All procurements by competitive negotiation for professional or non-professional services that are expected to exceed \$100,000 in value shall include consideration of the proposer's past and proposed use of small business and businesses owned by women and minorities in the evaluation of proposals.

SECTION 3.3 PROFESSIONAL SERVICES

The architectural, fire protection, civil, structural, mechanical and electrical portions of the Project shall be planned and designed by or under the immediate supervision of a licensed Architect or Engineer who has expertise in the particular discipline involved. Where such licensed expertise is not available within the A/E of record or where the A/E chooses to subcontract a part of the Work, the A/E shall employ an associate or consulting Architectural or Engineering firm with the requisite expertise to provide the required services. The consultants, associates, or subcontractors proposed by the A/E during the selection process to be part of the A/E project team shall perform the work as proposed. If circumstances require a change, the A/E shall advise the University of the proposed change, the reasons therefore, and the name and qualifications of the proposed replacements. The replacements must be acceptable to the University.

Associates, consultants or subcontractors proposed to be part of the A/E's project team shall be contracted by the A/E at the beginning of the work and shall be active participants in all phases of the Work related to their discipline from beginning to end. The A/E shall be responsible to the University for the Work of all associates, consultants and subcontractors, whether employees of the A/E or not, performed under the Contract.

SECTION 3.4 TAXPAYER IDENTIFICATION NUMBER

The A/E shall furnish to the University at the time of contract award its Federal Employer Identification Number (FEIN) if a corporation or a partnership or its Social Security Number (SSN) if a sole proprietor.

SECTION 3.5 RELATIONSHIP OF ARCHITECT/ENGINEER TO UNIVERSITY

Once the Contract for A/E services has been fully executed, the A/E shall be the professional advisor and consultant to the University for technical matters related to the project and shall be responsible directly to and only to the University. The University shall communicate all approvals, rejections, change requirements and other similar information to the A/E. The A/E shall advise the University of changes necessary to keep the project within the prescribed area and cost limits. The A/E's status, relationship and authority during the construction phase of the project are further defined in Section 15, paragraphs (a) thru (h) of the General Conditions of the Construction Contract (CO-7).

Generally, the University will observe the procedure of issuing orders to the Contractor through the A/E or, if the A/E's construction period duties have been so modified, through the University's designated project representative. If the University issues orders directly to the Contractor, the A/E shall be copied on such orders.

SECTION 3.6 UNIVERSITY HIGHER EDUCATION CAPITAL OUTLAY MANUAL

This Manual and all revisions thereto, shall be incorporated into the Contract in their entirety except as amended or superseded in the Contract or an Addendum thereto.

For the sake of simplicity, the provisions of this Manual dealing with Architects and Engineers are written as though they apply to the design of buildings and to construction administration only. They also shall apply, however, to all professional architectural and engineering services of every kind including, but not limited to, project studies, development of site plans, other studies, and related Professional Services.

Many of the changes, additions, or deletions made in revisions to this Manual are necessary to keep abreast with codes, statutes, or regulations related to the project. They require immediate compliance. If the A/E determines that including the requirements of any Manual revision issued subsequent to the revision shown on the Contract Between the University and A/E (HECO-3), will require additional work on its part, the A/E shall notify the University of same within 60 days of the date of distribution of the revision, and shall provide an itemized list of the additional work required by the revision. The University shall provide direction to the A/E regarding incorporating the requirements of the revision and, if appropriate, issue a change order to the A/E for the extra work as described in Chapter 6 of this Manual.

Generally, revisions issued prior to the date of approval of the preliminary submittal can be incorporated with minimal, if any, additional work on the part of the A/E.

If the A/E fails to notify the University within 60 days after the date of distribution of the revision that the revision will require additional work on the A/E's part, the A/E waives the right to make claims for additional services based on the contents of the revision.

SECTION 3.7 "DESIGN-NOT-TO-EXCEED" COST AS RELATED TO A/E CONTRACT

The University shall provide the A/E with a description of the Project including information on functions, space requirements, special features and requirements, aesthetic requirements, authorized square footage and "Design-not-to-exceed" construction budget. The A/E's Contract requires that if the low bid or the estimate of any phase submittal exceeds the "Design-not-to-exceed" cost identified in the A/E Contract by more than 10%, any A/E revisions to the plans and specifications required to bring the cost of the project within the "Design-not-to-exceed" cost shall be executed by the A/E at no additional cost to the University, unless otherwise directed by the University.

The A/E's cost estimate shall be in the systems format described in Chapter 8 and Appendix E and shall be to a level of detail commensurate with the current level of design. The A/E shall submit a Cost Estimate with each phase Submittal unless otherwise noted in the Contract or Project Order.

If the cost estimate indicates a potential problem in securing a bid within the "Design-not-to-exceed" cost, the A/E shall notify the University and shall work with the University to redefine the design concepts of space utilization, building efficiencies, materials of construction, etc., so that the estimated cost of construction does not exceed the "Design-not-to-exceed" cost. Substantial changes in the project scope, such as those which affect the area or function of the proposed facility, must be justified by the A/E and may require the approval of the Vice President of Facilities.

SECTION 3.8 CODE AND REGULATORY COMPLIANCE

The A/E, in accordance with the applicable standards of care established by the HECO Manual and under Virginia law, is responsible for designing the Project and administering the construction phase of the Project in accordance with the Virginia Uniform Statewide Building Code (USBC) (hereafter referred to as the "Code"), this Manual and other regulatory requirement applicable to the Project. Nothing contained herein shall be construed as relieving any A/E, Professional design Consultant, Contractor, Supplier or any other participant from any Professional or legal responsibility for performance. Reviews, comments and approvals by the University, or the staff of any State Department in no way absolve any other person, firm or corporation involved in a Project from their full responsibilities under law, codes and professional practice. Lack of comment by a University or State reviewer does not relieve the A/E from designing to meet the Code or this Manual requirements or applicable state regulations or local regulations related to water, sewer, fire department service, and other utilities.

If the correction of a Code, or Manual requirement, or regulatory violation results in a Change Order during construction, any additional costs incurred shall be borne by the party responsible for the violation. The University will bear only the costs attributable to the actual Code or regulation-required enhancement of the Project.

If the A/E believes that a Code, or Manual requirement, or a regulation is unclear as to meaning, he or she shall request a written opinion as to the applicable interpretation from the University or from the applicable regulatory University, as appropriate, and the A/E shall be entitled to rely on the written opinion, if any, which he or she receives.

SECTION 3.9 LIABILITY INSURANCE, DESIGN ERRORS AND/OR OMISSION AND RECORDS RETENTION

The A/E shall carry professional liability insurance covering negligent acts, errors, and omissions violating the contractual standard of care for all state-owned projects designed by the A/E which are currently under contract or construction. The A/E shall carry either "basic practice policy" or "project policy insurance" coverage. The minimum amount of professional liability insurance required to be carried by the A/E shall be calculated as an amount not less than 10% of the estimated cost of construction of all University-owned projects designed by the A/E which are currently under construction and twice that amount in the aggregate for each policy year. Insurance in the amount of \$1,000,000 per claim and twice that amount in the aggregate for each policy year is the minimum amount regardless of the construction cost. The maximum amount of insurance

required, regardless of the construction cost, shall be \$5,000,000 per claim and \$10,000,000 in the aggregate for each policy year.

The A/E shall maintain this insurance in force after completion of the services under the contract for a period of five years (5) after completion of construction. The A/E shall maintain coverage in the amount equal to the highest dollar amount of coverage for the highest construction cost project for a period of 5 years after the completion of the project. If the A/E cancels their professional liability insurance policy prior to 5 years past substantial completion, they must purchase an Extended Reporting Period equal to the number of years the coverage is required

Neither the University's review, approval, or acceptance of, nor payment for any of the services required shall be construed to operate as a waiver by the University of any rights or any cause of action arising out of the Contract. The A/E shall be and remain liable to the University for all costs of any kind which are incurred by the University as a result of negligent acts, errors, or omissions on the part of the A/E including its subcontractors and consultants, in the performance of any of the services furnished.

The A/E shall be responsible for all costs resulting from its errors, omissions, and other breaches of the applicable standards of care established by this Manual and/or under Virginia law including, but not limited to, its own costs for labor and other in-house costs, any resulting Contractor Change Order costs including the costs for demolition, cutting, patching, repairs, removal, or modification of Work that is already in place, any Contractor or University delay damages, and any judgments, fines or penalties against the University resulting from A/E errors, omissions, and other breaches of the applicable standards of care. However, the A/E shall not be responsible for the cost of the correct equipment or system which should have been originally specified, except the A/E shall be responsible for any increased costs, whether the result of inflation, reordering, restocking or otherwise, of incorporating the corrected Work into the Contractor's Contract Change Order. For the purposes of determining the A/E's share of such costs for Work which has not yet been performed, the cost of Work performed by Contractor's Change Order shall generally be presumed to be 15% greater than if the Work had been included in the Contractor's Contract. The A/E shall have the burden of disproving this presumption.

The University shall actively pursue reimbursement of costs resulting from the A/E's errors, omissions, or breaches of the applicable standard of care. Upon determination that there may be A/E financial responsibility involved, the A/E shall be contacted by the University. The A/E shall be advised of the design deficiency, informed that it is the University's opinion that the A/E may be financially responsible, and requested to provide a technical solution to the problem, including cost estimate. Upon notification of potential liability, the A/E should coordinate with the University to determine required technical support and timing to minimize delay costs. Pending final decision by the University, the A/E will be invited to attend all price negotiations with the Contractor for the corrective work. The A/E shall participate as a non-voting technical advisor to the University's negotiator. If the A/E refuses to cooperate in the negotiations or disputes its responsibility, the University shall have the right to proceed with the remedial construction and/or change order negotiations without the A/E.

Alternatively, where there is clearly a design error, the A/E may discharge its financial responsibility through negotiation with, and direct payment to, the Contractor. This action must be participated in and approved by the University.

The A/E shall retain record copies of its design calculations, drawings, bid/contract documents, addenda, field orders, clarifications and responses to Requests For Information, approved shop drawings and submittals, inspection / observation reports, fiscal records, and other documents relative to the contract for five (5) years after completion of the services under the contract or five years after completion of construction, whichever occurs earlier. Should the A/E cease its business prior to that time, the A/E will provide those project related documents to the University for safe keeping.

SECTION 3.10 OTHER INSURANCE REQUIRED OF THE A/E

Prior to the start of any work under the contract, the A/E shall provide to the University Certificates of Insurance forms approved by the University and shall maintain such insurance until the completion of all Work under the contract. The minimum limits of liability shall be as follows:

1. ☐ Worker's Compensation -- Standard Virginia Workers Compensation Policy with statutory requirements and benefits;
2. Employers Liability -- \$500,000;
3. Broad Form Commercial General Liability --\$1,000,000 Each Occurrence and \$2,000,000 Aggregate. The coverage shall include: Premises / Operations Liability; Products and Completed Operations Coverage; Independent Contractors Liability; University's and Contractor's Protective Liability; and Personal Injury Liability (Libel, Slander, Defamation of Character, etc.);
4. Automobile Liability -- \$1,000,000 Combined Limit for bodily injury and property damage per occurrence.

The University shall be named as an additional insured with respect to the services being provided.

George Mason University in no way warrants that the minimum limits contained herein are sufficient to protect the Consultant from liabilities that might arise out of the performance of the work under this contract by the Consultant, their agents, representatives, employees, or sub-consultants. The Consultant shall assess its own risks and, if it deems appropriate and/or prudent, maintain higher limits and/or broader coverages. The Consultant is not relieved of any liability or other obligations assumed or pursuant to the contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration, or types.

SECTION 3.11 OWNERSHIP OF DOCUMENTS AND MATERIALS

Ownership of all materials and documentation including the original drawings and the Plans and Specifications and copies of any calculations and analyses prepared pursuant to the Contract between the University and the A/E, and files shall belong exclusively to the University. Such materials and documentation, whether completed or not, shall be the property of the University whether the work for which they are made is executed or not. The A/E shall not use these materials

on any other work or release any information about these materials without the express written consent of the University.

Such material may be subject to public inspection. Security-related documents and information are excluded from the Act unless a specific need to know can be shown. Trade secrets or proprietary information submitted by a bidder, offeror, or contractor in connection with a procurement transaction shall not be subject to disclosure under the University Procurement Policy, provided the bidder, offeror, or contractor invokes the protections of the University Procurement Policy, prior to or upon submission of the data or other materials, identifies the data or materials to be protected and states the reason why the protection is necessary.

The A/E shall provide the following documents to the University at the completion of the A/E's work:

1. Original sealed and signed drawings and specifications
2. Copy of analyses made for the project
3. Indexed copy of the calculations made by each discipline for the project
4. University copy of all shop drawings, submittals, cut sheets, operation and maintenance instructions, parts lists, and other material related to the project.

If a computer aided drafting and design program other than AutoCAD or Revit is used to generate project drawings, the A/E shall be responsible for all conversion procedures necessary to generate the AutoCAD and/or Revit files to specifications for delivery to the University.

The University has the right to use the project documents as a prototype to demonstrate scope, size, functional relationships, etc., to an A/E designing a similar project. The A/E for the original project design shall not be responsible or liable to the University for any such use of the documents.

The A/E for the similar project shall be responsible for providing a complete set of project and location-specific "Final Documents" with its seals and signatures which meet all applicable codes and standards in effect at the time those "Final Documents" are submitted.

SECTION 3.12 STANDARD PLANS

Where the University has engaged the A/E to prepare "Standard Designs" and/or "Standard Plans" for structures such as picnic shelters, sheds, bath houses, single family residences, cabins and utility buildings for the University to site adapt for use at various locations, the drawings for the Standard Plans shall show:

1. Name of the University, i.e.
2. Title of the Standard Structure for which the design was developed,
3. Name of the A/E, and
4. Seal and signature of the responsible licensed professional.

The Standard Plans shall also show the applicable codes, standards, loadings and design parameters used to develop the design.

Where the A/E has not been engaged to review the site adaptation of the Standard Plans nor review the submittals or construction, the University, and not the A/E, shall be responsible for the proper site adaptation and use of the Standard Plans. The A/E shall, however, be responsible for negligent acts, errors or omissions in the Standard Plans.

When the Work involves the site adaptation of Standard Plans, the cover sheet for the project plans shall list the drawings included in the set of plans and shall differentiate between the Standard Plans and the "site-specific" site development, utility, and foundation drawings prepared by the A/E for that site. These site-specific drawings shall be sealed and signed by the responsible licensed A/E.

SECTION 3.13 REQUIREMENTS FOR A/E SEALS AND SIGNATURES

3.13.1 General: The Seal and Signature of the licensed Professional Engineer, Architect or Certified Landscape Architect on the drawings provides notice to the public the drawings are complete and that the professional has exercised complete direction and control over the work to which the seal or signature is affixed. All plans and specifications for building projects designed for the University must bear the seal and signature of the responsible licensed professional.

In accordance with the Virginia Administrative Code (VAC) §18VAC10-20-760 - Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects Regulations - An electronic seal, signature and date may be used in place of an original seal, signature and date when it is a unique identification of the professional, is verifiable and its use is under the professional's direct control. The electronic seal shall be 2 inches in diameter, meeting all criteria of the regulations referenced above. The printed name shall appear above the license number and both shall be legible. An electronic signature, which may contain digital signature verification, is acceptable as long as all relevant text is legible.

Each drawing to be reproduced shall show:

1. the name of the A/E,
2. the Project Title,
3. the Project location,
4. the state Project Code,
5. the Drawing / Sheet Title,
6. the Drawing / Sheet number,
7. the seal and signature of the responsible licensed professional,
8. and the uniform date of the completed documents
9. All plans shall have a North Arrow for orientation. All discipline building plans shall be consistent in orientation insofar as practical.

The Title sheet drawing(s) shall also have:

1. the Index of Drawings,
2. the Project VUSBC data,
3. the Seal and Signature of the A/E Principal-In-Charge or responsible licensed professional of the project,
4. and the uniform date of the completed documents.

5. (A/E may also require the seal and signature of a principal of its consultants.)

The Specifications Table of Contents shall have:

1. the Seal and Signature of the A/E Principal-In-Charge or responsible licensed professional of the project,
2. the uniform date of the completed documents, and
3. the listing of specification sections included for the project.
4. (A/E may also require the seal and signature of a principal of its consultants.)

3.13.2 "Contract Documents" submitted to the University for review is expected to be complete documents ready for bidding. All drawings shall bear the seal of the responsible licensed professional. The Cover Sheet shall show a complete list of the drawings in the set.

Occasionally, for George Mason University Foundation projects, there may be a need to purchase AIA contract documents. If there is a need for such documents the American institute of Architects offers a library of over 100 forms and agreements that address the full spectrum of project types including conventional, small project, design build, and federally funded projects.

The website is <http://www.aia.org/contractdocs>. Log on using an AIA member username and password, go to the store at the top of the page and continue with the purchase process.

3.13.3 "Final Documents" are completed documents ready for bidding and include all corrections required by the University review. Each sheet of the drawings reproduced in the bid documents, including the cover sheet, shall bear the seal and signature of the responsible licensed professional and a uniform document date. The original cover sheet without seal and signature shall be reproduced and attached to copies of the other drawings in the set. Each cover sheet print shall then be sealed, signed and dated with original seals and signatures. These official "Final Documents" shall be distributed to the following:

1. University Building Official: Number of sets requested
2. Regional State Fire Marshal's Office: 1 Set
3. Additional sets: 2 full sized and 3 half sized sets to the University

3.13.4 "Addendum" to the Final Documents: The first sheet of each and every addendum issued to bidders shall show the number of pages in the addendum and shall list any attached sketches, drawings or other material included in the addendum. In addition, the first sheet of each and every Addendum shall bear the name of the project, the Project Code number, the date and the seal and signature of the responsible licensed professional. Copies of each addendum with seal and signature shall be distributed to the above recipients in the same fashion as the official "Final Documents".

SECTION 3.14 SUBCONTRACTS

No portion of the A/E professional services shall be subcontracted without prior written consent of the University. Consultants proposed by the A/E during the selection and fee negotiation phases are assumed to be acceptable to the University unless the University notes otherwise during those phases. In the event that the A/E desires to subcontract some part of the Work required by the Contract to a consultant or subcontractor not previously approved, the A/E shall furnish the

University names, qualifications and experience of the proposed consultants. The A/E shall, however, remain fully liable and responsible for all Work performed by his consult however, remain fully liable and responsible for all Work performed by his consultants and subcontractors and shall assure that their Work complies with all requirements of the A/E's Contract.

SECTION 3.15 MODIFICATION OF THE A/E CONTRACT (A/E CHANGE ORDERS)

The University may, upon mutual agreement with the A/E, issue written modifications to the scope of services of the Contract using HECO-11A/E. Any single change order, or accumulation of change orders, which increases the original A/E Contract Amount by 25% or \$50,000, whichever is greater, must have the approval of the Senior-Executive Vice President for Administration and Finance or consistent with existing board policies his or her sub-delegate.

Once the cumulative total of modifications exceeds 25% of the original contract amount, or \$50,000, whichever is greater, all succeeding additive Change Orders must receive said prior approval. In making any modification, the resulting increase or decrease in cost shall be determined by one of the methods selected by the University in accordance with requirements of Chapter 6 of this Manual.

SECTION 3.16 PAYMENTS TO THE ARCHITECT/ENGINEER (A/E)

The A/E shall submit its invoice to the University using the GMU HECO Form – A-E Invoice. The invoice shall itemize a breakdown of the various phases or parts of the Total Contract Amount, the value of the various parts, the previously invoiced and approved amounts for payment, and the amount of the current invoice. The invoice shall be submitted in the University's web-based project management software, e-builder, unless otherwise instructed. Instructions on the use of e-builder can be found at the following link:

<https://gmufacilities.freshdesk.com/support/solutions/folders/33000208944>.

Failure to use the required form will result in return of the invoice and payment will not be made until the proper completed format is used. Although basic service fees are delineated by fee per task, payments will be made with overall fee percentage completed as a major factor. By submission of a current request for payment of the fee for services rendered, the A/E warrants to the University that (1) the date shown is accurate; (2) the work covered by the invoice has been completed in conformance with the A/E contract, (3) all previous payments received from the University on account of the A/E contract have been applied to discharge (except for allowable retainage) all obligations of the A/E to its sub-consultants incurred in connection with work covered by prior invoices.

The GMU HECO Form – A-E Invoice format requires the use of Microsoft Excel software. Should the A/E accounting procedures use another spreadsheet, the addition of Excel must be added to its accounting operation.

Use of the web-based service, GCPay, for all pool-funded projects that include funds provided by the Six-Year Capital Outlay Plan Advisory Committee (i.e., Chapter 1 and other Pooled Projects) is mandatory. At this time, the use of GCPay is optional for other state projects. The monthly fee

for using this system is paid by the project General Contractor. Payment requests for General Contractors and A/Es, and all project costs (equipment, testing, moving, move coordination, etc.), shall be accounted for in this system. Training on the use of the system is available from GCPay at www.gcpay.com. Access to and instructions for the use of the GCPay statewide contract are available at the Department of General Services website.

Invoices for Work being performed on an hourly rate, not-to-exceed, basis shall show the extended cost amount. The A/E should be aware of the following payment policies:

1. Unless there is a dispute about the compensation due the A/E including, but not limited to, claims by the University against the A/E, then thirty (30) days after receipt by the University of the A/E's invoice, which shall be considered the invoice receipt date, the University shall pay to the A/E the amount approval less any retainage and less than any prior payments or advances made to A/E. The date on which payment is due shall be referred to as the Payment Date.
2. The University may agree to make progress or partial payments to the A/E during any phases of the Work based on the estimated value of the Work completed by the A/E on that phase. Any such progress payment shall be based on the University's opinion of the value of the Work completed as the date of the invoice. The A/E may invoice the University and, if the University agrees that the submittal for the particular design phase is complete, the University may approve payment of a cumulative amount of not more than 95% of the value of that phase at the time the phase submittal is made to the University. The A/E may invoice the University for the remaining 5% (balance of the value of that phase) when the submittal has been reviewed and approved.
3. Disputes about the compensation due the A/E may include, but are not limited to, the amount due, the value or percentage of the Work completed, defects or deficiencies in the Work, quality of the Work, compliance with the Contract Documents, completion itself, or negligent acts, errors, or omissions on the part of the A/E. In the event of disputes, payment shall be mailed on or before the Payment Date for amounts and Work not in dispute, subject to any setoffs claimed by the University.
4. All prior payments, whether based on estimates or otherwise, may be corrected and adjusted in any payment and shall be corrected and adjusted in the final payment. In the event that any invoice by the A/E contains a defect or impropriety which would prevent payment by the Payment Date, the University shall notify the A/E in writing of such defect or impropriety within ten (10) days after the invoice receipt date. Any disputed amounts determined by the University to be payable to the A/E shall be due thirty (30) days from the date the dispute is resolved.
5. Interest shall accrue on all amounts owed by the University to the A/E which remain unpaid seven (7) days following the Payment Date. Said interest shall accrue at the discounted ninety day U.S. Treasury bill rate as established by the Weekly Auction and as reported in the publication entitled The Wall Street Journal on the weekday following each such Weekly Auction.

During the period of time when the amounts due to the A/E remain unpaid following the fifteenth day after the Payment Date, the interest accruing shall fluctuate on a weekly basis and shall be that established by the immediately prior Weekly Auction. It shall be the responsibility of the A/E to gather and substantiate the applicable weekly interest rates to the satisfaction of the University and to calculate to the satisfaction of the University the interest due. In no event shall the rate of interest charge exceed the rate of interest established pursuant to §58.1-1812, *Code of Virginia*.

No interest shall accrue when payment is delayed because of a dispute between the University and the A/E as described in subparagraph (4) above, or dispute as to the accuracy of any Request of Payment received. This exception to the accrual of interest shall apply only to that portion of a delayed payment which is actually the subject of the dispute and shall apply only for the duration of such disagreement. Nor shall interest accrue on retainage, which is withheld to assure faithful performance of the Contract.

No interest penalty shall be paid to any debtor on any payment, or portion thereof, withheld pursuant to the Comptroller's Debt Setoff Program commencing with the date the payment is withheld. If, as a result of an error, a payment or portion thereof is withheld, and it is determined that at the time of setoff no debt was owed to the University, interest shall accrue at the rate determined above on amounts withheld which remain unpaid after seven days following the payment date.

6. In those cases where payment is made by mailing, the date of mailing of any payment by the U.S. Postal Services is deemed to be the date of payment to the addressee. Where payment is made by electronic transfer of funds, the date of the transfer of funds is deemed to be the date of payment.
7. The University is entitled to interest on all amounts from the A/E that remain unpaid thirty (30) days after the amount is deemed due, whether as a result of a resolution of a dispute or otherwise. Any such interest shall be calculated by the same method as set forth in this subsection.

SECTION 3.17 PAYMENTS BY ARCHITECT/ENGINEER (A/E)

The following procedures are established in conformance to the University Procurement Policy. The A/E shall at the time of contract award require every consultant, subcontractor and supplier to provide its Social Security Number (SSN), if a sole proprietor, or its Federal Employer Identification Number (FEIN), if a corporation or partnership.

Except in cases of bona fide disputes, or where the A/E has some other justifiable reason for delaying payment, the A/E shall pay:

1. To each of its Consultants, Subcontractors and Suppliers, not later than seven (7) calendar days after receipt of amounts paid to the A/E by the University, the proportionate share of the total payment, including any interest, received from the University attributable to the Work performed by Consultants and Subcontractors and materials furnished by Suppliers

less a retainage of not more than five percent (5%), said retainage being the same money, not additional money, retained by the University from the payment to the A/E.

2. In the case of bona fide disputes or where the A/E has some other justifiable reason to delay payment, not later than seven (7) calendar days after receipt of amounts paid to the A/E by the University, the A/E shall notify the University and the Consultant, Subcontractor or Supplier, in writing, of his intention to withhold all or a part of the Consultant, Subcontractor or Supplier's payment with the reason for nonpayment. The A/E shall make timely payments of those portions of the payment not in dispute.
3. The A/E shall pay interest to the Consultants, Subcontractors or Suppliers on all amounts owed by the A/E that remain unpaid after seven (7) days following receipt by the A/E of payment from the University for work performed by the Consultants, Subcontractors or materials furnished by Suppliers under the contract, except for amounts withheld as allowed in subsection (2) of this Section. Unless otherwise provided under the terms of this contract, interest shall accrue at the rate of one percent per month
4. The A/E's obligation to pay interest to its Consultants, Subcontractors or Suppliers pursuant to subsection (3) of this Section shall not be construed to be an obligation of the University.
5. A contract modification shall not be made for the purpose of providing reimbursement to the A/E for such interest charge. The A/E's invoice shall not include any amount for reimbursement for such interest charge.

SECTION 3.18 AUDIT

The A/E shall provide documentation subject to audit for all invoices requesting payment for services provided on a cost reimbursement or hourly rate basis. Compensation paid to the A/E on these bases is subject to adjustment based on the results of the audit.

The A/E, by signing the Contract, agrees to retain all books, records, and other documents relative to the contract for five (5) years after final payment, or until audited by the University, whichever is sooner. The University, its authorized agents, and/or State auditors shall have full access to and the right to examine any of the materials during said period.

SECTION 3.19 CONFLICTS OF INTEREST

The A/E, including any subsidiaries or affiliates or other entities in which the A/E has a pecuniary interest, which design, prepare plans and specifications, or cost estimates for a construction contract is prohibited from providing all or a portion of said construction, or the supplies or equipment used in such construction. (§2.2 - 4374; *Code of Virginia*).

In addition, an entity which provides to the A/E any design services specifying a sole source for materials, supplies or equipment to be used in the construction shall be prohibited from bidding on, or otherwise furnishing such materials, supplies or equipment for the construction. This prohibition does not apply to a vendor who provides catalog information, technical data and such on products, material or equipment to the A/E for the A/E's consideration.

SECTION 3.20 RELEASE OF INFORMATION PERTAINING TO PROJECT DESIGN

Release in any form by the A/E of information pertaining to the estimated construction cost of a project under design to anyone other than authorized University personnel, and other A/E's or Consultants performing design of related University facilities is prohibited.

The A/E shall not give out information concerning a project to anyone other than authorized University personnel, other A/E's performing design of related University facilities without specific approval of the University to release such information.

When the project is ready to be advertised, the A/E may provide the following information to "construction information / plan room" services who serve the construction industry:

1. type of project or facility,
2. size (area) and number of stories,
3. types of materials,
4. bidding requirements,
5. invitation for bid (IFB document) source, and
6. a project cost range (e.g. \$2,000,000 to \$5,000,000).

As documents are issued to prospective bidders, a current list of plan holders should be made available to those who request such information, including the plan room services.

During the bidding period, the A/E shall not respond to requests by prospective bidders to clarify or state the intent of Plans or Specifications unless such requests are in writing. The response must be in the form of an addendum issued to all plan holders. Sources of supply for special equipment may be made available in writing to all bidders/contractors. The A/E should promptly prepare and issue addenda for any necessary corrections or clarifications of the Plans and Specifications.

SECTION 3.21 DEFAULT

In case of the A/E's failure to deliver the reports, documents or services in accordance with the Contract terms and conditions, the University, after due written Notice, may procure same from other sources, and the A/E shall be responsible for any resulting additional procurement and administrative costs. This remedy shall be in addition to any other remedies which the University may have.

SECTION 3.22 TERMINATION OF CONTRACT

The University may terminate the Contract for cause or for convenience after giving thirty (30) days written notice to the A/E. The written notice shall include a statement of reasons for the termination.

3.22.1 Termination for Cause: If the A/E should substantially breach the Contract or fail to perform the services, or any portion thereof, required by the Contract, the University may terminate the Contract for cause by giving written notice as set forth above or may give the A/E a stated period of time within which to remedy its breach of contract. If the A/E shall fail to remedy the

breach within the time allotted by the University, the Contract may be terminated by the University at any time thereafter upon written notice, effective immediately upon receipt. The University's forbearance in not terminating the contract shall not constitute a waiver of the University right to terminate in the future for similar breaches or failures to perform. If the Contract is terminated for cause, the A/E shall be responsible for all damages incurred by the University as a result of the A/E's breach of contract or failure to perform, including but not limited to, all costs and expenses incurred in securing a replacement A/E to fulfill the obligations of the Contract. Any termination by the University for default, if determined by a court of competent jurisdiction not to have been justified as a termination for default, shall be deemed a termination for the convenience of the University.

3.22.2 Termination for Convenience: The University may terminate the Contract in whole or in part for convenience by delivering to A/E a written notice of termination as set forth above, specifying the extent to which performance under the contract is terminated and the effective date of the termination. Upon receipt of such notice, the A/E must stop Work, including but not limited to Work performed by subcontractors and consultants, at such time and to the extent specified in the notice.

If the contract is terminated for convenience, the A/E shall be entitled to those fees earned for Work performed in accordance with the Contract prior to the notice of termination. Thereafter, the A/E shall be entitled to any fees earned for work not terminated, but shall not be entitled to lost profits for the portions of the Contract which were terminated. The A/E will be compensated for reasonable costs or expenses for delivery to the University of the products of the services for which the A/E has or will receive compensation.

3.22.3 Delivery of Materials: Any termination shall not relieve the A/E of the obligation to deliver to the University all products of the services for which the A/E has been or will be compensated, including, but not limited to, the original drawings and specifications, copies of CADD/ Revit files (including all appropriate referenced drawings), calculations, and analyses. Unless otherwise agreed to in writing, the A/E shall deliver the materials to the University within thirty (30) days of receipt of the notice of termination. Failure to do so shall result in the withholding of final payment and shall constitute a material or substantial breach of contract.

3.22.4 Compensation Due to the A/E: When the A/E is terminated for convenience, the following method shall be utilized in computing amounts due the A/E for services prior to termination:

1. If terminated at the completion of a design phase or the bidding phase, the amount due shall be the cumulative total of the fees for the phases completed according to the Contract.
2. If terminated prior to completion of a design phase or the bidding phase, the amount due shall be the sum of the previously completed phase fees plus a negotiated amount based on the portion of services provided for the phase not completed.
3. If terminated during the construction phase, the total amount earned shall be the sum of the previously completed design and bidding phase fees plus a negotiated amount based on the portion of the construction period services provided through the notice of termination.

4. Payment for the Additional Services portion of the fee shall be any portion of those services provided up through the notice of termination.
5. Payment for the Reimbursable Expenses shall be based on approved reimbursable expenses incurred up through the notice of termination.

The A/E shall submit invoices for all such amounts in accordance with the normal billing process, but in no event later than 60 days after the last Work is performed. All amounts invoiced are subject to deductions for amounts previously paid or for amounts due the University.

SECTION 3.23 ASSIGNMENT OF CONTRACT

The A/E shall not assign the Contract between the University and the A/E, in whole or in part, without the written consent of the University. The assuming A/E shall, if it hasn't already, provide the University with current AE-1-6 forms, proof of licensure and registration in accordance with §3.2.1 and shall self-register with eVA and in e-Builder.

SECTION 3.24 ANTITRUST

By entering into a contract, the A/E conveys, sells, assigns, and transfers to the University all rights, title and interest in and to all causes of the action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the University under said Contract.

SECTION 3.25 ETHICS IN PUBLIC CONTRACTING (§2.2-4367 ET SEQ., CODE OF VIRGINIA)

The A/E shall not offer or receive any kickbacks or inducements from any other offeror, supplier, manufacturer or subcontractor in connection with this project. The A/E shall not confer on any public employee having official responsibility for this project any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

SECTION 3.26 ANTI-DISCRIMINATION

By signing the Contract, the A/E certifies to the University that it, as contractor for the services described in the RFP and the Contract, will conform to the provisions of the Federal Civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment Act of 1975, as amended, where applicable, and the University Procurement Policy which provide that:

In every contract, the provisions in 1 and 2 below apply:

1. During the performance of this contract, the contractor (A/E) agrees as follows:
 - a. The A/E will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contracting firm. The A/E agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - b. The A/E in all solicitation or advertisements for employees placed by or on behalf of the A/E, will state that such contracting firm is an equal opportunity employer.
 - c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this Section.
2. The A/E will include the provisions of the foregoing paragraphs a, b, and c in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

Where applicable, the Virginians with Disabilities Act and the federal Americans with Disabilities Act shall apply to the A/E and all subcontractors.

SECTION 3.27 APPLICABLE LAW AND COURTS

The A/E contract shall be governed in all respects by the laws of the Commonwealth of Virginia and any litigation with respect thereto shall be brought in the courts of the Commonwealth, as provided under Virginia law.

In performing services under the Contract, the A/E shall comply with applicable federal, state and local laws and regulations.

SECTION 3.28 PROHIBITION OF ALCOHOL AND OTHER DRUGS IN THE WORKPLACE

The University seeks to establish and maintain a work environment free from the adverse effects of alcohol and other drugs. The adverse effects of alcohol and other drugs create a serious threat to the safety and welfare of all personnel at the jobsite, to jobsite safety in general, to worker productivity and quality of workmanship, and to the project schedule.

In conformance with the University Procurement Policy, the A/E shall prohibit the following acts by the A/E, its employees, subcontractors, consultants and suppliers while performing services under the terms of the Contract.

1. The unlawful or unauthorized manufacture, distribution, dispensation, possession, or use of marijuana or other drugs (except the possession and use of medically prescribed drugs for legitimate medical purposes) in the workplace or at the construction site;

2. The unlawful or unauthorized manufacture, distribution, dispensation, or use of alcoholic beverages in the workplace or at the construction site during hours of work;
3. The impairment of a person in the workplace, or at the construction site, related to the use of alcohol, marijuana, or other drugs including impairment from prescription drugs.

The A/E shall post a copy of this policy in a conspicuous place at the workplace and assure that all personnel are advised of the policy. A violation of this policy will be recognized as a breach of contract and may result in termination of the Contract.

SECTION 3.29 DESIGN OF SECURITY SYSTEMS

Any bidder/offeror for the installation, service, maintenance, or design of security equipment or any central station alarm condition monitoring service shall be licensed by the Department of Criminal Justice Services pursuant to §9-183, Code of Virginia. An A/E proposing to provide any of these services with its own staff shall be exempt from the DCJS licensing requirement if properly licensed by the APELSLA Board. (§9-1 83.2; Code of Virginia) If the A/E proposes to have the security system designed by a subcontractor/consultant, such entity shall be properly licensed as required by §9-1 83, Code of Virginia.

Any projects designed by the A/E which have such security systems shall include the licensing requirements of §9-1 83, Code of Virginia, in the specifications and the requirement that the successful bidder shall provide documentation within five (5) calendar days of bid opening that the entity (contractor or subcontractor) performing the security system work possesses the proper license.

SECTION 3.30 USE OF STANDARD FORMS AND FORMATS

The A/E shall incorporate in every construction contract the applicable CO-7 (General Conditions of the Construction Contract) and CO-7a (Instructions to Bidders), which may be found in Appendix A of this Manual. These forms shall not be retyped or modified in any way. If changes are required to either, the changes shall be made in the form of "Supplemental General Conditions" or "Supplemental Instructions to Bidders". Such "Supplements" shall be approved by the Vice President of Facilities prior to their incorporation in the construction contract.

The A/E shall use the applicable Higher Education Capital Outlay Forms which are included in Appendix B of this Manual. The wording on the forms shall not be modified or altered without the specific written approval of the Vice President of Facilities. Where spaces are provided for insertion of information, the size of the space may be adjusted to accommodate the information being inserted.

The A/E shall use the Standard Formats which are included in Appendix C and subsequent Appendices of this Manual for the applications indicated. Formats may be edited to delete portions which are not applicable to the project and to insert necessary information; however, the format and the basic wording shall be retained.

SECTION 3.31 REPORTS ON THE PARTICIPATION OF SMALL BUSINESSES AND BUSINESSES OWNED BY WOMEN AND MINORITIES

An Actual Involvement Report is required for professional service contracts. The A/E shall submit a report on the actual dollars paid to small businesses and businesses owned by women and minorities as part of the submission of the final invoice for payment. At a minimum, this report shall include for each firm contracted, the Business Class, the Federal Tax ID number, the total dollars of fee, and the percent of the total estimated contract value.

1. **Periodic Progress Reports/Invoices:** The A/E shall include a report on involvement, if any, of small businesses and businesses owned by women and minorities as a part of their periodic invoice. The report will specify the actual amounts of contracts to date with such businesses, and the actual dollars paid to date with such businesses on this contract. This information shall be provided separately for small businesses, women-owned businesses and minority-owned businesses. The A/E shall provide a copy of this information to the University. Failure to submit the required information will result in invoices being returned without payment.
2. **Final Actual Involvement Report:** The A/E shall submit, prior to completion or at completion of the contract and prior to final payment, a report on the actual dollars paid to small businesses and businesses owned by women and minorities during the performance of this contract. At a minimum, this report shall include for each firm contracted, the Business Class, a comparison of the total actual dollars paid on this contract with the planned involvement of the firm, the totals for each business class as specified in the proposal, and the actual percent of the total estimated contract value.

CHAPTER 4:

PROCUREMENT PROCEDURES FOR PROFESSIONAL SERVICES

SECTION 4.1 GENERAL POLICY ON PROCURING A/E SERVICES

This Manual sets forth the general parameters for the procurement of professional services. The sections in this chapter provide further definition of the requirements for procurement of professional services at the University. The policy of the University is to contract with a single entity in acquiring the full range of disciplines necessary to provide the services identified for a project. The entity may be an Architectural & Engineering (A/E) firm with in-house capabilities in all disciplines or it may be an Architectural firm, be an Engineering firm, a Land Surveying firm or a Landscape Architectural firm which subcontracts for disciplines not in-house. All of the above entities have an equal opportunity to compete for projects. Consideration will be given to the proposer who demonstrates it is best suited for and has the ability to meet the required criteria. In any case, the proposer will be referred to as the A/E and will be required to provide the complete services indicated in the University's A/E Contract with all disciplines coordinated.

The person having overall responsibility for the project management and coordination of disciplines may be a licensed Architect, a licensed landscape architect, a Professional Engineer or a licensed Surveyor. A licensed Architect shall be in charge of planning and design of the architectural aspects of the project. A licensed Engineer competent in that particular discipline shall be in charge of each discipline of the Engineering aspects of the project. The licensed landscape architect shall be in charge of all major landscape projects and issues but a licensed Land Surveyor shall be in charge of all survey requirements. All professional persons shall be registered and licensed by the Virginia Department of Professional and Occupational Regulation (DPOR) in accordance with requirements of the *Code of Virginia*.

Per this Manual the Executive Vice President for Administration and Finance is delegated by the Board of Visitors as responsible for the administration and supervision of Mason's capital outlay and construction program. The Executive Vice President for Administration and Finance shall be responsible for assuring that Mason conforms to the policies and procedures in the Manual for the procurement and administration of professional and nonprofessional service contracts and for the procurement and administration of construction contracts.

SECTION 4.2 PROCUREMENT OF RELATED CONSULTANTS

The following types of services are typically required for capital projects and for planning, construction and renovation projects:

4.2.1 Professional: Land surveyors, geotechnical engineers, soils engineers, or any service requiring the use of a licensed architect, landscape architect, engineer, or surveyor are by state law considered to be and shall be procured as Professional Services as outlined in this Manual.

4.2.2 Non-Professional: Cost consultants, interior design services, soil testing, concrete testing, project management, project administration, inspection/clerk of the works, and other services which may be performed by either licensed or non-licensed professionals are considered to be Nonprofessional Services and shall be procured using procedures contained in the Rules Governing Procurement of Goods, Services, Insurance, and Construction by a Public Institution of Higher Education of the Commonwealth of Virginia. .

4.2.2.1 Preplanning Studies:

Preplanning studies are authorized to allow the Agency to develop a more detailed definition of cost and scope for a future Capital Budget Request. Because these studies precede the Preliminary Design Phase, they may be performed under nonprofessional service agreements. Consultants engaged in significant preplanning studies including programming and project approvals in advance funding and preliminary design may not participate in the subsequent professional services procurement for the project design and/or construction effort due to conflict of interest. A Preplanning study may include the following elements, as appropriate:

1. Statement of program definition including functional space requirements, estimates of gross and net square footage, and functional adjacency requirements;
2. Analysis of program execution options, including review of new construction versus renovation alternatives, necessary phasing or sequencing of the project, and coordination with other ongoing or proposed capital projects;
3. Site analysis, including options considered and, for the site chosen, any specific issues related to topography, utilities, or environment;
4. Condition assessment of systems or infrastructure elements such as roofs, plumbing, or electrical to determine the extent of repair or replacement work that needs to be done.
5. Presentation, including site plan, conceptual floor plans and elevations, and conceptual exterior;
6. Identification of any Uniform Statewide Building Code compliance or permit requirements unique to the project;
7. Cost estimate for the project to include total cost of the project, construction cost for the project, total cost per square foot, construction cost per square foot, costing methodology, and identification of any factors unique to the project that may affect overall project cost.

SECTION 4.3 PROJECT SCOPE OF WORK

Once the University determines the need for professional services, a Scope of Work will be prepared to identify or outline the services required, to identify the criteria, limitations and parameters for the services, and to describe the product(s) expected. The Scope may range from very general to very specific and will usually reference this Manual, Mason Design Manual, the Budgeting Instructions, the Building Code and/or other standards for the specific related requirements.

Architectural or Engineering Planning for or construction of, or acquisition of any capital project shall not commence without an approved CO-2 / HECO-2 (Refer to Chapter 14).

SECTION 4.4 ADVERTISEMENTS FOR PROFESSIONAL SERVICES

A VCCO shall assure that the requirements of the University Procurement Policy are met for the procurement of professional services.

4.4.1 Request for Qualifications (RFQ):

If the University Chooses to first solicit a Request for Qualifications before using a request for proposals, the following procedure shall be used:

Public notice of the Request for Qualifications shall be given at least 30 days prior to the date set for receipt of qualifications. When requested and justified by the University Project Manager in writing, the Vice President of Facilities may approve a reduction in the number of days' notice required to a number not less than 10 days.

Public notice of any Request for Qualifications shall be given by the following methods:

1. By publication in a daily newspaper of statewide circulation; and
2. By publication of a notice on the On-Line Bids page of eVA, Virginia's electronic procurement website. The URL is <http://www.eva.virginia.gov>
3. Where practicable, by publication in a newspaper of general circulation in the general area of the project and;

The public notice will show the name, address, and phone number of the issuing office. Provide in the notice/advertisement the following information as a minimum:

1. Name and Address of the University
2. Title of the Project
3. Scope of Services
4. A Brief Description of the Project
5. Criteria for Evaluation and Selection of the A/E
6. Submittal of AE-1 to AE-6, AE Firm Data Forms Required; and
7. Last Date for Submitting a Response (i.e., a date which is not less than 21 days from date of advertisement)
8. *For Term A/E Contracts*, Provision to Extend the Contract for Four One-Year Options at the Sole Discretion of the University.

4.4.2 Request for Proposals (RFP):

The Request for Proposal (RFP) will be provided to the A/E's short-listed from review of the Request for Qualifications responses, if the RFQ process is used. If the RFQ process is bypassed, the RFP will be the initial solicitation following the requirements of public posting noted in paragraph 4.4.1 above. The RFP will indicate in general terms the nature of the project and the architectural and/or engineering services which are sought, show the factors which will be used in evaluating the responses, incorporate by reference the Manual including the contractual terms and conditions contained therein, and set forth specifically any additional contractual terms and

conditions. The RFP will state any unique capabilities or qualifications which will be demanded of the A/E. Each respondent to the RFP agrees to provide all the architectural and/or engineering services with respect to the project that are set out in this Manual and the RFP.

The RFP may specify the method to be utilized during negotiations in arriving at the fee amount for services; however, it will not call for Proposers to furnish estimates of man-hours, labor rates, or cost for services with their qualification proposals. If no method is specified, the respondents may propose methods for negotiating the fee amount.

Each respondent shall submit current AE-1 to AE-6, AE Firm Data Forms, and other requested information in response to the RFP and include the data and qualifications of any A/Es to be associated with it on the Project. Responses which do not include the Forms and/or do not include the requested information and data may be considered as Not Responsive to the RFP.

Proprietary information from respondents will not be disclosed to the public or to the competitors provided such proprietary information is properly identified, as required by the University Procurement Policy, in the RFP response.

SECTION 4.5 SMALL BUSINESSES AND BUSINESSES OWNED BY WOMEN AND MINORITIES

On proposals for Contracts with a fee, or accumulation of fees, expected to exceed \$100,000, the A/E shall be required to submit with the RFP response, a report of past efforts to utilize the goods and services of such businesses and plans for involvement on the proposed contract. By submitting such information with their proposal, Proposers certify that all information provided is true and accurate. If a Proposer fails to submit all information requested, the purchasing University may require prompt submission of missing information after the receipt of A/E proposals. Failure to provide information required by the RFP will ultimately result in rejection of the proposal as non-responsive.

On RFP's for A/E services, with an anticipated fee of \$100,000 or more, the University should set a minimum of 10 points out of 100 total points for scoring SWAM participation.

The following data is required on each small business, women-owned business and minority-owned business: (1) Ownership, (2) utilization in the most recent twelve months, and (3) planned involvement or services to be performed on the proposed project. (The formats for submission of this data are included at Forms Center website:

<https://facilities.gmu.edu/resources/forms/>

On contracts for professional services which exceed \$100,000 in total gross fees, the A/E is required to submit reports on the involvement of small businesses and businesses owned by women and minorities in the work or in support of the work on this contract.

SECTION 4.6 SWAM PROCUREMENT PLAN (SMALL, WOMEN-OWNED, AND MINORITY-OWNED)

4.6.1 University Plan: In accord with Executive Order 20 (2014), an annual SWAM Procurement Plan that specifies the University's plans and goals for SWAM procurement is required.

Department of Minority Business Enterprises (DMBE) certification of SWAM businesses is required.

4.6.2 Audits: In order to assure compliance with certification requirements of SWAM subcontracting plans, the contracting or certifying University or institution shall contractually provide for appropriate auditing of vendors and contracts. Such audits shall include the right to make on site audits at any time during the term of the applicable contract or certification.

SECTION 4.7 PROCEDURES FOR A/E SELECTION

In the event of an emergency, selection may be made without regard to use of these procedures, but a formal request signed by the Vice President of Facilities, explaining the circumstances shall be filed in the Planning and Design Project File.

4.7.1 Non-Capital Projects: For all alternatively non-capital University projects with expected fees less than \$10,000 the University Project Manager must:

1. Select a firm or professional from a list of firms/professionals which have expressed an interest in doing work for the University, have filed Forms AE-1 to AE-6, AE Firm Data Forms, appear to be qualified to render the required services (this requirement can be met by utilizing the category B qualifications pool maintained by the Division of Engineering and Buildings), and are licensed DSBSD certified micro business, or use an established Term Type Contract (See Section 4.8 below).
2. Create a fee proposal request, conduct a telephone or personal interview with the firm to determine current workload and capability to meet the proposed schedule, and to determine personnel qualifications, expertise and past performance on similar projects.
3. Negotiate a fee for services.
4. Complete a HECO-3.1a and obtain required approvals. A Purchase Order incorporating this Manual and the Mason Design Manual will be issued.

If agreement cannot be reached with the originally selected licensed DSBSD certified micro business or term A/E, the University Project Manager shall then contact another licensed DSBSD certified micro business or term A/E. The process shall be repeated until a fair and reasonable price is reached. If, upon due diligence, it is determined that no micro businesses in this category exist, are willing to participate, or are appropriately qualified, then a DSBSD certified SWAM business (as opposed to a micro business) may be contacted. Due diligence is determined by the Director of Purchasing and Fiscal Services within Facilities.

For all non-capital University projects with expected fees exceeding \$10,000 but less than \$50,000 the University Project Manager will:

1. Select 3 firms or professional from a list of firms/professionals which have expressed an interest in doing work for the University, have filed Forms AE-1 to AE-6, AE Firm Data Forms, appear to be qualified to render the required services (this requirement can be met by utilizing the category B qualifications pool maintained by the Division of Engineering and Buildings), and are licensed DSBSD certified SWAM business

- (including one micro business), or use an established Term Type Contract (See Section 4.8 below).
2. Create a fee proposal request, conduct a telephone or personal interview with the firm to determine current workload and capability to meet the proposed schedule, and to determine personnel qualifications, expertise and past performance on similar projects.
 3. Make a selection based upon the informal solicitation on a firm with whom to negotiate. If the micro business is capable than preference shall be given to this firm.
 4. Negotiate a fee for services.
 5. Complete a HECO-3.1a and obtain required approvals. A Purchase Order incorporating this Manual and the Mason Design Manual will be issued.

If agreement cannot be reached with the originally selected firm, the University Project Manager shall then contact another licensed DSBSD certified SWAM business or term A/E. The process shall be repeated until a fair and reasonable price is reached. If, upon due diligence, it is determined that no micro businesses in this category exist, are willing to participate, or are appropriately qualified, then only DSBSD certified small business (as opposed to a micro business) may be contacted. Due diligence is determined by the Director of Purchasing and Fiscal Services within Facilities.

For all non-capital University projects with expected fees exceeding \$50,000 the University Project Manager will use an established Term Type Contract (See Section 4.8 below) or utilize the RFP procedure set forth in in section 4.4 above.

4.7.2 Capital Projects: For all capital projects three committees shall be formed; a- Selection Committee, a Steering Committee, and a Building Committee. The Roles of these Committees are outlined in Chapter 12. The Selection Committee shall notify the Assistant Vice President of Planning, Design, and Construction and the Vice President for Facilities of their recommendation for selection of the Architect/Engineer.

The Selection Committee shall:

1. Review the responses to the Request for Qualifications, if utilized, and shortlist the firms selected to move to the next step of the selection process in accordance with the requirements noted in the RFQ.
2. Review the responses to the Request for Proposal (RFP), based upon the general terms the nature of the project and the architectural and/or engineering services which are sought, the factors which will be used in evaluating the response, the appropriate chapters of this Manual, including any supplements thereto, and the contractual terms and conditions contained herein, and any additional contractual terms and conditions not contained herein. The review shall also take into consideration any unique capabilities or qualifications which will be required of the Architect or Engineer noted in the RFP. The submission of the response to the RFP shall utilize the AE-1 to AE-6, AE Firm Data Forms.
3. Recommend the top 3 to 6 firms for interviews. The Assistant Vice President of Planning, Design, and Construction will approve the panel final short-list.
4. The Selection Committee shall interview the top-ranked, short-listed firms (preferably 3-6 firms) who are deemed to be fully qualified, responsible, and suitable on the basis

of their initial responses and their response to the detailed RFP. Solicit more detailed information, where applicable, on the above criteria as well as specific information as to the personnel proposed to be assigned to the project and their individual qualifications; the concepts, methods and approaches proposed for the design; and other pertinent information. Evaluate responses of each interviewed firm and rank order as best suited for the project. Proprietary information from respondents shall not be disclosed to the public or to the competitors provided such proprietary information is appropriately noted in the RFP response. The selection committee will determine, in writing, the top three firms, and rank them in order of preference. The Vice President of Facilities will approve the selection ranking and authorize fee negotiations to begin.

Upon approval of the selection, the selected firm and the non-selected firms shall be notified concurrently.

The University Project Manager with the support of the Contracts office shall negotiate with the Architectural/Engineering firm ranked first as to overall suitability and qualifications. Those negotiations should proceed to establish a fee amount for the Scope of the Project. All of this Manual's requirements apply. It is anticipated that the fee amount will not be later increased. At the time of negotiation, a method of increasing the fee amount for additional services must be set forth in the original agreement.

The fee amount shall include all work necessary to provide the required basic services and any other services requested by the University. If the parties cannot reach agreement on a fee amount, the negotiations shall be formally terminated in writing. The University may then proceed to negotiate with the Architectural/Engineering firm ranked second. If not successful, then third, etc. It is understood that at any time during the negotiations, they may be terminated and the project re-advertised. When agreement is reached, the terms of agreement shall be recorded in a written MOU and incorporated in the HECO-3 contract form, which shall be signed by the Executive Vice President for Administration and Finance or, consistent with existing board policies, his or her sub-delegate, and the A/E.

Once the fee negotiations are complete, the University shall "Post" a Notice of Intent to Award or Notice of Award and the completed contract in eVA.

SECTION 4.8 TERM A/E CONTRACTS

The following policy governs the use of Term Contracts.

4.8.1 Applicability: Term Contract Procurement of A/E services may be used for engaging an A/E to provide investigations, cost estimates, designs and related services for specific projects consisting of multiple related work orders over a specified period of time.

In the case of a Term Contract, the University will procure the services of an A/E for a project defined by the University to include several work orders of a particular type, although not all work services can be identified at the outset of the project. At least one work order will be identified for the A/E's services at the time of award. Use of the A/E's services on future service orders is at the discretion of the University.

As used herein, the term “project” shall refer to a related group of like kind architectural, design or engineering services needed by the University. The group of services can be related by geographical area within the University, by architectural or engineering specialty, or by unique architectural or engineering needs, as determined by the University.

The ordinary Term Contract will be for A/E Services for a term of one year or services totaling \$1,000,000, whichever comes first with the option to renew four (4) additional one-year terms. Renewals shall begin no sooner than twelve (12) months following the execution of the contract resulting from the original solicitation or the Owner’s previously exercised renewal. The limit for each project order is \$200,000. Breaking down a large A/E fee (exceeding \$200,000.00) into incremental Project Order fees of \$200,000 or less is prohibited. The sum of all projects performed in a contract term shall not exceed \$1,000,000.00. When the aggregate total of all Project Orders, including Change Orders to those Project Orders, reaches the term dollar limit, no further Project Orders may be issued during that Term.

It is the intention of the University to spread the amount of A/E Services out to as many firms as possible while still maintaining the most economically advantageous strategy possible. Accordingly, the Vice President of Facilities may determine that it is advantageous to procure Term contracts at service levels ranging from \$100,000 to \$1,000,000, none to exceed the one-year term total contract amount. Contracts are renewable at the University’s discretion, up to four additional one-year terms. No A/E firm may at any one time have in effect more than one (1) Term Contract with the University without approval from the Vice President of Facilities.

4.8.2 Advertisement/RFP: The advertisement/RFP public posting and announcement on the Online Bids page of eVA (<http://www.eva.virginia.gov>) and post/publish the notice in a newspaper of general circulation statewide and/or in the general area of the project when the expected procurement exceeds Fifty Thousand Dollars (\$50,000) shall include a description of the nature of the projects, potential service orders to be offered and the services to be required for the project. Any other factors pertinent to the evaluation and selection process shall also be described. Multiple A/E Term contracts may be awarded to separate A/E firms from a single A/E Term contract RFP advertisement/selection process with the approval by the Vice President of Facilities that additional services are needed and a plan for distributing multiple service orders exists.

The RFP and contract documents should include wording similar to the following provisions: “The University reserves the right, at its sole discretion to issue RFPs for similar work and other projects as the need may occur. The University also reserves the right to issue service orders to other Term Contract Firms, based on its sole discretion, in consideration of its evaluation of each Firm’s qualifications, expertise, capabilities performance records, current workload, location or distance to the project, and other factors as may be pertinent to the particular project.” The University must identify at least one work order for which the A/E’s services will be used. The RFP should also indicate that although the potential exists for multiple future service orders, the University does not represent or guarantee that the Term Contractor will receive any future additional service orders.

4.8.3 Selection, Negotiation and Award: The selection process described in section 4.7.2 above shall be followed except if more than one firm is to be selected from one advertisement/ selection process then two additional firms shall be interviewed for each additional selection.

The University and the selected firm(s) shall first negotiate and agree upon the labor rates and the terms and conditions which shall apply to work to be performed based on the First Service Order. The fee and rate agreement must be reflected in the Memorandum of Understanding.

If the negotiations are successful, the University will award a Contract to the selected firm. If negotiations are not successful, the negotiations shall be formally terminated and the project offered to the next firm for negotiation and possible Award of the Contract.

The University may offer additional project orders of a similar nature to the firm in accordance with the Contract and, upon successful negotiation of a fee for the services, order the services pursuant to the terms provided in the firm's Contract.

The fee for the services on each project order shall be negotiated individually considering the Scope of Services required, the man-hours required for each level/discipline and the maximum labor rates agreed upon in the Memorandum of Understanding (MOU). Should the University and the firm not agree on a fee for an additional project order, negotiations shall be formally terminated. The project order may then be offered to and negotiated with another firm with a Term A/E Contract for similar services or the A/E services for the service may be procured separately in accordance with the procedures prescribed in this Manual.

4.8.4 Project Orders: Individual service orders or requests for services will be issued in the form of project orders. Fee proposals by the firm will be negotiated and awarded on a "fixed fee" amount for each service order. However, project orders may be used to secure services for investigations or similar work where an estimate of time required cannot reasonably be determined. In such cases, an exception is allowable to use the scheduled man-hour rates with a Not to Exceed amount as the basis for the project order fee. A form HECO-3.1a shall be completed for each service order. The HECO-3.1a shall show the "cumulative total to date" of service orders awarded to the A/E under the Contract. Contractual limit on each project order shall be \$200,000 and, while the potential exists for multiple project orders during the Contract, with the aggregate fees up to \$1,000,000, there are no representations or guarantees that the A/E will receive any Project Orders

SECTION 4.9 TERM PROJECT MANAGEMENT CONTRACTS

The University may also award contracts to Term Firms for Construction Administration/Project Administration related services. Such services shall be procured using non-professional services procedures as provided in the Rules Governing Procurement of Goods, Services, Insurance, and Construction by a Public Institution of Higher Education of the Commonwealth of Virginia. These services may include (but shall not be limited to) claim analysis, constructability reviews, peer reviews, cost estimates and construction management/administration services.

SECTION 4.10 CONTRACT FORMS TO BE USED

The Standard Forms of Contract for Architect and Engineer Services, HECO-3, 3.1, and 3.1a, shall be used for A/E Term Contracts. These forms are listed in Appendix B and can be found on the websites mentioned in that Appendix. Other than filling in the appropriate data and information, these Contract forms shall not be modified without the recommendation of the VCCO and the approval of the Vice President of Facilities.

Any details of the fee negotiations, the scope of work, the A/E schedule, and other items agreed to in the negotiations shall be detailed in the Memorandum of Understanding (MOU).

SECTION 4.11 GENERAL TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

General Terms and Conditions for Professional Services Contracts are contained in Chapter 3 of this Manual. They shall be made a part of all contracts for professional services and shall not be modified without approval of the VCCO and the Director of Purchasing & Fiscal Services for the Facilities Department or the Vice President of Facilities.

CHAPTER 5:

BASIC SERVICES AND RESPONSIBILITIES

SECTION 5.1 RESPONSIBILITIES OF THE UNIVERSITY TO THE A/E

The following information or data shall be provided by the University, if needed, in the planning of the project. The information so furnished shall not relieve the Architect/Engineer of responsibility for making the studies and checks necessary for the proper planning of the project which the University undertakes. In the event the University is unable to furnish this information, the University shall procure the information in accordance with published procurement procedures. In the event the University desires the information to be furnished by the Architect/Engineer, the requirement to provide such information shall be included in the Request for Proposal for Architectural/Engineering Services.

1. Provide the Architect/Engineer a written scope of work that will clearly inform the Architect/Engineer of the scope of the project to be designed. The project scope shall not be modified or substantially ($> \pm 10\%$) altered without prior written approval of the Board of Visitors.
2. Provide a budget cost, not to exceed the construction cost on the approved CO-2/ HECO-2, for the project to the A/E which will be the “Design to” cost.
3. Set a schedule for pursuing the planning for the project, at the time of employment of the Architect/Engineer. Such a schedule shall allow reasonable times for review of the various phases by review Agencies such as the Building Official, the State Fire Marshal, the State Art and Architectural Review Board (AARB), The Department of Historic Resources, the University Board of Visitors (BOV), the Mason Steering Committee, the Department of Health, the Division of Soil and Water Conservation, etc. The schedule shall be developed in conjunction with the Architect/Engineer but based on the date determined by the University as to when the project needs to be placed under contract for construction. The schedule, therefore, becomes an integral part of the project planning scope and shall be monitored by all parties concerned for adherence. The University agrees to make every reasonable effort to assist in complying with the schedule.
4. Provide available “record” drawings.
5. On a case by case basis, the University may choose to obtain services of a professional cost estimator when the University determines an independent detailed quantitative cost estimate is required. This does not relieve the Architect or Engineer of responsibility for providing the cost estimate required by the Architectural or Engineering contract.
6. Determine any specific requirements of political subdivisions appropriate and consistent with State policy, opinions of the Attorney General, and existing statutes. (Total request and/or requirements of a political subdivision, preferably over the signature of the chief

administrative officer, are to be obtained at the inception of the project and submitted no later than the project criteria and schematics in order that any questions might be reconciled very early in the planning process.)

7. Unless negotiated otherwise, pay the invoice cost of all sets of plans and specifications for schematic, preliminary and working drawings document submittals. The A/E will bear the cost of any required re-submittals resulting from more than 2 reviews by the appropriate authority having jurisdiction.
8. Unless negotiated otherwise, pay the cost of services in the preparation or presentation of any submittals to secure approvals for environmental or other applicable special requirements including water, air and noise pollution provisions or local, State or Federal Agencies, to include environmental impact reports. These extra services are apart from those normally required by the Project Committee, State Fire Marshal, the Building Official (DEB) or his or her designee, State Art and Architectural Review Board (AARB), Department of Historic Resources, Department of Health, State Water Control Board, Division of Soil and Water Conservation, and State Air Pollution Control Board as of the date of this Manual.
9. Delegated Design:

The use of Delegated Design shall be submitted to the University by the A/E after schematic design approval and accepted/approved at the discretion of the University. See Section 7 for OUBO responsibilities regarding review and approval for permitting. Systems for which Delegated Design may be considered include, but are not limited to, the following:

Systems with Shop Drawing review / approval by the OUBO after the A/E reviews and approves the Shop Drawings:

- Fire Suppression Systems
- Smoke Control Systems
- Fire Alarm Systems
- Access Control (Security) Systems

Systems with Shop Drawing review / approval by the A/E:

- Rammed aggregate piers
- Helical piers
- Segmental block retaining walls
- Common steel structural connections
- Interior non-load bearing metal stud walls
- Pre-engineered metal buildings
- Precast concrete buildings
- Fabric arch buildings
- Wood and light gauge steel trusses
- Precast structural concrete
- Precast concrete cladding

- Steel stairway structure including handrails and guards
- Bolted and welded steel connections
- Architectural mock-ups
- Curtain walls
- Storefront
- Ductwork support hangers
- Piping support hangers
- Lightning protection
- Electrical coordination studies
- Fault and arc flash studies
- Short circuit studies
- In-building emergency communications infrastructure

SECTION 5.2 QUALITY OF WORK

The A/E shall be responsible for the professional services, including the technical accuracy and coordination of all designs, drawings, specifications, cost estimates, and other work or materials provided. The project documents submitted by the A/E shall represent a reasonable, code compliant, and acceptable architectural and/or engineering solution based on the scope of work, “design-not-to exceed” budget limitations and other constraints of the A/E's contract. All work must be in accordance with current criteria, guides, and specifications set forth in this Manual, and shall conform to good architectural and engineering practices. Workmanship shall be neat with all lines and lettering of uniform weight and clarity for complete legibility and satisfactory reproduction. All elements of the A/E's submittals shall be checked by professional personnel trained in that specific discipline. The A/E's submittal will be reviewed by the Building Official or his or her designee for compliance with USBC. The University Project Manager will review per compliance with this Manual's project requirements and criteria. Errors and deficiencies shall be corrected by the A/E at no additional cost to the University.

If the A/E or the University determines that a meeting with the Building Official or his or her designee is necessary or would be beneficial to discuss or review the A/E's approach to designing the project, the A/E shall request such a meeting, and the University Project Manager shall schedule it.

SECTION 5.3 BASIC SERVICES OF THE A/E

5.3.1 General: The Basic Services normally provided by the A/E consist of the phases described below and are more fully described in Chapter 8 (Project Design Standards and Requirements), and Chapter 9 (Construction Procurement and Administration). The A/E shall adhere to the design policies outlined in the Mason Design Manual for Project Design. If the project is subject to DEB review, it is the responsibility of the A/E to ensure compliance with the CPSM as well as this manual and the Mason Design Manual. The University Project Manager shall be made aware of any conflicting requirements. He or she will make the determination on how to proceed.

The A/E firm must restrict itself to the authorized scope of work provided as a basis for negotiation of fee. Deviations from the authorized scope include incorporating embellishments increasing the

cost above programmed amounts for the project, increases in area, major changes in construction criteria, the inclusion of unauthorized buildings or areas, selections of specific systems or equipment without economic or technical evaluation, or introduction of special equipment is prohibited.

It is the A/E's contractual responsibility to design a facility which can be constructed within the funds available and which is in conformance with applicable codes and the technical criteria included and/or referenced in this Manual.

During the progress of the work, the A/E may expect minor changes in criteria within the general scope of the project and should make necessary adjustments accordingly. Generally, the preliminary (35%) design submittal is intended to clarify and establish specified requirements of the project. Incorporation of Value Engineering (V/E) comments of minor consequence or changes justified on payback, and changes in functional layout occurring during review are considered within scope of the Contract. Changes or modifications required to conform to Code requirements are also considered to be within the scope of the Contract. Should minor changes in the scope of work be authorized, appropriate modifications to the A/E contract will be negotiated.

5.3.2 Delegated Design: Engineered systems and products that the A/E believes are most effectively and efficiently designed and engineered by a subcontractor or manufacturer in Shop Drawings shall be submitted to the University for review and approval for the use of Delegated Design. The A/E shall provide the University approved Delegated Design list with the Preliminary submittal, and shall include the final Delegated Design list on the Title Sheet of the drawings. The A/E shall be responsible for compatibility of the Delegated Design systems and products with the design and construction of the building, and shall verify compatibility during Shop Drawing review of the Delegated Design items. The A/E fee may be adjusted depending upon the type and number of engineered systems and products for which Delegated Design is used. The graphic configuration of Delegated Design systems that demonstrates building code compliance, compliance with referenced accessibility standards, and the specific design criteria (structural design loads or reference standards) for the project shall be included in the contract documents. A written description of a code compliant design and a generic reference to standards do not meet these criteria.

5.3.3 Special Consultants: The University may require the use of consultants with a particular expertise related to special features of the project. The A/E shall engage such a consultant, subject to the University's approval, and incorporate such work in the project.

5.3.4 Reimbursable Expenses: (unless negotiated otherwise) The costs of electronic transmissions, all mailings, fax transmissions, and long-distance phone calls are considered part of the A/E's overhead expenses and are not normally reimbursable.

The University shall reimburse the A/E for the actual costs and no more than a 10% markup for handling of blueprinting or other reproductions of drawings, specifications, and other documents required for submittals. Compensation for travel and living expenses associated with the performance of the project scope of work will be included in the negotiated fee.

Reimbursement for travel and living expenses of technical personnel while traveling in the discharge of duties in connection with extra services may be authorized by the University at the travel rates and per diem rates for lodging and subsistence shown in the University Lodging, Meals and Incidentals Rate Table. The A/E Must provide receipts and will be reimbursed for actual costs.

5.3.5 Meeting Notes: Provide meeting notes in writing for all meetings, direction, guidance, clarification, site visit observations, field orders, etc., documenting significant items of discussion and/or agreement. The meeting minutes shall include the following: decisions required, information, or actions required; identification of responsible party for the decision noted previously; date action item was raised. Minutes should be cumulative with unresolved items remaining on Minutes until resolution. Upon resolution item should be noted as resolved with decision or action recorded along with the date of resolution. The item can then be removed from the next minutes issues. These meeting notes shall be sent to those parties relevant to the issues, and structured to include all pertinent information. Also, minutes should be issued within five (5) days of meeting with amendments provided within three (3) days. Finally, provide a proposed meeting agenda prior to each meeting. Project meetings include pre-design, design, procurement, preconstruction and construction meetings discussed in Chapters 5, 8 and 9 of this Manual.

5.3.6 Project Initiation Phase: (study/scope/schematic) Consult with the University to clarify and define the University's requirements for the Project; review available data; establish the scope of the project and the services required from the A/E; review the "design to" cost; establish the quality of materials, aesthetics desired and other factors pertinent to the project. Some or all of this information may be contained in the Capital Project Request.

Identify and analyze requirements of governmental authorities having jurisdiction to approve the design of the Project and participate in consultations with such authorities.

Provide analyses of the University's needs, planning surveys, site evaluations and comparative studies of prospective sites and solutions. Unless provided by the University, provide boundary and topographic surveys of the site in the form of topographic maps or maps of areas necessary for the proper location of buildings as to scale and, where necessary, showing bench marks, grades, lines of streets, pavements, utilities, property lines, rights-of-way, restrictions, easements, archaeological features, other improvements and trees.

Provide a general economic analysis of the University's requirements applicable to various alternatives.

Provide location of existing buildings and where the interior arrangement construction or floor level of existing building affects the studies, or plans for the project, the necessary information as to interior arrangement.

The necessary roof scans, structural, chemical, and mechanical investigations, tests and reports, shall be included in the A/E contract. The cost of the testing, analysis and design recommendations can also be included in the A/E contract. The geotechnical services contract shall include testing, borings or load tests for soil bearing capacity, analysis of test results and design recommendations based on preliminary design parameters, and is normally procured directly by the University. The

results of the geotechnical report will be provided to the A/E. It should be considered as information, it is the responsibility of the A/E to provide a complete design based upon the report. The University reserves the right to negotiate this scope of services into the A/E contract if not directly procuring. The geotechnical services (if applicable) and preliminary design parameters provided by the Architect/Engineer for the University shall be considered part of the Architectural/Engineering service contract.

5.3.7 Schematic Design Phase: (20% submission) After written authorization to proceed with the Schematic Design Phase, the A/E shall:

1. Prepare and submit schematic design documents.
2. Prepare a detailed cost estimate.
3. Prepare submittal and make presentation to Steering Committee designated for the specific project; the Board of Visitors; and AARB.
4. Prepare and submit to the University written responses to all reviewing Agencies' comments and provide the technical data for the University necessary to substantiate any waiver request required.

5.3.8 Preliminary Design Phase: (35% submission) After written authorization to proceed with the Preliminary Design Phase, A/E shall:

1. Prepare and submit preliminary design documents.
2. Prepare a detailed cost estimate.
3. Prepare submittal and make presentation to Steering Committee designated for the specific project and AARB (if necessary).
4. Prepare and submit to the University written responses to all reviewing Agencies' comments and provide the technical data for the University necessary to substantiate any waiver request required.

5.3.9 Contract Documents Phase: (100% submission) After written authorization to proceed with the bidding documents, A/E shall:

1. On the basis of the accepted Preliminary Design documents and the review comments, prepare final drawings for incorporation in the Contract Documents to show the complete scope, extent and character of the work to be furnished and performed by Contractor(s) and Specifications (which will be prepared in conformance with the format of the Construction Specifications Institute).
2. Prepare and submit completed working drawings/contract documents for approval.
3. Prepare a detailed cost estimate and submit to the University with Contract Document submittal. Provide recommendation on number of days estimated for completion of the construction of the project.
4. Make revisions to plans and specifications necessary to incorporate review comments and submit a written response to all reviewing Agencies' comments prior to bidding the project.

5.3.10 Bidding Phase: After written authorization to proceed with the Bidding Phase, A/E shall:

1. Where applicable, maintain a record of prospective bidders to whom Bidding Documents have been issued, attend pre-bid conferences, and receive and process deposits for Bidding Documents.

2. Issue addenda as appropriate.

5.3.11 Construction Phase: After award of the construction contract the A/E shall provide the following services. The following services are also described in Chapter 9 of this Manual and in Section 15 (a) - (h) of the General Conditions of the Construction Contract, Form CO-7. They shall be provided by the A/E of record as part of Basic Services and shall not be delegated to others unless such delegation has been specifically approved in writing by the University:

5.3.11.1 Submittal Review and Construction Administration Services required to be performed by the A/E:

1. **Consultations:** A/E shall consult with and advise the University on all technical matters and act as the University's representative in dealing with the Contractor on all such matters. The University's instructions to Contractor(s) can be issued through the A/E, who has authority to act on behalf of the University to the extent provided in the General Conditions except as otherwise provided in writing.
2. **Interpretations and Clarifications:** The A/E shall issue all necessary interpretations and clarifications of the Contract Documents and in connection therewith prepare any necessary field orders and Change Orders.
3. **Field and Change Orders:** Issue Field Orders and assist the University in preparing and issuing Change Orders. When the change order (HECO-11) the A/E shall affirm the reason category noted on part 3 of the HECO-11a. Where the University has modified the A/E Contract to reduce the A/E's Construction Phase services, the following shall apply:
 4. Any matters of a technical nature which affect the integrity of the exterior architectural, structural or fire safety systems or which affect the integrity or operation of the mechanical, plumbing, or electrical systems shall be reviewed and certified by the A/E before a Field Order or Change Order is issued.
 5. Field Orders on non-technical matters such as landscaping, finishes, colors, and similar items which do not affect the exterior architectural appearance or the structural, fire safety, mechanical, plumbing, or electrical system integrity may be handled by the University.
6. **Shop Drawings:** The A/E shall review and approve (with or without conditions), reject or take other appropriate action on Shop Drawings and other submittals required of the Contractor on a timely basis. The A/E shall review for conformance with the Project design concept and compliance with the information given in the Contract Documents. Such reviews and approvals or other action shall not extend to means, methods, techniques, sequences or construction procedures or safety precautions and programs incident thereto.
7. **Equals:** The A/E shall evaluate and determine the acceptability of any substitutes equal materials or equipment proposed by Contractor.
8. **Structural and Special Inspections:** The A/E shall provide the services described in section 8.15 of this Manual relating to proper installation of structural systems on the project, including the review of applicable inspection and test reports by the University's Project Inspector. This is not meant to take the place of the 3rd party testing required by the CO-6 a&b.

9. **Contractor Claims:** The A/E shall act as initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the work hereunder and shall make recommendations to the University on all Contractor claims relating to the acceptability of the work or the interpretation of the requirements of the Contract Documents pertaining to the execution and progress of the work.

5.3.11.2 Construction Visits, Inspection and Closeout Services:

1. **Visits to Site and Observation of Construction:** An A/E representative who is knowledgeable of the project and competent in each discipline which has trade activities and stages of construction being performed shall visit the site at intervals to observe as an experienced and qualified design professional the progress and quality of the various aspects of the contractor's work. Based on information obtained during such visits and on such observations, the A/E shall endeavor to determine whether such work is proceeding in accordance with the Contract Documents and shall keep the University informed of the general progress of the work in relation to the overall schedule.
2. **Inspections of Work in progress by the A/E:** During his or her periodic visits to the Site to observe the work in progress, the A/E (accompanied by the Project Inspector) shall, as a minimum, spot check the work installed and the work in progress to determine compliance with the requirements of the Contract Documents and the codes and installation/workmanship standards listed therein (e.g. clearances and lap lengths for reinforcing bars per ACI; duct construction and installation conforming to SMACNA; pipe support terminals conforming to Code; wiring installation, anchorage and terminations conforming to NEC; and such). Defective and noncompliant work shall be noted in the A/E's inspection report and pointed out to the Project Inspector and Contractor. The A/E shall identify for the Project Inspector any specific checks or inspections to be made. The results of these inspections shall be made a part of the Mason Project Inspector's Daily Report. The A/E shall document field observations in writing.
3. **Supplemental Inspections and Tests:** For Work not in compliance with the Contract Documents, the A/E shall, with the University's approval, require additional or supplemental inspection or testing. The A/E shall receive and review all certificates of inspections, testing and approvals required by laws, rules, regulations, ordinances, codes, orders or the Contract Documents and shall determine whether their content complies with the requirements of each. The A/E shall also determine whether the results certified indicate compliance with the Contract Documents. This information shall be documented in writing.
4. **Defective Work.:** During its site visits and based on its observation during such visits, the A/E may disapprove or reject Contractor(s) work, or any portion thereof, while the work is in progress if A/E believes that such work does not conform to the Contract Documents, including the approved shop drawings or other submittals. The A/E may also recommend that the University reject any work which it believes will not result in a completed Project that conforms generally to the Contract Documents or that it believes will prejudice the integrity of the design as reflected in the Contract Documents. The A/E will document this information in writing.
5. **Contractor Applications for Payment (HECO-12 Schedule of Values):** Based on the A/E's on-site observations as an experienced and qualified design professional,

information provided by the University's Project Inspector and review of applications for payment and the accompanying data and schedules, the A/E shall determine the amounts due to Contractor(s) and recommend in writing payments to the Contractor(s). Such recommendations will constitute a representation to University, based on such observations and review, that the work has progressed to the point indicated and that to the best of the A/E's present knowledge, information and belief, the quality of such work is generally in accordance with the Contract Documents (subject to an evaluation of such work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents and any other qualifications stated in the recommendation). In the case of unit price work, the A/E's recommendations for payment will include final determinations of quantities and classifications of such work subject to any subsequent adjustments allowed by the Contract Documents.

6. **Substantial Completion Inspection:** Prior to scheduling a substantial completion inspection, the A/E shall verify that the project is, in fact, ready for such an inspection as described in sections 9.17 through 9.19 and advise the University in writing of same. At a minimum, the A/E's licensed professional architect, mechanical engineer, and electrical engineer shall be present at the substantial completion inspection unless absent on an express written waiver by the University. This inspection will be performed by Building Official or his or her designee and will be documented in writing.
7. **Final Completion Inspection:** The A/E shall conduct a final inspection to determine if the completed work is acceptable. The A/E shall notify the University in time to allow Building Official or his or her designee and the University representatives to participate in the inspections. If the Final Completion Inspection is successful, the A/E may recommend, in writing, final payment to Contractor(s) and give written notice to the University and the Contractor(s) that the work is acceptable. The A/E may, however, accept some portions of the Work and reject others or may accept some or all of the Work subject to certain conditions. Written notice shall be provided to the University and Contractor of the results of such inspections as described in Chapter 9.
8. **Contractors Completion Documents:** The A/E shall receive and review maintenance and operating instructions, schedules, guarantees, bonds and certificates of inspection, tests and approvals which are to be assembled by Contractor(s) in accordance with the Contract Documents and shall transmit them to the University with written comments. The A/E shall receive the As Built drawing mark-ups required from the Contractor and transfer data to the Record drawings. The A/E shall prepare and submit Record Drawings to the University Project Manager for archiving. (See Appendix Q- Record Document Standards & Formatting)
9. **Project Closeout:** A/E shall provide project closeout services as outlined in section 9.21
10. **Other:** The A/E shall perform all duties described in or reasonably implied by this Manual, the Construction Contract, including the Plans and Specifications and the General Conditions of the Construction Contract.

SECTION 5.4 EXTRA SERVICES

The following, among others, are considered to be Extra Services to the Basic Services provided by the A/E. The A/E and University will normally determine the additional services (i.e. services in addition to the “Basic Services” identified in this Manual) required of the A/E at the time of contract negotiation and negotiate the fees for such services at the same time as the basic services fee negotiation. Once the contract is signed, any additional or extra services required shall be agreed upon and added to the A/E Contract by Change Order.

Where, after approval of any stage of the design, it is found that substantial change in the overall scheme is advisable, and such change is ordered by the University, the fixed fee amount for the additional work shall be agreed upon and added to the A/E contract.

Where, delinquency, insolvency or necessary change of the Contractor requires extraordinary demands on the time of the Architect or Engineer.

When the Substantial Completion of construction is delayed beyond the Contract Completion Date for more than 30 days by the Contractor or the University and through no fault of the A/E, the A/E may be entitled to additional compensation for authorized additional periodic site visits / inspections necessitated by the delay. Requests for such compensation shall include documentation naming the person(s) making the additional visit, date(s), time(s), etc. as may be required by the University.

The University’s requested changes to drawings and specifications after work is under construction, which might result in a change order.

Providing special or continuous on-site services for an approved period when required by unforeseen site conditions.

Preparation of the environmental impact report.

Provide special commissioning services for HVAC equipment design, submittal approval, point by point testing requirements, component testing, and systems testing.

If the A/E is required to participate in the Value Engineering Study as described in Chapter 8, the A/E’s participation fee should be included as an additional service in the project fee negotiation.

SECTION 5.5 INTERIOR DESIGN SERVICES FOR FURNITURE, FURNISHINGS AND DECORATIONS FOR BUILDING PROJECTS

The Basic Services of the A/E for a project require the A/E to provide informational floor plans which use basic furniture outlines to show that the required furniture will fit in the rooms or spaces. The A/E is also required to specify all building materials and finishes and to select the colors for all building components which the building contractor is required to provide and/or install.

Additional services or separate contract for Interior Design services for the selection, specification, and procurement of furniture and furnishings that are not a part of the A/E’s Basic Services as

defined by this Manual shall be determined and, if necessary, a fee negotiated for the interior design services.

SECTION 5.6 IDENTIFICATION OF DOCUMENTS AND MATERIALS

The University and the A/E shall note the Project Number provided by the University on all project documents, correspondence, memoranda, invoices, submittals and other related material. The A/E shall require that the project number is shown on all submittals, correspondence, and other documents generated by contractors, subcontractors, suppliers, consultants, testing entities or others associated with the project.

SECTION 5.7 A/E PERFORMANCE EVALUATION

Upon completion of the construction contract, an evaluation may be completed by the University with emphasis on quality and constructability of the design; timeliness and response with respect to shop drawing review, clarification of drawings/specifications intent and resolution of construction problems and cooperation.

The completed evaluation (along with attachments and A/E responses, if any) are considered Confidential information equivalent to the A/E's 'personnel records' for the A/E performance of work for the University and shall be subject to the same protections. The completed evaluations shall be retained in the A/E's performance file for review and consideration by future A/E selection panels. The completed A/E evaluation forms may be shared by the custodian with other state agencies for the purpose of "references" to assist in state University selection panels in evaluating the A/E during the selection process.

Upon completion of the construction contract, the A/E may be required to complete an evaluation of the Contractor's performance during construction, HECO-14a, *Opinion of Contractor's Performance*, using the current edition posted on the Forms Center. An Evaluation may be completed by the University Project Manager and Construction Administration Manager. The evaluation will emphasize the evaluator's opinion of the quality and construction, timeliness of the work and conformance with the project schedule, and timeliness of shop drawing submittals, number and validity of contractor requests for clarification of drawings/specification intent, resolution of construction problems, and cooperation.

CHAPTER 6:

FEES AND PAYMENTS FOR A/E SERVICES

SECTION 6.1 ARCHITECTURAL AND ENGINEERING FEES

The University's policy is to compensate Architects and Engineers in a fair and reasonable manner for providing the high-quality services required by this Manual. Compensation or fees should be negotiated based on the Scope of Work for the particular project, the estimated effort (man-hours) necessary to accomplish the work, and hourly rates comparable to those earned by other equally competent architects, engineers, technicians, and support personnel in the Commonwealth. Calculating fee as a percentage of construction cost should only be done as a secondary check. This chapter provides guidance for determining fair and reasonable fees by using a detailed fee proposal describing the services to be provided and showing the estimated man-hours by discipline and skill level and the corresponding hourly rates for each.

SECTION 6.2 A/E FEE PROPOSAL STANDARDS AND GUIDES

The A/E is expected to be thoroughly familiar with this Manual and the definitions, scope of services, submittal requirements, technical criteria and standards, standard procedures, and standard forms required. These basic requirements, combined with the specific project requirements, are the basis for the fee proposal.

Competitive negotiations for professional services are based on qualifications. However, most often all of the A/E firms selected for interview are fully qualified technically to provide the services required for the project and the ranking of the A/E's is based on other factors such as recent experience on a similar project, A/E workload and perceived ability to meet the schedule, or similar factors. Therefore, the top ranked firm is considered "fully qualified technically and best suited" for the work. With this in mind the intention is to negotiate hourly rates and fees for services which are fair and reasonable to the A/E, the University, and the taxpayers of the Commonwealth of Virginia.

6.2.1 Plans and Specifications: The A/E should be aware that there are differences between private work and work for work as described in Chapter 5. Particularly, the A/E must conform to Manual requirements for describing and specifying the Work to be performed as part of the construction contract. The A/E must also conform to the requirements of the University Purchasing as clarified and expanded upon in the Manual.

6.2.2 Personnel Classifications and Hourly Rates: The following shall be used as guidance by the A/E in developing its fee proposal and by the University in evaluating the proposal and negotiating the fees for services:

6.2.2.1 A/E Project Technical Personnel

Technical personnel shall be construed to mean the A/E's project manager /Coordinator, architects (licensed), engineers (licensed) by discipline, designers including individuals who have received an architecture education and/or have experience working in the office of an architect, non-licensed

engineers, project inspector, surveyor, survey team, interior designer, landscape architect, draftsman, estimator, specifications writer, typist / clerical staff, field inspectors, and CADD computer operators.

“Principals”, “Partners”, “Associates”, “CEO” and similar titles are generally considered by the Commonwealth to be administrative and/or management functions whose costs have been included in the overhead markup of the rates for technical categories.

Technical activities which are performed by principals, etc., are categorized for fee negotiations, for change orders, and for hourly rate payment at the rates indicated for the technical activity or function that the Principal, etc., may be performing. See the descriptions of Personnel Classifications below in section 6.2.2.3.

6.2.2.2 Hourly Rates

The hourly rates proposed for the various classifications, categories, disciplines, and skill levels should be comparable to the average actual salary of qualified and competent persons in that skill level as marked up or adjusted for overhead and profit. Overhead markup consists of direct technical salary overhead (or “fringes”) such as payroll taxes and insurances, vacation, holidays, health insurance premiums, and other benefits and of general office overhead such as administrative salaries, rent, utilities, business and liability insurances, telephone, equipment rental and depreciation, travel, promotion, etc. Hourly rates agreed to shall be the “marked – up” rates including all overhead and profit.

Generally, review, negotiations, supervision, etc. by the principals or other senior personnel are usually considered part of the general office overhead expense included in the hourly rates or the activity is part of the “project management” function.

The University shall have the right to require the A/E submit documentation to support the proposed hourly rates with mark-up factors proposed for use in the fee negotiations and fee determination when the proposed hourly rates exceed what the University considers the “norm” for the area. The average hourly rates by classification, including markups which are negotiated and accepted in fee negotiations, shall be recorded and listed in the Memorandum of Understanding (MOU) which is appended to the A/E contract.

A/E accounting methods and procedures for determining overhead and “marked-up” hourly rates often vary. For instance, policies on vacation, sick leave, holidays and employer contributions to insurance vary from A/E to A/E. Methods of tracking man-hours and expenses vary depending on whether the A/E is determining its overhead rates or the profitability of each project. The procedures presented herein use the “tax return” approach where general materials, supplies, depreciation of computers and software, insurances, and such, are treated as general office overhead expenses.

The negotiated rates should be comparable to those of similarly experienced and qualified personnel in those classifications in Virginia firms providing similar services.

6.2.2.3 Technical Personnel Classifications

The following personnel classifications, categories, disciplines and skill levels descriptions are recognized as those directly involved with the coordination, planning, quality control and delivery of the A/E services required for the project:

1. **A/E Project Manager/Coordinator:**
An experienced and licensed architect or engineer who has overall responsibility for the planning, design, coordination of all disciplines, quality assurance, and deliver of the A/E services to the University. Note: A Principal of the A/E firm may perform this function, especially in a small firm. In larger firms a Principal, Associate or similarly “titled” person of the A/E firm may be assigned this responsibility. Regardless of title, the function is the same and the marked-up rate should be comparable to project managers of other firms in Virginia.
2. **Architect (Professional):**
A registered and licensed architect who has the knowledge, skills and experience to perform all architectural services required for the project and who is qualified to be in “responsible charge” of the architectural aspects of the project.
3. **Cost Estimator:**
Skills required include a knowledge of building systems and components, the ability to read plans and specifications, the ability to make quantity takeoffs and apply pricing, the ability to obtain pricing information from reliable sources and adjust / apply such information to the specific project conditions and the ability to present a cost estimate with proper back-up documentation.
4. **CADD / BIM/ Draftsperson:**
The skills required of this level position include tracing work already drawn to scale; drafting plans, sections and details to scale from sketches and data; modifying typical sections and details to be project/situation specific; and other miscellaneous duties supporting the preparation of contract documents. Note: Depending on the personnel organization and operation standards of the A/E, Designers (Architects and Engineers), Draftsman, or both may be required to use CADD/BIM or have CADD/BIM skills.
5. **Designer (Architects and Engineers):**
Architects and/or engineers who by education, practical experience or a combination of education and experience have the knowledge and skills to perform analyses, calculation, and/or detailing for portions of a project in a particular discipline. This level person usually has either a degree and is gaining experience to become certified – licensed – registered or has many years of experience in layouts, detailing and/or calculations and works under the supervision of a licensed professional.
6. **Engineers – Structural, Mechanical, Electrical, Civil (Professional):**
A licensed professional engineer who has the knowledge, skills and experience to perform the analyses and design, to prepare the documents for the particular discipline and to be “in responsible charge” of that discipline.
7. **Landscape Architect:**
A licensed landscape architect who has the knowledge, skills and experience to provide the design and documents for the site landscaping for the project.
8. **Interior Design:**
A certified interior designer who has the knowledge, skills and experience to provide the interior design services and documents for the project. **Note:** The layout of spaces,

selection of finishes, and similar functions are Basic Services whether the A/E uses an Architect or an Interior Designer. “Additional Services of an Interior Designer” for Fee calculations / negotiations on state work relate to furnishings and accessories which are not part of the construction contract and are further explained in Section 5.5 of this Manual.

9. **Specifications/Report Writer:** A professional level architect or engineer skilled in writing technical specifications for building and site related systems, equipment and components. The Writer shall also be skilled in preparing contract documents and understand the basic legal requirements and applications thereof.
10. **Typist/Clerical:** Skills required include knowledge of the terms and procedures of the design and construction process and a proficiency in the use of word processing and spreadsheet applications used in the production of specifications, reports and associated typing and clerical functions.

6.2.3 Additional Services: Chapter 5 describes the Basic Services required of the A/E as well as the responsibilities of the University and typical additional services that the University requests the A/E to perform. The A/E and University will normally determine the additional services (i.e. services in addition to the “Basic Services” identified in the Manual) required of the A/E prior to or during contract negotiation and negotiate the fees for such services at the same time as the basic services fee negotiation. The additional services to be provided by the A/E and the compensation for such shall be set out in the Contract or the MOU. Once the contract is signed, any additional or extra services required will be a change in scope and shall be authorized in writing by Change Order using Form HECO-11a/e. Any Change Order authorizing work to be performed which does not stipulate a fixed sum amount for the work shall be subject to audit by the University for a period of three (3) years following conclusion of the Contract.

6.2.4 Computer Services: Computer use is commonplace in the A/E profession for analyses, designs, drafting (plans), word processing (specifications) and estimating. As such, the computer is a “tool” used by the technical person to produce his/her product. These “tools” are purchased and depreciated or leased and are, therefore, considered a part of the A/E’s office overhead expense included in its overhead. Only specialized computer services required by the University which must be acquired from an outside vendor are considered for payment in fee negotiations.

Computerized analyses and designs for building systems, word processing, and data processing utilized by the A/E to provide Basic Services are normally considered by the University to be a part of the project design effort and are not an additional service required by the University.

Specialized outside computer analysis services required by the University for the project may be treated as an additional service. The compensation for such specialized computer analyses may be negotiated lump sum or a reimbursable expense. The allowable reimbursable expense method will normally be the actual charge made by an outside computer service organization plus 10% mark-up for A/E overhead and profit.

6.2.5 Special Consultants: Consultants engaged by the A/E to augment the A/E’s staff to provide the required A/E services are considered by the University to be part of the A/E’s staffing for the project.

The University may require the use of a special consultant with a particular expertise related to some feature of the project. The Architect / Engineer shall engage such a required consultant, subject to the University's approval, and incorporate such work in the services for the project. The compensation for such consultant shall be negotiated and set out in the MOU and included in the total A/E fee. The A/E will normally be allowed to mark up the University approved direct cost to the A/E of such special consultant by 10% for the A/E's overhead and profit.

6.2.6 Reimbursable Expenses: The costs of telegrams, FAX transmissions, long distance phone calls, postage and similar expense incurred by the A/E in the performance of the Contract are considered by the University to be a part of the A/E's overhead expenses and are not normally reimbursable.

The University shall reimburse the Architect/Engineer for the reproduction of drawings, specifications, and other documents required for initial schematic, preliminary, working drawing and Bid Set submittals in accordance with the policy in Chapter 8 at the actual costs plus 10% markup for handling. If re-submittals are required to correct deficiencies and/or complete the documents for submittal, the cost of reproduction for these submittals shall be borne by the A/E unless waived by the University.

Where the A/E is engaged by the University to secure the reproduction of the Bid Documents, the A/E may be reimbursed for the actual direct cost of reproduction plus a markup of 10% to account for the A/E's overhead and handling cost in securing this service for the University. The cost of reproduction and sending addenda to address University review comments, clarify or supplement the Bid Document and/or correct errors or omissions are considered to be an expense of the A/E and shall not be included in the allowable reimbursement costs.

The University shall reimburse the Architect / Engineer for the actual costs of overnight or second day shipping of submittals and / or shop drawings when such method of shipping is directed by the University. The University should establish a budget amount for such reimbursements and include same in the Contract amount and as a line item in the MOU breakdown of the Fee.

Compensation for travel and living expenses associated with the performance of the project scope of work will be included in the fee negotiated and set out in the MOU as a lump sum amount for travel and/or subsistence for each particular facet of the work where travel compensation is proposed by the A/E. The University shall reimburse the A/E for actual expenses based on the **per diem allowance for state travel**.

The A/E may be reimbursed for travel and living expenses of technical personnel while traveling in the discharge of duties in connection with extra services authorized by the University. The travel rates and the per diem rates for lodging and subsistence shall not exceed the maximum amounts allowable for such expenses in the University's Travel Regulations. Records supporting such requests for reimbursement shall be subject to audit by the University.

Each item / account planned for reimbursement should have a "budget" amount established and included in the A/E Contract with the condition that payment for these items will be subject to

proper authorization and documentation. Further, the Contract Amount will be adjusted upward and downward by Change Order, as appropriate, based on the actual amounts approved for reimbursement.

6.2.7 Interior Design: The A/E's basic architectural services includes sizing of spaces for the intended function, providing diagrammatic furniture layouts to the client to confirm functional layouts, and the selection and specification of building fixtures and finishes which are necessary to provide a complete and useable facility and/or which are included in the construction contract.

SECTION 6.3 A/E FEE PROPOSAL WORKSHEET

The Architect/Engineer shall prepare a detailed fee proposal using the Form HECO-2.3. The hourly rates and the man-hours proposed should relate to the rates and times required for a qualified and competent person in that skill level to perform the work. Supplement information shall be attached as necessary to support the proposed drawings, hourly rates and man-hour estimates. Guides for the use of the form are as follows:

1. Disciplines / Classifications commonly used are indicated on the form. Additional classifications may be listed.
2. Hourly rates should be the average for those persons in that skill level/discipline/classification.
3. Indicate the drawing size and proposed / estimated number of sheets for each discipline. Attach a proposed or estimated list of drawings.
4. Enter the estimated (proposed) number of hours for each discipline / skill level and multiply times the Hourly Rate to yield the Estimate Cost.
5. CADD line is for drafting hours to produce a CADD basic plan for each level, wing or area to use as a base sheet for the various disciplines. The man-hours to produce the individual sheets for each discipline, whether manually or CADD should be shown for the applicable discipline.
6. Spec/Report Writer effort includes the mark up and edit of standard and / or master specification sections and writing any required special sections.
7. Typist effort includes typing new specification sections and editing masters on the word processing program.
8. Cost Estimate effort includes the takeoff of quantities and the application of prices to produce the Cost Estimate in the required format.
9. Bid Assistance service includes the effort of the Professional to conduct the Pre-bid Conference, assist in opening Bids, and evaluate the bids / bidders for responsiveness and responsibility. It also includes the clerical level effort to receive document deposits, issue bid documents, receive/review returned bid documents and return deposits / issue refunds.
10. Shop Drawing Review includes the professional/technical level effort to review shop drawings and other submittals to determine compliance and conformance with the requirements of the Contract Documents and the markup / approval of same. It also includes the clerical level effort to log submittals in and out, to copy markups from the reviewer's master review set to the copies being returned to the Contractor and others, and the distribution of same.
11. Record Drawing Preparation includes the efforts of a Drafting level person to transfer

Note: It is generally perceived that a person being compensated at a rate higher than the norm would be more efficient / productive /take less man hours than a person being compensated at a rate below the norm. data from the Contractor's "As Built" set of drawings and specs to the "Record Copy" reproducible. This work also includes the Professional/Technical Level effort to compare the "As Built" set to the "Record Copy" for correctness.

1. Construction Observation and Administration includes the Professional / Technical level effort to perform the onsite inspections / observations, job meetings, payment request evaluations and administrative functions required by the contract and the Clerical level effort to type minutes of meetings and similar functions.
2. The Additional Services portion of the Worksheet is generally self-explanatory for the items listed. If those items are proposed to be provided by outside consultants/subcontractors (excludes architectural, structural, mechanical, & electrical disciplines which are considered the A/E), the subcontract negotiated amount may be marked up 10% by the A/E for A/E overhead and profit. In-house additional services should be computed using the estimated man-hours and marked up hourly rates similar to the Basic Services Fee Proposal.

SECTION 6.4 PROPORTIONING OF THE A/E FEE AND PAYMENTS

6.4.1 Phases of Work: Payments to the Architect or Engineer for Design Phase and Construction Phase Services shall be based on the negotiated fee amount as proportioned for each phase of the project. The amount approved for progress payments shall be based on the University's judgment of the proportion of the work on that phase or facet which has been completed versus the work required / value of that phase or facet. The A/E fee shall be proportioned for each phase or facet of the work and shown in the A/E Contract or in the MOU. The proportioning of the fee should account for and show the negotiated amount for the following phases or facets of work:

1. Pre-design services (Additional Services such as studies and similar activities.)
2. Design Phase services include
3. Schematic phase
4. Preliminary phase
5. Working drawing phase
6. Bidding phases services
7. Construction phase services include:
8. Shop drawing / submittal reviews and admin.
9. Site visits, inspections and admin.
10. Project Closeout
11. Maintenance & Operations Manuals
12. Record Drawings
13. Budgeted Reimbursable Amounts
14. Additional Services (itemize)

In addition to the proportional amount due for Design Phase or Construction Phase Services, the A/E shall be entitled to payment for authorized additional services performed and for authorized reimbursable costs incurred during the period.

Where the University contracts with the A/E for less than or more than the basic services indicated for the various phases, the proportioning of the fee may be adjusted accordingly and shown in the Memorandum of Understanding.

Where a detailed breakdown of the A/E fee is not provided in the HECO-2.3 Fee Proposal Worksheet used for negotiation, the total negotiated A/E fee (excluding additional services and reimbursable) will be proportioned as follows:

1. Design Phase Services = 75% of Total Fee
2. Construction Phase Services = 25% of Total Fee

In consideration of the services required by the Manual, the proportioning of the A/E fee for progress payments during the various parts of the Design Phase and the Construction Phase will be as follows:

6.4.2 Design Phase Services: When the Design phase services totals 75% of the fee, that design effort is further broken down as follows:

6.4.2.1 Schematic Design Phase: Value of the Schematic Phase is 20% of the Design Phase Fee. This phase is complete when outstanding issues are resolved, the schematic are approved, and the A/E is authorized to prepare Preliminaries.

6.4.2.2 Preliminary Plans and Specifications: Value of the Preliminary Phase is 30% of the Design Phase Fee. However, a proportional part may be billed monthly during the development of the documents. This phase is complete when outstanding issues are resolved, the preliminaries are approved as evidenced by completion of the conditions shown on the Form HECO-5, and the A/E is authorized to prepare Working Drawings.

6.4.2.3 Working Drawings and Specifications: Value of the Working Drawings Phase is 50% of the Design Phase Fee. However, a proportional part may be billed monthly during the development of these documents. This phase is complete when outstanding issues are resolved, all changes have been made to the documents so that they are ready for bidding, and the working drawings and specifications are approved as evidenced by completion of the conditions shown on the Form HECO-6.

Note: The University may withhold as retainage an amount not exceeding 5% of the dollar value of progress payments for the Design Phase Fee until the Working Drawings, including all corrections required to resolve review comments, are finally completed and acceptable. See Section 3.16 of this Manual.

6.4.3 Construction Phase Services:

6.4.3.1 Bidding Phase: Value of this phase is 5% (maximum) of the fee amount for Construction Phase Services and is due upon award of the construction contract or rejection of bids (unless the A/E is obligated to redesign at no additional fee). Reimbursement for reproduction expenses for bidding documents would also be payable.

6.4.3.2 A/E Construction Period Services: Value of this phase is 90% of the Construction Phase Services fee amount. This 90% is usually prorated over the total construction period including the 30 days allowed for punch list corrections and billed monthly during the construction phase as construction progresses.

6.4.3.3 Project Closeout Phase: The remaining 5% of the fee (or sum as stipulated in the Contract or MOU) for Construction Phase Services is allocated to closeout and Record Drawing preparation. It shall be payable when the A/E's services for the project are fully completed and "Record" drawings and specifications are delivered to University, as set forth in Chapter 9.

6.4.4 Payments to the A/E: Payments to the A/E shall conform to the requirements in Section 3.16 of the Manual.

6.4.5 Payments by the A/E: Payments by the A/E to its consultants, subcontractors and suppliers shall conform to the requirements in Section 3.17 of the Manual.

SECTION 6.5 DETERMINING CHARGES FOR CHANGES IN THE SCOPE OF WORK

6.5.1 Changes to the Scope of Services: The University shall notify the A/E in writing when a change in scope or "extra services" are required. The University and A/E shall develop a defined scope for the services and the A/E shall prepare a fee proposal for such work. A lump sum fee will normally be negotiated based upon a completed HECO-2.3 and agreed on and a written change order (HECO-11a/e) issued before the extra work is performed (i.e., changes in the plans or specifications, models, studies, etc.). In such cases, the fee negotiations will be based on the defined scope change or work to be done, the estimated technical personnel time to accomplish the work times the rates listed in the Memorandum of Understanding, and any reimbursable expenses authorized.

When the scope cannot be defined to allow a reasonable estimate of time required, the University may authorize the additional work at the hourly rates or unit costs listed in the Memorandum of Understanding. In such cases, the University shall establish maximum fee limits, as applicable. Work beyond the maximum fee limit shall require justification and the University's approval prior to proceeding with further additional work.

Many of the revisions or requirements included in a Revision to the Manual are made to reflect changes in the Code of Virginia, University Procurement Policy, or other requirements which must have immediate compliance.

Therefore, a revision to the Manual shall be effective on the date stipulated and shall apply to any and all projects for which an approved CO-6 has not been issued as of the date printed on the revision.

Prior to approval of Preliminaries and issuance of the CO-5, Revisions to the Manual can generally be incorporated in the A/E's work with little or not additional effort. If the A/E claims that incorporating the Revision into its services requires extra work, the A/E must notify the University of this claim and submit documentation to the University to clearly support such claim within 60 days of the distribution date of the Revision.

If, after the CO-5 is issued and before the CO-6 is issued, the A/E determines that including changes resulting from the revision will require additional work on his part, the A/E shall, within 60 days of the distribution date of the revision, provide the University an itemized list of the additional work required by the revision. The University shall then provide direction to the A/E and, if necessary, issue a change order for the work.

A/E's shall assure that the documents submitted for review contain the latest design requirements, the latest editions of forms, and the latest editions of the standard Instructions to Bidders and the General Conditions.

6.5.2 Hourly Rates for Changes in Work: The University and the A/E shall at the time of fee negotiations establish and record in the Memorandum of Understanding the nominal hourly rates for all technical personnel categories, disciplines and/or skill levels to be used to calculate A/E fees for extra services or changes in the work. The hourly rates listed shall include all markups and adjustments for taxes, insurances, benefits, overhead, profit, etc.

Technical activities by principals, such as project manager, Architect, or Engineer, are categorized for payment at the rates indicated for the technical activity or function being performed.

6.5.3 Overtime for Changes in Work: No overtime requiring rates higher than regular rates shall be considered for payment for additional services. Consideration of the time for approved personnel when traveling in connection with the project (when such travel is required by the Contract and authorized in writing by the University) shall be construed to be time engaged on the project up to the completion of an 8 hour workday.

6.5.4 Invoices for Changes in Work: Invoices or statements of expenses incurred by the A/E for reimbursable and for work authorized to be performed on an hourly rate or unit cost basis shall be rendered to the University monthly. Invoices shall be supported by a certified accounting of the time expended by date, by person, and the skill level of the work being done. (e.g. Drafting would be paid for at the "drafting" rate regardless of who does the work – principal, draftsman or trainee.) Statements shall show the cost during that period and indicate the status of the authorized work. The reporting of these costs shall be in such form and detail as required by the University. The A/E's disbursements and job records shall be subject to audit by the University for work done on a reimbursable and/or hourly or unit cost basis. The University shall notify the A/E of any defect or deficiency in the invoice including supporting data within ten (10) days after receipt of same, and payment of approved invoices, or portions thereof, shall be made within 30 days after receipt of the invoice.

6.5.5 Audit of A/E's Records: Any Change Order authorizing work to be performed which does not stipulate a fixed sum amount for the work shall be subject to audit by the University for a period of three (3) years following conclusion of the Contract. Also, any authorization for payment of reimbursable expenses shall be subject to audit by the University for a period of three (3) years following conclusion of the Contract.

SECTION 6.6 CHANGES TO A/E CONTRACT

Changes in the Scope of Work and/or Cost of the A/E Contract (HECO-3 and HECO-3.2) will be documented through the execution of a HECO-11 a/e, A/E Contract Change Order. Any A/E contract change order which increases the original contract amount by more than 25 percent of the project cost or \$50,000, whichever is greater, must have the prior approval of the Vice President for Administration and Finance or his or her designee. Changes will be submitted and executed within the University's web-based project management software, e-builder, unless otherwise indicated. Instructions on the use of e-builder can be found at the following link:

<https://gmufacilities.freshdesk.com/support/solutions/folders/33000208944>.

CHAPTER 7:

ENGINEERING AND TECHNICAL CRITERIA

SECTION 7.1 GENERAL

This section contains standards and requirements that clarify the applications of Virginia Uniform Statewide Building Code (USBC), and mandatory University standards and technical requirements, as they pertain to buildings on State property.

The University has prepared a set of design and construction guidelines (Mason Design Manual) which are available at this website facilities.gmu.edu.

Chapter 7 clarifies and supplements these guidelines to meet energy, performance, maintenance, safety, and accessibility standards for public buildings. The Architect/Engineer shall design to meet the standards and requirements stated in this chapter as well as the Mason Design Manual.

SECTION 7.2 BUILDING CODES &

7.2.1 Code Administration: The Office of University Building Official (OUBO) is the Building Official for all projects.

The OUBO shall perform fire safety reviews for all projects involving new construction, additions, or renovations that involves a change in use of a facility. The responsible State Fire Marshal's Office (SFMO) shall perform fire safety reviews and conduct fire safety inspections of construction when coordinated by the OUBO pursuant to the University Management Agreement.

7.2.2 Review Procedures: The OUBO reviews documents for compliance with the Virginia Uniform Statewide Building Code (USBC), HECOM, and the Mason Design Manual on all projects. Mason Facilities reviews documents for compliance with both the HECOM and Mason Design Manual on all projects. Such reviews do not relieve design consultants from responsibility for designing in accord with these standards and Federal Law.

7.2.3 Virginia Uniform Statewide Building Code (USBC)

The Building Code for all University projects on Commonwealth property is the current edition of the Virginia Uniform Statewide Building Code (USBC) with supplemental requirements, clarifications and modifications as indicated in this Manual. The provisions of the USBC are based on nationally recognized model building codes and fire codes published by the International Code Council, Inc. These model codes are adopted by reference into the USBC. The USBC is divided into 3 stand-alone parts:

Part I - Virginia Construction Code

Regulations specific to the construction of new buildings and additions

Part II – Virginia Existing Building Code

Regulations specific to the rehabilitation of existing buildings, including

renovations and change of occupancy

Part III – Virginia Maintenance Code

(Not applicable to GMU construction and renovation projects)

7.2.4 Additional Codes: In addition to the USBC the following codes and regulations apply to projects on Mason property:

Title II, Americans with Disabilities Act of 1990
Virginia Statewide Fire Prevention Code (SFPC)
Virginia Industrialized Building Safety Regulations (IBSR)
Virginia Manufactured Home Safety Regulations (MHSR)
Virginia Amusement Device Regulations (VADR)
Virginia Public Building Safety Regulations
Virginia Fire Safety Regulations
Virginia Department of Environmental Quality - Erosion and Sediment Control Regulations
Virginia Department of Environmental Quality - Stormwater Management Regulations
Virginia Department of Environmental Quality – Water Division Regulations
Virginia Department of Health Regulations
Virginia Department of Professional and Occupational Regulation
Virginia Department of Transportation “Road & Bridge Specifications”
Section 504 of the Rehabilitation Act of 1973 (HUD)
Fair Housing Act Accessibility Guidelines (HUD)
VCC Chapter 11-Accessibility
ANSI A117.1-Accessible and Usable Buildings

Certain projects may be required to comply with other codes or regulations, such as federal or special state regulations. Those codes may take precedence over the USBC, and the Accessibility and Energy Conservation Standards. All such codes shall be clearly stated in the Preplanning Documents and displayed on title sheets of preliminaries and working drawings. The mixing of code requirements between two editions of the code is not allowed. Code requirements in one section are often dependent upon conformance with requirements in other sections, therefore are not allowed without written authorization from the Building Official or his or her designee.

7.2.5 Energy Conservation and Environmental Performance:

State agencies and A/Es shall assure that new construction, renovation, and maintenance of buildings are performed in accord with the Virginia Energy Conservation Code and the following minimum standards for energy conservation and environmental performance. Individuals who perform the compliance modeling must have obtained a Building Energy Modeling Professional Certification such as ASHRAE Certification. Similar qualifications will be considered individually. The proposed Virginia Energy Conservation Code compliance path shall be clearly identified.

7.2.6 High Performance Buildings Act - Design

State agencies and architects / engineers shall ensure that new construction and renovation of buildings is performed in accord with the following minimum standards for energy conservation and environmental performance. Individuals who perform the compliance modeling must have

obtained a Building Energy Modeling Professional Certification such as ASHRAE Certification. Similar qualifications will be considered individually.

Executive branch agencies and institutions entering the design phase for:

- 1) construction of a new building greater than 5,000 gross square feet in size (as calculated in accord with the VCC), or
- 2) renovation of a building greater than 5,000 gross square feet (as calculated in accord with the VCC) where the cost of renovation exceeds 50 percent of the value of the building (see Chapter 2, definition of HPBA Building Value) shall comply with the HPBA.

To determine the existing building value, use worksheet DGS-30-383, available on the Forms Center.

When the new construction and/or renovation is required to meet the requirements of the HPBA, it shall be designed and constructed in accord with the Virginia Energy Conservation and Environmental Standards (VEES) and shall comply with Appendix V - Virginia Energy Conservation and Environmental Standards (VEES).

If there are sections where compliance cannot be achieved, the Agency may send a request to OUBO requesting relief from the specific VEES requirement. Request must provide details as to why compliance cannot be achieved. The request must be received and approved by OUBO prior to proceeding from Preliminary Design to Working Drawings. Contact the OUBO office for additional information.

7.2.6.1 High Performance Buildings Act - Submittal Procedure

Schematic Design

Determine if the project is subject to the High Performance Buildings Act (HPBA). The schematic design narrative shall state whether the project is subject to the HPBA. If subject, submit completed form DGS-30-382 “VEES Checklist” to OUBO with the Schematic submittal.

Preliminary Design

Submit a narrative with the Basis of Design indicating intended compliance methods in accord with Appendix V - Virginia Energy Conservation and Environmental Standards to OUBO for review. Indicate where compliance documentation can be found. The narrative shall be reviewed by OUBO as part of the Preliminary Design Review. Provide a revised form DGS-30-382 “VEES Checklist”.

Working Drawings

OUBO will use VEES and the final form DGS-30-382 “VEES Checklist” as part of their review to assure all required elements are included in the working drawings.

During Construction

The A/E shall document the items required by VEES. The agency is to verify the documentation.

Completion

When the requirements of VEES have been completed, submit completed forms DGS-30-381 “VEES Verification” and DGS-30-382 “VEES Checklist” to OUBO. If requested, plaques are available from OUBO.

7.2.6.2 High Performance Buildings Act - Compliance Statement

The Title Sheet of the drawings and the executive summary of the Basis of Design Narrative shall have a High Performance Buildings Act Compliance Statement indicating one of the following:

1. *In accord with the High Performance Buildings Act, the building shall comply with the Virginia Energy Conservation and Environmental Standards (VEES) as detailed in Appendix V of the Construction & Professional Services Manual.*
2. *In accord with the High Performance Buildings Act, the building is exempt from compliance because the new building construction is not greater than 5,000 gross square feet.*
3. *In accord with the High Performance Buildings Act, the building is exempt from compliance because the renovated building area is not greater than 5,000 gross square feet.*
4. *In accord with the High Performance Buildings Act, the building is exempt from compliance because the cost of the renovations does not exceed 50% of the value of the building.*

7.2.7 Virginia Energy Conservation Code Compliance Statement

The 2018 Virginia Energy Conservation Code offers multiple different paths to compliance as indicated on Figure 6.1.5.1 “2018 Virginia Energy Conservation Code Compliance Flow Chart.” The chosen compliance path applies to the complete project in its entirety and shall be identified on the construction documents.

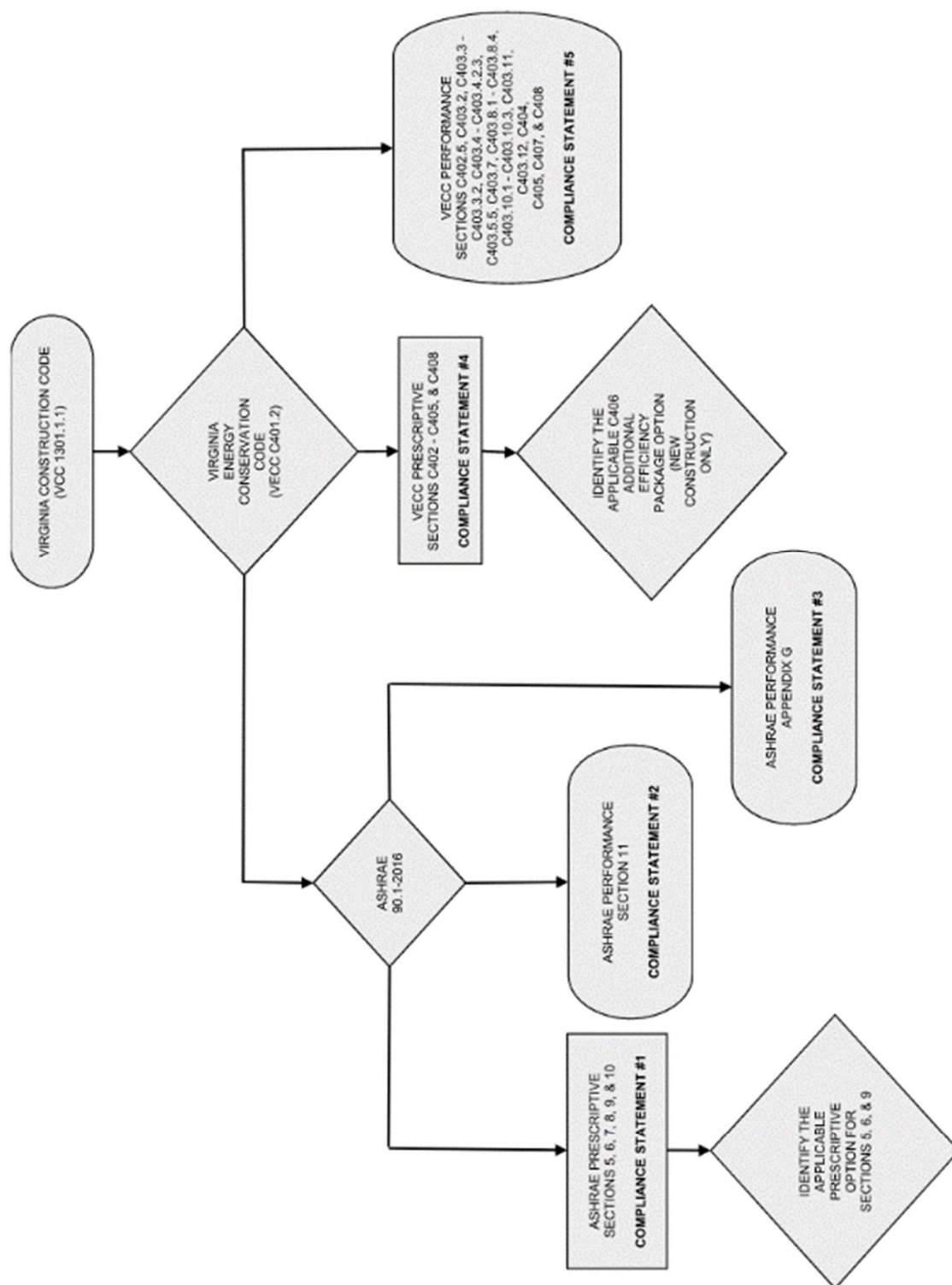


Figure 6.1.5.1
2018 VIRGINIA ENERGY CONSERVATION CODE COMPLIANCE FLOW CHART

The Title sheet of the drawings and the executive summary of the Basis of Design Narrative shall identify the Virginia Energy Conservation Code compliance path selected by including one of the following compliance statements:

1. *In accord with the Virginia Energy Conservation Code (VECC), the building shall comply with ASHRAE 90.1-2016 sections 5, 6, 7, 8, 9, & 10.*
 - a. *Section 5 Building Envelope compliance will be via (choose one)*
 - i. *Section 5.5 – Prescriptive Building Envelope Option.*
 - ii. *Section 5.6 – Building Envelope Trade-Off Option*
 - b. *Section 6 HVAC compliance will be via (choose one)*
 - i. *Section 6.3 – Simplified Approach Option for HVAC Systems.*
 - ii. *Sections 6.4 – Mandatory Provisions and 6.5 – Prescriptive Path*
 - iii. *Sections 6.4 – Mandatory Provisions and 6.6 – Alternate Compliance*
 - c. *Section 9 Lighting compliance will be via (choose one)*
 - i. *Section 9.5 – Building Area Method*
 - ii. *Section 9.6 – Space-by-Space Method*
2. *In accord with the Virginia Energy Conservation Code (VECC), the building shall comply with ASHRAE 90.1-2016 section 11.*
3. *In accord with the Virginia Energy Conservation Code (VECC), the building shall comply with ASHRAE 90.1-2016 Appendix G.*
4. *In accord with the Virginia Energy Conservation Code (VECC), the building shall comply with VECC sections C402 through C405 and C408.*
 - a. *Section C406 Additional Efficiency Package compliance will be via (choose one, new construction only)*
 - i. *C406.2 – More Efficient HVAC Equipment Performance*
 - ii. *C406.3 - Reduced Lighting Power Density*
 - iii. *C406.4 - Enhanced Digital Lighting Controls*
 - iv. *C406.5 - On-Site Renewable Energy*
 - v. *C406.6 - Dedicated Outdoor Air System*
 - vi. *C406.7 - Reduced Energy Use in Service Water Heating*
 - vii. *C406.8 - Enhanced Envelope Performance*
 - viii. *C406.9 - Reduced Air Infiltration*
5. *In accord with the Virginia Energy Conservation Code (VECC), the building shall comply with VECC sections C402.5, C403.2, C403.3 through C403.3.2, C403.4 through C403.4.2.3, C403.5.5, C403.7, C403.8.1 through C403.8.4, C403.10.1 through C403.10.3, C403.11, C403.12, C404, C405, C407, and C408. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.*

7.2.8 Clarifications to Climate Zone for University and State-Owned Buildings and Buildings on University and State-Owned Property:

Climate zones for University-and State Owned Buildings and buildings on University and State Owned Property shall be determined from the 2013 edition of ASHRAE Standard 169, table B-1.

7.2.9 Reactivated Projects: Prior to reactivating a project that has been inactive for a period during which the effective code has changed, the University Building Official or his or her designee shall determine which code applies. The plans and specifications shall be revised as necessary to comply.

7.2.10 Modifications or Variances of Code Requirements: If a modification to the code is thought to be necessary, the A/E shall request such modification in writing at the time preliminaries are submitted. The request shall clearly state the nature of the problem and the supporting rationale and justification for the modification. All requests to modify to the requirements of the USBC will be addressed to the University Project Manager, who will in turn, present the modification to the University Building Official or his or her designee.

7.2.11 Code Clarifications: Code clarification requests should be made in writing to the OUBO. The following are code clarifications that shall be applied to University and state-owned buildings and structures.

7.2.11.1 Buildings at Colleges and Universities:

1. Buildings for business and vocational training shall be classified and designed for the (Use) Group corresponding to the training taught.
2. Academic / educational buildings having classroom-type education functions (including associated professor / teacher office spaces), shall include the following additional requirements:
 - a. Provide a fire alarm system in the building.
 - b. Provide 72” minimum corridor widths in the classroom corridors.
 - c. Calculate the occupant load for each space based on VCC Chapter 10 and the type of occupancy (not Group) of the space.
3. Buildings housing research, testing and science laboratories shall include a fire alarm system.
4. Dormitories, Fraternity and Sorority Houses and similar dwelling units with sleeping accommodations – provide one of the following:
 - a. Written University Policy which prohibits the use of these residences as housing for persons / groups / occupants for periods of less than 30 days, or
 - b. Design that complies with the most stringent requirements of both Group R-1 (Hotels) and Group R-2 (Dormitory)
5. Dormitory Occupant Load Calculations and Plumbing Fixture Calculations:
 - a. The number of occupants shall be computed per VCC Chapter 10 with the following changes to the maximum floor area allowances per occupant:
 - i. Dormitory sleeping areas – 1 occupant / 50 net SF

- ii. Other occupied areas – 1 occupant / unit of area based on function/occupancy of space
 - iii. Remaining areas – 1 occupant / 200 gross SF
- b. The minimum number of required plumbing fixtures shall be based on the occupant load and plumbing classification/occupancy, but will not include occupants identified in the “remaining areas.”

7.2.11.2 Baby Changing Facilities in State-Owned or Leased Buildings:

All new University buildings shall provide two (2) baby changing facilities minimum, one located in the men’s restroom and one in the women’s restroom. Two (2) additional baby changing facilities shall be provided, located in both the men’s and women’s restrooms, for each twenty (20) total toilet fixtures required by the Virginia Construction Code for new construction. In addition, baby changing facilities shall be provided in required family or assisted use bathrooms for new construction. If only one (1) pair of baby changing facilities is required, they shall be located on the main entrance level. Baby changing facilities may be furnishings or equipment. The installation of the baby changing facilities shall not interfere with required Americans with Disabilities Act (ADA) clearances and access in the restroom. The baby changing facilities shall comply with ADA requirements for accessibility. Buildings that serve programs that are both secure and that do not permit children under the age of 30 months as visitors may submit a letter signed by the Vice President of Facilities with the Preliminary Design submittal indicating that the agency program has these requirements. The Title Sheet shall include the statement: Baby Changing Facilities: Building program requires security measures to control entrance and/or exit, and does not permit children under the age of 30 months as visitors.

7.2.12 State Building Construction in Flood Plain: Executive Memorandum 2-97 prohibits the construction of new university-owned buildings within the 100-year flood plain unless a modification is granted by DEQ or their delegated authority, and after consultation with the State Coordinator for the National Flood Insurance Program.

7.2.13 Fire Safety Reviews:

Fire Safety reviews shall be conducted by the OUBO for all new construction projects, projects with both additions and/or renovations, and projects with a change of use.

Fire suppression, fire detection, and fire alarm shop drawings shall be reviewed and approved by OUBO prior to the work being installed. Where a complete fire protection system is designed and shown on the construction documents, the drawings and/or specifications shall state that deviations in materials, locations, configurations, or sizes proposed by the Contractor are subject to being reviewed under the provisions of Section 26 of the General Conditions as a “substitution”.

When the fire suppression, fire detection, and fire alarm systems are not complete on the construction documents, then shop drawings or submittal data shall first be reviewed and approved by the A/E of record. The reviewed documents, with any added notations by the A/E, shall be submitted to the appropriate OUBO Fire Safety reviewer and/or responsible State Fire Marshal Office) for final review and approval.

Safety equipment not required by code, including Fire Detection, Fire Alarm, and Fire Suppression Systems, which are not required by code, but are provided at the University's option in state owned buildings and structures shall be complete in accord with the code. Work that is planned as a complete system, but requires phased construction to provide a complete system is acceptable. Providing partial systems to certain spaces such as storage spaces that will improve safety without giving a false sense of security to building occupants will be considered on a case-by-case basis.

SECTION 7.3 Accessibility Standards for State-Owned Buildings:

The Americans with Disabilities Act, 1990: Title II, Subtitle A (and not Title III) of the Act applies to all state-owned buildings and structures. The *Code of Virginia* [§ 2.2-1159](#) provides that the Division of Engineering & Buildings shall prescribe standards for the design, construction, and alteration of buildings constructed in whole or in part or altered by the use of state funds, other than schools, necessary to ensure that persons with physical disabilities will have ready access to, and use of, such buildings. The prescribed accessibility standards are the Department of Justice's [2010 ADA Standards for Accessible Design](#), dated September 15, 2010. (Access Board, Suite 1000, 1331 F Street, NW, Washington, D.C. 20004-1111) For technical assistance, call the Office of Technical and Information Services at 202-272-0080 and 800-872-2253 or email ta@access-board.gov. The Virginia Office for Protection and Advocacy (VOPA) promulgates regulations that address nondiscrimination on the basis of disabilities under state grants and programs. (*Code of Virginia* [§ 51.5-40](#))

7.3.1 Conflicting Standards:

The [2010 ADA Standards for Accessible Design](#) incorporates by reference editions of the International Building Code. The applicable code for the project shall be that which is adopted by the Commonwealth at the time of building design and permit, as described in [Section 7.2.4](#).

Where codes and standards conflict, the most stringent standard shall be used in designing accessible facilities. That is, the code or standard most favorable or advantageous to the disabled shall be used. As ADA is a federal law, modification or waiver of the ADA law requirements cannot be granted by the OUBO. The OUBO reviews documents for compliance with these standards during its normal review of all projects. Such review does not relieve design consultants from responsibility for designing in accord with the standards and federal law.

7.3.2 Clarifications for Owned Buildings: Accessible facilities must be provided at the completion of construction. Adaptable facilities do not meet the requirements for accessibility in University or state-owned buildings and buildings constructed or placed on university or state-owned property.

Section 7.3.2.1 Site Elements:

2010 ADA Standards for Accessible Design, Section 201.1, Scope: Addition: Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) dated

July 26, 2011 shall apply to the design of site elements provided on state-owned property that are not regulated by the 2010 ADA Standards and are not in the Virginia Department of Transportation Right-of-Way. The [PROWAG guidelines](#) are available for free download from the Access Board. These site elements are defined in PROWAG and are generally provided as part of an agency outdoor program.

SECTION 7.4 SPECIAL PROCEDURES FOR ASBESTOS ABATEMENT

7.4.1 General Asbestos Requirements: Buildings on which construction started prior to January 1, 1985 are presumed to have asbestos-containing materials (ACM) in materials including, but not limited to, asphalt and vinyl flooring, resilient floor covering, mastics, fibrous pipe insulations, caulking, roofing, flashings, bonding agents, coatings, and binders until such materials have been tested and found not to contain asbestos.

An estimated cost for asbestos abatement, when suspected or predetermined, shall be included in the cost estimate supporting the construction budget or budget request. For renovation / demolition / addition projects, including roofing materials, the University shall test for asbestos-containing materials (ACM) prior to submittal of the preliminary design. The asbestos survey / inspection report must be made available to the project A/E for information and use in preparing the project documents.

If asbestos-containing materials are found, the University shall have a licensed asbestos designer in concert with the A/E prepare an asbestos abatement plan and prepare or update the University Asbestos Management Plan as required by the University in compliance with § 2.1-1164, Code of Virginia. The asbestos abatement contractor shall be required to mark up the Asbestos Management Plan to show the “As Built” conditions resulting from its work to include areas where asbestos was abated, areas where asbestos was encapsulated, and areas where asbestos containing materials exist but were left in place.

Based on the report of the asbestos survey/inspection report and the Asbestos Management Plan, the construction drawings for renovation or addition projects shall indicate all locations where ACM have been found, where ACM are to be disturbed and where ACM are to remain. The asbestos survey/inspection report and the Asbestos Management Plan must be made available for their respective information to the contractor(s) for demolition and for construction.

The Demolition Plan sheets and the Architectural Floor Plan sheets for each floor shall also have an Asbestos Disclosure Statement indicating one of the following:

1. “An asbestos inspection was performed and no asbestos-containing materials were found. The asbestos survey/inspection report is available to the Contractor(s) for demolition and for construction for his information.”
2. “An asbestos inspection was performed and asbestos-containing materials were found generally in the areas indicated. However, the work in this project is not intended to disturb the existing asbestos-containing materials. The asbestos survey/inspection report and the Asbestos Management Plan are available to the contractor(s) for demolition and for construction for his information.”

3. “An asbestos inspection was performed and asbestos-containing materials were found generally in the areas indicated. The asbestos survey/ inspection report is available to the contractor(s) for his information. The asbestos-containing materials shall be removed prior to any other work being performed in these areas. The Asbestos Management Plan is included in the documents. The asbestos abatement contractor shall mark up the Asbestos Management Plan to show the “As Built” conditions resulting from its work to include areas where asbestos was abated, areas where asbestos was encapsulated, and areas where asbestos containing materials exist but were left in place.”
4. “An asbestos inspection was performed and asbestos-containing materials were found generally in the area indicated. The asbestos survey/inspection report and the Asbestos Management Plan are available to the contractor(s) for demolition and for construction for his information. Asbestos-containing materials shall not be disturbed in this work except where specifically indicated and required for connections to utilities. Where such connections are required, the contractor shall have the obstructive and adjacent asbestos-containing materials removed by a licensed asbestos contractor using approved procedures as specified. The asbestos-containing materials that are to remain and the new non-asbestos-containing material shall be labeled accordingly. The asbestos abatement contractor shall mark up the Asbestos Management Plan to show the “As Built” conditions resulting from its work to include areas where asbestos was abated, areas where asbestos was encapsulated, and areas where asbestos containing materials exist but were left in place.”

The A/E shall be responsible to the University for coordinating the design of the renovation / addition work with the asbestos abatement work in order to prevent conflicts, claims, and work stoppages.

7.4.2 Asbestos Removal: All ACM that will be disturbed as a result of a renovation/ demolition/ addition project must be removed. The University shall have asbestos project specifications written by a Virginia licensed designer. The designer’s license number, name and signature shall appear at the beginning of the asbestos specifications.

The asbestos project specifications shall adhere to all current federal and state regulations and policies.

The specifications shall include a copy of the project specific asbestos inspection report and Asbestos Management Plan indicating the sampling of and analyses for all materials that will or may be disturbed or accessed by the project. The specifications shall include a section that covers project notification by the asbestos contractor to the United States EPA, Virginia OSHA, and Division of Air Pollution Control at least 20 calendar days prior to the actual start of the asbestos project.

Asbestos drawings and specifications shall be submitted to a Commonwealth of Virginia licensed or properly certified asbestos project designer for review and approval. The University has two contracting options for use in removal of asbestos from a structure although option (2) is the preferred method:

1. A separate contract for removal of the asbestos prior to renovation, demolition or addition.
2. A contract where the abatement is an integral part of the renovation, addition or demolition project in which the general contractor is licensed as an asbestos contractor or hires a licensed asbestos abatement subcontractor to perform the work.

The Asbestos Abatement Contractor shall be required to mark up the Asbestos Management plan to show the As Built conditions resulting from its work to include areas where asbestos was abated, areas where asbestos was encapsulated, and areas where asbestos containing materials exist but were left in place.

7.4.3 Use of Asbestos or Asbestos Containing Materials: The use of materials that contain asbestos shall be prohibited in any new construction or renovations.

7.4.4 Removal and Replacement of Sprayed-on Fireproofing: The A/E in consultation with the University shall verify early in the design phase with the Building Official or his or her designee the original purpose of the fireproofing material to be removed or replaced and what, if anything, must be done to restore the fire resistive characteristics. Plans and specifications shall be submitted to the Building Official or his or her designee, which will include any bidding documents, addenda, or change orders which may relate to the fire resistive characteristics of the structure. On a submittal to the Building Official or his or her designee, indicate the construction date, original and present uses, height in floors and feet, whether sprinkled and any other information that may assist the Building Official or his or her designee in his or her determination. If sprayed-on ACM is to be removed and replaced with another material, the University or its A/E shall also submit copies of the specifications for the intended replacement material and the bridging encapsulate specified by the asbestos project designer for review. The bridging encapsulate must be correctly matched with the replacement material to ensure maximum bonding strength and intended fire rating integrity of the assembly and acceptable flame spread ratings.

7.4.5 Asbestos Related Work Insurance Requirements: Asbestos inspectors, project designers and project monitors and their firms are required to provide evidence of professional liability/errors and omissions insurance, with asbestos coverage, in an amount not less than \$1,000,000.00. Mason, its officers, employees, agents or any other person acting in an official capacity, temporarily or permanently, in the service of the Commonwealth, should also be named as additional insured persons.

Section 11 (e) of General Conditions of the Contract for Capital Outlay Projects requires the asbestos Contractor or Subcontractor, as the case may be, to name the A/E as an additional insured on the Contractor's liability insurance with asbestos coverage. Where the A/E for the renovation project is also a Virginia licensed asbestos designer and prepares the asbestos project drawings and specifications, the requirement of Section 11 (d) to name the A/E as an insured party is waived.

7.4.6 Conflict of Interest Policies: The asbestos surveyor / inspector, the asbestos abatement designer, the University's asbestos management plan author and any other person or firm hired by the University to provide consulting or inspection services on the project shall not be associated by any business or financial relationship to the asbestos abatement contractor.

Asbestos abatement contractors are not eligible to bid on those particular projects for which the asbestos surveys, inspections, bulk sample analyses, project designs, or asbestos management plans were performed by individuals or firms employed by or financially affiliated with the contractors during the time period in which the inspections were conducted, samples analyzed or the project designs written.

Asbestos surveyors, asbestos abatement designers or asbestos abatement management plan authors shall not contract with the asbestos abatement contractor to provide services on the project. Asbestos project inspector (project monitors) are not eligible to contract for project inspection work on a project if they are financially affiliated with or employed by the asbestos abatement contractor on any project. These services are to be directly contracted for by the University, and the monitoring personnel shall be accountable only to University officials.

All laboratories utilized for asbestos sampling analyses for project purposes shall have no direct business or financial relationship with the contractors conducting asbestos abatement activities.

SECTION 7.5 SPECIAL PROCEDURES FOR LEAD- BASED PAINT ABATEMENT

Effective June 3, 1993 the U. S. Department of Labor's interim final rule amends the Federal OSHA standards for occupational health and environmental controls in subpart D of 29 CFR part 1926, adding a new Section 1926.62 indicating protection requirements for construction workers exposed to lead. The entire rule is contained in the *Federal Register* Vol. 58, No. 84, May 4, 1993. The Virginia OSHA regulations have subsequently adopted the federal regulations in total.

The Virginia Department of Labor and Industry (DLI) established an emergency regulation in the May 27, 1996 *Virginia Register* requiring, among other things, that a permit be issued by DLI to the lead abatement contractor. This requirement is also stated in the General Conditions of the Construction Contract. When planning a renovation, demolition or addition project, the university will contract with a Commonwealth of Virginia licensed Lead Inspector/Contractor to have the facility to be renovated surveyed for lead based paint (LBP) contamination and document all quantities and locations found.

An estimated cost for lead paint abatement, when suspected or predetermined, shall be included in the cost estimate supporting the construction budget or budget request.

The construction drawings for renovation or addition projects shall indicate all locations where lead-based paint is to be disturbed or to remain and shall also have a lead-based paint disclosure statement indicating one of the following:

1. A lead-based paint inspection was performed and no lead-based paint was found.
2. A lead-based paint inspection was performed and lead-based paint was found in indicated areas. However, the work in this project is not intended to disturb existing lead-based paint.
3. A lead-based paint inspection was performed and lead-based paint was found in the areas indicated. The lead-based paint shall be removed prior to any other work being performed in these areas.
4. A lead-based paint inspection was performed and lead based paint was found in the areas indicated. Lead-based paint shall not be disturbed in this work except where specifically

indicated and required for connections to utilities. Where such connections are required, Contractor shall have the obstructive and adjacent lead-based paint removed by a licensed lead-based paint abatement contractor using approved procedures as required by VOSHA. The lead-based paint that remains and new non-lead-based paint areas shall be labeled accordingly.

5. A lead-based paint inspection was performed and lead-based paint was found in the areas indicated. The contractor shall be responsible for compliance with all requirements of the Virginia Occupational and Health Administration regulations regarding lead-based paint protection for workers.

If abatement and encapsulation is to be done by the General Contractor, the A&E shall identify the type and location of all lead-based paint and notify the contractor that this work is part of the contract for construction. Lead-based paint must be identified and the contractors notified that they must be in compliance with VOSHA requirements for worker safety. It shall be the contractor's responsibility to comply with the requirements of VOSHA.

The contractor shall establish a schedule with the University for abatement and containment in buildings that are to remain occupied during construction.

Following removal of lead-based paint containing materials, additional TCLP tests in accordance with EPA guidelines shall be done on these materials to determine disposal requirements. TCLP tests of waste materials shall identify whether the material will be required to be disposed of as toxic waste or as ordinary construction debris. It shall be unlawful for materials identified as toxic waste to be disposed of with ordinary construction debris.

SECTION 7.6 UNDERGROUND STORAGE TANK SYSTEMS (USTS) AND ABOVE GROUND STORAGE TANKS (AST)

Technical standards related to USTS and AST are contained in the Department of Environmental Quality, Water Division, Regulations: 9VAC25-580, *Underground Storage Tanks: Technical Standards and Corrective Action Requirements*; 9VAC25-91-100, *Facility and Aboveground Storage Tank Registration Requirements*; and 9VAC25-91-130, *Above ground Storage Tank Pollution Prevention Requirements*.

Pursuant to Section 36-98.1 of the *Code of Virginia*, the Director of the Department of General Services has delegated to local building departments inspection and enforcement authority for state-owned USTS and AST for the purpose of issuing permits, Certificates of Use and performing inspections required by 9VAC25-580; 9VAC25-91-100; and 9VAC25-91-130.

The University shall request the services above from the authority having jurisdiction on all UST and AST projects/actions. For capital outlay projects the University will provide the local building department copies of the appropriate sections/sheets of the specifications/ drawings. The University shall pay to the local building department the same fees as would be paid by a private citizen for the services rendered.

The Virginia Department of Environmental Quality (DEQ) requires the University to register all ASTs over 660 gallons and regulated USTs (motor fuel and generator fuel) and obtain permits for removal and replacement of tanks.

All petroleum storage tanks, AST and UST must be double-walled, and all associated underground piping must be double-walled. In addition, UST must be equipped with interstitial monitoring for release detection, automatic gauging, automatic line leak detectors, and approval by Safety, Emergency, & Enterprise Risk Management (SEERM).

Drawings and specifications for any tank, either AST or UST, shall be reviewed and approved by SEERM for compliance with the DEQ requirements and the University's *Vessel and Equipment Compliance Manual* and *Integrated Contingency Plan*. All required registration information must be supplied by the contractor to the Project Manager. Copies of permits, inspection reports, and approvals shall be provided by the Project Manager to SEERM to document compliance with regulatory requirements.

SECTION 7.7 CHESAPEAKE BAY PROGRAM:

The University will ensure that their projects are located, designed and constructed to protect the water quality and living resources of the Chesapeake Bay. Adherence to *the Chesapeake Bay Watershed Development Policies and Guidelines* will be required in the development of all project sittings/designs. This publication is available from the Chesapeake Bay Local Assistance Department, (804) 225-3440.

SECTION 7.8 SPECIAL BUILDING PLANNING REQUIREMENTS

Generally, a building efficiency of 65 to 75 percent shall be achieved for classroom, dormitory (with shared toilets), office, laboratory, assembly, and dining facilities, or combinations of these uses unless predetermined otherwise in University programming. Higher efficiencies per standard industry criteria would apply to service buildings, warehouses, garages, and other housing or dormitory (suite with internal toilets), apartments or townhouses facilities.

7.8.1 Guidelines For Office Space Planning: See Mason Design Manual for space planning requirements

SECTION 7.9 EARTHWORK:

The A/E shall consider the recommendations in the geotechnical/soils report in developing the design.

Drawing details of the following conditions will be required:

1. Over-excavation and replacement with suitable materials.
2. Subsurface profiles (boring logs) and limits showing the extent of rock, existing fill materials, water and existing unsuitable bearing materials.
3. Specific drawing notes stating that earthwork details shall be included in the base bid. Earthwork beyond the extent indicated will be considered for an extra cost, only if

- necessary and approved by the A/E, and not a result of the contractor's failure to maintain site/excavation stability, drainage or protection from frost penetration.
4. Earthwork specifications shall be definite, not general.
 5. Coordinate Specifications with the Drawings.
 6. Include a geotechnical/soils report in the Appendix to the Specifications (Project Manual) and a disclaimer stating that the report is not part of the Contract Documents each time this report is referenced.
 7. Specifications for materials and instructions shall state whether they are included in the base bid or will be an extra cost item.
 8. Rock excavation shall be included in the base bid to the extent that locations are sufficiently identified in the geotechnical/soils report.

Earthwork specifications shall include soil and aggregate material definitions for all materials used in the project. The soil materials shall be defined by a recognized soil classification system, such as the Unified Soil Classification System or the AASHTO Soil Classification System. The definitions below are by the Unified system. The aggregates shall include gradations required for each material. Note: Unedited master or standardized specifications often are too conservative in defining soil materials - often eliminating the on-site soils as acceptable materials, even for general fill/backfill. Quality control is also often not provided in the form of aggregate gradations. All A/E standard specifications shall be edited to conform to the following requirements:

7.9.1 Structural fill/backfill - Generally restricted to GW, GP, GM, SM, SW, and SP unless other materials are specifically approved by the soils engineer or firm that conducted the on-site soils evaluations. SC, CL, and ML might be considered in some situations with the approval of the soils engineer.

7.9.2 General fill/backfill - Includes all classifications of materials noted above.

7.9.3 Unsuitable Materials - Includes OL, MH, CH, OH and PT, saturated material which in the judgment of the soils engineer cannot be aerated to be made acceptable, uncompacted fill (for structural bearing conditions), fill with unacceptable quantities of non-soil products, or other materials judged unsuitable by the soils engineer.

7.9.4 Aggregates - They may include porous backfill, pipe bedding, under slab fill, any special blend or open-graded material required for a special bearing or drainage use.

7.9.5 Moisture content of soil materials - Laboratory tests are generally conducted on samples to determine the maximum density of soils, usually achieved at optimum moisture content. Field conditions during construction prevent attaining and maintaining the optimum moisture content. This requires that a tolerance for departure from this optimum must be specified. This tolerance is generally specified in the range of plus or minus 3% to 5% from the optimum moisture content without significantly affecting the ability to achieve the specified density.

7.9.6 Quality Assurance / Testing: The specifications shall list the tests required to be performed on the Work (i.e. ASTM, AASHTO, VDOT or other test procedures) and stipulate the values to be achieved.

SECTION 7.10 STORMWATER MANAGEMENT & EROSION AND SEDIMENT CONTROL REQUIREMENTS

George Mason University is subject to project review and compliance for state stormwater management and erosion and sediment control. All land disturbing activities, as defined by Virginia Stormwater Management Program (VSMP) Regulations, as amended (9VAC25-870) *and* Virginia Erosion and Sediment Control (VESCP) Law, as amended (9VAC25-840) shall be vetted through Mason Land Development Office (LD).

Disturbance of land exceeding 2,500 square feet requires submission of an erosion and sediment control and stormwater plan to LD in Mason Facilities Administration Building. This office has Department of Environmental Quality (DEQ) certified staff to review and approve ESC & SWM plans. The submission must be made in accordance with Mason's Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management (AS&S), which is available at Stormwater.gmu.edu under the Mason Land and Disturbance Permit section.

A Land Disturbance Application shall be completed and submitted to Mason LD with a construction drawings and locations of the proposed work. Prior to starting a land-disturbing project, the project must have a Mason Land Disturbance Permit issued by Mason LD if disturbing activities more than 2,500 square feet, and [Construction General Permit](#) issued by DEQ if disturbing activities more than one acre.

Site-Specific ESC, SWM, and Stormwater Pollution Prevention Plan (SWPPP) shall be prepared for all projects involving a regulated land-disturbing activity as defined in 9VAC25-151-80.

7.10.1 Plans and Specifications: Requirements shall be included in the specifications to assign to the contractor (as part of the contract) the responsibility of erosion and sediment control and stormwater management at all sites (on or off the University's property) of borrowing, wasting or stockpiling of soil products.

A statement similar to the following shall be used:

“The Contractor shall be responsible for satisfying any and all erosion and sediment control (ESC) and stormwater management (SWM) requirements for any land disturbing activities, including but not limited to, on-site or offsite borrow, on-site or offsite stockpiling or disposal of waste materials. Before undertaking any land disturbing activity for which the plans do not specifically address erosion control and stormwater management, the Contractor shall contact Mason LD office to determine what ESC and SWM measures are necessary. The Contractor shall completely satisfy all requirements of the Mason Land Disturbance Permit and DEQ Construction General Permit before continuing with the concerned activity.” **Note:** This instruction may be added to one appropriate specs section - such as Erosion and Sediment control or Earthwork - with a reference made to that section each time borrow, waste or stockpiling is mentioned in other sections.

7.10.2 Computation and Recordation

ESC, SWM, and SWPPP plans, narratives, and necessary attachments shall be submitted to the Mason LD for review and approval prior to any land-disturbing activities. Submittal packages

shall be delivered to Mason LD office or following the Permit Application-Land Disturbance (PALD) process in e-Builder. The required elements for various submittal phases can be found in Appendix C: *Plan Review Completion Checklist* of the AS&S. Final submittals for land-disturbing projects including infrastructure/utility work shall include hardcopy, electronic copy (PDF), and CAD drawings. CAD drawings shall conform to National CAD Standard regarding layers, plot styles, line types, etc.

As-built drawings shall be submitted in order to close out the Mason Land Disturbance permits. The requirements for as-built drawings can be found Mason's Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management (AS&S).

Section 7.11 Fire Protection and Life Safety Systems

Refer to Chapter 8 for Schematic, Preliminary, & Working Drawing(s) requirements of fire protection and life safety systems.

Integrated testing is required to be performed for all interconnected fire protection and life safety systems in accordance with NFPA 4, Standard for Integrated Fire Protection and Life Safety System Testing in high-rise buildings as required by the VCC. This is to be pre-coordinated with various installation trades ahead of acceptance testing.

Where two or more fire protection or life safety systems are interconnected the required response of each system must be verified when testing occurs (e.g., emergency elevator operations during fire alarm test, sprinkler water flow fire alarm monitoring, etc.) in accordance with the VCC.

7.11.1 Fire Detection and Alarm Systems

Validation of the Fire Alarm Systems

Fire alarm systems are to be acceptance tested in accord with the requirements of the code. The Office of the University Building Official (OUBO) shall observe the installed fire alarm system and witness the fire alarm system performance tests in accordance with the Uniform Statewide Building Code and NFPA 72. The A/E and Contractor shall certify that the fire alarm system is complete. **On capital projects**, the regional State Fire Marshal's office shall be notified in advance of final testing to determine their availability to be on-site.

7.11.2. Mass Notification System (Emergency Communication Systems)

All new fire alarm systems shall be tone and voice evacuation systems with a digital message repeater and microphone allowing for local paging from the control panel/annunciator. All acoustically distinguishable spaces (ADS) shall be identified in the drawings for purposes of voice intelligibility in accordance with NFPA 72.

This will facilitate the installation of In-Building Mass Notification Systems (Emergency Communication Systems). A mass notification risk analysis is required for any new building on campus in accordance with the USBC and NFPA 72. This risk analysis to be completed during schematic design and a determination be made for the need of a mass notification system in accordance with the USBC and NFPA 72.

7.11.3 Fire Suppression Systems – Water-based: Fire Sprinkler/Standpipe

Validation of the Water-based Fire Suppression Systems

Fire suppression systems are to be acceptance tested in accord with the requirements of the code. The Office of the University Building Official (OUBO) shall observe the installed fire alarm system and witness the fire alarm system performance tests in accordance with the Uniform Statewide Building Code and NFPA 13, 13R, 13D and 14. The A/E and Contractor shall certify that the fire suppression system is complete. The regional State Fire Marshal's office shall be notified in advance of final testing to determine their availability to be on-site for all Capital projects.

7.11.4 Fire Suppression Systems – Alternate Automatic Systems

Validation of the Alternate Fire Suppression Systems

Fire suppression systems are to be acceptance tested in accord with the requirements of the code. The Office of the University Building Official (OUBO) shall observe the installed fire alarm system and witness the fire alarm system performance tests in accordance with the Uniform Statewide Building Code and NFPA 11, 12A, 16, 17, 17A, 2001 as applicable. The A/E and Contractor shall certify that the fire suppression system is complete. **On capital projects**, the regional State Fire Marshal's office shall be notified in advance of final testing to determine their availability to be on-site.

Section 7.11.5 Fire Pumps (Electrical or Diesel-Driven)

Validation of the Fire Pump

Fire pumps are to be acceptance tested in accord with the requirements of the code. The Office of the University Building Official (OUBO) shall observe the installed fire alarm system and witness the fire alarm system performance tests in accordance with the Uniform Statewide Building Code and NFPA 20 as applicable. The A/E and Contractor shall certify that the fire suppression system is complete. **On capital projects**, the regional State Fire Marshal's office shall be notified in advance of final testing to determine their availability to be on-site.

Section 7.11.6 Smoke Control/Management Systems

Validation of the Smoke Control System(s)

The smoke control system(s) are to be inspected and acceptance tested in accord with the requirements of the code and the special inspection requirements of VCC chapter 17. The Office of the University Building Official (OUBO) and the Special Inspector shall observe the installed smoke control/management system in accordance with the Uniform Statewide Building Code

and NFPA 92 as applicable. The A/E and Contractor shall certify that the smoke control system is complete. **On capital projects**, the regional State Fire Marshal's office shall be notified in advance of final testing to determine their availability to be on-site. Refer to *Smoke Control Special Inspections Supplemental Guidelines* for additional validation requirements.

Integrated testing is required to be performed for the fire alarm system in accordance with NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing* where interconnected with a stair pressurization and/or exhaust smoke control system as required by the VCC. This is to be pre-coordinated with various installation trades ahead of acceptance testing.

Note: Simplified Acceptance Testing for Stairwell Pressurization System(s):

1. Inspection of the stair pressurization system includes an inspection of the fire-rated enclosure, doors, door hardware, door latching and smoke detector locations.
2. A timed sequence of the fan operation under normal and standby power is observed by the OUBO inspection team.
3. The inspection will observe and report the following tests to confirm the stair pressurization system is operating in compliance with the VCC:
 - i. Observation of door operation with stair pressurization system off.
 - ii. Observation of stair pressurization system operation as initiated by smoke detector and immediate loss of normal power (standby power).
 - iii. Observation of stair pressurization system operation as initiated by smoke detector and while under normal power.
 - iv. Observation of stair pressurization system as initiated at the firefighter's stair pressurization control panel.
 - v. Observation of door operation with stair pressurization system on.
 - vi. Test shall be conducted under both normal and standby mode.
4. The Contractor should schedule the OUBO inspections to include A/E representative, fire alarm contractor, electrical contractor, and the mechanical contractor, along with sufficient staff to prevent stairwell from being used during the test shall be present.
5. The Special Inspector with pressure differential meter and pound-force gauge for the door forces shall verify the following:
 - i. Meters and gauges must have been calibrated within the past year.
 - ii. The door opening forces shall be measured as set forth under design.
 - iii. The stairway enclosure shall be inspected to confirm that there are no utilities installed within the stairway that do not serve the stairway.
 - iv. All penetrations shall be inspected to ensure listed through penetration fire stop systems are utilized.
 - v. All doors should be automatic or self-closing doors and be capable of re-latching with an active alarm after a building occupant exits through the door.

Section 7.11.7 Spray-Applied Fire-Resistant Materials (SFRM) and Fire-Resistant Coatings

Validation of Sprayed-on Fire Resistant Materials (SFRM) Assemblies

Applied fire resistant material assemblies are to be acceptance tested in accord with the requirements of the code and the requirements defined herein. The OUBO and the Special Inspector shall observe the installed SFRM assemblies. The independent testing laboratory reports shall clearly show the location of the tests and test results. The A/E and Contractor shall certify that the SFRM assemblies are complete. Copies of the reports shall be sent through the A/E to the Owner, OUBO and the regional State Fire Marshal.

Validation Testing Requirements

All applied SFRM shall be tested after installation according to ASTM E-605, ASTM E-736, ANSI/UL 263 and ANSI/UL 1709, latest editions and **shall be performed as part of the code-required special inspections program**. The minimum location and number of tests of the applied SFRM shall conform to the requirements below:

1. For thickness on floor sections: One out of every four bays or similar units shall be inspected, but in no case shall a bay or unit exceed 2,500 sq. ft. Each bay or unit selected shall be divided into quarters. In each quarter, a 12- inch square shall be selected for taking thickness measurements. The thickness shall be determined by taking the average of at least ten individual symmetrical thickness measurements within the 12-inch square. Where more than one thickness is required by design, a similar procedure shall be followed for each of the required thicknesses.
2. For thickness on beams and columns: Beam and column thickness measurements shall be taken within each bay or similar unit in which floor insulation thickness measurements are made. Four sets of random measurements shall be taken for each bay or unit.
3. For density: Samples for density determination shall be taken for each 10,000 sq. ft. of pre-selected floor area, but in no case shall there be less than two per floor.
4. For bond strength: Samples for cohesion / adhesion shall be taken on thoroughly dried material adjoining test sections used for thickness and density determinations. There shall be one test for beams and one test for decks for each 10,000 sq. ft. of pre-selected floor area, but in no case shall there be less than two tests per floor.

7.11.8 Fire Protection Openings and Fire/Smoke Dampers

Validation Testing Requirements

Applied fire resistant material and fire protection rated assemblies are to be acceptance tested in accordance with the requirements of the code and the requirements defined herein and **will typically be required to be conducted by a third-party inspection agency in accordance with OUBO procedures**. The OUBO and/or approved third-party barrier inspection agencies (damper, fire door, etc.) will verify proper location, installation and that testing meets applicable code requirements. The third-party inspection reports shall clearly show the location of the tests and test results. The A/E and Contractor shall certify that the specific assemblies are complete. Copies of the reports shall be sent through the A/E to the Owner, OUBO and the regional State Fire Marshal.

SECTION 7.12 PRESSURE VESSELS

All fired or unfired pressure vessels whether a part of an equipment package or an entire piece of equipment shall be specified to comply with the ASME Code. The specifications shall require that the pressure vessel be so stamped in an easily identifiable location and that the manufacturer's data indicating ASME compliance be submitted.

Comply with the Boiler and Pressure Vessel Rules and Regulations issued by the Virginia Department of Labor and Industry <https://www.doli.virginia.gov/>.

SECTION 7.13 TEMPORARY ELECTRICAL SERVICE

The Architect/Engineer shall coordinate with the University as to the type of electric service available, location and who will pay for the electricity required for construction. The temporary service shall be metered.

CHAPTER 8:

PROJECT DESIGN STANDARDS AND REQUIREMENTS

SECTION 8.1 GENERAL

The Contract Documents submitted shall represent a reasonable and cost effective architectural and engineering solution for the scope of work and construction budget constraints in the A/E contract.

All elements of submittals shall be checked by the A/E and such check should be made by persons other than those preparing the materials and by professional personnel trained in that specific discipline. Errors and deficiencies shall be corrected by the A/E at no additional cost to the University.

The A/E shall perform a quality assurance review for both the technical accuracy and discipline coordination. Such items as section, detail, and note references to other sheets, major dimensions, and equipment locations shall be checked. Verify that all equipment is correctly identified the same way on all sheets and in the specifications. Existing landscape and utility conditions shall be overlaid with proposed utilities locations and site improvements. Architect to indicate all vents, penetrations, stacks, equipment, etc. on elevations.

The A/E should be aware that there are differences between private work and work done for the purposes of this manual. These include:

1. The Commonwealth cannot limit bidding to a selected list of contractors. Unless contractors are prequalified for the project in accordance with Section 10.7, any licensed contractor may bid. Since the knowledge and experience of the contractors bidding on the project is an unknown, drawings and specification requirements must leave nothing to the imagination. They must be clear, concise, and provide thorough detailing of existing and proposed construction.
2. Sections, details, and dimensions must be in sufficient quantity, clarity and detail to allow the bidder to understand what is expected, to make takeoffs of material types and quantities, and, once hired to prepare shop drawings and execute the construction. This particularly applies to stairs, special connections for framing, typical details of system interfaces, flashings for roofs and walls, and similar building features. Details should clearly distinguish between existing and proposed/ new construction. Drawings must also clearly show and/or describe demolition requirements.
3. Project design is the sole responsibility of the A/E. Specifications which require the contractor to provide engineering design are not acceptable unless the products or systems specified for contractor design are closed engineered systems. Closed engineered systems include: pre-engineered buildings, manufactured mechanical equipment, prefabricated

trusses, and precast and common steel structural connections. Other systems can be defined as closed engineered systems if approved by the Vice President for Facilities.

4. In order to encourage competition required in the expenditure of University and public funds, performance specifications that define a desired result or assembly, or reference recognized standards to define a desired result or assembly, are strongly preferred. If performance specifications are not practical, and a manufactured product must be used to define a desired result of assembly, then three manufacturers and three products shall be referenced. Do not reference both manufactured products and performance criteria because conflicts in the performance criteria and the product performance create unnecessary conflicts. Sole source and proprietary specifications are not allowed without prior written authorization.

Failure to grasp these basic differences in rules and policies has been the source of many costly disputes, claims and document re-submittals by the A/E.

8.1.1 Project Aesthetics: Good architecture can be achieved simply by good design. Sensitivity to scale, massing, proportion, materials, detail and even color should be kept in mind throughout the design. The University and the A/E must work together to achieve an aesthetically acceptable design which meets the functional requirements of the project within the stipulated design-not-to-exceed cost.

8.1.2 LEED Certification: It is the University's policy that all new buildings shall be designed to meet a minimum of LEED silver. However, the University strives to go beyond this minimum standard and would look to achieve Gold or Platinum in the majority of cases. The University typically does seek certification from the USGBC but on occasion will design to that standard without seeking certification.

8.1.3 Project Identification on Documents: The University and the A/E shall show the Project Code on all plans, specifications, contracts, correspondence, sketches, invoices, memoranda, addenda and other documents related to the project. Where the project has been subdivided, also show the two-digit subproject identification code number. Documents without the required identification are not complete. The University will assign a project number for each project.

Each page/sheet/sketch/drawing of any addenda shall show the project code, addendum, and page or sequence number to clearly indicate that the material is a part of the contract documents. The A/E shall require the Contractor to show the PC# and University Work Order on all submittals including invoices, schedules, shop drawings, change order proposals, correspondence and other project documentation.

8.1.4 Capital Project Initiation: The University will be authorized to initiate the design of a Capital construction project upon completion of an approved CO-2/HECO-2 Form. Depending on the project documentation previously submitted and the action wording on the CO-2/HECO-2, one or more of the following design progress phases for review by the Building Official may be required:

1. Schematic Design/Project Criteria
2. Preliminary Design
3. Working Drawings/ Contract Documents
4. Revised Working Drawings
5. Clouded Documents

Minimum requirements for data, drawings, specifications, and cost estimates to be included in the submittal for the indicated phases are described in this chapter and the referenced Appendices.

8.1.5 Non-Capital Projects: This applies to all General funded, Non-general funded, and Maintenance Reserve projects. Construction or improvement projects undertaken on University property that are not classified as Capital Outlay projects are not required to follow the capital outlay procedures. However, they are subject to review by the Building Official or designee for conformance to the USBC including its referenced standards, for the technical and procurement requirements of the Manual, and Mason Design Manual. “Changes in Use Group Classification” of existing University owned buildings require the submittal of information for the review and approval, and issuance of a new Certificate of Use and Occupancy by OUBO. Non-Capital Projects shall follow the guidelines established by the OUBO.

SECTION 8.2 DRAWING STANDARDS

The following clarifies the requirements, standards, and expectations applicable to drawings prepared for bidding and construction on state projects:

8.2.1 General Requirements: The Title sheet(s) shall clearly indicate the following:

1. Project Title and project code
2. Activity or function(s) to be performed in the facility
3. Version (date) of USBC on which the design is based
4. Other major code used as a basis for design
5. Use Group classification(s)
6. Maximum USBC occupancy for each level and total for building
7. USBC classification of construction type
8. Area for each floor and entire building; volume of building
9. Location and Vicinity Maps;
10. Seals of the responsible Architect and Engineers, signed and dated
11. Indicate the number of beds (dormitory or hospital), fixed seats (auditorium) or parking spaces (parking deck), and other information relating to capacity of the facility as applicable.
12. Provide a master listing of all applicable abbreviations and symbols used in the set of drawings or provide a listing of all common abbreviations and symbols at the beginning of the drawings and provide a listing of the discipline specific abbreviations and symbols at the beginning of each discipline.
13. Building floor plans and drawings for all disciplines shall be oriented the same to avoid confusion and to facilitate overlaying of drawings.

8.2.2 Drawing Requirements & Specifications:

8.2.2.1 Arrangement of Drawings: Drawings shall be arranged in the following order with the discipline identifying character shown:

G - Title Sheet, Index, Code Compliance, and Life Safety Drawings
C - Plot and/or Site plans
C - Sanitary and Civil
B - Boring logs
L - Landscaping
D - Demolition
A - Architectural
S - Structural
FA – Fire Alarm
FX – Fire Suppression, Standpipes, and Accessories
P - Plumbing
M - Mechanical (heating, cooling, ventilation, etc.)
E - Electrical
R - Asbestos Abatement
T–Telecom/AV
AC – Access Controls (Access Controls, Cameras, and Alarm Systems)

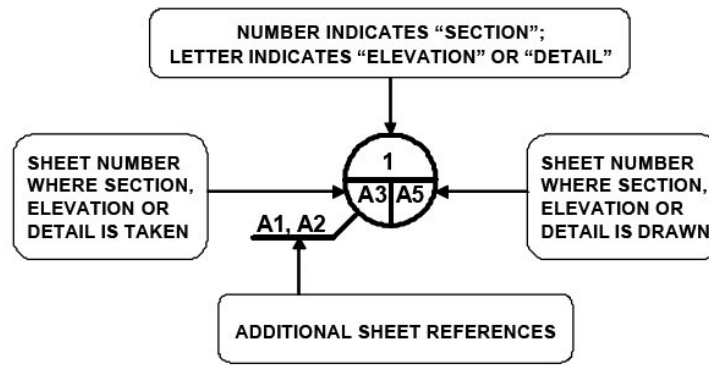
8.2.2.2 Sizes of Drawing Sheets: Drawing sheet size, except in special cases approved by the University Project Manager, shall be 24" by 36" (preferred) or, alternatively, 30" by 42". Drawings shall be prepared so as to be suitable for optical scanning and for making clear, legible half-size reproductions.

8.2.2.3 Drafting Media: All drawings will be done in AutoCAD or Revit version currently in use by Mason Facilities Management. New buildings and major renovations will be designed in Revit. Completed computer generated working drawings shall be suitable for reproduction in ink. For record drawings requirements see Appendix Q.

8.2.2.4 Orientation: It is customary for a building plan to be oriented with the main entrance toward the bottom or right edge of the sheet, depending upon the building shape. All plan sheets shall have a North Arrow for orientation. All discipline building plans shall be consistent in orientation insofar as practicable.

8.2.2.5 Lettering: Mechanical (typed or CADD) lettering shall be 1/10" minimum and in all caps. Make minimum gap between lines equal to one-half the letter height. Lettering and line weight must be in accordance with the above.

8.2.2.6 Section and Detail Designation: The standard section symbol (Figure 8.2 - 2) will be shown both where the section or detail is cut and where the section or detail is drawn. When practicable, the AE should batch and hyperlink the detail and drawing callouts throughout the documents prior to submission to the OUBO.



STANDARD SECTION, ELEVATION OR DETAIL SYMBOL

NOTE: SYMBOL SHOULD ALWAYS APPEAR AS PART OF TITLE, PLACED UNDER THE VIEW

Figure 8.2-2

8.2.2.7 Scales: An indication of the scale of the object drawn shall be located directly under the title of each plan, elevation, section, detail, etc. (Example: Scale 1/8" = 1'-0"). Closely related groups of details having identical scales and tied together with a common title may receive a single indication of scale under their title. Each drawing shall, as a minimum, have a graphic scale shown for the predominant scale used on that sheet.

8.2.2.8 Drawing Numbers: Drawings shall be sequenced by discipline letter and number, i.e., A-1, A-2, A-3.1, A-3.2, S-1, S-2, etc. Page numbers shall be in sequential order and pages and details shall only be included if applicable to the project. If there is a specific note associated with a design element it should be applied to that specific sheet whenever practicable.

8.2.2.9 Relation of Drawings and Specifications: Drawings generally indicate the scope of work, locations, relationships, and dimensions while specifications generally indicate quality, performance and installation requirements. Drawings and specifications shall supplement each other and must not conflict. Terminology used in specifications and drawings should be the same.

8.2.2.10 Boring Log Presentation: Boring logs representing soil conditions encountered in the site investigation including pertinent logs from previous explorations in the project location shall be presented on the drawing(s). Logs shall show the ground elevation, the depths of borings, depths and classifications/descriptions of materials encountered, blow counts per ASTM D-1586, ground water elevation, and other pertinent information. Boring locations relative to the project shall be shown on a small-scale location plan or on the Site Plan. Boring logs may be photocopied to stick-on transparencies and securely and neatly organized on the Boring log sheet if legible.

8.2.2.11 Seals: Since working drawing submittals are intended to be 100%, complete and ready for bid, all drawings submitted for final working drawing review shall bear the Virginia seal of the individual or individuals responsible for its design. See Chapter 3 for specific requirements regarding the application of seals and dates.

Asbestos drawings and specifications shall have the name, signature and Virginia license number of the asbestos project designer shown on each asbestos drawing sheet and at the beginning of the asbestos specifications section.

8.2.2.12 Date: All drawings and the specifications shall be dated with the same date which is established by the A/E as the date the documents are (or will be) complete, sealed, signed and dated, and ready for bid. Documents printed for bidding shall bear the date described above with no revision numbers or dates. See Chapter 3 for specific requirements regarding seals and dates.

8.2.2.13 Limits of the Work: The drawings shall describe/show the Work to be provided by the Contractor. Existing features, structures, archaeology features, or improvements to remain shall be so noted. Existing features, structures, or improvements to be demolished and/or removed shall be noted or identified. Work, improvements, demolition or construction which the University will perform or have performed by separate contract shall be identified as “Not In Contract” or “NIC” if the abbreviation has been defined.

SECTION 8.3 SPECIFICATION STANDARDS

8.3.1 General: Specifications shall clearly define the quality, performance, and installation standards for the Work and the conditions under which the Work is to be executed. They shall be in sufficient detail to describe without ambiguity, the materials, equipment and supplies, and the methods of installation and construction. Required tests and guarantees shall be indicated in the specifications.

Federal Specifications, MILSPECS, Corps of Engineers Specifications and the like often contain requirements or standards which are not applicable to state work. Those specifications also contain requirements and options ranging from the lowest quality to the highest quality product which must be carefully reviewed, selected and identified in the specifications. Therefore, the reference to Federal Specifications shall not be permitted.

All specification sections shall be written / edited to apply specifically to the project and shall not include materials, standards, requirements or data not pertaining to the project.

8.3.2 Project Manual/Specifications Arrangement: Specifications shall be on 8 1/2" by 11" sheets with bid sets preferably printed on both sides of the sheet. Type print size shall be suitable for scanning and shall not be smaller than 12-pitch type size. The table of contents pages shall be dated with the same date as the drawings and shall be sealed and signed. The Project Manual shall include:

1. Table of Contents (*See Sample Specification Table of Contents in Appendix C.*)
2. Notice of Invitation to Bid
3. Instructions to Bidders (CO-7a)
4. Pre-bid Question Form
5. Bid Form
6. The current General Conditions of the Construction Contract (CO-7) (See Section 8.3.3 below.)

7. Supplemental General Conditions, if applicable
8. Contract Between University and Contractor (HECO-9, HECO-9CM(ER), HECO-9CM(1), HECO-9CM(2), HECO-9TERM, HECO-9ESCO, HECO-9DB)
9. Workers Compensation Insurance Certificate (HECO-9a)
10. Standard Performance Bond (HECO-10)
11. Standard Labor and Material Payment Bond (HECO-10.1)
12. Change Order blank (HECO-11)
13. Change Order Estimate (General Contractor) (HECO-GC-1)
14. Change Order Estimate (Subcontractor) (HECO-SC-1)
15. Change Order Estimate (Sub-subcontractor) (HECO-SS-1)
16. Schedule of Values and Certificate for Payment (HECO-12)
17. Affidavit of Payment of Claims (HECO-13)
18. Final Report of Structural Special Inspections (HECO-13.1b)
19. Certificate of Completion by Contractor (HECO-13.2)
20. Certificate of Partial or Substantial Completion by Contractor (HECO-13.2a)
21. Certificate of Completion by Architect/Engineer (HECO 13.1)
22. Certificate of Partial or Substantial Completion by Architect/Engineer (HECO 13.1a)
23. List of Drawings
24. Submittal Register Format (refer to example DGS-30-364)
25. Vendor eVA Registration Requirements
26. VEES Verification (DGS-30-381)
27. Structural and Special Inspections List (DGS CO-6b)
28. Division 1 - General Requirements, Special Conditions, etc.
29. Technical Specifications:
 - a. Technical Specification Sections shall be numbered with appropriate five-digit section numbers corresponding to the CSI Masterformat Broadscope numbering system. The numbering system shall be consistent within the entire submittal.
 - b. Technical Sections should, where possible, be subdivided into the Part I - General, Part II - Products, Part III - Execution format.
30. Appendices containing Soils Report, Asbestos Inspection Survey Report, Lead Inspection Survey Report, Lead-based Paint Report and/or other information pertinent to the project but not a part of the Work. Such material should be noted as "INFORMATION ONLY" for use by the Contractor as he/her deems appropriate.
31. All blank pages should be removed from the final version of the Project Manual.

Note: CSI Master format numbering is subject to change. Changes under consideration shall be incorporated by the A/E.

For "On-Demand" (Make/Buy) bidding the Table of Contents shall include applicable requirements of the above, but should indicate the following documents as "Included by reference": HECO-9, HECO-9a, HECO-10, HECO-10.1, HECO-11, HECO-12, HECO-13.2, and HECO-13.2a.

8.3.3 General Conditions of the Construction Contract: The General Conditions for the Construction Contract (CO-7) are standard documents required to be incorporated in the documents for all building related construction, renovation, addition, and/or repair projects for

which plans and specifications are prepared. The General Conditions (CO-7) have very significant legal implications and, as such, have been reviewed by the Office of the Attorney General. No item of the General Conditions may be amended or deleted or its intent changed without prior written approval of the Vice President of Facilities.

The A/E shall be familiar with the above requirements and provisions and shall coordinate the requirements in the Specifications with those in the above documents.

8.3.4 Supplemental General Conditions: The Supplemental General Conditions modify, amend or delete specific portions of the General Conditions. Where it is necessary to modify or amend a section of the General Conditions the changes shall be set forth and labeled “Supplemental General Conditions”, and shall be submitted for review and approval by the Vice President of Facilities. Excluding those specific modifications provided in Appendix A such as for Section 11 (Contractor’s and Subcontractor’s Insurance, Section 12 (“All-Risk Builder’s Risk Insurance), Section 25 (Fees, Services and Facilities), or Section 43 (Damages for Delay; Extensions of Time) for liquidated damages, any proposed modification or amendment shall first be approved.

Supplemental General Conditions shall be incorporated in all documents that require the General Conditions of the Construction Contract form CO-7. The Supplemental General Conditions provide for the inclusion of Small Businesses and Women –Owned and Minority Owned (SWAM) Business.

Liquidated Damages: The University reserves the right to include Liquidated Damages in Construction Contracts. If the University opts to include Liquidated Damages, the Director of Purchasing & Fiscal Services shall prepare a justification for doing so and attach documentation on how the proposed amount per day was determined. The justification shall document costs that can be clearly identified and defended in court such as project management costs, rental costs, transportation costs associated with the work and the like. It shall NOT include speculative costs, such as loss of future revenue. This information will be presented to the Vice President of Facilities and the University’s Legal Counsel for review and approval before incorporating Liquidated Damages in to the construction documents.

8.3.5 Special Conditions: The “Special Conditions” set forth specific requirements that are peculiar to the specific project. These include such items as hours of work restrictions, Contractor office and storage area restrictions, coordination requirements for utility interruptions, hazardous material data sheet submittals, and so forth. The Special Conditions shall be included in Division 1 of the Technical Specifications.

8.3.6 Instructions to Bidders, CO-7a(s): The Instructions to Bidders, CO -7a, is a standard document which has been written to conform to the requirements and procedures of the Mason Procurement & Payment. The Instructions to Bidders shall be reproduced and included in the Documents without modification. They shall not be retyped. The requirements and procedures delineated in the Instructions to Bidders have significant legal implications and shall not be changed without the prior written approval of the Vice President of Facilities.

The Architect/Engineer for the project shall be familiar with and conform to the requirements of the Instructions to Bidders, Form CO-7a.

Information on where Bid Documents can be viewed and shipping charges, if any, be should be placed in the Advertisement and Notice of Invitation for Bids. See Chapter 9.

8.3.7 Types of Specifications: The following three types of specifications are used on University projects.

1. **Non-proprietary or Performance Specifications:** This is the preferred method of specifying materials, equipment and systems. A non-proprietary specification shall be written either as (a) a generic performance specification (preferred); or as (b) a specification naming several manufacturers with associated model or series numbers.
 - a. A generic performance specification must be written to describe the required characteristics, performance standards, capacities, quality, size or dimensions, etc. of the item or system. A minimum of three manufacturers must be able to meet all requirements shown in the specification. The specification shall not be contrived so as to exclude any of the three manufacturers or to benefit any one manufacturer over any of the other manufacturers. The performance specification shall not name manufacturers or brand name products.
 - b. A manufacturer/model number type specification must list several manufacturers with their respective model numbers. Each of the listed manufacturers/model numbers must have been determined by the A/E to meet the specifications and be acceptable. If a named manufacturer prepackages or pre-assembles its item or system, the model number shall be specified. If the named manufacturer(s) custom builds the item or system, naming of model numbers is not required.
 - c. The manufacturer/model specification must describe the required characteristics, performance standards, and capacities which will be used to determine equal products as allowed by Section 26 of the General Conditions. Do not specify extraneous characteristics that do not relate to the products performance or suitability for the project. If only two acceptable manufacturers can be found and documented by model number but other equal products are acceptable if found by the bidder, the A/E may request permission from the Vice President of Facilities to list only those two manufacturers but consider equals if proposed by the Contractor.
 - d. Where a particular manufacturer's product is indicated as the basis for design/detail, the following statement shall be placed on the drawing with appropriate noting/references:

“The design/detail/section shown is based on (manufacturer, model) equipment and is intended only to show the general size, configuration, location, connections and/or support for equipment or systems specified with relation to the other building systems. See specification for technical requirements pertaining to the product.”

2. **Proprietary Specifications:** A specification is proprietary if it fails to meet requirements of a non-proprietary specification. Although a proprietary specification should be avoided because it restricts competition, circumstances such as space limitations, mandatory performance standards, compatibility with an existing system, etc, may leave no other reasonable choice (see below). Two typical situations that may require proprietary specifications are:

- a. when only two manufacturers or suppliers provide an acceptable product or system, when there are no equals and when no substitutions are allowed; or
- b. when there is only one manufacturer but two or more vendors or suppliers can purchase the material and compete to provide the product or system to contractors or bidders.

Proprietary specifications may be used when the University Project Manager or A/E requests and receives, in writing, authority from the Vice President of Facilities to use a proprietary specification. The University Project Manager or A/E must request authority as soon as the need for the specification is recognized, preferably in the preliminary design stage but definitely prior to submission of Working Drawings/Contract Documents. The request shall explain why the proprietary specification is necessary.

If proprietary specification authorization is granted, the specification shall state that “the product shall be used to the exclusion of all others and no other product will be considered to be equal.”

3. **Sole Source Specifications:** A specification is sole source when it names only one manufacturer or product to the exclusion of others, or when it is contrived so that only one manufacturer, product, or supplier can satisfy the specification. Because it eliminates all competition, it can be used only in the most exceptional circumstances and under the strictest conditions. A product or piece of equipment which is available only thru an area franchised vendor is also considered to be a Sole Source item.

It is the policy of the University that contracts are to be awarded on a competitive basis and that the use of sole source procurement be limited to those instances where only one source is practically available that will meet the specific requirements of the project.

Sole source specifications may be used when the University Project Manager or A/E requests and receives, in writing, authority from the Vice President of Facilities to use a Sole Source specification. The University Project Manager or A/E must request authority as soon as the need for the specification is recognized, preferably in the preliminary design stage but definitely prior to submission of the Contract Documents.

The justification for a sole source request shall address the following (by number and order) in a direct and concise manner:

- a. Explain why this is the only product or service that can meet the needs of the University.
- b. Explain why this vendor is the only practicably available source from which to obtain this product or service.
- c. Explain why the price is considered reasonable.
- d. Describe the efforts that were made to conduct a noncompetitive negotiation to get the best possible price.

Prior to advertising the project for bids, the University shall either procure the sole source item and specify it as University furnished/Contractor installed or the University shall negotiate a fixed price for the item or system with the sole source vendor and require that the vendor provide the specified Sole Source Work as a subcontract to the bidder who is awarded the contract. In the latter case, the Bid Form shall show the vendor's name and the subcontract price for the item/system to be included in the Contractor's bid. See Sample Bid Form Format for required wording. The University shall procure the item or system (including installation where applicable) in accordance with the provisions of University Procurement Policy.

8.3.8 Virginia Manufactured Products: Pursuant to House Joint Resolution No. 3 of the 1984 Session of the General Assembly, when brand and/or manufacturers names are specified and one or more of those named are known to be Virginia based vendors and/or contractors, those known Virginia based vendors or contractors shall be listed prior to listing non-Virginia based firms.

8.3.9 Use of Standard or Guide Specifications: The use of standardized specifications or guide specs as a basis or resource for editing has many advantages for the A/E, the Reviewer and the Contractor. Performance guide specifications prepared by Masterspec, Spectext, the U. S. Navy and the Corps of Engineers are acceptable for editing. These guide specifications are available from the AIA, the CSI, the National Institute of Building Sciences in Washington, D. C., and others.

The A/E shall edit the guide specifications to include only the materials, requirements, and procedures applicable to the project. Specifications that are submitted without editing will be rejected as an incomplete submittal and appropriate notation made on the A/E's performance evaluation.

Where Navy or Corps of Engineers guide specifications are used on a project, they shall be edited to delete references to Military specifications and Federal Specifications. References to the Contracting Officer should be changed to the University. Also, requirements for tests, inspections, visits to the manufacturer's plant, etc. which are not normally required for state projects shall be deleted.

8.3.10 Restrictive Specifications and Performance Requirements: The A/E shall not require samples, shop drawings, or similar materials to be submitted for approval prior to receipt of bids.

The specifications must contain sufficient information to describe to the contractor and bidders the performance and quality standards that will be used to evaluate the submittals.

8.3.10.1 Bidder Experience: Number of years of experience, or time in business, shall not be specified as a basis for award of contract. This applies not only to contractors, but also suppliers of equipment.

8.3.10.2 Prequalification of Special Systems: Complex and/or sensitive systems such as locking systems, detention equipment and security control systems for prisons often require manufacturers with a proven history of reliable, operable equipment in special situations with minimal malfunctions, as well as subcontractors who are experienced installers of that manufacturer's products. In such instances, the University and A/E will develop the necessary documents to justify the use of proprietary products in accord with Section 8.3.7.1 and 8.3.7.2 and prequalify the subcontractors in accord with Section 10.1. The names of those prequalified shall be listed in the bid documents for use by all general contract bidders

8.3.11 Equal materials, equipment or assemblies: Any brand, make or manufacturer of a product, assembly or equipment which in the opinion of the A/E is the equal of that specified, considering quality, capabilities, workmanship, configuration, economy of operation, useful life, compatibility with design of the work, and suitability for the intended purpose, will be accepted unless rejected by the University as not being equal.

8.3.12 Substitute materials, equipment or assemblies: The General Conditions permit the Contractor to propose a substitute or alternate material, product, equipment, or assembly which deviates from the requirements of the Contract Documents but which the Contractor deems will perform the same function and have equal capabilities, service life, economy of operations, and suitability for the intended purpose. Examples of substitutes or alternates include proposing to substitute "precast concrete" for "cast-in-place concrete" floors or to substitute "precast concrete panels" for "masonry" walls. The Contractor's proposal must include any cost differentials proposed. The University would have the A/E provide an initial evaluation of such proposed substitutes to include a recommendation on acceptability and indicate the A/E's redesign fee to incorporate the substitution in the design. If the proposed substitute is acceptable to the University, a Change Order would be proposed to the Contractor to accept the substitute and to deduct the cost of the A/E redesign fee and the proposed cost savings from the Contractor's Contract amount. The University will have the right to limit or reject substitutions at its sole discretion.

8.3.13 Unit Prices: Certain aspects of construction projects, such as the depth to suitable foundation bearing for footings, piles or caissons, or the locations and amount of rock to be encountered and removed often must be estimated based on limited factual data. In such situations, to ensure fairness for the University, the Bidders and the successful bidding Contractor, estimated quantities are shown for unit pricing and determining the low bidder. A statement is included on the Bid Form stating that actual quantities will be measured for the listed work and that the Contract Price will be adjusted upward or downward by change order to reflect the actual quantities involved times the Contractor's unit price shown on the Bid Form (unless such prices have been modified by the Contract). See Standard Bid Form Format in Appendix C.

Where unit prices are used to competitively bid work that may vary depending on actual conditions encountered, the following method shall be used:

1. The A/E shall provide on the Bid Form the unit price schedule to include an estimated quantity of each work task or material listed. The estimated quantities should be reasonably accurate based on the best available information and the designers experience and judgment.
2. The bidders insert the unit prices for each and extend the estimated quantity times unit price to yield a cost.
3. The extended costs will then be added to the base bid for other work to give a total base bid.
4. A statement shall be included on the Bid Form stating that the payment for work listed in the unit price schedule will be based on actual quantities of listed items required for completion of the work.

Example of Unit Price Method and Wording

Base Bids for Parts C, D and E shall be based on the estimated quantities indicated to be provided complete and in accordance with the applicable portions of the plans and specifications. Payment amounts for each of these items will be based on the actual quantities authorized, provided and approved times the unit costs indicated by the bidder. The final contract amount shall be adjusted upward or downward based on the actual payment amounts versus the bid amounts for PARTS C, D and E.

Part C. - Excavation of Additional Unsuitable Material

Excavation of unsuitable material, where authorized or directed, below the levels required for the Work in Parts A and B and backfill with compacted material per specifications. (price per cubic yard) (Final amount shall be adjusted upward or downward based on actual quantity authorized)
Estimated quantity of 150 cubic yards @ \$_____ per cubic yard = _____
(A/E fill in estimated quantity to be included in bid)

Part C = _____ Dollars \$

Part D. - Piling (Example for Timber Piling)

Timber piling provided complete in place in accordance with the plans and specifications (Priced per each pile at the indicated length):

40' Timber Piling 60 ea @ \$ ea = \$ 30' Timber Piling 20 ea @ \$ ea = \$

Part D = _____ Dollars \$

Part E. - Caissons (Sample for Caisson Foundations) Cast-in-place concrete caissons complete in place in accordance with the plans and specifications (Priced per linear foot of caisson complete and accepted for each caisson diameter):

36 inch Diameter 250 linear feet @ \$ / linear feet =\$ _____

48 inch Diameter 175 linear feet @ \$ / linear feet =\$ _____

Part E = _____ Dollars \$

8.3.14 Specifying New Types of Materials Equipment or Systems: Projects for the University are not testing grounds for materials or equipment new to the market within the last five (5) years; however, the fact that a material is newly developed does not preclude its use if documentation of independent laboratory tests clearly shows that the material will meet the applicable requirements for the project. The Vice President of Facilities must approve such utilization.

Unless the manufacturer of a new material furnishes factual data sufficient to evaluate the material, it should not be considered for use. If a new material is considered for use, a competitive-type specification must be written to assure that a competitive; good-quality product will be obtained. The Vice President of Facilities may, where justified, authorize use of a new material, equipment or system for a particular project on a trial basis for observation/evaluation.

8.3.15 Phraseology: Specifications must clearly indicate the requirements for the project. Words or phrases that are vague or may be interpreted more than one way often lead to problems during bidding or construction and result in change order claims/requests. The following instructions are intended to reduce common errors and conflicts evolving from interpretations of the specifications:

1. Under “Requirements”, do not say “the Work consists of ...” Drawings should show the entire scope of the Work. If necessary to list certain parts, say “Generally, the Work includes...”
2. In lieu of reference to the accompanying drawings, use the words “as shown”, “as indicated”, “as detailed” or “as approved by ...,” “as directed by,” “as permitted by”
3. There are two parties to the Construction Contract: (1) the University for whom the Work will be performed and (2) the Contractor who has the responsibility to the University for all Work in the Contract. Do not name which subcontractor will do the work (i.e., the plumbing contractor, the earthwork contractor, etc.). The Contractor is responsible for determining the packages of work for each subcontract. It is acceptable for certain specialty work to be performed by persons qualified, certified or licensed (if appropriate) and experienced in this type of work.
4. Do not use “etc.” This term is too indefinite for bidding and inspection purposes.
5. Minimize the use of cross-references and in no case use paragraph numbers for this purpose. If necessary to refer to a particular paragraph, do so by its section number and title (e.g. Section 03300, Cast-in-Place Concrete).
6. Do not set up a paragraph in the various sections entitled “Work not included.”
7. Describe the work that is included under the respective sections.

8. Specifications should clearly delineate air conditioning ducts, heating ducts and piping systems that are required to be insulated. The phrase “insulating all ducts except in conditioned spaces” has resulted in differences of opinion and claim situations. All duct systems should be appropriately designated as supply, exhaust, outside air intake, transfer, relief, or return and further clarified by stating insulating requirements.
9. Do not confuse any and all; “Correct any defects” should read “correct all defects”
10. Do not confuse the words “either” and “both”; e.g., “Paint sheet metal on either side” should read “Paint sheet metal on both sides”. “Either” implies a choice.
11. Do not confuse “or” and “and”; e.g., “The equipment shall not have defects in workmanship and material.” The use of “and” in this sentence indicates both requirements must be met. e.g. “Additives that decrease strength or durability are not permitted.” The use of “or” implies either condition would disqualify the additive.
12. Do not use “and/or”. The courts have considered this phrase to be intentionally ambiguous and, therefore, claims are often rendered in favor of the Contractor.
13. Use statements that are definite and contain no ambiguous words and phrases.
14. “Remove” implies to take away from its current location. If “remove” is used, the A/E must also indicate whether to dispose of, salvage or re-install the material “removed”.
15. “Reinstall” implies put existing back in an indicated place. If “reinstall” is used, the A/E must also indicate that the Contractor must carefully remove the item, properly store it, and then “reinstall” the item at the appropriate time.
16. “Replace” implies removal of old material and furnish and install new material. The preferred wording would be to “remove” and “provide”
17. “Provide” is defined as “furnish and install”. When material or equipment is “furnished” by the University directly or under other contracts for installation by the Contractor, the term, “install” should be used; however, the Contractor may be required to “provide” foundations, fastenings, etc., for the installation. If the word “install” is used alone, the Bidder or Contractor has a right to assume, on the basis of the definition cited, that the University will “furnish” the materials in question.

8.3.16 Specifications on CD, DVD, Bluray, or Flash Drive: The University requires the A/E to provide one copy of the final completed Divisions 1 thru 16 specifications including addenda. As required by Appendix Q.

8.3.17 Hardware Specifications and Schedules: Hardware specifications and schedules may be written to specify the applicable Builders Hardware Manufacturer's Association (BHMA) / American National Standards Institute (ANSI) standards and designations or the specifications and schedules may be written by specifying three manufacturers and model numbers for each item. In

either case the specifications must give sufficient information of the type, size, function, finish, etc., for the vendor to know what is required and for the A/E to evaluate the submittals. See Mason Design Manual for proprietary hardware information.

SECTION 8.4 COST ESTIMATE STANDARDS

Detailed descriptions and requirements for cost estimates are provided in Appendix E. A detailed cost estimate consistent with the level of design is required from the A/E with each submittal. A Building Cost Summary form shall be completed indicating the estimated cost of each system included in the project. The system quantity, system unit cost and unit cost per building square foot shall be shown on the form. Backup estimating information, including quotes of estimated cost for major items of equipment or built-in systems, shall accompany the Building Cost Summary form.

A required independent cost estimate will be provided by the University for the Preliminary Submittal. The A/E and independent cost estimator shall endeavor to reconcile differences in the estimates. On large projects, where construction cost versus budget is in doubt, the University may also obtain an independent cost estimate based on the final plans and specifications.

SECTION 8.5 DESIGN INITIATION/PRE-DESIGN CONFERENCE

The University shall arrange for a pre-design conference. Participants should include the Assistant Vice President for Planning, Design, & Construction, Assistant Vice President for Capital Strategy & Planning, CS&P Campus Planner, Facilities Project Manager, the A/E's Project Manager and the responsible designer in each discipline (architect, civil, structural, mechanical, and electrical and others if needed).

If the University determines that such a conference is not needed for the project, the University shall notify the listed participants in writing, of the decision.

The purpose of the pre-design conference is to clarify to all parties involved the procedures, needs and requirements for the particular project. Therefore, it may be beneficial to all for an A/E providing services for the first time on state work to have the pre-design conference before the fees and terms of the A/E Contract are finalized.

The following is a sample of topics that may be included in the pre-design conference agenda:

1. Introduction of Attendees
2. Authorized Communications
3. Design not to exceed Construction Budget
4. Proposed Design Schedule
5. Requirements of the Manual related to the University Procurement Policy, Chapters 7-10 of the Manual, and Fire Safety Reviews
6. Clarification / Resolution of Budget Development Comments
7. Submittal Contents
8. Review Requirements
9. Intent of Review Comments

10. Waivers and Code Modifications
11. Sole Source/Proprietary Specifications
12. Use of Standard HECO and CO Forms and Formats
13. Value Engineering
14. Prequalification of Contractors
15. Other Regulatory Reviews
16. Design Approach

Project Scope to include:

1. Functional layout requirements
2. Type of occupancy and activities to be housed
3. Capacity requirements of spaces and/or building
4. Exterior finish or appearance requirements
5. Interior finish requirements
6. Types of construction or materials required
7. Style and character of building desired
8. Special considerations such as expansion
9. Floor and Roof Live Load, Wind Load, and Seismic Design Criteria
10. Special HVAC or environmental requirements and existing systems and requirements.
11. Fuel Analyses & Selection
12. Special electrical power or lighting requirements and existing systems and requirements.
13. Schedule requirements for design and for occupancy
14. Geotechnical data requirements
15. Site particulars and requirements -A/E's questions and clarifications

SECTION 8.6 SCHEMATIC DESIGN/PROJECT CRITERIA

8.6.1 General Requirements: Unless waived by the CO-2/HECO-2 Action Wording, a schematic design/project criteria submittal shall be made to the Building Official. The purpose of the schematic submittal is to further develop data, detail and scope including schematic plans, as well as verify the data and program contained in the Capital Project Request or departmental MOU. The project scope established by the schematic design, as agreed to by the University and the A/E, shall become a part of the A/E Contract as further definition of the scope described in the Capital Project Request Data.

The Schematic submittal shall include an updated/current copy of the Capital Budget Request, an Assignable Room and Space Listing, or Department MOU which was the basis for development of the Schematic Design.

A schematic “On Board” review meeting with the Building Official may be requested by the University, A/E, or University Project Manager to assist in verifying the design and program approach, the systems proposed for the project and/or to resolve issues raised by the review of the Schematic submittal.

A Schematic Design presentation to the State Art and Architectural Review Board and the University Architectural Review Committee is required. (See Appendix L) Reviews by the University Steering Committee are also required. Also, see the Mason Design & Construction Guidelines.

All review issues must be resolved before the A/E is authorized to proceed with the preliminary design.

8.6.1.1 Verification of Existing Conditions: The A/E shall visit the site and ascertain pertinent local conditions that must be addressed in the design. As part of the required services, it is the A/E's responsibility to verify, by on-site observations of applicable existing buildings, the configurations, locations, dimensions, sizes and conditions accessible for verification. Certain assumptions are made regarding existing conditions in the remodeling and or rehabilitation of an existing building. Some of these assumptions may not be verifiable without additional exploration or investigation of the building or site. To minimize the risk during construction of uncovering conditions that are not as shown on the documents and delaying project progress, the Agency should consider and evaluate the advice of the A/E to conduct additional investigation, verifications or checks to verify.

8.6.2 Basis of Design Narrative: The Schematic Design shall include a Basis of Design Narrative which provides the following information: See Appendix D for Narrative requirements.

8.6.3 Schematic Drawings: The following drawings shall be included as a minimum:

Title Sheet & Code Compliance Plans (G) Plans (G)

1. Project Identification: Agency, Project Code Number, Appropriation Act Title
2. Activity or function(s) to be performed in the facility
3. Edition (year) of the USBC on which the design is based.
4. Applicable accessibility standards.
5. VCC Construction Type.
6. (Use) Group(s) per VCC. For mixed-use occupancies, indicate which Groups are separated and non-separated.
7. Other major code(s) used as a basis for design.
8. Indicate if High Performance Buildings Act is applicable.
9. Identify the applicable Virginia Energy Conservation Code Compliance Statement (Refer to Section 7.2.7).
10. Location and vicinity maps noted to show project location.
11. Tabulation of GSF per floor (new and renovated), total GSF (all floors - new and renovated), total building volume.
12. Tabulation of "Building Area" per VCC definition (per story).
13. Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
14. Design occupant load for each level and total for the building.
15. Index of drawings.
16. The uniform date of the completed schematic design documents.

17. Statement documenting whether the local emergency public safety personnel utilizes public safety wireless communications.

Architectural Drawings (A)

The following drawings shall be included as a minimum:

1. Architectural Floor plans of each floor showing space names, nominal room sizes, and circulation paths.
2. Architectural Roof plan showing roof slopes and drainage.
3. Longitudinal building section with floor to floor and floor to ceiling dimensions
4. Transverse building section
5. Exterior elevations
6. Structural plan of a typical supported floor framing scheme and a typical section showing the proposed components of the floor system
7. Orientation and approximate location of proposed roads, walks and parking on a site plan
8. The rooms and spaces to be protected by any proposed fire suppression system (including clean agent) and the proposed locations of the major fire suppression system components.
9. Any other information that is of value to the Agency and the Architect/ Engineer reviewing the project.

Life Safety (G) Drawings

Provide the following as a minimum:

1. Indicate whether or not the building will be equipped with fire protection sprinkler system and/or fire detection/fire alarm systems.
2. Design occupant load(s), including the number of occupants to be accommodated in each space. The determination for the occupants is based on the use and function of the spaces.
3. Indicate paths for means of egress, paths of exit access, travel distances to exits and common paths of travel.
4. Indicate specific locations where access controls or security locking systems will be provided within means of egress paths.
5. Identify projects that will have partial or phased occupancy.
6. Indicate fire-resistance rating(s) of all proposed assemblies. Completely show the continuity of the rated assemblies using reference symbols.

8.6.4 Cost Estimate: See Appendix E for Schematic Cost Estimate requirements.

SECTION 8.7 PRELIMINARY DESIGN

8.7.1 General Requirements: Based on the previous approvals and direction, the A/E shall prepare the Preliminary Design consisting of drawings, narrative, outline specifications, and other documents to fix and describe the size and character of the entire Project as to exterior appearance; foundation, structural, mechanical, and electrical system; materials; and such other essentials as may be appropriate. If any change from the information submitted at the schematic stage relating

to the mix or amount of space occurs, submit new information in the format of an updated/current copy of the Capital Budget Request, an Assignable Room and Space Listing, or Department MOU which was the basis for development of the Preliminary Design.

8.7.1.1 Verification of Existing Conditions: The A/E shall visit the site and ascertain pertinent local conditions that must be addressed in the design. As part of the required services, it is the A/E's responsibility to verify, by on-site observations of applicable existing buildings, the configurations, locations, dimensions, sizes and conditions accessible for verification. Certain assumptions are made regarding existing conditions in the remodeling and or rehabilitation of an existing building. Some of these assumptions may not be verifiable without additional exploration or investigation of the building or site. To minimize the risk during construction of uncovering conditions that are not as shown on the documents and delaying project progress, the Agency should consider and evaluate the advice of the A/E to conduct additional investigation, verifications or checks to verify.

8.7.2 Preliminary Cost Estimate: The A/E shall submit to the University an estimate of the construction cost of the proposed design without regard to available funds. The estimate shall relate only to the estimated bid amount for the construction shown and shall not include fees or unknown contingencies. The cost estimate summary shall include any built-in equipment, even if such equipment is bid separately. Any proposed additive bid items must be justified and indicated by a separately stated estimate amount. The cost estimate must indicate the derivation of the pricing for the estimate and shall, as a minimum, for an Architectural project, include the data required by Appendix E (Cost Estimate).

Utilities, sitework, civil and other special projects such as boiler installation; a utility system; a road system; a water plant; a wastewater plant; a refrigeration or chiller installation; etc., must be estimated on a quantitative basis for the major components and a lump sum estimate for the remainder.

Preliminary submissions shall be deemed to be incomplete if the above are not included.

8.7.3 Value Engineering: For every Project whose construction cost is valued at \$5,000,000 or more, the Commonwealth requires that a Value Engineering study be performed. (See §2.2-1133 Code of Virginia. The procedure for conducting the Value Engineering Study shall comply with Section 8.14. For projects which are delivered through Design/Build or Construction Manager at Risk, the University Project Manager can request a waiver for the Value Engineering from the Vice President of Facilities. The theory is that Value Engineering is continuous with these two construction delivery processes and doing a separate VE study would be redundant. The University must seek and receive written approval from DGS requests that a written log of the value engineering decisions be submitted to DGS, so University Project Managers are advised to keep records accordingly. The University is required to report value engineering activity each year. This report includes a summary of the amount saved and general categories of savings.

8.7.4 Review Process: The A/E shall prepare and submit to the University Project Manager, in quantities specified, black line prints of all drawings together with copies of cost estimates, Narrative, reports and other data as set forth below. After the University Project Manager reviews the submittal, one set of review comments will be provided E-Mailed to the A/E for response

and/or resolution. Unless otherwise relieved at the Schematic Design presentations, a Preliminary Design presentation to the State Art and Architectural Review Board is required. (See Appendix L) Reviews by the University Steering Committee, are also required. The University Project Manager shall evaluate the need for the following reviews and assign responsibility accordingly:

1. Fire Safety Review
2. Erosion and Sediment Control Storm Water Management
3. Department of Historic Resources (As required)
4. Department of Health
5. State Water Control Board
6. Department of Air Pollution Control
7. Department of Waste Management
8. Community Advisory Board

The submittal documents along with the review comments and the agreed upon resolutions of the comments shall be the basis of the approval for the A/E to prepare the working drawings. The A/E shall not proceed with the development of the Contract Documents until all issues in the reviews are agreed to by the University.

8.7.5 Preliminary Submittal Requirements: The following information and data shall be the minimum acceptable requirements for a Capital Outlay project:

1. Basis of Design Narrative describing the project scope, the functional and operational criteria to be met, the justification for the decisions or choices made, and any proposed deviations from the standards required by this Manual. See Appendix D.
2. Cost estimate per Section 8.4 Cost Estimate Standards.
3. Soils report to include boring logs, geotechnical analysis and foundation design recommendations. (For new construction and additions)
4. Preliminary drawings as described hereafter.

Preliminary submittals shall include ventilation design criteria and sufficient data to show compliance with code requirements and standards of good practice.

8.7.6 General Requirements for Preliminary Drawings: Preliminary drawings shall show the following information unless such information is not applicable to the project:

Title Sheet(s)

1. Project Identification: Project Code, Appropriation Act number, and University Work Order number (if applicable).
2. Activity or function(s) to be performed in the facility
3. Edition of the USBC (Part I VCC or Part II VEBC) on which design is based
4. For design on Part II (VEBC), classify work as *repairs*, *alterations* (clarify Level 1 or Level 2), change of occupancy, addition, historic building or moved building.
5. Applicable accessibility standards
6. VCC Construction Type
7. Activity or function(s) to be performed in the facility
8. (Use) Group(s) per VCC. For mixed-use occupancies, indicate which Groups are separated and non-separated
9. Other major code(s) used as a basis for design
10. Asbestos Disclosure Statement and Lead Disclosure Statement.
11. The applicable High-Performance Buildings Act Compliance Statement (Refer to Section 7.2.6 and Appendix D)
12. The applicable Virginia Energy Conservation Code Compliance Statement (Refer to Section 7.2.7 and Appendix D)
13. Maximum VCC occupancy for each level and total for the building.
14. Location and vicinity maps noted to show project location.
15. Tabulation of GSF per floor (new and renovated), total GSF, (all floors – new and renovated), total building volume.
16. Tabulation of “Building Area” per VCC definition (per story).
17. Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
18. Statement for exception to providing Baby Changing Facilities, if applicable (Refer to Section 7.2.11.2)
19. Building Purpose/Occupancy.
20. Design occupancy load for each level and total for the building
21. Index of drawings.
22. The uniform date of the completed preliminary design documents
23. Agency approved Delegated Design list
24. Structural Observations: State N/A or list the specification sections that require Structural Observations. (Refer to Section 8.15.1)
25. Statement documenting whether the local emergency public safety personnel utilizes public safety wireless communications.

Site Plans (site/improvement plan & composite utility plan minimum for new construction and additions; should be based on approved comprehensive Master Plan.):

1. Plan scale and north arrow.
2. New and existing elevation contours affected by the new work.
3. Floor and contour elevations.
4. Applicable boundaries with survey computations.
5. Location and dimensioned relationship of major components of the new work with respect to boundaries and existing structures.
6. FEMA floodplain designation(s). Show floodplain boundaries. Show the base flood elevation for sites in the 100-year or 500-year floodplains

7. Location of test borings.
8. Location and quantities of general parking and handicap parking.
9. Accessible routes
10. Pedestrian traffic routes.
11. Items to be demolished: structures, walks, utilities, trees, etc.
12. Proposed landscaping (planting materials)
13. Existing and new utilities: storm drainage, sanitary sewers, water distribution, fuel gas distribution, building utility distribution pipes and tunnels, electric and telephone poles and lines, hydrant locations, and data on fire flow test, etc.
14. Site improvements such as fencing, lighting, etc.
15. Typical paving section for proposed types/thicknesses.
16. Identify/show special earthwork recommended and construction considerations noted in soils report.
17. Archaeology Features

Demolition Drawings:

For Interior Demolition:

1. Identify items to be removed;
2. Asbestos Disclosure Statement;
3. Lead Disclosure Statement

For Total Building Demolition:

1. Provide a floor plan showing building size;
2. Describe existing material /construction to be removed;
3. Show an elevation (drawn or photographic) of building;
4. Asbestos Disclosure Statement
5. Lead Disclosure Statement.
6. AARB Approval Letter

Architectural Drawings:

Floor Plans (for each floor):

1. Plans of each floor at 1/8" = 1'-0" minimum (1/16" = 1'-0" must be justified)
2. Overall dimensions.
3. Space names and/or numbers assigned by the Planning and Design, and number of occupants of all spaces.
4. If the work is an addition, show the relationship of new to existing spaces.
5. Distinguish new work from existing construction.
6. Show demolition on the architectural plans or separate plans.
7. Indicate asbestos locations regardless of who removes it or how it is removed.
8. Indicate all openings, entrances, delivery areas (including door numbers).
9. Identification of accessible routes, accessible building entrances, and Areas of Refuge (Rescue Assistance).
10. Plan scale and north arrow.

Roof Plan:

1. All proposed and existing drains.
2. Roof slope: 1/4" per 1'-0" to drain minimum for all areas (unless waived for re-roofing) including auxiliary drains.
3. Indicate slope (high to low) with direction arrows
4. All new and existing equipment.
5. All significant roof penetrations and structures.
6. Identification of materials on existing roofs and new roofs.
7. Typical roofing section identifying materials.
8. Access to roof.

Exterior Elevations (Scale 1/16" = 1'-0" minimum):

1. All openings: windows (including operable notation), doors, louvers, and vents.
2. Percentage of glass vs. gross wall area (per elevation and/or exposure).
3. Floor elevations (above sea level).
4. Identification of all major finishes.
5. All stairs, ramps, and railings.
6. Rooftop equipment, vents, stacks, penetrations, and structures.
7. Expansion and control joints.
8. Grade at the face of the building wall.
9. Subsurface construction (dotted in).
10. Existing and new work clearly distinguished.

Building Cross Sections (Scale: 1/16" = 1'-0" minimum):

1. One longitudinal and one transverse section minimum.
2. Show all floor levels on sections.
3. Indicate ceilings in proper relation to floors.
4. Method and extent of insulating exterior envelope.

Wall Sections (Scale: 3/4" = 1'-0" minimum):

1. One section for each type of wall construction.
2. Identify all major materials and components.
3. Identify insulation and note "R" value.
4. Identification of air barrier and moisture barrier

Finish Schedule:

1. May be included in the Basis of Design narrative or on drawing. Indicate proposed finishes for all spaces. Note those existing finishes to remain.
2. Show ceiling heights of interior spaces.

Furnishing/Equipment Plans:

1. Show all major equipment to approximate scale.
2. Show all built-in furnishings to scale.
3. Show on these plans or on separate furniture information plans, furniture/furnishings outlines that the space was designed to accommodate.

Structural Drawings:

1. Provide Live Loads, Snow Loads, Wind Loads, and Seismic Criteria used for structural design. Refer to VCC Chapter 16. In the Seismic Criteria, also include the building height, H_n and the fundamental period used, T .
2. Show design bearing / support capacity (soil bearing, pile capacity, caisson capacity) for foundation system geo-tech design criteria for shallow and deep foundations and earth structures.
3. Provide the design lateral active and at-rest earth pressures, where applicable.
4. Provide foundation Plan indicating type & tentative sizes
5. Provide foundation details and improved improvements to bearing strata and other special requirements.
6. Provide Floor and roof Framing Plans of each level indicating type of system and tentative member sizes/depths and column spacing with defined grid lines.
7. Provide Typical Section(s) of framing identifying materials, tentative member sizes, thicknesses and, depths proposed.
8. Provide Typical Section of floor system.
9. Indicate structural construction materials and properties.
10. Provide Details of connections to existing buildings, if applicable.
11. Identify elements of proposed lateral force resisting system.

Code Compliance & Life Safety (G) Plans:

1. Applicable edition of USBC and other applicable codes, including accessibility standards.
2. For existing buildings, compliance with the VEBC shall first be established. The work performed on an existing building or structure must be classified on the construction drawings as repairs, alterations, change of occupancy, addition, historic building or moved building, as further defined in the VEBC. Alterations to be further classified as Level 1 or Level 2.
3. Define each Use Group area and show its USBC Use Group classification
4. Height and area calculations in accord with USBC.
5. Total building perimeter (linear feet)
6. Location of all 30' wide open perimeter spaces
7. Tabulation of area for each building level, story, or floor indicating number of occupants accommodated by each. If the project is an addition, list new and existing areas and occupancies.
8. Required or intended fire protection systems, fire detection and alarm systems, fire pump systems, smoke control systems.
9. Indicate use(s) of all building spaces (offices, auditoriums, etc.) or reference drawings where complete information may be found.
10. Show the room/space number and the maximum number of occupants per USBC for each space.
11. Distinguish new walls from existing walls and new construction from existing construction. Completely show routes of all fire walls, fire separation walls (including exit access corridor walls), and smoke partitions.
12. Identify the extent of all fire rated floor/ceiling and roof/ceiling assemblies.
13. Identify and show rating of all rated assemblies, smoke barriers.

Fire Suppression (FX) Plans:

1. Water flow test data required by NFPA 13.
2. Identify each type of automatic fire suppression system and where it is or is not used.
3. Identify occupancy hazard classifications and densities as established in NFPA 13 for each floor level.
4. Show and identify all new and existing standpipes.
5. Provide a small-scale drawing showing locations of water hydrants, test and low hydrants (for water flow tests), and routing of underground pipe; or, alternatively, state the drawing number where the information may be found on other drawings. Conduct the test in conformance with NFPA 13, 14, and 291 and provide the required documentation of test results. (See NFPA 13 annex for additional guidance.) Two locations are required for these tests of water supplies. Use an approved gauge to read the 'test' or 'residual' pressures at the hydrant nearest the building and a 'Pitot' tube or gauge at the next closest hydrant to measure the 'flow'. If the local water authority prohibits flow testing, indicate on the documents the flow and pressure data provided by the authority and note as such.
6. Determine capability of water supply and verify initially if a fire pump is necessary to boost the available water supply pressure. Where an existing fire pump is to be used in the project, its performance and condition is to be established and validated. This is to be accomplished by submitting a copy of the recent report of the fire pump inspection, testing, and maintenance, compliant with the Virginia Statewide Fire Prevention Code: Fire Pumps - Testing and Maintenance. This section requires that fire pumps be inspected, tested, and maintained in accordance with NFPA 25. The current edition of NFPA 25 defines the parameters for the report. The performance and condition of the fire pump is to be validated on an annual basis.

Fire Alarm, Detection and Signaling System (FA) Plans:

Provide plan of each level showing the following (refer also to chapter 7 of this manual for additional information):

1. On floor plans, show location of control unit (FACU), battery and charger, transmitter, annunciator, fusible safety switch, remote trouble device, alarm devices and appliances, and each actuation device including fire extinguishing system switches.
2. Show single line fire alarm riser diagram.
3. A mass notification risk analysis is required for any new building on campus in accordance with the USBC and NFPA 72.
4. Statement documenting whether the local emergency public safety personnel utilizes public safety wireless communications.
5. Floor plans showing proposed locations for In-Building Emergency Communications infrastructure.

Plumbing Drawings:

1. Provide plans of each floor (with space names and numbers) noting fixture locations and types and indicating routing of main distribution lines with tentative sizes.
2. Provide riser diagrams for all piping systems.
3. Provide location of water supply and distribution, sanitary drainage, storm drainage, sprinkler services, and fuel gas services to the building.
4. Provide plumbing fixture schedule.
5. Provide location, sizes, and types of Water Heaters/Heat Exchangers, Storage Tanks, Flues, etc.
6. Provide fuel gas piping layout and connected load, if applicable.

Mechanical (HVAC) Drawings:

1. Provide plans of each floor (with space names and numbers) showing single line duct layouts, tentative air (supply, return, outdoor air, exhaust) quantities, equipment locations, and layouts and general routing of heating/cooling piping.
2. Provide riser diagrams for all major duct systems and piping systems.
3. Provide equipment schedules with tentative sizes, capacities, ID #, features, etc.
4. Indicate locations and sizes of fans, pumps, compressors, air handling equipment, dampers, etc.
5. Provide preliminary layout and elevation of equipment room and/or central system showing configuration, tie-ins, etc. as necessary to describe system.
6. Provide central heating or cooling plants, distribution piping, equipment.

Electrical Drawings:

Power and lighting plans (with space numbers) may be combined if submittal clearly conveys required information. (See Appendix D for additional Preliminary Submittal requirements.)

Provide plans depicting the following:

1. Lighting plans for each floor showing approximate fixture locations, type, and lighting level required (design level in foot-candles).
2. Power distribution plans showing location of incoming service (transformers and primary switches), generators, main switchgear, motor control centers and panel boards.
3. Show interface points for service entrances, main control panels, and backboards for communications, EMCS and other pertinent systems. Plans for each floor showing proposed locations of receptacles, telephone and data outlets, switches, and other devices.
4. It is the A/E's responsibility to contact the utility company during development of the project design in order to determine the available fault current at the project site.

SECTION 8.8 WORKING DRAWINGS PHASE (CONSTRUCTION DOCUMENT PHASE)

8.8.1 General Requirements: Based on the Preliminary Design submission documents including the review and the value engineering comments and resolution thereof, the A/E shall prepare the working drawings and specifications. The working drawings Contract Documents shall set forth in detail the requirements for the construction of the entire project and include the applicable bidding information. The A/E shall assist in the preparation of the bidding forms, the Special Conditions of the Contract, and the Contract between University and Contractor, HECO-9. All drawings shall bear the seal, signature and date of the Architect or Engineer responsible for that discipline. The Specification Cover Sheet shall bear the seal, signature and date of the Architect and all Engineers.

Specifications and drawings for any type of built-in equipment must be submitted with the working drawings Contract Documents for the building, whether or not such equipment is to be procured under another contract, in order that such work can be coordinated and bid on at the same time.

If any change from the information submitted at the preliminary stage relating to the mix or amount of space for institutions of higher education is made, the University Project Manager and/or A/E shall submit new information.

The A/E shall include on the working drawings and in the specifications all necessary information to describe the components for the fire-resistive rated construction assemblies and fire protection systems needed to provide the necessary fire integrity of the structure for compliance with all applicable governing Codes.

Reviews by the University Building Committee and responsible State Fire Marshal Office are required.

8.8.1.1 Verification of Existing Conditions: The A/E shall visit the site and ascertain pertinent local conditions that must be addressed in the design. As part of the required services, it is the A/E's responsibility to verify, by on-site observations of applicable existing buildings, the configurations, locations, dimensions, sizes and conditions accessible for verification. Certain assumptions are made regarding existing conditions in the remodeling and or rehabilitation of an existing building. Some of these assumptions may not be verifiable without additional exploration or investigation of the building or site. To minimize the risk during construction of uncovering conditions that are not as shown on the documents and delaying project progress, the Agency should consider and evaluate the advice of the A/E to conduct additional investigation, verifications or checks to verify.

8.8.2 Plans, Sections and Details of Equipment or Systems: The drawings shall have sufficient plans, sections and details to generally indicate the intended equipment or system configuration in the space. Recognizing that it is often necessary to use some piece of equipment as a basis for designing, dimensioning and detailing, the drawings (but not the specifications) may be noted to indicate that the A/E has designed or detailed around a particular brand of equipment. In doing so, the A/E shall ensure that there is adequate space, capacity, etc., available to accommodate the other brands indicated in the specifications and any service requirements of such equipment. See Section 8.3.7 for requirements concerning the use of brand names and models.

8.8.3 Cost Estimate: The A/E shall submit a detailed Cost Estimate in conformance with the requirements of Appendix E, and advise the University of any adjustments to previous statements of estimated construction cost. The A/E shall submit a signed Building Cost Summary Sheet with the estimated cost of work covered by the working drawings and specifications and square footage of the proposed building data completed. If this data varies significantly from that shown on the Preliminary Cost Estimate, the A/E will attach an explanation to the working drawing Cost Estimate. For large projects, the University may choose to have an independent cost estimate made using copies of the working drawings and specifications. This may be beneficial in determining if the project is likely to be within budget and in determining sufficient clarity and detail of the documents for bidding.

8.8.4 Permits and Utilities: The A/E shall assist the University in filing the required documents for approval of governmental authorities having jurisdiction over the project. If the Contractor will be required to interface with, coordinate with, or obtain inspection or approvals from any local authority or utility, the requirements and the name and address of such entity shall be shown in the documents.

8.8.5 Calculations: Calculations must be organized, indexed, numbered and submitted for each discipline involved. Design calculations should indicate assumptions, considerations and factors involved in the design and support the design shown on the plans and specifications. Provide one copy of the completed design calculations of each discipline to the University with the Contract Document submission.

Plumbing Calculations:

Include calculations for the following:

1. Domestic Water Supply Fixture Unit/Demand Calculations to support main/branch pipe sizing.
2. Domestic Hot Water Fixture Unit/Demand Calculations to support all scheduled equipment.
3. Sanitary Drainage Fixture Unit/Demand Calculations to support main/branch pipe sizing.
4. Storm Drainage Calculation (Primary & Emergency) to support roof drain, main/branch pipe sizing.
5. Fuel Gas Piping Calculation to support main/branch pipe sizing with demand
6. External Static Pressure Calculations (pipes) to support HP of motors for all pumps.

HVAC Calculations:

Include calculations for the following:

1. Heating and Cooling Load Calculations to support all scheduled equipment.
2. Ventilation (Outside Air & Exhaust) Calculations for all spaces to support all scheduled equipment.

3. Refrigerant System Calculations to prove compliance with Table 1103.1 of the 2018 IMC.
4. External Static Pressure Calculations (ducts) to support HP of motors for all fans.
5. External Static Pressure Calculations (pipes) to support HP of motors for all pumps.
6. Smoke Control System Calculations to support all scheduled equipment.
7. Hydronic and steam piping expansion and anchoring.
8. Fuel oil supply and storage sizing.
9. Energy Conservation Calculations.
10. Include calculations for the following:
 - a. ASHRAE 90.1 compliance check (applicable where using ASHRAE 90.1 as the proposed Virginia Energy Conservation Code compliance path).
 - b. Energy Code Compliance documentation (COMcheck or equivalent).
 - c. Energy Model Output Reports when required by Performance Compliance Path.
 - d. Building envelope thermal resistance and U-values.

Electrical Calculations:

1. COMCheck verification
2. Demand load for all switchboard, panelboards, and feeders to multiple loads in a tabular form.
3. Voltage drop calculations
4. Photometrics of emergency lighting along the entire path of egress, at the same scale as the floor plan provided in the working drawings. NOTE: If egress paths are not indicated on the plan, it will be assumed that the lighting levels for the entire room or area will need to meet the required illumination levels required by the VCC.

Structural Calculations:

1. Calculations for every structural member are not required. Structural calculations for members representative of the various types of structural elements should be submitted. If submitted, computer printouts shall clearly indicate the individual member being analyzed or shall be accompanied by diagrams labeled with member numbers corresponding with the printout.
2. The A/E shall be responsible for storing the complete set of calculations.

8.8.6 Submittal Documents: Contract Documents shall be complete, coordinated, checked and ready for approval to bid. Contract Documents shall bear a uniform date as described in this Manual. Architectural and engineering details shall be included on the drawings with cross-references on both the plan and the detail sheets designating specifically the location to which the particular detail applies. Do not include details that do not apply to the particular project.

8.8.7 Working Drawings: Shall show or provide the following information (in addition to items required for preliminary submission):

Title Sheet(s)

1. Project Identification: Appropriation Act number, Project Code.
2. Activity or function(s) to be performed in the facility
3. Edition (year) of the USBC on which the design is based
4. Part of the USBC (Part I VCC or Part II VEBC) on which the design is based.
5. For designs based on Part II (VEBC), classify work as repairs, alterations (clarify Level 1 or Level 2), change of occupancy, addition, historic building or moved building.
6. Applicable accessibility standards
7. VCC Construction Type
8. (Use) Group(s) per VCC. For mixed-use occupancies, indicate which Groups are separated and non-separated
9. Other major code(s) used as a basis for design
10. Asbestos Disclosure Statement and Lead Disclosure Statement
11. Dig Notice- add "Contact Miss Utility at 811, 1-800-552-7001, or <http://www.missutilityofvirginia.com> no less than 72 hours prior to excavation and do not disturb the soil until dig ticket has been processed."
12. Points of Contact- Include owner representatives, construction managers, utilities, and communications contractors as appropriate
13. The applicable High Performance Buildings Act Compliance Statement
14. The applicable Virginia Energy Conservation Code Compliance Statement
15. Location and vicinity maps noted to show project location.
16. Tabulation of floor areas (new and renovated), total area, total building volume.
17. Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc. ☐ Listing of applicable codes with dates.
18. Building Purpose/Occupancy.
19. Use Group(s) per USBC.
20. Type of construction and USBC Type #
21. Occupancy Load(s) per USBC.
22. Design Floor Live Loads.
23. Professional seal(s) of the architect(s) and engineer(s) responsible for the design.
24. Index of drawings.
25. The uniform date of the completed construction documents
26. Final Delegated Design List (as approved by the Agency)
27. Structural Observations: When required by the VCC, list the specification sections that require Structural Observations as determined by the Agency's structural observer. (Refer to Section 8.15.1)
28. Statement documenting whether the local emergency public safety personnel utilizes public safety wireless communications.

Site Plans (site/improvement plan & composite utility plan minimum requirements for new construction and additions):

1. Based on approved comprehensive Master Plan.

2. Scale and north arrow.
3. Existing and new contours affected by the proposed work.
4. Floor and pavement elevations.
5. Applicable boundaries with survey computations.
6. Dimensioned relationship of new work to boundaries and existing structures.
7. FEMA floodplain designation(s). Show floodplain boundaries. Show the base flood elevation for sites in the 100-year or 500-year floodplain.
8. Location of test borings.
9. General parking and accessible parking.
10. Accessible routes.
11. Pedestrian traffic routes.
12. Demolitions: structures, walks, utilities, trees, etc.
13. Proposed landscaping (planting materials).
14. Existing and new utilities: storm sewers, sanitary sewers, water supply, gas, steam distribution pipes and tunnels, electric and telephone poles and lines, and hydrant locations with data on fire flow test.
15. Profile of all utilities and any roads over 100 feet in length.
16. Site improvements such as fencing, lighting, etc.
17. Typical paving section of each type and thickness required.
18. Identify/show special earthwork recommended and construction considerations noted in soils report.
19. Archaeology Features.
20. Protected Natural Features.

Demolition Drawings:

For total building demolition, provide:

1. Plan of building with length & width dimensions.
2. Elevations (drawn or photographic) and cross section of building to be demolished.
3. Details of termination of demolition, underpinning, etc.

For interior / selective demolition, provide:

1. Floor plans showing existing partition, etc., and showing or describing existing material /construction to be removed.
2. Information or estimates for bidding for work to be removed.

Architectural Drawings:

Floor Plans (for each floor):

1. Plans of each floor at a minimum $1/8" = 1'-0"$ preferred (but not less than $1/16" = 1'-0"$).
2. Show room/space numbers assigned by Planning & Design.
3. Overall dimensions.
4. If the work is an addition, show the relationship of new to existing spaces.
5. Distinguish new from existing construction.
6. Show demolition on the architectural plans or separate plans.
7. Indicate asbestos locations regardless of who removes it or how it is removed.
8. Indicate all openings, entrances, delivery areas.

9. Indicate accessible route and identify ADA required features.
10. Show scale and north arrow.

Reflected Ceiling Plans:

1. Ceiling tile / grid layout
2. Light fixture locations
3. Sprinkler head locations
4. HVAC diffuser and grille locations
5. Coffers, drop soffits, changes in height or materials
6. Space numbers
7. Speakers and smoke detectors

Roof Plan:

1. Plan(s) of each roof at a minimum $1/8" = 1'-0"$ preferred (but not less than $1/16" = 1'-0"$).
2. All proposed and existing drains, including auxiliary drains.
3. Roof slope: $1/4"$ per $1'-0"$ to drains minimum (unless waived for re-roofing).
4. All new and existing equipment.
5. All significant roof penetrations and structures.
6. Identification of materials on existing roofs.
7. Typical roofing section identifying materials.
8. Access to roof.
9. Indicate direction of slope (high to low) with arrows.

Exterior Elevations:

1. Scale ($1/16" = 1'-0"$ minimum).
2. All openings: windows, doors, louvers, vents.
3. Percentage of glass vs. gross wall area.
4. Floor elevations (above sea level). Coordinated with Site Plan elevations.
5. Identification of all major finishes.
6. All stairs, ramps, and railings.
7. Rooftop equipment, vents, stacks, penetrations, and structures.
8. Expansion and control joints.
9. Grade at the face of the building wall.
10. Subsurface construction (dotted in).
11. Existing and new work clearly distinguished.

Building Cross Sections (Scale: $1/16" = 1'-0"$ minimum):

1. One longitudinal and one transverse section minimum.
2. Show all floor levels / elevations on sections.
3. Indicate ceilings in proper relation to floors.
4. Method and extent of insulating exterior envelope.

Detail Sections (Scale: $3/4" = 1'-0"$ minimum):

1. One section minimum for each type of wall construction.
2. Identify all major materials and components.
3. Identify insulation and note "R" value.

4. One section with dimensions and details for each stair configuration.

Details:

1. Typical window, door and special opening details shall be drawn at a minimum 1-1/2" = 1'-0" scale.
2. Interior and exterior details, including special doors, windows, woodwork and other decorative work.
3. Toilet plans and elevations shall be drawn at a minimum 1/4" = 1'-0" scale.

Finish Schedule:

1. Indicate proposed finishes for all spaces. Note those existing finishes to remain.
2. Give ceiling heights of interior spaces.
3. Show (or specify) all finishes, textures, colors, etc., required to be provided by the Contractor.
4. Use University assigned room numbers.

Door Schedule:

1. Doors numbered to University standards, type, size, material, hardware set number and fire rating if required.
2. Provide door type elevations, frame details, head details, threshold details, and access control details

Window Schedule:

1. Type, size, material and lintel requirements.
2. Elevations of each window type.

Furnishing/Equipment Plans:

1. Show outline of all major equipment to approximate scale.
2. Show outline of all built-in furnishings to scale.
3. Provide elevations, sections and details as necessary to describe built-in equipment, casework and furnishings included in the work of this contractor.

Structural Drawings:

1. Unless indicated otherwise below, all structural steel connections shall be designed and supporting calculations provided in the construction documents except for standard shear connections found in the AISC Manual of Steel Construction as adopted by the current building Code.
2. Show design live loads, wind loads, and seismic criteria used for design of structural systems per USBC Section 1603.
3. Design procurement criteria and typical details for engineered systems such as Cast- In-Place Post-Tensioned Concrete, Precast Concrete Components, Steel Joists and Joist Girders, Pre-Engineered Metal Structures, and Shop / Prefabricated Wood Components described in Chapter 9 may be required to be provided by the contractor. In this case, the structural drawings shall include complete loading information as well as all other performance or size constraints for the components.

4. Structural drawings shall include plans, with defined gridlines, at the same scale as the architectural plans. Details and sections shall be at a scale of not less than 3/4" = 1'-0".
5. The plans, details and specifications shall completely define the structural system and any special conditions for the project.
6. Foundation Plan indicating type & sizes.
7. Foundation details with improvement criteria for bearing strata and other special requirements.
8. Floor Framing Plans of each level indicating type of system, and member sizes/depths and column spacing and all penetrations.
9. Roof Framing Plan.
10. Typical Section(s) of floor and roof systems identifying materials, thicknesses, depths. Provide appropriate details to define structure.
11. Details of connections to existing buildings, if applicable.
12. Underpinning and temporary support of existing structures shall be designed to extent possible with available information. Design criteria and load information to be provided for completing the design by the Contractor for review by the A/E.
13. Typical details for openings in floors and walls with limitations clearly noted.

Code Compliance & Life Safety (G) Plans:

Life Safety Plan and Calculations

Provide the following as a minimum on the construction G drawings to demonstrate compliance with the code:

1. Applicable edition of USBC and other applicable codes, including accessibility standards.
2. For existing buildings, compliance with the VEBC shall first be established. The work performed on an existing building or structure must be classified on the construction drawings as repairs, alterations, change of occupancy, addition, historic building or moved building, as further defined in the VEBC. Alterations to be further classified as Level 1 or Level 2.
3. Use Group(s) per VCC. For mixed-use occupancies, indicate which Groups are accessory and/or incidental, separated and non-separated as further defined in the VCC.
4. Construction Type per VCC.
5. Indicate type and extent of fire protection sprinkler system and fire detection/fire alarm systems.
6. Tabulation of square footage per floor and total building area including new SF, existing SF to be renovated, other existing SF and total building volume (cubic feet).
7. Tabulation of units: Number of auditorium seats, bedrooms, etc.
8. Calculations to support the indicated design occupant load on a use and function, and floor by floor basis. Include the design occupant load for the functions of the rooms and spaces in accord with VCC Table 1004.5.
9. Indicate paths of means of egress, paths of exit access, travel distances and common paths of travel. Indicate specific locations where access controls or security locking systems will be provided within means of egress paths.

10. For projects that will have partial, phased occupancy, indicate locations and construction of temporary barriers, fire resistance ratings of temporary barriers, locations of temporary exit signage, locations of temporary means of egress emergency lighting and the temporary exit access patterns at each floor for each substantially completed phase.
11. With reference symbols, identify each new and existing, if known or available, fire resistance rated structural element and change in element design (including wall, floor, ceiling, and other vertical or horizontal elements). Indicate rating of all fire resistance-rated assemblies, smoke barriers, and smoke partitions. Provide a matrix that defines the “fire-resistance rating requirements” for building elements (VCC Table 601) including exterior walls, fire walls, fire barriers, shaft enclosures, fire partitions, smoke barriers and horizontal assemblies. Matrix shall indicate the listed design assemblies proposed to achieve the required fire resistance ratings as demonstrated below. Include copies of each listed assembly.

ELEMENT	RATING	DESIGN REFERENCE	DETAIL LOCATION
Columns	2 hours	UL# XXXX	3/S-2
Floor-Ceiling Assembly	2 hours	IBC Table XXX, Item X.x	4/S-7
Elevator Shaft	2 hours	UL# XXXX	Partition Type 2/A-4.2
Top of Elevator Shaft	2 hours	UL# XXXX	5/S-7
Use Group Separation	1 hour	IBC Table XXX, Item X.x	Partition Type 4/A-4.2
Etc.			

12. Completely show the continuity of vertical fire resistance rated assemblies, with reference symbols. Distinguish new walls from existing walls and new construction from existing construction.
13. Identify the extent of horizontal fire-rated floor/ceiling and roof/ceiling assemblies, with reference symbols.
14. Provide drawings that clearly define the locations and extent of the application of applied fire-resistant materials.
15. Buildings assigned to Risk Category III or IV shall require special inspections to be performed for through-penetrations, fire dampers, smoke dampers, membrane penetration firestops, fire-resistant joint systems and perimeter fire barrier systems. The aforementioned systems are critical to maintaining the integrity of fire rated construction, including fire walls, fire barriers, fire partitions, smoke barriers and horizontal assemblies. Define the validation test required of the special inspector to include as-built drawings identifying each approved agency system.
16. Indicate locations of all portable fire extinguisher cabinets.
17. Indicate whether the building is designated as an “essential facility” for purposes of compliance with VCC Chapter 16.
18. Indicate the seismic design category.
19. Calculations in support of the indicated Construction Type, based on Group, allowable height and allowable area, and permitted or required height and area modifications.
20. Calculations to support the indicated design occupant load on a use and function and floor by floor basis.
21. Calculations to demonstrate and support the indicated capacity of the egress components throughout the building.

22. Define the UL (or equivalent) through penetration firestop assemblies for all utilities penetrating fire rated construction. When penetrating a fire resistance-rated assembly a fire rated penetration assembly is required. When penetrating a floor assembly, the through penetration assembly generally requires both F-ratings and T-ratings (limited exceptions under USBC). **A table of typical listed assembly(ies) for the project is required to be provided with construction drawings with deferred submittal required in the specifications** – as an alternate for non-capital projects, designer can provide typical firestop assembly details with further detail provided in specification and required deferred submission. Engineering Judgments should be limited and be identified as early in the project as possible to eliminate issues near the completion of the project. Refer to specific guidelines for submission of Engineering Judgments (EJs).

Specifications must include the required fire test response characteristics (flame spread index, smoke developed index, critical radiant flux, etc.) for all interior finishes.

Fire Suppression (FX) Plans

Fire Suppression Systems – Water-based: Fire Sprinkler/Standpipe

The A/E shall confirm complete project specific drawings and specifications that define a code compliant fire suppression system. User's programmatic requirements which may supplement or provide additional levels of protection above the minimum requirements of the code shall be included in the design. Changes to the design during the construction phase of the project shall be submitted to the Office of the University Building Official (OUBO) for review and approval. The A/E shall assure that code compliant fire suppression systems(s) is provided through the review of the fire suppression shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the fire suppression system(s) is complete and code compliant. It is the responsibility of the A/E to provide a project specific design. **Performance criteria do not meet the intent of this section.**

Working Drawing Submission

Provide the following as a minimum to demonstrate code compliance on the working FX drawing submission:

1. Identify the occupancy hazard classification and show the location of sprinklers for each of the spaces on each floor within the buildings. The location of sprinklers are to be based on the VCC, NFPA 13 and the user's programmatic requirements with the understanding that the quantity, coverage, location and type of sprinkler are not to be altered by the Contractor, without prior written approval by the A/E and the Office of the University Building Official (OUBO).
2. Show the location of fire department valves and risers within the building. Indicate that the fire department valves are attached to either a standpipe riser, combined standpipe and sprinkler riser, or wet pipe sprinkler system risers. The locations of fire department valves are to be based on the VCC, NFPA 13, NFPA 14 and the user's programmatic requirements.

3. Show proposed sprinkler piping and standpipe layout including the sprinkler mains (including cross mains) within the building and layout of branch lines for the most hydraulically demanding zone(s) on each floor of each sprinkler system. Indicate the size of pipes that are shown.
4. Provide a table summarizing the characteristics of each of the sprinkler systems. Define the type of sprinkler system(s), areas of coverage, hazard, minimum rate of water coverage (density) per area, water required for each area of coverage, hose stream allowances for each area, total water requirements for each area of coverage, hydraulically calculated pressure requirements at a common reference point at design flow for each area of coverage, and water supply (flow & pressure) available at the common reference point.
5. Provide a small-scale drawing showing locations of water hydrants, test and flow hydrants (for waterflow tests), and routing of underground pipe. Indicate the waterflow Test results, the date and time taken and who conducted the test. Indicate the water supply (flow & pressure) at a reference point common with the sprinkler/standpipe system design. Refer to Section 8.7.6, Preliminary Drawings for additional information on waterflow test procedures required.
6. Show and identify all existing sprinkler systems and standpipe systems.
7. Show and indicate all new connections to existing systems.
8. Provide sprinkler riser diagram with appropriate fittings, accessories, sizes, alarms, valves, etc., noted.
9. Detail inspector's test station location(s) and associated discharge/ drainage piping.
10. Show the location of the fire department connection(s) with all interconnecting piping to the sprinkler and standpipe systems.
11. Show the location and details of the fire pump, driver, fire pump controller, piping, components and piping specialties.
12. Show the location of the fire pump test header and all interconnecting piping.
13. Show sprinkler type (i.e., standard, quick-response, residential, etc.), K-factor and temperature ratings.

Specifications

Provide the following as a minimum to demonstrate code compliance:

1. Provide complete specifications to reflect the systems that are defined on the drawings.
2. Provide wording in the specifications that indicate that the type of systems, the location of major components, the quantity, type, coverage, location of sprinklers, and modifications to the distribution system are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. Changes to the design depicted within the construction documents shall be submitted to the Building Official for review and approval.

3. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the OUBO and the regional office of the State Fire Marshal (**Capital projects only**).

Calculations

Provide the following as a minimum to demonstrate code compliance:

1. Provide final hydraulic calculations for each sprinkler system and standpipe system.
2. The calculations shall demonstrate the performance of the system with an automatic water supply for the most hydraulically demanding zone on each floor of the building for each of the fire sprinkler systems compliant with NFPA 13 and NFPA 14.
3. The calculations shall also demonstrate the performance of the sprinkler and standpipe systems as connected to the manual water supply (fire department pumper truck – validate pumper truck performance with local fire department as applicable for non-high-rise buildings) by the fire department connection and interconnecting piping compliant with VCC, NFPA 13 & NFPA 14.

Shop Drawings Review

Shop drawings (working plans, product data and calculations) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. Shop drawings shall meet applicable provisions of the *OUBO Water-Based Fire Suppression System Shop Submission Guidelines*.

Water Mist Fire Suppression Systems

Automatic water mist systems are water-based system considered an alternative fire suppression system to automatic sprinkler systems and are approved to designed and installed in accordance with the Uniform Statewide Building Code and NFPA 750. Refer to pertinent requirements above as applicable to all water-based systems and follow NFPA 750 for the development of the required shop submission.

Fire Suppression Systems – Alternate Automatic Systems

The A/E shall provide complete project specific drawings and specifications that define a code compliant fire suppression system. User's programmatic requirements which may supplement or provide additional levels of protection above the minimum requirements of the code shall be included in the design. Changes to the design during the construction phase of the project shall be submitted to the Office of the University Building Official (OUBO) for review and approval. The A/E shall assure that code compliant fire suppression systems(s) is provided through the review of the fire suppression shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the fire suppression system(s) is complete and code compliant. It is the responsibility of the A/E to provide a project specific design. **Performance criteria do not meet the intent of this section.**

Alternate automatic systems include wet-chemical systems (NFPA 17A), dry-chemical systems (NFPA 17), foam systems (NFPA 11 and/or NFPA 16), carbon dioxide systems (NFPA 12A)

and clean agent systems (NFPA 2001). Halon systems shall not be used in the design of new fire extinguishing systems in state owned buildings (**existing systems undergoing renovation shall be removed and replaced with a water-based or alternate automatic suppression system**).

Commercial cooking suppression systems shall either be: a pre-engineered automatic dry and wet chemical extinguishing systems tested in accordance with UL 300, and labeled and listed for the intended applications, or developed in accordance with one of the above-referenced NFPA standards.

Working Drawing Submission

1. Applicable edition of USBC and other applicable NFPA codes and standards indicated.
2. Show and identify rooms / spaces / components to be protected by the proposed fire suppression system.
3. Show the enclosure partitions (full and partial height) of the protected area.
4. Identify the locations of the major fire suppression system components.
5. Show the routing of the fire suppression system lines between the stored agent and the dispersion nozzles within each of the protected spaces. Indicate sizes of pipes that are shown.
6. Provide a table defining the type of fire suppression system(s), areas of coverage, hazard, minimum required concentration of fire suppression agent, volume of agent required for each area of coverage, total volume of agent for the areas protected by this system.
7. Show and identify all existing fire suppression systems.
8. Show the location of all dispersion nozzles for all spaces/areas protected.
9. Show the locations and components of the automatic detection system and agent releasing system. Define the specific locations for actuation devices.
10. Show the location of and define the interface requirements to connect to the building's fire alarm system.
11. Show the location of components for means of manually releasing of agent.
12. Location of controlled devices such as dampers and shutters
13. Provide fire suppression system riser diagram with appropriate fittings, fire suppression agent storage tanks, accessories, sizes, alarms, valves, etc.
14. Show and indicate all new connections to existing systems.
15. Show the location of instructional signage.

Specifications

Provide the following as a minimum to demonstrate code compliance:

1. Provide complete specifications to reflect the systems that are defined on the drawings.
2. Provide wording in the Specifications that indicate that the type of system, concentration requirements, quantity of agent required, location and type of dispersion nozzles, location of major components and modifications to the distribution system are not to be altered by the Contractor, without prior written approval by the A/E and the Building Official. Changes to the design during the construction phase of the project shall be submitted to the Building Official for review and approval.
3. Provide complete step-by-step description of the system sequence of operations including functioning of abort and maintenance switches, delay timers, and emergency power shutdown.
4. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the OUBO and the regional office of the State Fire Marshal.

Calculations

Provide the following as a minimum to demonstrate code compliance:

1. Complete calculations to determine enclosure volume and quantity of agent required.
2. The method used to determine number and location of audible and visual indicating devices.
3. The method used to determine number and location of detectors.
4. Refer also to fire alarm section above for additional working drawing requirements.

Shop Drawings Review

Shop drawings (working plans, product data and calculations) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. Shop drawings shall meet applicable provisions of the *OUBO Alternate Fire Suppression System Shop Submission Guidelines*.

Fire Pump Design Supporting Material

Fire Pumps (Electrical or Diesel-Driven)

The A/E shall provide complete project specific drawings and specifications that define a code compliant fire pump system. User's programmatic requirements which may supplement or provide additional levels of protection above the minimum requirements of the code shall be included in the design. Changes to the design during the construction phase of the project shall be submitted to the Office of the University Building Official (OUBO) for review and approval. The A/E shall assure that code compliant fire pump systems(s) is provided through the review of the fire pump shop drawings and the observation of the progress and quality of the work. The A/E shall confirm

that the fire pump system(s) is complete and code compliant. It is the responsibility of the A/E to provide a project specific design. **Performance criteria do not meet the intent of this section.**

Application of Fire Pumps in Fire Suppression Systems

A fire sprinkler/standpipe suppression System is to provide a reasonable degree of protection for life and property from fire based on sound engineering principles, test data, and field experience. One key component of the system is a reliable water supply of acceptable volume and pressure. The connection of the fire suppression system to a public water supply that is of acceptable volume and pressure is considered the most “reliable water supply”. Where the building characteristics are such that the water supply requirements of the designed fire suppression system cannot be provided by the available water supply then the incorporation of an automatically controlled fire pump into the fire suppression system, compliant with NFPA 20 *Standard for the Installation of Stationary Pumps for Fire Protection*, shall result in an “acceptable water supply.” Sound engineering principles are to be incorporated into the design of the fire suppression system to result in the most reliable and acceptable water supply for the project.

Electrical Requirements

Fire pump electrical components and systems shall comply with the National Electric Code (NFPA 70) section(s) on fire pumps in addition to NFPA 20 controller requirements. The power for fire pumps shall be from a service which is both electrically and mechanically separate from the remainder of a building’s power supply.

Emergency Electrical Systems

Fire pumps are considered to be an emergency system and shall comply with the additional electrical requirements of the National Electric Code (NFPA 70) section on emergency power and NFPA 20 annex language, where any of the following condition(s) occurs:

1. The building is more than 75 feet in height.
2. The building has a total assembly design occupant load that exceeds 1,000 people.
3. The building is designated as an Emergency Shelter (VCC Chapter 16).
4. Electric motor driven fire pumps are used, and the height of the structure is beyond the capacity of the fire department apparatus.

Working Drawing Submission

Provide the following as a minimum to demonstrate code compliance:

1. Show the location of the fire pump, pressure maintenance pump, pump controllers, piping, components and piping specialties.
2. Provide details of the fire pump, pressure maintenance pumps, pump controllers, suction piping, discharge piping, components and piping specialties.
3. Provide a table summarizing the water supply characteristics for the most demanding area of each of the sprinkler systems supplied by the fire pump. Define the type of sprinkler system(s), water flow and pressure requirements for each area of coverage,

- hose stream allowances for each area, resulting total water flow and pressure Requirements for each area of coverage, water supply (flow & pressure) available, fire pump, resulting available water supply, resulting safety factor in psig for each sprinkler system.
4. Provide a small-scale drawing showing locations of water hydrants, test and flow hydrants (for waterflow tests), and routing of underground pipe. Indicate the waterflow test results, the date and time taken and who conducted the test. Indicate the water supply (flow & pressure) at a reference point common with the sprinkler/standpipe system design.
 5. Show and identify all existing sprinkler systems and standpipe systems in the vicinity of the fire pump(s).
 6. Show and indicate all new connections to existing systems.
 7. Show the location of the fire department connection(s) with all interconnecting piping back to the fire pump.
 8. Show the location of the fire pump test header and all interconnecting piping.
 9. Show the location of the electrical components of the fire pump, driver, fire pump controller and ancillary electrical components.
 10. Show the location, size and routing of the conduits and conductors serving the fire pump, driver, fire pump controller, and ancillary electrical components.
 11. Provide details of the electrical components serving the fire pump, driver, fire pump controller, piping, components, and piping specialties.
 12. Where multiple fire pumps or multiple sources of power are required, provide a diagram on the drawings that defines all of the applicable components and defines the sequence of operation.
 13. Fire Pump Rooms: Fire ratings for fire pump room are to be 1-hour or 2-hour based on building and fire sprinkler system characteristics. Fire pump rooms must be physically located with direct access to the outside, unless provided with an approved passageway or enclosed stair equivalent in fire resistance rating to fire pump room rating.
 14. Access to pump room to be labeled with identification of 2-in letter height and 3/8-in. letter stroke.
 15. Coordination with multiple disciplines is necessary to verify that normal and emergency lighting, proper ventilation, and heating, along with adequate drainage are afforded within the pump room enclosure.
 16. Circuits supplying fire pumps to be designed with survivability protection in accordance with Virginia Uniform Statewide Building Code and NFPA 20.
 17. An approved metering device is to be installed on fire pump bypass. Device to be sized and installed in accordance with NFPA 20.

Specifications

Provide the following as a minimum to demonstrate code compliance:

1. Provide complete specifications to reflect the systems that are defined on the drawings.
2. Provide wording in the specifications that indicate that the modifications to the fire pump and ancillary components are not to be altered by the Contractor, without prior written approval by the A/E and the Office of the University Building Official (UOBO). Changes to the design during the construction phase of the project shall be submitted to the UOBO for review and approval.
3. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the OUBO and the regional office of the State Fire Marshal (**Capital projects only**).

Calculations

Provide the following as a minimum to demonstrate code compliance:

1. Provide hydraulic calculations that demonstrate that the most hydraulically demanding zone(s) of the fire sprinkler system(s) is satisfied by the automatic water supply (water supply plus fire pump) compliant with the requirements of NFPA 13, NFPA 14 and NFPA 20.
2. Where the height of the structure is beyond the capacity of the fire department apparatus, provide hydraulic calculations that demonstrate the performance of the standpipe system(s) as connected to the automatic water supply (water supply plus fire pump) compliant with the VCC, NFPA 13 & NFPA 14.

Existing Fire Pumps

Where an existing fire pump is to be used in the project, its performance and condition is to be established and validated. This is to be accomplished by submitting a copy of the recent report of the fire pump inspection, testing, and maintenance, compliant with the Virginia Statewide Fire Prevention Code: Fire Pumps - Testing and Maintenance. This section requires that fire pumps be inspected, tested, and maintained in accordance with NFPA 25. The current edition of NFPA 25 defines the parameters for the report. The performance and condition of the fire pump is to be validated on an annual basis.

Shop Drawings Review

Shop drawings (product data, sketches and certified shop test pump curves) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. Shop drawings shall meet applicable provisions of the *OUBO Centrifugal Fire Pump Shop Submission Guidelines*.

Smoke Control/Management Systems

Changes to the design during the construction phase of the project shall be submitted to the Office of the University Building Official (OUBO) for review and approval. The A/E shall assure that a code compliant smoke control/management system is provided through the review

of shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the smoke control system is complete and code compliant.

The VCC defines 3 methods of smoke control. These are 1) Pressurization Method, 2) Airflow Design Method and 3) Exhaust Method. Large, enclosed volumes, such as atriums, shall be permitted to utilize the Exhaust Methods. Smoke control systems using the Exhaust Method shall be designed in accordance with one of the design approaches defined in NFPA 92, *Standard for Smoke Control Systems*. The OUBO's approval is required for the use of any of these methods within a project. Where stairway pressurization systems are implemented into the design in lieu of stairwell smokeproof enclosures in fully sprinklered buildings, design shall follow the VCC and meet general design guidelines stipulated in NFPA 92 for approach.

The A/E shall submit a "preliminary Rational Analysis" to the OUBO for review and approval. A meeting may be required by OUBO to discuss this analysis with A/E and owner. The focus of the preliminary rational analysis will be on the design fire scenarios. The initial report should cover for other than pressurization method of design:

1. System performance goals and objectives
2. Performance criteria including tenability
3. Building characteristics
4. Design basis fire
5. Number of design fires scenarios to be analyzed
6. Fire location
7. Constraints
8. Design approach
9. Egress and tenability analysis
10. Conceptual floor plans, location of barriers, cross section that identifies the locations of the major components, pertinent calculations, and sequence of operations.
11. Fire models to be utilized (zone fire models such as Consolidated Model of Fire and Smoke Transport (CFAST), Computational Fluid Dynamics (CFD), Fire Dynamics Simulator (FDS)).

When the preliminary "Rational Analysis" is accepted by the OUBO, complete and submit the final Rational Analysis documents with the Working Drawing design documents to OUBO for review and approval.

Rational Analysis:

Provide conceptual floor plans which identify the locations of the major components, pertinent calculations, sequence of operation and any other information that may assist in the evaluation of the methods are to be included in the documents submitted to the Building Official. It is the

responsibility of the A/E to provide a project specific design. Performance criteria do not meet the intent of this section.

Provide the following as a minimum to demonstrate code compliance:

1. Indicate the VCC edition.
2. Provide conceptual floor plans identifying and locating system components as further indicated below.
3. Locate and identify all the walls, floors and ceilings that define the perimeter of the space(s) to be protected by the smoke control system.
4. Locate and identify the HVAC system components, including control air tubing, respective to the smoke control system. Provide a sequence of operation matrix that outlines the operation of components and function.
5. Locate and identify all smoke dampers respective to the smoke control system.
6. Locate and identify all motorized dampers respective to the smoke control system.
7. Locate and identify the interface requirements with the fire alarm system.
8. Locate and identify the interface requirements for all devices whose operation is required by the smoke control system such as door hold open devices, smoke dampers, fire shutters, motorized ventilation dampers, fans, air handlers and smoke detectors.
9. Identify the primary and secondary power supplies and connections.
10. Provide wording in the specifications that indicate that the components of and their locations which make up the smoke control system are not to be altered by the Contractor, without prior written approval by the A/E and the Office of the University Building Official (OUBO). Changes to the design depicted within the construction documents shall be considered substitutions in accord with the General Conditions and are to be documented by change order.
11. Provide a description of the acceptance testing requirements (conducted by the Special Inspector). Further indicate which of the acceptance tests are to be witnessed by the OUBO and the regional office of the State Fire Marshal (**Capital projects only**).
12. Provide calculations as defined by the VCC and NFPA 92 that establish the performance requirements for the method of smoke control for this project.
13. Define the calculated Required Safety Egress Time (RSET).
14. Account for:
 - a. Conditions with doors closed and exterior door open.
 - b. Delay in detection and activation.
 - c. Location of detectors, type, access for testing/maintenance.
 - d. Effects on levels opening to design fire space (such as open floors, balconies, walkway).
 - e. Impact of egress door on pressure difference (opening force, undercut, listed door, operators, etc.).
15. Define the maximum exhaust rate and effects on door opening forces.

16. Define assumptions of stack effect, temperature of fire, wind effect, climate, impact of HVAC system.
17. Define the velocity of makeup air. At no point shall it exceed 200 feet per minute.
18. Provide the total cubic volume of each floor level accounted for in the design of the smoke control system.

Spray-Applied Fire-Resistant Materials (SFRM) and Fire Resistant Coatings:

The A/E shall provide complete project specific drawings and specifications that result in code compliant fire-resistive construction through the use of applied fire-resistant materials. Applied fire resistant materials include spray-applied fire-resistant materials (SFRM), fire resistant mastics and intumescent coatings. The A/E shall determine which members are required to be protected and indicate the minimum thickness of the applied fire-resistant materials to be applied. Changes to the design during the construction phase of the project shall be submitted to the Office of the University Building Official (OUBO) for review and approval. The A/E shall assure that code compliant fire resistive construction is provided through the review of the applied fire-resistant material shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the fire resistive construction is complete and code compliant.

Provide the following as a minimum to demonstrate code compliance as part of the Working Drawings:

1. Provide drawings (small scale structural framing plans) including typical and special details that clearly define the locations and extent of applied fire-resistant materials. Drawings should be structural steel plans without irrelevant walls, doors and other features that would obscure a clear representation of the extent of fireproofing.
2. Define the UL design assemblies (or equivalent) specific to the respective locations and application of the applied fire-resistant materials.
3. Provide complete Specifications to reflect the applied fire-resistant materials assemblies that are defined on the drawings.
4. The specifications shall clearly state that no asbestos-containing material will be permitted. Contractor shall be required to certify that the material being used contains no asbestos.
5. Where 1) a protected steel member or 2) an unprotected steel member with a cross-sectional area exceeding 4.65 inches square connects to a protected steel member with a greater required thickness of applied fire-resistive material, the greater thickness of material shall extend onto the adjoining steel member a minimum of 18 inches from the point of connection. Refer to the *UL Best Practice Guide for Passive Fire Protection for Structural Steelwork: Fire Resistance and External Exposure Characteristics, 1st Edition, October 2018*.
6. Where an unprotected steel member with a cross-sectional area equal to or less than 4.65 inches square, including metal attachments such as miscellaneous angles, light gage framing, hangers, etc., connects to a protected steel member, the area of attachment shall be covered with the same thickness of applied fire-resistant materials as the structural member.

7. All applied fire-resistant materials shall be tested after installation according to ASTM E-605, ASTM E-736, ANSI/UL 263 and ANSI/UL 1709, latest editions. Include the specific validation testing requirements as defined below. These tests shall be made by an independent testing laboratory. The Owner shall arrange and pay for laboratory services for field and laboratory tests and reports. The Contractor shall schedule the tests while the material is accessible. If additional tests are required as a result of non-compliance with the specifications; the additional tests and reports shall be paid for by the Contractor.
8. The independent testing laboratory reports shall clearly show the location of the tests and test results. Copies of the reports shall be sent through the A/E to the Owner, State Fire Marshal and Office of the University Building Official.

Removal and Replacement of Sprayed-on Material

The A/E shall contact the Office of the University Building Official (OUBO) early in the design phase to verify the original purpose of the SFRM to be removed or replaced and what, if anything, must be done to restore the fire resistance characteristics. Submit plans and specifications to the OUBO which will include any bidding documents, addenda or change orders which may relate to the fire-resistance characteristics of the existing structure. Include the date(s) of construction, original and present uses, height in floors and feet, whether sprinkled and any other information that may assist the University Building Official (OUBO) in his determination.

Installation of hangers, relocation of partitions and/or penetrations will disturb the existing SFRM. Disturbed SFRM is required to be repaired. The statement repair to “same as before” will not be sufficient. Provide repair details. Identification of existing SFRM material will be required and a patching material that is compatible shall be chosen. Identify the maximum area to be repaired consistent with patching material instructions.

Shop Drawings Review

Shop drawings (working plans, product data and calculations) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. At the conclusion of the shop drawing review, the A/E of record shall:

1. Verify the Underwriters Laboratories (UL) design assemblies and for the materials, and components provided for this project result in code compliant fire resistive construction.
2. Provide a “sealed” statement, attached to the reviewed shop drawings indicating that the sprayed-on fire resistant materials (SFRM) shop drawings (working plans, product data and calculations) satisfy the requirements of the project contract documents and the code.
3. Provide the regional office of the State Fire Marshal a copy(s) of the approved complete shop drawings **on capital projects**.
4. Provide OUBO a copy of the “sealed” statement and a copy of the transmittal to the regional office of the State Fire Marshal (**on capital projects only**).

Fire Protection Openings and Fire/Smoke Dampers

The A/E shall provide project specific drawings and specifications that locate, identify and define code compliant fire protection openings, fire dampers, smoke dampers, combination dampers, corridor dampers and ceiling radiation dampers. Changes to the design during the construction phase of the project shall be submitted to the Office of the University Building Official (OUBO) for review and approval. The A/E shall assure that code compliant fire resistive construction is provided through the review of the material shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the fire resistive construction is complete and code compliant.

Working Drawings

Drawings shall provide the following minimum information to demonstrate compliance with the requirements of the code:

1. Locate and identify the fire-resistance rating of all fire and smoke dampers.
2. Locate and identify all ceiling radiation dampers or corridor dampers in rated ceilings.
3. Typical fire damper detail(s) indicating damper, sleeve, method of support, fusible link, duct access door and a breakaway joint between the sleeve and the connecting duct with notation regarding compliance with specific manufacturer's instructions.
4. Fire protection doors and window openings to meet the requirements of NFPA 80 and to meet the rating requirements of the Virginia Uniform Statewide Building Code (VUSBC). Glazing for fire protection rating or fire resistance rating as applicable shall be marked as designated in USBC. This must be designated on construction documents for all rated fire protection openings.
5. Buildings assigned to Risk Category III or IV shall require special inspections to be performed for through-penetrations, fire dampers, smoke dampers, membrane penetration firestops, fire-resistant joint systems and perimeter fire barrier systems. The aforementioned systems are critical to maintaining the integrity of fire rated construction, including fire walls, fire barriers, fire partitions, smoke barriers and horizontal assemblies. Define the validation test required of the special inspector to include as-built drawings identifying each approved agency system.

Specifications

Specifications shall provide minimum information to demonstrate compliance with the various code requirements of the VUSBC and NFPA 80. Provide description of validation requirements for final acceptance testing.

Fire Alarm, Detection and Signaling System (FA) Plans:

Fire Detection and Alarm Systems

The A/E shall provide complete project specific drawings and specifications that define a code compliant fire alarm system. User's programmatic requirements which may supplement or provide additional levels of protection above the minimum requirements of the code shall be included in the design. Changes to the design during the construction phase of the project shall be submitted to the Office of the University Building Official (OUBO) for review and approval. The A/E shall

assure that code compliant fire alarm systems(s) is provided through the review of the fire alarm shop drawings and the observation of the progress and quality of the work. The A/E shall confirm that the fire alarm system(s) is complete and code compliant. It is the responsibility of the A/E to provide a project specific design. **Performance criteria do not meet the intent of this section.**

Working Drawing Submission

Provide the following as a minimum to demonstrate code compliance for Working FA Drawings:

1. Locate and identify all fire alarm system alarm-initiating and notification appliances.
2. Locate and identify where protective covers are utilized with fire alarm system alarm initiating and notification appliances.
3. Locate and identify all fire alarm control and trouble signaling equipment.
4. Locate and identify all existing alarm system alarm-initiating and notification appliances.
5. Locate and identify all existing fire alarm control and trouble signaling equipment.
6. Locate and identify the interface requirements for all fire alarm system alarm initiating devices provided by other trades (e.g., HVAC duct smoke detectors, kitchen hood fire suppression systems, fire sprinkler flow and tamper switches, etc.).
7. Locate and identify the interface requirements for all devices whose operation is initiated by the fire alarm system such as door hold open devices, fire shutters, elevator recall, electronic door hardware and smoke control systems.
8. Identify the primary and secondary power supplies and connections.
9. Identify the candela output levels for all visual alarm notification appliances in accordance with NFPA 72 parameters. Candela ratings such as “15/75” are not compliant.
10. Provide a matrix that defines the interface of the fire safety control functions. Define the action that will initiate an alarm or trouble condition. Define the alarm-initiating device activated, the action of the control and trouble signaling equipment, and the resulting alarm notification appliance actions and resulting operation of interfaced equipment.
11. Provide fire alarm system riser diagram showing all system components. Define the “zones” to be protected. Diagrammatically define the location of the constantly attended location from which the fire alarm system will be supervised. Define the interface between the fire alarm system and the constantly attended location.
12. Provide wording in the Specifications that indicate that the location and type of fire alarm system alarm-initiating appliances and the type of fire alarm system alarm notification appliances and control and trouble signaling equipment, the location of major components are not to be altered by the Contractor, without prior written approval by the A/E and the Office of the University Building Official (OUBO). Changes to the design during the construction phase of the project shall be submitted to the Building Official for review and approval.

13. Provide a description of the acceptance testing requirements. Indicate which of the acceptance tests are to be witnessed by the OUBO and the regional office of the State Fire Marshal (**Capital projects only**).
14. Demonstrate that the quantity and location of the audible alarms as indicated on the drawings attain the required sound pressure levels in each of the respective spaces.
15. Demonstrate that the required capacity of the secondary power supply is attained.
16. Demonstrate that the indicated candela performance is attained for alarm notification devices where protective covers are utilized.
17. One site plan, show location of any PIV valves or other devices to be connected to the fire alarm system.
18. All acoustically distinguishable spaces (ADS) shall be identified in the drawings for purposes of voice intelligibility in accordance with NFPA 72.
19. Floor plans showing proposed locations for In-Building Emergency Communications infrastructure.
20. The design shall include a rebroadcasting agreement signed by the FCC License holder authorizing the system.
21. The design shall identify components to be provided by the locality.

Shop Drawings Review

Shop drawings (working plans, product data and calculations) are to be reviewed by the A/E of record for compliance to the project contract documents and the code. Shop drawings shall meet applicable provisions of the *OUBO Fire Alarm and Emergency Communication (ECS) System Shop Submission Guidelines*.

Provide plan of each level showing the following (refer also to chapter 7 of this manual for additional information):

1. On floor plans, show location of control unit (FACU), battery and charger, transmitter, annunciator, fusible safety switch, remote trouble device, alarm initiating devices and notification appliances, and each actuation device including fire extinguishing system switches. Indicate where additional NAC booster panels could be located as applicable.

In-Building Emergency Communications System:

When an In-Building Emergency Communications System is required, the scope of work shall include the design of a complete and functioning system.

- a. Provide floor plans for each floor indicating locations for In-Building Emergency Communications infrastructure.
- b. The design shall include a rebroadcasting agreement signed by the FCC License holder authorizing the system.
- c. The design shall identify components to be provided by the locality.
- d. If delegated design of the system is specified, the design shop drawings shall be reviewed and approved by the A/E. Refer to Section 5.3.2. The delegated design shall be sealed by a Virginia Professional Engineer or a design technician with an FCC License.

Access Controls (AC) Plans:

Shop drawings shall be submitted to the Office of the University Building Official (OUBO) for work elements including the following: a) electric trim b) electric latches, c) electric locks, d) other electronic controls (card keys, access buttons, proximity sensors etc.), even if used as an overlay on mechanical door hardware.

Provide the following as a minimum to demonstrate code compliance:

1. Building floor plans defining the locations and components of the access control hardware proposed.
2. Door hardware details and elevations defining the locations of all associated access control hardware.
3. A copy of the door hardware (mechanical hardware) shop drawings for the doors where the access controls are to be provided.
4. A sequence of operations demonstrating compliance with the requirements of the VCC regarding **Doors, Gates and Turnstiles**.
5. Documentation demonstrating that each of the access control components are listed for the intended use and that per the manufacturer's documentation the specific components are compatible with each other.
6. A description of how the elements interface with the building's fire alarm system.

Other security measures including cameras, contact switches or other security items which do not affect means of egress are not required to be included.

Plumbing Drawings:

1. For renovation projects, provide (here or on cross-referenced demolition plans) plans showing demolition in sufficient detail that the work may be bid from the drawings.
2. Provide plans of each floor (with space names and numbers) noting fixture locations and types.
3. Provide plumbing fixture schedule(s) showing designations, connection sizes, and mounting heights.
4. Provide plans showing layouts and sizes of sanitary DWV piping, cold condensate drainage systems, floor drains, acid waste systems, neutralizing tanks, etc.
5. Provide plans showing roof drains and areas served by each in square feet, piping and sizes. Show downspout boots and connections to foundation drains.
6. Provide plans showing domestic hot and cold water systems, including piping sizes, domestic water heaters with expansion and storage tanks, backflow preventers, water hammer arrestors, water meters, relief devices, and valves including pressure reducing, isolation and balancing.
7. Provide plans showing fuel gas piping sizes, layout, and connected load.
8. Provide plans showing layouts and sizes of compressed air piping, air compressors, air dryers, drains, etc.
9. Provide plans showing deionized water systems.
10. Provide plans showing location, sizes, and types of Water Heaters/Heat Exchangers, Storage Tanks, Flues, etc.

11. Provide plans with location of water supply and distribution, sanitary drainage, storm drainage, sprinkler services, and fuel gas services to the building.
12. Provide riser diagrams for sanitary DWV, domestic hot and cold water, storm drainage, fuel gas, deionized water, and compressed air. Risers shall be designated and keyed to the plans. Show room numbers where the outlets/inlets occur, and show drainage fixture units at the base of each riser. Show sizes of water hammer arrestors.
13. Provide details of hookups at water heaters, air compressors, etc., and roof drain installation.
14. Provide schedules of water heaters, pumps, air compressors, air dryers, storage tanks, heat exchangers, and drains.

Mechanical (HVAC) Drawings:

1. For renovation projects, show demolition in sufficient detail that it may be bid from the drawings.
2. Provide plans of each floor (with space names and numbers) showing double line duct layouts, all airflow (supply, return, outdoor air, exhaust) quantities, equipment locations, and layouts.
3. Provide plans of each floor (with spaces names and numbers) showing chilled water, heating hot water, steam, and condensate piping layouts and piping sizes. Show provisions for expansion. (This may be shown on ductwork plans where congestion is not a problem.)
4. Provide layouts of mechanical equipment and fan rooms to a scale not less than twice that of the floor plans. Show equipment, ducts, piping, etc. to coordinate the installation in tight areas. Show access and service space requirements such as that required for tube, coil, and fan removal.
5. Provide plans showing locations and sizes of fans, pumps, compressors, air handling equipment, dampers, etc.
6. Provide plans showing central heating and cooling plants, distribution piping, equipment, anchors, expansion joints, etc.
7. Provide riser diagrams for all major duct systems and piping systems.
8. Provide schematic diagrams of chilled and heating water, steam, and condensate piping.
9. Provide schedules for all mechanical equipment, steam traps, air devices, etc. showing sizes, capacities, ID #, HP, CFM, electrical characteristics, locations, features, etc.
10. Provide drawings showing control schematics, automation points, etc.
11. Provide sections as required to clearly show the work in 3 dimensions.
12. Show the building loads (in BTU or pounds of steam per hour) to include transmission plus infiltration, outside air, domestic hot water, and kitchen, laundry and hospital hot water and outside air loads that are supplemental to those mentioned where applicable.
13. Indicate the sensible and total air conditioning load of the building in tons. Also show the outside air portion of the cooling load in tons.
14. Provide details as necessary to show fittings for ducts.

Electrical Drawings:

(Power and lighting plans may be combined if the combined drawing clearly conveys required information.)

Provide plans depicting the following:

1. In renovation work or existing buildings, show existing electrical equipment, devices and lighting fixtures, etc., both to be removed and to remain. Provide sufficient detail so that work may be bid from the drawings.
2. Plans shall show all casework, furniture, mechanical equipment and other equipment that impacts the electrical design.
3. Plans shall list, in kVA, the total electrical load and the total load on any generators. Indicate the largest motor size, in horsepower.

Lighting Plans:

1. Lighting plans for each floor showing fixture location, type, and lighting level (calculated, in foot-candles).
2. Photometric plans of normal, egress, and emergency lighting along the entire path of egress, at the same scale as the floor plans. NOTE: If egress paths are not indicated on the plan, it will be assumed that the lighting levels for the entire room or area will need to meet the required illumination levels required by the VCC.
3. Provide Lighting Fixture schedule on the drawings. Schedule to include the following, at a minimum: fixture type, lamp and ballast information, reflector, lens and louver information, mounting method.

Power Plans:

1. Power distribution plans showing location of incoming service (transformers and primary switches), generators, main switchgear, motor control centers, and panel boards.
2. Service entrances, main control panels, and backboards for communications, fire alarm, EMCS and other pertinent systems.
3. Plans for each floor showing locations, and mounting heights, of receptacles, telephone and data outlets, switches, disconnect switches, motor starters and other devices.

Site Plan:

1. Electrical site plan showing: electrical and telephone/data/CATV services, both new and existing; new and existing site lighting and their associated circuitry; location of transformers, primary switches, generators; circuitry to chillers, cooling towers, etc.
2. Details of duct banks, equipment pads, manholes, lighting pole bases

Schedules, Risers, etc.:

1. Provide control diagrams, panel board schedules, motor control center schedules, distribution panel and main switchgear schedules, and riser diagrams for power, telephone, security and other systems.
2. Sizes of all overcurrent protective devices, relays, CTs, PTs, starters and disconnects

Electrical Coordination Analyses:

Indicate required range of selective coordination to be provided in the delegated design Electrical Coordination Analyses.

1. Provide one-line diagrams identifying devices and equipment requiring coordination. Indicate circuit breaker type, frame size, trip type, characteristics and required accessories. Indicate any breakers without instantaneous trip feature.
2. Indicate maximum fault current at all equipment on one-line diagrams. Include all overcurrent protective devices and generator output breakers.
3. Coordinate new overcurrent devices with all existing overcurrent protection.
4. Provide specifications reflecting systems indicated on drawings.
5. Specify how transfer switches achieve withstand ratings.
6. Specify equipment settings, acceptance testing, commissioning, and report submittals for A/E review.
7. Refer to Section 8.18 for Electrical Coordination Analyses Review (Shop Drawings)

Control Systems:

1. Provide a written sequence of operation for each mechanical and electrical control system stating explicitly how systems are to function.
2. Give all pertinent data regarding safety, alarms, indicators, and control parameters.
3. The sequence of operations may be shown on the control diagrams in lieu of in the specification.
4. Provide control system diagrams.
5. Indicate point(s) of connection of new to existing system.
6. Indicate or describe location of operator interface (PC) unit.

Rock Excavation: See Section 9.3.13 for requirements. Provide estimated quantities of rock excavation on the Bid Form.

With this submission, the A/E shall furnish the University with an estimate of the time for constructing the project and include such in the appropriate paragraph of the Bid Form.

SECTION 8.9 BID FORMS AND PROCEDURES

For Instruction to Bidders: See Sections 8.3.6 and the CO-7a

For Unit Price Bids: See Section 8.3.13

For Bid Form Preparation: See Chapter 9.

Prequalification of Contractors or Subcontractors: Prequalification criteria, procedures, and appeal process requirements are shown in Chapter 10.

Advertising: The University shall notify the A/E in writing when final Contract Documents have been approved. See Chapter 9 for advertising requirements.

SECTION 8.10 ADDITIVE BID ITEMS

The A/E is responsible for the development and design of the project to meet the scope and to be within the “Design Not to Exceed” Construction Budget identified in the A/E contract. The Work included in the Total Base Bid shall provide a complete and functional facility meeting all Code, accessibility and safety requirements.

When the project cost estimate indicates that the Total Base Bid for the project scope may not be within the available funds, the University and A/E should consider what features would be negotiated out if bids are over budget and include that Work as Additive Bid Items for cost or budget control. After the University and A/E have incorporated reasonable cost containment measures in the design, Additive Bids Items may, with the approval of the Vice President of Facilities be used for budget control subject to the following limitations:

1. When additive bid items are approved for use, a maximum of four (4) Additive Bid Items may be included. Such Additive Bid Items are not intended to be a pricing exercise for the bidders.
2. The total cost estimate of the Total Base Bid plus all Additive Bid Items shall not exceed 110% of the funds available.
3. Additive Bid Items shall be structured to minimize additional effort needed to prepare the bid.
4. Additive bids shall not be used to provide essential elements of the project, such as connection to water supply, required lighting levels, or adequate HVAC capacity, or Work without which the building would not be habitable, functional or safe.
5. The Work/Design as described in the Base Bid shall be of the level of quality required for the project. Additive bids shall not be used as a shopping list to upgrade, substitute for, or delete for credit any part of the Work included in the Base Bid.
6. Only the term Additive Bid Item shall be used. Use of the term Alternate is not permitted.
7. The Work included in each Additive Bid Item shall produce a complete component that may be incorporated into the work in the Base Bid.
8. Each Additive Bid Item shall be independent of other Additive Bid Items.
9. None of the Additive Bid Items shall compromise the work in the Base Bid and other Additive Bid Items for compliance with Code, accessibility or safety requirements.
10. Additive Bid Items shall be listed so the most essential Additive is first, and so on.
11. When the project bids are received and opened, the low bidder shall be determined based on the lowest cumulative bid for the Total Base Bid plus the total amount of the Additive

Bid Items, taken in sequence as the University in its sole discretion decides to accept or award.

12. Out-of-sequence selection of Additive Bid Items is prohibited, even if such manipulation would fit within the available funding.
13. Negotiations of Additive Bid Item amounts are prohibited. Negotiations are allowed only for the Base Bid Work. If negotiations are required to allow the award of the Base Bid, the inclusion of any of the Additive Bid Items in the contract may not be considered in discussions during the negotiations, even if the negotiations of the Base Bid amount would yield sufficient savings to include an Additive Bid Item.

SECTION 8.11 PROJECT SUBMISSION REQUIREMENTS

8.11.1 Electronic Documents Submission:

The submission of electronic documents to the OUBO for review is required. Refer to Appendix U–ELECTRONIC DOCUMENT REVIEW (EDR) PROCESS DOCUMENT

8.11.2 Other Document Submissions

The A/E shall provide adequate copies of plans, specifications, cost estimates, and other applicable data for the University’s use and for review by other applicable reviewing agencies. Submissions for building projects are indicated below (Figure 8.11.2) and shall be adjusted as appropriate for a particular project.

Figure 8.11.2

Other Documents Submissions

Agency	No. of copies to be submitted to Agency						
	<u>SC</u>	<u>PD</u>	<u>WD</u>	<u>RWD</u>	<u>BID</u>	<u>PBM/CO/PR</u>	
-							
OUBO / University Building Official	0	0	0	0	0	0	
<hr/>							
<u>DEQ – Div of Soil & Water Conservation</u>							
DEQ Erosion & Sediment Control	Coordinate with the agency						
DEQ Stormwater Management	Coordinate with the agency						
Art & Architecture Review Board	Presentations to Board at SC, PD						
Dept. of Historic Resources	Coordinate with the agency						
Dept. of Health (Food Service)	Coordinate with the agency						

Dept. of Health (Medicare/Medicaid funded facilities) Coordinate with the agency

Dept. of Environmental Quality (DEQ)

DEQ Air Division **Coordinate with the agency**

DEQ Water Division **Coordinate with the agency**

DEQ Waste Division **Coordinate with the agency**

The Joint Commission (Medicare/Medicaid funded facilities) Coordinate with the agency

Legend:

SC: Schematic Design

PD: Preliminary Design

WD: Working Drawings

RWD: Revised Working Drawings

BID: Bid Documents, including Addenda (submitted for State Building Official signature before the Building Permit is approved)

PBM/CO/PR: Post Bid Modifications, Change Orders, or Permit Revisions (revisions to drawings and/or specifications issued after the Building Permit is approved and signed by the State Building Official after DEB review/approval)

SECTION 8.12 AUTHORITY HAVING JURISDICTION REVIEW AND APPROVALS

Prior to the submissions to the University Building Official and other State Agencies, the University Project Manager shall review the documents to ensure that they meet the functional and operating requirements of the project.

8.12.1 General: Reviews are performed as a service to of the University and does not relieve the its A/E, or its Consultant from compliance with all codes, laws, rules, regulations, directives and standards applicable to the project whether or not cited in the review. See Section 8.13, Quality Control/Quality Assurance, for A/E requirements pertaining to this before providing Contract Documents and subsequent submittals.

When the Building Official is satisfied that the documents are in conformance with all requirements, a Building Permit, will be issued by the Building Official or his or her designee. Final approval of the working drawings / bid documents is based on the understanding that the A/E has complied, or certifies that it will comply, with the foregoing and with all review comments concerning these requirements prior to printing the documents for release to bidders.

8.12.2 Annual Permit Work: The University Building Official's office provides guidance for review and issue of permits for Work not specifically requiring a Building Permit, but for

which other Code and standards may apply.

8.12.3 Review Comments: The OUBO will transmit its review comments to the University Project Manager in one of the following ways:

1. By eBuilder: Within 1 week after receipt of written comments from all applicable disciplines from the University Project Manager, the A/E shall provide a written response to all comments, preferably by eBuilder with the response noted below the review comment. All issues in dispute shall be resolved before proceeding to the next phase.
2. By a meeting/conference: at OUBO or A/E office where the comments are discussed, and critical issues resolved. This method may be required by the University where it is expedient to identify the general types or nature of deficiencies, especially if a resubmittal will be required. The proposed actions and decisions reached in the meeting will be accurately recorded in writing by the A/E and distributed to all meeting participants within five (5) workdays after the meeting.

8.12.4 Resubmittals: Drawing Submittals which are incomplete, which require extensive revisions, and/or which do not conform to the requirements of the Manual shall be properly completed and resubmitted for a new review. The A/E may be required to make such drawing resubmittals without compensation or reimbursement.

8.12.5 Revised Submittals: All changes, and revisions, and additions shall be clouded on the revised submittal documents and sent for review and approval by the A/E, PM, and OUBO.

8.12.6 Print and Release of Bid Documents: Bid documents (plans and specifications) shall not be printed or released to bidders until the Building Official reviews revised documents and authorizes them to be printed and released.

When authorized to advertise for bid on Capital Projects by the approved revised HECO-2, Mason Facilities Contracts shall establish a bid receipt date.

Complete and coordinated documents, checked and sufficiently detailed to provide bidders and builders with a clear description of the University project requirements will be the key to gaining approval to print/release documents for bidding.

Clarification and corrective data shall be included in addenda to those documents issued at least 10 days prior to the date set for receipt of bids.

8.12.7 Advance Advertisement/Notice: In some cases, it may be advantageous to the University to advertise a project before bid documents are fully revised. In such case the procedures below shall be followed:

1. If Advertisements are authorized to be placed in the newspapers and on the eVA website before bid documents are approved for printing and release, the Advertisement shall

indicate: “Bid documents will be available to bidders on or about ____ (date) ____.” The bid date shall be set to allow reasonable time to complete revisions, to review and print the documents, to issue the documents, and to give bidders at least three weeks to prepare bids.

8.12.8 Review Times: The review times published on the OUBO Plan Review website ([Plan Review – Office of the University Building Official \(gmu.edu\)](http://PlanReview-OfficeoftheUniversityBuildingOfficial(gmu.edu))) will be the goal for the project, exclusive of holidays, unless the submissions are obviously incomplete, (in which case the documents will be returned to the A/E).

The Art and Architectural Review Board receives presentations from the University at its normal monthly meeting (usually the first Friday of each month) and makes recommendations to the Governor; see Appendix L.

8.12.9 Approvals: Approval of the submittal at any stage is dependent on the University and the A/E satisfactorily resolving the issues raised during the reviews by the Building Official and other pertinent review agencies. Approval of Preliminaries on any project for which a Value Engineering Study is required will be dependent on the successful resolution of the Value Engineering recommendations and Building Official review comments.

SECTION 8.13 QUALITY CONTROL/QUALITY ASSURANCE

The A/E shall be responsible for the professional and technical accuracy and coordination of all designs, drawings, specifications, cost estimates, and other work or materials furnished.

The A/E shall perform a Quality Assurance review of the working drawings Contract Documents prior to submitting the working drawings documents to OUBO. The specification section numbers reflect those often used and are intended to show the types of information that should be included in the Quality Assurance check regardless of actual specification section numbering used by the A/E or where (which discipline’s drawings) the information occurs on the drawings.

The first sheet of the plans and specifications submitted to OUBO shall contain the following statement signed by the responsible A/E:

“A Quality Control/Quality Assurance check has been made on this project’s documents and corrections have been made. The undersigned states that these plans and specifications submitted for review are complete and ready for bidding.”

Signed: _____
(Type Name & Title)

This statement shall not appear on the sets of documents issued to bidders

SECTION 8.14 VALUE ENGINEERING (VE)

8.14.1 General: Capital Projects with an estimated construction cost greater than \$5,000,000 shall have a 40-hour Value Engineering (VE) Study conducted on the design. (See §2.1-1133, *Code of Virginia*.) The study shall be conducted by a qualified VE Team prior to or concurrent with the preliminary (35%) design review utilizing the five-step job plan as recognized by the Society of

American Value Engineers (SAVE). A presentation of the study results shall be made to the University. A waiver of this requirement may be requested of the VP of Facilities.

For projects that (i) are designed utilizing either the Design-Build or Construction Manager at Risk construction delivery method, (ii) have the value engineering process as an integral component, the VP of Facilities shall approve all cost savings decisions before modifications to the design may be finalized. OUBO shall be provided a summary (this is not a Value Engineering Study as defined by HECO Manual Section 8.14.1) of cost savings that have been incorporated into the design as well as potential cost savings that were considered but not incorporated. The summary shall be reviewed and recommendations made to the VP of Facilities prior to approval of preliminary design documents and prior to the issuance of any building permits.

8.14.2 Scope of VE Study: Generally, the VE Study should be made by a multi-discipline team of five VE qualified certified professionals meeting on five consecutive work days. The study group will follow the five-step job plan as recognized by the Society of American Value Engineers (SAVE). The VE report shall encompass the recommendations of the VE study group and include detailed cost estimates, life cycle analysis and sketches, as necessary.

The VE Team should convene in a manner to allow dedicated deliberation without normal daily interruption. The University, or Certified Value Specialist (CVS) if so contracted, will provide a suitable room with tables and chairs, with immediate or convenient dedicated use of a copier. VE services shall be performed in a timely manner concurrently with the normal preliminary design review to minimize any delay in the schedule, dependent on availability of a functional cost estimate.

8.14.3 Procurement of the VE Study: The University may choose to separately procure the VE services. If so, the University shall procure the services of a Value Engineering consultant using professional services procurement procedures. The procurement process should begin at least 90 days prior to the anticipated date the preliminary drawings will be submitted. RFP evaluation factors shall include the experience, qualifications and expertise of each proposed team member.

The VE proposer's response to the RFP shall include the proposer's list of proposed and alternate team members and their respective resumes representing their various disciplines/areas of expertise, together with the certified (CVS) team leader's qualifications and discipline shall be submitted with the proposal and approved at the time of negotiations.

The CVS is responsible for pre-study work, assembling, editing and reproducing the recommendations generated by the Value Engineering Team Study. The CVS must edit and sign the final report.

8.14.4 Qualifications of VE Team: The VE proposer/consultant shall provide one team consisting of a Certified Value Specialist Team Leader and at least one licensed architect and one licensed professional engineer from each discipline which have significant work on the project, usually one each or structural, mechanical and electrical engineers. VE Team members shall be experienced designers who are separate and completely independent from the Project A/E & its consultant firms.

The VE Study shall be coordinated, supervised and led by a person having Certified Value Specialist credentials that qualify him/her to perform such services. The CVS shall be certified by the Society of American Value Engineers and shall have had a minimum of eight years combined college education and practical on-the-job VE experience. Practical experience is considered to have been gained by being actively engaged as a consultant in VE activities. Members of the team shall be registered architects and professional engineers licensed in the Commonwealth of Virginia. All shall have a good understanding of VE principles and methodology as evidenced by attending a certified forty-hour workshop. Team members shall be knowledgeable of the design and operational requirements and characteristics of the systems applicable to their discipline and the type of facility being studied.

Information Supplied to the VE Team: Prior to commencing the VE study, the A/E will forward the following information to the VE Team:

1. Two sets of 35% drawings (full size)
2. Five sets of half size drawings
3. Outline Specifications & Systems Checklists (2 copies)
4. Detailed Cost Estimate (6 copies)
5. Basis of design (6 copies)
6. Design Calculations (Structural, Mechanical, Electrical)
7. Boring logs and soil reports
8. Scope of Project/Program requirements (6 copies)

8.14.5 Certified Value Specialist (CVS) Responsibilities: The CVS shall have the following responsibilities for the VE Study:

1. Pre-Study
 - a. Review complete design package & identify high cost areas.
 - b. Prepare cost model (actual vs. historical)
 - c. Prepare bar graphs of all sub systems.
 - d. Prepare preliminary cost worth ratios.
2. 40-Hour Study
 - a. Team Leader and coordinator.
 - b. Team recorder.
 - c. Presentation of recommendations.
3. Post Study
 - a. Write and assemble report.
 - b. Proof all VE recommendations, especially the cost estimate and life cycle analysis.
 - c. Calculate redesign effort for each recommendation in man-hours.
 - d. Sign and submit final report within 7 days. Express mail 10 copies to the University and 5 copies to A&E of record.

8.14.6 VE Report Requirements: The results of the VE study performed on the project shall be documented as follows:

1. Contents page.
2. Brief description of total project and project requirements with a copy of the University's program requirements.
3. Brief summary of VE recommendations.
4. One site plan, floor plan and elevation on 8-1/2"x 11" or fold out.
5. Summary sheet (only) of 35% cost estimate.
6. VE cost model of project.
7. Each VE recommendation will be described before and After VE and will be accompanied with a detailed cost estimate of savings, life cycle cost analysis, and sketches as necessary.
8. Complete 5-step job plan (worksheets) of all work will be submitted as appendices for reference.

All reports must be systematically assembled and must be short and concise, yet informative enough for decision making. VE Reports shall be prepared and submitted on 8-1/2" x 11" bond paper and bound under hardback cover appropriately identified. Sketches may be 8-1/2" x 11" or fold-out. Pages must be sequentially numbered in the lower right hand corner to facilitate assembly. Tabs should be used for quick reference of important sections of report.

8.14.7 Oral Presentation: At the completion of the Value Engineering Study, the VE team leader and members as appropriate shall make an oral presentation of the items recommended to be implemented on the project. Audience for the presentation will include representatives of the following: The A/E; University personnel including the Vice President of Facilities, Requestor, Architect for the University, University Project Manager and other specialist personnel).

8.14.8 A/E Participation: The design A/E's involvement in the VE Study with anticipated man-hours by discipline for routine general construction is summarized as follows:

	PM	ARC	STRCT	MEC	ELEC	CIVIL
• A/E Design Team Present Over view of Design Concept	4	4	4	4	4	4
• A/E Design Team supports, reviews, & Supplements VE Effort	4	4	4	4	4	4
• Oral Presentation of VE Study Results to University	4	4	_*	_*	_*	_*
• A/E Review, Supplement, and Comment on VE Report to University	8	4	4	4	4	4
· Follow-up on Questions/Decisions	4	-	-	-	-	-
Totals (*As required)	24	16	12*	12*	12*	12*

The design A/E responsibilities include the following:

1. Present an overview of the project criteria and development to the value engineering team.
2. Provide comments on the VE study report to the University within 14 days of receipt of the report.
3. Participate in joint 35% review/VE resolution meeting at the University.
4. Submit a final report within 14 calendar days of the resolution meeting to the University. Implement all finally accepted VE recommendations into the project design.

8.14.9 Criteria Challenge: In the package of documentation which the design A/E prepares for the Value Engineering Consultant, the design A/E may include a Criteria Challenge Package to question specific project design criteria, instructions and/or user requirements and to identify alternate items or procedures that might satisfy the required functions at a lower life cycle cost.

Examples of criteria which might be challenged are the exterior appearance or materials which may have resulted from a visit to the AARB, requirements of the Design Manual for the University, the Energy Budget required by the Manual, a user requirement for every office to have a window, or a user criterion for square footage in spaces which exceed that necessary for the space function. Each challenge must include Code references, a life cycle analysis supported by recent research and testing, and any calculations that are necessary to support the challenge. A brief narrative describing the advantages, disadvantages and magnitude of potential savings shall be included as well.

The Criteria Challenge Package with the documentation provided to the Value Engineering Consultant shall be marked VALUE ENGINEERING and submitted with the Preliminary Submittal to the University Review Unit. However, project development will be based on current standards until such time as a formal approval is received for any waiver or deviation from codes, standards or Manual requirements.

8.14.10 A/E Action on VE Study: The following clarifies the specific submittals and approval procedures required for the VE Study responses and proposed action:

1. Both the University and the Architect/Engineer (A/E) shall review and evaluate the Value Engineering recommendations.
2. The A/E shall provide a written comment and/or evaluation of each VE recommendation to the University Project Manager, along with the A/E's recommendation to accept, to reject, or to accept with modifications each VE recommendation.
3. The A/E shall provide justification for rejection of, or modification to, any VE recommendation.
4. The A/E shall prepare a Summary of Value Engineering Recommendations and indicate its recommended disposition of each item. The Summary sheet shall accompany the detailed responses / explanations sent to the University.
5. The University shall review the A/E's evaluation and recommendations on the VE Study. The University shall indicate its proposed action (acceptance, rejection, or acceptance as modified) on the Summary sheet
6. If any proposed action deviates from the requirements of the Virginia Uniform Statewide Building Code (USBC) or the Manual, the University shall also submit a request for code modification or waiver of Manual requirement for each item along with appropriate justification.
7. The Building Official or his or her designee will review the responses to the University review comments and, in conjunction with the Architect for the University and the University Project Manager, the proposed action on the VE recommendations. The review will address where the A/E has rejected a VE recommendation for a design change that was identified in the VE study to meet the criteria of the project and save money. Upon resolution of the issue and agreement on a specific design direction, the revised HECO-2

will be approved and authorization given to prepare working drawings the Contract Documents.

SECTION 8.15 STRUCTURAL AND SPECIAL INSPECTIONS, & STRUCTURAL OBSERVATIONS

Chapter 1 of the VCC prescribes the minimum inspections to be performed on a project. VCC Chapter 17, Special Inspections and Tests prescribes certain tests and inspections which are required to be performed on the structural systems for the building. These inspections have been, heretofore, provided on state projects by a combination of the University's Project Inspection, the A/E and the University's Independent Testing Lab.

8.15.1 Application to State-Owned Buildings:

The Office of University Building Official (OUBO) for all State-Owned buildings establishes the following procedure for the application of the Structural and Special Inspections for capital outlay projects:

8.15.1.1 A/E Responsibilities:

The A/E, as part of its Basic Service of preparing bid documents, shall include in the project specification the requirements for the materials, for the submittals, and for the tests and inspections to be performed. Identify those tests and inspections to be performed by the University's Independent Testing Service and require all other tests to be performed and paid for by the Contractor. The A/E shall include a summary of required Special Inspections in Division 1 of the Specifications. See Appendix M for the Concept of the Process. The A/E, as part of its construction period Basic Services, shall review and approve the shop drawings, material submittals and other data required to assure compliance with the requirements of the bid documents. The A/E in accord with their contract shall visit the site with representatives of each discipline having work in progress to assure conformance with the design shown in the documents. Where an Agency has received permission to exclude this service from the A/E contract, qualified Architects and Engineers of the Agency shall perform this function.

8.15.1.2 Construction Field Representative (CFR) Responsibilities:

Each project shall have an on-site Construction Field Representative who shall, as part of his responsibilities, check all materials delivered to the site for conformance with the approved submittals. The CFR shall also check the installation for proper materials, methods, clearances, etc., as described in the plans and specifications and in the approved submittals. The University's CFR shall furnish copies of all reports to the A/E.

8.15.1.3 University's Independent Test Lab:

The University's Independent Test Lab shall inspect foundations, log and inspect pile and caisson installations, inspect and test concrete, and inspect and test bolted and welded connections as required by the specifications. The University's test service shall furnish copies of all reports to the A/E.

8.15.1.4 Statement:

The Agency shall submit with the CO-6 (or prior to submitting for the CO-17) one (1) copy of the completed and signed Form [DGS-30-048](#) (CO-6a) Statement of Special Inspections, with an attached copy of the edited schedule for Special Inspections from the Form DGS-30-048 ([CO-6b](#)).

8.15.1.5 Final Report:

The Agency shall submit a copy of the completed and signed Form [DGS-30-120](#) (Final Report of Structural and Special Inspections, [CO-13.1b](#)) with its request for a Certificate of Occupancy or other documentation supporting its request to occupy a facility and close the building permit.

8.15.1.6 Listing of Structural and Special Inspections:

Appendix M, Special Inspections, contains the list of structural & special inspections required for state-owned buildings. The A/E shall edit the applicable list as necessary to indicate those materials and inspections which are and are not required for the project.

8.15.1.7 Additional Information

See Appendix N for additional information on other Construction Field Representative (CFR)/Project Inspector functions.

SECTION 8.16 STRUCTURAL OBSERVATIONS

When structural observations are required by VCC 1704.6, the Agency's structural observer shall be a Professional Engineer licensed in the Commonwealth of Virginia and identified on Form CO-6a. Structural observations shall be referenced on the Title Sheet and on Form CO-6b. The structural observer's written statement identifying the frequency and extent of the structural observations shall be included in the Project Manual. A final report of structural observations attached to Form CO-13.1d shall be submitted to OUBO prior to the Agency's request for Beneficial Occupancy.

SECTION 8.17 "COMMISSIONING" OF HVAC SYSTEMS

"Commissioning" for HVAC systems, as described in ASHRAE Guideline(s) for Commissioning of HVAC Systems, begins with the development of the project criteria, continues through the design of the HVAC systems including preparation of the plans and specifications describing the HVAC system components and requirements, continues through the review of shop drawings and submittals, continues through the inspection of the installations of the systems and observation of applicable tests and concludes with the final testing, balancing, start-up, initial operation, and acceptance of the HVAC system including controls. The A/E must begin at the project inception to develop an orderly process to document and set forth the various elements of the process so that the commissioning criteria and requirements are integrated with the design and the specification of the HVAC system and so that procedures are defined for the required testing, balancing and operational checks.

The A/E shall specify Contractor requirements related to functional performance testing including, but not limited to, pressure tests, flushing, cleaning, testing, balancing, adjusting and start-up of equipment and the calibration and testing of automatic controls. The specifications shall require that every mode of every part or zone of the HVAC system be operated under full and part load and through all normal operational modes. The specifications set forth the procedures and requirements for the performance testing, system acceptance and training of University personnel if required.

See section 9.14 for "Commissioning" inspection requirements.

SECTION 8.18 ELECTRICAL COORDINATION ANALYSES (SHOP DRAWINGS) REVIEW

8.18.1 Review of the Electrical Coordination Analyses

The A/E shall review the delegated design of the Electrical Coordination Analyses for compliance with NEC and the approved permit documents. Refer to Section 5.3.2. This is an iterative process between the A/E and the contractor. The A/E and delegated design professional shall collaborate and ensure that the design demonstrates equipment and a system that complies with the NEC and applicable codes and standards. Changes required to the approved permit documents to provide a code compliant system shall be made at no cost to the Owner. Submit final Electrical Coordination Analyses design to OUBO for review.

The Electrical Coordination Analyses shall:

1. Utilize applicable industry standards and application data including IEEE, ANSI and NEMA.
2. Utilize an industry standard software package specifically designed for performing these analyses.
3. Group Time-Current Curves (TCC) into code required and non-code required sets for ease of review. The TCC's shall be labeled with the same nomenclature as the permitted documents.

Submittal Contents:

1. The Electrical Coordination Analyses shall be indexed and contain individual, tabbed sections. The tabbed sections shall contain the information as outlined in this document including the following as a minimum:
 - a. GMU Project Code,
 - b. Project Name,
 - c. Firm Name, Address, Phone Number and dated & signed seal of the registered Professional Engineer who performed the Electrical Coordination Analyses,
 - d. The date the Electrical Coordination Analyses was completed,
 - e. Method used to perform the Electrical Coordination Analyses,
 - f. Short-circuit analysis with protective device evaluation,
 - g. Protective device coordination analysis,
 - h. Arc Flash Analysis,
 - i. Input Data,
 - j. One-line diagram used as the basis of the model,
 - k. The Electrical Coordination Analyses shall include ground fault protection coordination and recommended device settings for the devices provided with ground fault protection. Ground fault protection settings shall be coordinated with phase current device settings.

SECTION 8.19 FIRE PROTECTION SHOP DRAWINGS:

Refer to chapters 7 and 8 of this manual for the OUBO submission guidelines for additional information related to various fire protection systems. Fire protection shop drawings and product submission data shall be reviewed and approved by the A/E of record. When the submission, with any added notations is satisfactory to the A/E, the A/E shall provide a “sealed” statement, attached to the reviewed shop drawings indicating that the fire protection shop drawings (working plans, product data and calculations as applicable) satisfy the requirements of the project contract documents and the code (cite the applicable NFPA and USBC Sections).

CHAPTER 9:

CONSTRUCTION PROCUREMENT AND ADMINISTRATION

SECTION 9.1 GENERAL

“Construction” as used in this Manual, includes new construction, reconstruction, renovation, restoration, major repair, demolition and all similar work upon buildings and ancillary facilities owned or to be acquired by, including any draining, dredging, excavation, grading or similar work on real property.

Construction will generally be procured by competitive sealed bidding in accordance with the procedures of this chapter. However, competitive negotiations may be used on (1) projects using a fixed price design-build or construction management contract or (2) projects for the alteration, repair, renovation or demolition of buildings upon a determination in writing made in advance and approved by the Vice President of Facilities that competitive sealed bidding is either not practicable or not fiscally advantageous to the public. See Chapter 10 for Special Construction Procedures.

Contract Documents for capital outlay, maintenance reserve, and non-capital outlay construction projects including, but not limited to, renovation, remodeling, demolition and repair work on buildings and other structures that require Plans and Specifications prepared by an Architect or Engineer (A/E), shall include the General Conditions of the Construction Contract CO-7, and Supplemental General Conditions. The University, at its discretion, may include a Supplemental General Condition to waive the requirements of Section 12 (b) of the General Conditions of the Contract, CO-7, as it relates to the requirement for all Builders’ Risk insurance for these categories of work if the University has, for each project, verified with the Department of Risk Management that its insurance will provide adequate coverage.

All Construction Work, for both capital and non-capital projects (over \$1 Million), shall be procured in accordance with this Manual regardless of the source of funds by which the contract is to be paid. Non-Capital work (under \$1 Million) may be procured as non-professional goods and services in accordance with the Governing Rules. If there is doubt, either contact Facilities Contracts Office for guidance or use the procedures of this Manual for procurement of construction.

SECTION 9.2 METHODS OF CONSTRUCTION PROCUREMENT

Three methods of construction procurement are typically utilized for Commonwealth of Virginia construction projects:

1. Competitive Sealed Bids (Design-Bid-Build and Small Purchases): Refer to Section 9.3.
2. Construction Management at Risk: Refer to Section 10.3.
3. Design-Build: Refer to Section 10.2.

For emergency procurement of construction services, other alternative methods of construction procurement, prequalification procedures and requirements for partial building permits on phased construction projects, refer to Chapter 10.

9.2.1 Reciprocity: In accordance with Code of Virginia § 2.2-4324, whenever the lowest responsive and responsible bidder is a resident of any other state and such state under its laws allows a resident contractor of that state a percentage preference, a like preference shall be allowed to the lowest responsive and responsible bidder who is a resident of Virginia and is the next lowest bidder. If the lowest responsive and responsible bidder is a resident of any other state and such state under its laws allows a resident contractor of that state a price-matching preference, a like preference shall be allowed to responsive and responsible bidders who are residents of Virginia. If the lowest bidder is a resident contractor of a state with an absolute preference, the bid shall not be considered. The Department of General Services posts a list on the eVA website of the state by state reciprocal preference data.

SECTION 9.3 CONSTRUCTION BIDS

9.3.1 Capital Outlay Construction Projects: All construction shall be procured by competitive sealed bidding in accordance with The Governing Rules § 5 Methods of Procurement and the procedures described in this chapter or by special procedures as described in Chapter 10.

The Invitation for Bids for capital outlay construction projects shall include the General Conditions of the Construction Contract, G.S. Form E&B CO-7; the Instructions to Bidders, G.S. Form E&B CO-7a; the Notice of Invitation to Bid; a Bid Form; and other documents

9.3.2 Instructions to Bidders: Refer to Section 8.3.6 and Appendix A which contains instructions to bidders, HECO-7a

9.3.3 Virginia Construction Contracting Officer: A Virginia Construction Contracting Officer (VCCO) shall supervise the bidding and awarding HECO construction contracts. Procedures stipulated in this Manual shall be used in all cases.

9.3.4 Authorization to Advertise for Bids: Authorization to bid shall come from the approval of the Invitation for Bid process in e-builder. If the bid is contemplated before the completion of the review of the drawings by the OUBO Office than approval to bid shall come from the Vice President of Facilities or their delegee.

9.3.5 Preparation: Bid Forms shall be prepared using the format and wording shown on the Standard Bid Form Format, the Notice of Invitation for Bids Format, the IFB Cover Format and the Invitation for Bids Contents Format in Appendix C. The contractor's Disqualification Statement and the Immigration Reform and Control Act of 1986 statement shall be included on each bid form. In preparing these bid forms A/E's are reminded to keep the number of additives to a minimum and when including more than one, they shall be listed and accepted in order of importance. See Chapter 8.10 for further requirements and procedures concerning Additive Bid Items. Including or use of "Allowances" in the Bidding is not permitted.

9.3.6 Small Business Set Asides

Contracts for construction projects up to \$100,000 are set aside for small business as outlined below.

9.3.6.1 Total Construction Cost Less Than \$10,000

Contracts for less than \$10,000 are set aside for licensed contractors who are DSBSD certified micro businesses. Informally solicit bids from 2 micro businesses. If the cost is fair and reasonable, award the contract to the contractor with the lower bid. If the cost is not fair and reasonable, or upon due diligence (as determined by the Director of Purchasing & Fiscal Services in Facilities) it is determined that no micro business in a particular category exists, or was willing to submit a bid, the procedure in Section 9.3.6.2 below shall be utilized.

9.3.6.2 Total Construction Cost From \$10,000 to \$100,000

Contracts in this range are set aside for licensed contractors who are DSBSD certified small businesses. Informally solicit written bids from 4 licensed DSBSD certified small businesses and 1 licensed DSBSD certified micro business (unless upon due diligence it is determined that no micro business in a particular category exists, or was willing to submit a bid, as determined by the Director of Purchasing and Fiscal Services in Facilities). If the cost is fair and reasonable, award the contract to the contractor with the lowest bid. Post notice of award on eVA. If the cost is not fair and reasonable, the set aside is removed and a minimum of 5 contractors shall be informally solicited.

9.3.6.3 Total Construction Cost More Than \$100,000

For contracts in this range, there is no set aside. Formally solicit written bids through posting on eVA. The bidder shall indicate in its bid whether it will be using specific subcontractors to comply with its small business procurement plan. If so, any variances between the contractor's listed subcontractors and the actual participation shall be submitted to the agency along with an explanation as to why the change is being made.

9.3.7 Small Project Procurement Procedures

Construction, or repair or replacement in kind, or remodeling or renovation Work which is valued at \$100,000 or less may be procured using the procedures of Section 9.3.7.1 and 9.3.7.2, or by using the standard Competitive Sealed Bid procedures. A pre-bid conference shall not be mandatory for projects with an estimated cost of less than \$100,000.

9.3.7.1 Minor Construction Costing \$10,000.00 or Less

1. Develop scope of work (bid documents).
2. Use CO-7 General Conditions.
3. Informally solicit bids from at least two (2) licensed DSBSD-certified micro businesses.
4. Receive bids in e-builder (unless another method is indicated in the solicitation) by the specified deadline.
5. Open / announce bids next day at specified time.
6. If the price received from the solicitation is determined to not be fair and reasonable, or upon due diligence it is determined that no micro businesses exist in a particular category or were willing to submit bids, follow the procedure below in Section 9.3.7.2

9.3.7.2 Minor Construction Costing More Than \$10,000 Up To \$100,000

1. Develop scope of work including plans & specifications (bid documents).
2. Use CO-7 General Conditions.
3. Post notice of IFB in eVA.
4. Solicit bids from at least four (4) licensed DSBSD-certified small businesses and one (1) licensed DSBSD-certified micro business.
5. Receive bids in sealed envelopes or via eVA by specified deadline.
6. Open / announce bids next day at specified time.
7. Post notice of award in eVA. The Agency shall also post the Contract on eVA in accordance with the requirements of the Division of Purchases and Supply (DPS).
8. Bonds are not required but may be specified.
9. If the price received from the first solicitation is determined to not be fair and reasonable, or upon due diligence it is determined that no micro businesses exist in a particular category or were willing to submit bids, then remove the set aside and solicit bids from 5 businesses.

9.3.8 Use of DEB Contracts: For contract awards up to \$500,000 per project for renovation and up to \$250,000 per project for new construction, DEB has solicited and created a list of pre-qualified contractors. The list of contracts can be reviewed at the DEB Contracts web page. When soliciting from the pre-qualified pool, or issuing orders under the contracts, the set aside procedures above for micro businesses and small business are applicable.

1. Develop scope of work including plans & specifications (bid documents).
2. Use CO-7 General Conditions.
3. Solicit for at least 21 days via email written sealed bids from all businesses listed based on the trade and region of the project. Additionally, for projects requiring specialized skills (ie, historical plaster repair, repair of laboratory fume hoods), the agency may require Attachment 1 to further qualify the bidders.
4. Receive sealed bids and open bids 24 hours later.
5. If the cost is fair and reasonable, award should be made to the lowest responsive and responsible bidder.
6. Award the contract using HECO-9.1 (Notice of Intent To Award), HECO-9 (Construction Contract) and HECO-9.2 (Notice to Proceed).
7. Post the award on eVa.

9.3.9 Construction up to \$1,000,000: Construction up to and including \$1 Million can be procured as goods and services under Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors. Procurement methods may include direct awards as per small purchase procedures, awards to “on demand” prequalified contractors per established procedures, established cooperative contracts (including JOC), IFB and competitive negotiation. Procurement method shall be determined by the VCCO with input from the Project Manager and as needed the Facilities Director of Contracts and Capital Finance reviewing factors such as project timeline, budget, and complexity to determine method in the best interest of the University. When utilizing the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors the requirements of section 9.3.6 do not apply. When public posting of a solicitation is required the posting will typically be 30 days prior to the bid/proposal

due date, but shall be no less than 10 days; posting days for these purchases are at the discretion of the VCCO.

9.3.10 SEPARATE CONTRACTS FOR MATERIAL AND/OR EQUIPMENT

All procurements must be made in accordance with the University Procurement Policy and this manual. All assignment of contracts or materials must be done with the full prior knowledge of all parties to the contract. *The use of 'allowances' could be construed as non-competitive and may be deemed not to conform to the University Procurement Policy. If an allowance is requested, this must first be approved by the Director of Purchasing and Fiscal Services.* Work that is outside of the general contract, that is Not In Contract (NIC) for bidding but is to be included in the construction, must be coordinated with the contract documents in one of the following ways:

1. **Contractor purchased/Contractor Installed (subcontractor designated/price set by University):** Drawings and specifications must be included that describe the work including: scope of work, materials, installation, testing, and quality control. The Bid Form must include a statement that informs the General Contractor to accept the subcontract and coordinate the work as if the General Contractor had selected the subcontractor. The Bid Form shall also include the value/quote/negotiated price of the subcontract to be included in the Bid. An example of this is a pre-selected Building Automation Systems subcontractor.
2. **Contractor purchased (materials contract assigned by the University)/Contractor Installed:** Drawings and specifications must be included that describe the work including, scope of work, materials, installation, testing and quality control. The Bid Form must include the value/quote/price of the materials contract and a statement that informs the General Contractor of the intent to assign a specific materials contract, and directs the General Contractor to accept and install the materials and coordinate the work as if the General Contractor had purchased the materials. An example of this is laboratory or kitchen equipment.
3. **University purchased/Contractor Installed:** Drawings and specifications **must** be included that describe the work including: scope of work, materials, installation, testing, and quality control. The Bid Form must include a statement that informs the General Contractor of the intent to provide specific materials in a specific location, and directs the General Contractor to accept and install the materials and coordinate the work as if the General Contractor had purchased the materials. An example of this exists or is pre-purchased laboratory or kitchen equipment. The University shall pay the supplier directly for the materials.
4. **University purchased/University installed (or installed by University's Separate Contractor):** The Bid Form must include a statement that informs the General Contractor of the intent to perform specific work in a specific location, and directs the General Contractor to allow the work to proceed, and coordinate the work of the University and other contractors. An example of this is medical equipment.

SECTION 9.3.11 PROCUREMENT OF FURNISHINGS AND LOOSE EQUIPMENT

Loose equipment and furnishings are generally items moveable or portable versus permanently affixed to the building. It includes such items as residential refrigerators; unattached residential stoves; unattached furniture; and other similar furnishings or loose equipment. The University will

typically purchase loose equipment in accordance with the University Procurement Policy through University Purchasing.

SECTION 9.3.12 BUILT-IN EQUIPMENT

Built-in equipment comprises special purpose equipment or furnishings that are permanently built in or attached to the building. It includes such items as laboratory benches, kitchen cabinets, commercial laundry equipment, auditorium seating, stage rigging, and so forth. Built-in equipment may be procured in the following ways provided the procurement complies with Chapter 43 Title 2.2 of the *Code of Virginia*:

1. Bid as part of the General Construction Contract.
2. Bid prior to receipt of bids on the General Contract where the successful bidder agrees to be assigned as a subcontractor to the General Contractor. That price and vendor's name are then listed on the Bid Form using wording as shown on the Sample Bid Form in Appendix C for inclusion in the General Contract bids.
3. Bid and installed as a separate contract for both procurement and installation in accordance with the University Procurement Policy.

SECTION 9.3.13 ROCK EXCAVATION

Where rock excavation is likely to be encountered, the site shall have an adequate number of soundings taken. The designer shall use this data to show on the plans enough assumed rock profiles over the entire area to be excavated to identify clearly the condition assumed for the base bid. The specifications shall state the method of volume calculation and pay lines to be used.

The designer shall calculate and state in the Bid Form (See example below) an estimated quantity of rock to be excavated based on the assumed rock profiles. The bidder shall indicate a unit cost by which his bid for the rock excavation is calculated. This bid item shall be added to the other bid items to establish the Lump Sum Bid. The final net contract payment for rock excavation shall be adjusted (plus or minus) based on the actual quantity of rock excavated. This price shall include disposal of excess. General rock pay width shall be based on 18" outside of a neat wall face; or vertical projection from the extremities of the base, whichever is greater. Trench rock quantity shall be based on the widths stated in the specifications.

Rock excavation shall be defined as hard bedrock, boulders or similar material requiring the use of rock drills and/or explosives for removal. The criteria for classification of general excavation as rock shall be that material that cannot be removed by a track mounted D-8 dozer with a heavy ripper or 3/4 CY track mounted shovel with appropriate scoop. The criteria for trench rock shall be that material that cannot be removed by a 3/4 CY track mounted backhoe with a proper width bucket. The trench unit price shall only apply to material below the general grading level. When the overburden is removed and the rock surface is exposed, the A/E shall verify that the material is of a hardness that qualifies it for classification as rock excavation. Actual profiles shall then be taken. The net difference between the actual rock excavation and that estimated volume shown in the Proposal shall be applied times the contract unit price for adjustment of the final payment.

Examples of Rock Excavation for Bid Form

Part __ - Excavation of Rock Material: Excavation of rock material, where authorized or directed, and proper disposal off-site of excess material, complete per specifications. (Price per cubic yard) (Final amount shall be adjusted up/down based on actual quantity authorized.)

Estimated quantity of 100 cubic yards @ \$ _____ per cubic yard = _____ (A/E fill in estimated quantity to be included in bid)

Part = Dollars \$

Part __ - Excavation of Rock Material at Trenches: Excavation of rock material, where authorized or directed, proper disposal off-site of excess material and backfill with compacted trench fill material per specifications. (price per cubic yard) (Final amount shall be adjusted upward or downward based on actual quantity authorized.) Estimated quantity of 50 cubic yards @ \$ _____ per cubic yard = _____ (A/E fill in estimated quantity to be included in bid)

Part = Dollars \$

9.3.14 Advertising: The Construction Management Department shall establish a time and place for receiving bids. Bid receipt dates shall be coordinated through the University Construction Contract Administrator. The A/E shall use this information in completing the advertisement on the Notice of Invitation for Bids, Appendix C. Bids are generally not received nor opened on Mondays and Fridays. For general preparation of bid document see Chapter 8.

Also, the advertisement for bids should be posted in a designated public area used for posting of such notices. For optimum exposure, the advertisement should also be filed with all organizations that regularly advertise and report construction bid data. Advertisements in other newspapers may be necessary for large projects. The advertisement will be circulated and posted for appropriate maximum exposure by Construction Management and be posted on the eVA web site.

9.3.15 Pre-bid Conference: If a pre-bid Conference or project showing is held (whether optional or mandatory), representatives of the University and the A/E shall attend. The University shall make the Project location or building available to the attendees / prospective bidders for their observation or inspection.

The Project Management & Construction Department shall conduct the pre-bid conference. The agenda shall include the following:

1. Introductions of A/E and University representatives
2. Synopsis of the Work by citing or reading portions of:
 - a. Notice of Invitation for Bids
 - b. Instructions to Bidders
 - c. Pre-bid Question Form
 - d. Bid Form
 - e. Supplemental General Conditions
 - f. Special Conditions

9.3.16 General Requirements: Other conditions or requirements included in the Bid Documents that should be called to the attention of the bidders:

1. Questions from the floor - A/E should answer only those questions where the response is to direct the questioner's attention to a particular portion of the bid documents. ALL OTHER QUESTIONS SHOULD BE RECEIVED IN WRITING OR DOCUMENTED BY THE A/E AND RESPONDED TO IN WRITING IN AN ADDENDUM.
2. The A/E shall issue an Addendum to include a copy of the attendee's sign-in sheet and the questions posed with the response to each.

The University and the A/E must be careful not to provide any information, instruction, or clarification to pre-bid attendees which are not made available to all potential bidders.

9.3.17 Addenda to the Bid Documents: Addenda shall be issued as necessary to clarify or correct information in the Bid Documents, to respond to questions raised by the Bidders, and/or to modify the Bid Receipt Date.

No oral explanation in regard to the meaning of the drawings and specifications shall be made and no oral instructions shall be given to the Bidders.

Addenda to clarify or correct information in the Bid Documents should be issued at least 10 days prior to the Bid Receipt Date. Addenda which add work to the project, which provide significant information, which must be considered by subcontractors and suppliers, or which contain many pages of corrections must be issued at least 10 days prior to the date set for receipt of bids or the bid date must be delayed to allow the 10 days. Addenda, which serve primarily to provide clarifications or corrections, may be issued up to 3 days prior to bid receipt date. Addenda which only delay or cancel the date for receipt of bids must be issued at least 24 hours prior to the date and time set for bid receipt.

One copy of all Addenda shall be distributed to the OUBO at the same time and by the same means as the Addenda are issued to the Bidders.

9.3.18 Political Contributions Prohibited During Procurement Process: Per Code of Virginia § 2.2-4376.1 and § 2.2-3104.01, no bidder or offeror, including any individual who is an officer or director of such, who has submitted a bid or proposal to a state agency for the award of a public contract pursuant to the Virginia Public Procurement Act (Code of Virginia § 2.2-4300 et seq.) shall knowingly provide, or make an express or implied promise to make, a contribution, gift, or other item valued over \$50 to the Governor, his political action committee, or the Governor's Secretaries, if the Secretary is responsible to the Governor for any agency with jurisdiction over matters at issue ("Governor's Associates"), during the period between the submission of the bid and the award of the public contract. Likewise, the Governor's Associates shall not knowingly accept such a contribution, gift, or other item under these circumstances. Any person who violates this shall be subject to a civil penalty of \$500 or up to two times the amount of the contribution or gift, whichever is greater. The provisions of this paragraph shall not apply to contracts with a stated

or expected value of under \$5 million or contracts awarded as the result of competitive sealed bidding (as defined in Code of Virginia § 2.2-4302.1).

9.3.19 Receipt of Bids: A Virginia Construction Contracting Officer (VCCO), or a person acting under the supervision of the VCCO, will receive the bids when submitted. The University's standard bid submission requirement is that bids shall be submitted electronically via e-builder and the dates and times of receipt are automatically notated by the system. However, if the solicitation requires submission of paper bids, the VCCO or person under the supervision of the VCCO must record the time and the date and initial on the bid envelope. That record shall be retained. All envelopes, papers and data submitted with the bid shall be stapled together and permanently retained, except for bid securities or work papers which shall be retained only until a signed contract is obtained. At that time, bid securities must be returned to the bidders. Until that time, bid securities must be retained in a secure place. Work papers will be returned to the bidder unopened, unless needed to resolve a withdrawal of bid due to error claim. The preferred days for bid receipt are Tuesdays, Wednesdays, And Thursdays.

SECTION 9.4 BID OPENING

9.4.1 Bid Opening: Bids shall be publicly opened, either via a web conferencing system (for the opening of electronically received bids) or in person, by a VCCO and shall be reviewed for completeness. Tabulation shall be made showing bid price, presence of bid bond or certified check, completion time, work papers, acknowledgement of receipt of addenda, and any other pertinent information. See Appendix F for Procedures for Opening Bids.

The method of Bid Opening, either by web conferencing system or in person, shall be clearly defined in the bid documents.

SECTION 9.5 PROVISIONS FOR NEGOTIATION WITH LOW BIDDER

When the low bid exceeds available funds (noted on the Department MOU or CO-2/HECO-2) and upon approval of the Vice President of Facilities negotiations with the lowest responsive and responsible bidder may occur. In all cases, a record of the negotiations will become a part of the procurement *file* for the project. Negotiation shall be limited to the Work included in the Total Base Bid on the bid form only. Additive bid items, if any, cannot be considered in the negotiations nor can they be incorporated in the final negotiated contract. The A/E, as part of his basic services, shall advise the Owner as to the functional, operational, safety and code aspects of all proposed changes in the Work. The A/E shall also advise the Owner of the appropriateness of the dollar value of each change. Once the negotiations are complete, the A/E shall assist the agency in preparing the documentation of the negotiations and prepare any sketches, details or other modifications to the plans and specification to clarify the Work to be performed by the Contractor. If negotiations are unsuccessful with the lowest bidder, the University can choose to negotiate with the next lowest bidder upon approval from the Vice President of Facilities.

SECTION 9.6 AUTHORITY TO AWARD A CAPITAL OUTLAY PROJECT CONTRACT

The VCCO approves all requests to award a contract to the lowest responsive and responsible bidder for capital outlay projects. Note the construction line of the budget shall reflect the award

amount. Once the award is approved, the University shall "Post" a Notice of Intent to Award on the eVA website prior to contract award. If the low bid exceeds available funds (noted on the Department MOU or CO-2/HECO-2) by 25% or less, the Vice President of Facilities can choose to infuse additional funds. If the low bid exceeds available funds (noted on the Department MOU or CO-2/HECO-2) by 25% or more, the approval to infuse additional funds must come from the Executive Vice President for Administration and Finance.

SECTION 9.7 EXECUTION OF CONTRACT

The Executive Vice President for Administration and Finance has been delegated authority to execute contracts and, consistent with existing board policies, may sub-delegate this further. The Executive Vice President for Administration and Finance or delegate will execute a written contract with the Contractor using the HECO-9.

9.7.1 Protest of Award or Decision to Award: Any bidder who desires to protest the award or decision to award a Contract shall submit such protest in writing to the University, no later than ten (10) days after the award or the announcement of the decision to award, whichever occurs first. No bid protest shall lie for a claim that the selected bidder or offeror is not a responsible bidder. The written protest shall include the basis for the protest and the relief sought. The University shall issue a decision in writing within ten (10) days of receipt of the written protest stating the reasons for the action taken. This decision shall be final unless the bidder or offeror appeals within ten days of the written decision by instituting legal action as provided for in the Governing Rules § 50.

9.7.2 Stay of Award During Protest (Rules § 52): An award need not be delayed for the period allowed a bidder or offeror to protest, but in the event of a timely protest, no further action to award the Contract will be taken unless there is a written determination that proceeding without delay is necessary to protect the public interest or unless the bid or offer would expire.

9.7.3 Notices to Proceed: Will be issued by the VCCO after the execution of the Construction Contract. Bonds and insurance certificates will have to be submitted and reviewed by Legal Counsel before the first payment is requested. No construction can begin until the Building Permit has been issued.

SECTION 9.8 CONSTRUCTION CONTRACT ADMINISTRATION

9.8.1 General: The General Conditions of the Construction Contract, CO-7, describe the contract administration procedures. (Appendix A)

9.8.2 A/E Construction Period Services: Generally, the A/E's Basic Services requires the A/E to assist in the solicitation of bids, review and approve submittals, visit the site periodically and inspect the Work, complete Structural and Special inspections, review and certify Contractor payment requests, participate in on site preconstruction, progress and pre-installation meetings, issue clarifications of the Documents, issue Field Orders, process change orders, provide substantial and final completion inspections and certifications and other functions associated with contract administration. See Chapter 5 and Chapter 9 of this Manual for typical A/E services during construction. These services should also be referenced or described in the A/E Contract or its

Memorandum of Understanding. These services and/or other services may also be provided by special consultants.

9.8.3 Construction Program Management: The University may assign a Construction Program Manager to assist the University Project Manager as the University's on-site representative for the construction phase; to manage any other construction phase consultants; to coordinate other consultant, A/E and Contractor communications; to expedite resolution of all conflicts; to perform additional quality assurance oversight (such as inspection, verification, acceptance, rejection) and to perform other administrative oversight. The Construction Program Manager shall be included in all written decisions and notices to the Contractor and information and notices from the Contractor. All activities not specifically required to be performed by the A/E may be performed by the University Construction Program Manager or by the University's selected consultant.

The University may also delegate from the Architect/Engineer to any selected consultants' certain inspection, verification, acceptance, rejection, and administrative duties and authority. The University shall provide the Contractor and the A/E information in writing defining the limits of the selected consultants' authority.

SECTION 9.9 BONDS & INSURANCE:

9.9.1 Bid Bonds: For contracts with a value of \$100,000 or less, when Bid Bonds are not required by the Invitation for Bid or Request for Proposal, the University may require prospective contractors to be prequalified. For contracts with a value of more than \$100,000 but less than \$500,000, when Bid Bonds are not required by the Invitation for Bid or Request for Proposal, prospective contractors shall be prequalified. In no case shall bonding requirements be waived for projects with a value of \$500,000 or more.

9.9.2 Performance Bond and Labor and Materials Payment Bond: For contracts with a value of less than \$500,000, the University will consider waiving the Performance Bonds and Labor and Materials Payment Bonds if the University determines that the risk is acceptable. The decision will be noted in the bid documents. For contracts with a value of less than \$500,000, when Performance Bonds and Labor and Materials Payment Bonds are required by the Invitation for Bid or Request for Proposal, there are two methods to obtain these bonds - Commonwealth Self-Bonding Program or Standard Bonds. For bidders who have been prequalified in accord with the Commonwealth Self-Bonding Program, the Owner may at their sole discretion obtain the bonds through this program. All other contractors shall provide the Owner with Standard Bonds or Alternative Forms of Security (Code of Virginia § 2.2-4338). In no case shall bonding requirements be waived for projects with a value of \$500,000 or more.

9.9.3 Commonwealth Self-Bonding Program: The Commonwealth's Self-Bonding Risk Management Program for Small Construction Projects (Self-Bonding Program) was developed by the Department of the Treasury 's Division of Risk Management in conjunction with the Department of General Services' Division of Engineering & Buildings. This program was developed to address the mandates of the following sections of the Code of Virginia § 2.2-1839, §2.2-4336, and § 2.2-4337. The current procedures describing the Self-Bonding Program are available for view and download from the DEB website. Form HECO-16 Attachment (DGS-30-

174), requests additional financial and insurance data from contractors seeking to prequalify for self-bonded projects.

9.9.4 Builder's Risk Insurance: The Contractor shall procure and maintain "all-risk" Builder's Risk insurance with minimum coverage limits as follows:

1. **New Construction:** Builder's Risk valuation for new construction shall be equal to one hundred percent (100%) of the Contract Price and the value of all change orders.
2. **Addition:** Builder's Risk valuation for an addition shall be equal to one hundred percent (100%) of the Contract Price and the value of all Change Orders. If no Work is performed in the existing structure, then Builder's Risk is not required for the existing structure. If Work is performed in the existing structure, then Builder's Risk valuation for the existing structure shall be in accord with the requirements of this section for major renovation or limited renovation as applicable
3. **Major Renovation:** Builder's Risk valuation for a major renovation shall be equal to the structure replacement value plus one hundred percent (100%) of the Contract Price. Builder's Risk valuation shall be equal to the Virginia Department of Treasury, Virginia Agency Property System (VAPS) value. The agency shall ensure that this value is up-to-date and reflects the current configuration of the structure
4. **Limited Renovation:** When the Work is a Limited Renovation to an existing structure, the Contractor shall maintain "all risk" Builder's Risk insurance in an amount equal to one hundred percent (100%) of the Contract Price and the value of all Change Orders, to represent the total value of the Work on a replacement cost basis.
5. **ACORD Form:** Use of the ACORD form to identify the valuation and sub-limits of Builder's Risk Insurance is recommended. The agency shall verify that the ACORD form matches the insurance policy and that any limits, sub limits, or exclusions identified are not in conflict with the requirements of the General Conditions of the Construction Contract

SECTION 9.10 PRE-CONSTRUCTION MEETING

Prior to the start of construction, a Preconstruction meeting shall be held. Attendees should include the University Project Manager, Project Inspector, OUBO, the building user, the A/E's Representative including selected representatives of each design discipline involved in the project, special consultants, the Contractor's Project Manager, Superintendent (and Scheduler, if Contractor desires), and representatives of the Contractor's major Subcontractors.

SECTION 9.11 MONTHLY PAY MEETINGS

The intention is that the Contractor, the University Project Manager, the A/E and other consultants have timely exchange of information and cooperate to accomplish the Work as required by the Contract Documents. See the General Conditions of the Construction Contract (CO-7) section 50. The monthly pay meeting is normally the best opportunity to exchange information and should include the following topics:

1. Observations of status, quality and workmanship of work in progress
2. Validation of the Schedule of Values and Certificate for payment
3. Conformance with proposed construction schedule

4. Outstanding Requests for Information, Requests for Clarification and Requests for Proposal
5. Submittals with action pending
6. Status of pending Change Orders
7. Status of Running Punch List items
8. Work proposed for coming pay period
9. Discussions of any problems or potential problems which need attention

SECTION 9.12 OTHER MEETINGS

Other meetings, such as progress meetings, coordination meetings, pre-installation meetings and/or partnering meetings may also be appropriate. See the General Conditions of the Construction Contract (CO-7) section 50. Pre-installation meetings are required for all major trades. Such meetings should include the A/E, the project engineer for the mechanical discipline, the University Project Manager, the Inspector, any commissioning consultant, the Contractor's project manager and superintendent, the mechanical subcontractor's project manager and superintendent, and a representative of the major supplier/manufacturer.

SECTION 9.13 SCHEDULE OF VALUES AND CERTIFICATION FOR PAYMENT

The General Conditions of the Construction Contract, CO-7, describe in Sections 20 and 36 the requirements for completing the Schedule of Values and Certificate for Payment, HECO-12, and for providing documentation of Work performed and for properly stored materials. The A/E, as part of Basic Services, is required to review and approve the format and breakdown of the initial Schedule of Values and to review, evaluate, verify, and approve the Contractor's monthly submittal of the HECO-12 documentation requesting payment. The HECO-12 submission is required to be made within the University's web-based project management software, e-builder. Directions on this process can be found at the following link:

<https://gmufacilities.freshdesk.com/support/solutions/folders/33000208553>.

9.13.1 GCPay: Use of the web-based service, GCPay, for all pool-funded projects that include funds provided by the Six-Year Capital Outlay Plan Advisory Committee is optional. At this time, the use of GCPay is not used for other state projects, University developed projects, or Mason Foundation projects. The monthly fee for using this system is paid by the project General Contractor. Payment requests for General Contractors and A/Es, and all project costs (equipment, testing, moving, move coordination, etc.), shall be accounted for in this system. Training on the use of the system is available from GCPay at www.gcpay.com. Access to and instructions for the use of the GCPay statewide contract are available at the Department of General Services website.

9.13.2 Payment for Stored Materials: If the Contractor requests, or intends to request, payment for materials stored in an approved and secure manner, the Schedule of Values must indicate the amount for labor and the amount for materials, and in a supplement thereto must include an itemized list of materials for that trade or work section. The material breakdown shall be in sufficient detail to allow verification of the quantities required for the project, the quantities delivered, the Work completed, and the quantities stored on or off the site.

All off-site stored materials for which payment is being sought shall be scheduled for installation within 6 months. Off-site stored materials shall be stored within the Commonwealth of Virginia. If the Contractor requests payment for materials stored out of state, contact Mason for assistance.

A sample format for a Supplementary Agreements for off-site storage of materials or equipment away from the general location of the Project is available at the following link:

<https://facilities.gmu.edu/resources/forms/>

SECTION 9.14 INSPECTION OF WORK

9.14.1 General: The General Conditions of the Construction Contract, CO-7, describes in Section 16 the requirements, responsibilities and authorities for inspection of the construction Work and for correction of deficiencies and/or defects found. Also, Section 21 of the CO-7 describes access to the work site.

The A/E's inspection services generally require at least twice a month on-site inspections and availability to answer questions from the CFR/Project Inspector. The University will designate a specific individual to serve as CFR/Project Inspector. The duties and functions of the CFR/Project Inspector include those listed in Section 16 of the General Conditions of the Construction Contract, CO-7. A detailed list of duties along with sample formats for recording required information are included in Appendix N.

It is essential that the A/E, the Construction Administration Manager, the CFR/Project Inspector and any Project consultants work together, to observe and inspect the Work, and to regularly communicate to assure that work being performed conforms to the Contract Documents.

9.14.2 “Commissioning” Inspection of HVAC Systems: See section 8.17 for design phase commissioning requirements. Prior to any submittals and/or installation a pre-installation meeting will be held. See section 9.12 above. The A/E will observe the Contractor’s functional performance testing including, but not limited to, pressure tests, flushing, cleaning, testing; balancing, adjusting and start-up of equipment and the testing of automatic controls and report his observations to the A/E. The A/E shall schedule periodic inspections of the HVAC systems and be present for such testing as specified in the Mason Design Manual. Some sophisticated HVAC systems for facilities such as laboratories, medical science facilities, and archival storage facilities have minimal tolerances for deviations in temperature, humidity and/or air changes and, therefore, may require special commissioning or test/inspection services to assure the precise conditions required. The University may secure these services from the A/E as additional services or as extra services or the services may be procured from an independent testing / commissioning agent depending on the services required and the capabilities of the possible vendors/consultants.

Notwithstanding any "commissioning" inspections it shall remain the A/E’s responsibility to verify that the Contractor has all systems functioning properly per the sequence of operations and the design intent has been achieved; that equipment has been received is in accordance with the Submittal previously approved by the A/E; that all system components have been adjusted and a record made of final settings; and that manual and automatic operating modes have been

established for full load ranges prior to notifying the University that the system is ready for final start-up and acceptance testing. It is the intent that when the startup inspection team is called together to conduct final inspections and acceptance test that the work be started as scheduled and completed without exceptional delay. Major or time-consuming adjustments or modifications during final inspection shall be avoided. Final inspections requested when the systems are obviously not ready for such testing and inspections may result in a back-charge to the A/E or Contractor for the costs of inspection team visits and related costs. Applicable portions of the above requirements shall be included in the project specifications.

9.14.3 Structural Inspections: See Section 8.15 of this Manual and Appendix M for this requirement.

9.14.4 Other Inspections: The University may procure the services of independent laboratories or firms to provide other inspection and testing services for such areas as systems commissioning, foundations, steel frame connections, concrete testing, fire proofing and standard compaction control.

9.14.5 Fire Marshal Inspections: The Regional Office of the State Fire Marshal Office will normally be responsible for the Fire Marshal inspection.

SECTION 9.15 CONSTRUCTION CHANGE ORDERS

Generally, change orders will be administered in accordance with section 38 of the General Conditions of the Construction Contract (CO-7). The University may at any time, by written order utilizing the change order forms (HECO-11a and HECO-11) and without notice to the sureties, make changes in the drawings and specifications of this Contract which are within the general scope of this Contract, except that no change will be made which will increase the total contract price to an amount more than twenty percent (20%) in excess of the original Contract price without notice to sureties. For fixed price contracts, when a single change order or when the cumulative total of change orders exceeds the original contract amount by more than 25% or \$50,000 whichever is greater, that change order and any subsequent change order that increases the contract amount shall have the prior approval of the Executive Vice President for Administration and Finance. See Appendix K for standard change order procedures. No change order for Capital Projects shall be issued, regardless of cost that increases or decreases the approved scope of the project as shown on the approved CO-2/HECO-2 or as set forth in the Capital Project Request, Preplanning Study, or Department MOU by more than 25% without prior approval of the Board of Visitors. Additionally, the total cumulative amount for all change orders for a single contract shall not exceed the construction contingency available in the current budget noted on the CO-2/HECO-2 or the Department MOU. A revised HECO-2 to infuse additional funds or to transfer funds to the Total Project Budget shall be submitted within e-builder with appropriate written justification.

SECTION 9.16 DOCUMENTATION OF “AS BUILT” CONDITIONS

The Contractor shall be required at all times to maintain one record set of drawings and specifications in the Superintendent’s office at the project site. This set of documents shall be

designated the “As Built” documents and shall be used to record any changes or deviations from the original documents. The A/E and Project Inspector shall review this set when he or she visits the site, and prior to approving the monthly pay request to assure that the Contractor is making the notations as required. The “As Built” set of documents shall be furnished to the A/E at the completion of the project as a reference for preparing the final “Record” documents.

SECTION 9.17 INSPECTION FOR SUBSTANTIAL COMPLETION

When the project is sufficiently complete in accordance with the Contract Documents and it can be used for the intended purpose, the University Project Manager will ensure the requirements, procedures, inspections and approvals below and in section 44 of the General Conditions of the Construction Contract (CO-7) are completed.

When the Contractor determines that the work, or a designated phase or portion thereof, will be substantially complete and ready for testing and inspection, he shall complete and send Form HECO-13.2a with a list of the Work he knows to be unfinished or defective to the A/E at least ten (10) days prior to the date he has set for substantial completion. The A/E will forward the HECO-13.2a to the University and attach a written endorsement, based on his periodic inspections, as to whether or not he concurs that the project, or phase, should be substantially complete on the date set by the Contractor. The A/E coordinates and arranges a date on or shortly after the date set by the Contractor for the Substantial Completion inspection to be conducted. See definition of Substantial Completion.

Participants in the substantial completion inspection shall include the Building Official, the University Project Manager, the Project Inspector, representatives of the General Contractor, including those of the mechanical, electrical, and major equipment subcontractors, the A/E, and the responsible State Fire Marshal Office. The A/E shall conduct and document the inspection and compile a written list of the Work or deficiencies noted (punch list) which need to be completed or corrected.

If the A/E, the Fire Marshal’s representative and the Building Official agree that this project, or this portion of the project being inspected, is substantially complete in accordance with the contract documents and safe to occupy, the A/E shall execute the appropriate Certificate of Partial or Substantial Completion (HECO-13.1a), and submit them to the University. Attach copies of the punch list, the Contractor’s HECO-13.2a, the Application for Certificate of Use and Occupancy CO-13.3/HECO-13.3 and other documents as appropriate.

The University may submit this material to the Building Official and request that a Certificate of Occupancy be issued, or the University may wait to request the Certificate of Use and Occupancy when final completion is achieved. If one or more re-inspections of the Work that the Contractor declared to be Substantially Complete are required because the Work was not substantially complete as stated, the Contractor shall reimburse the University for the costs of the re-inspections. The University will not accept as Substantially Complete unless it (the part or whole) is ready for occupancy.

SECTION 9.18 BENEFICIAL OCCUPANCY

Once the University, the A/E, the Contractor, Building Official, and the State Fire Marshal's representative agree in writing that the facility, or a usable portion thereof, is substantially complete and ready for occupancy, the University may submit a CO-13.3/HECO-13.3, Application for Certificate of Occupancy, and a HECO-13.3b, Checklist for Beneficial Occupancy, along with copies of the HECO-13.1a, HECO-13.1b (if applicable), HECO-13.2a, Fire Marshal's acceptance report and other required operations permits to the OUBO (or to DEB if they are the authority having jurisdiction over the project).

The Building Official, when satisfied that the project and/or portion of the project is in fact substantially complete in accordance with the contract documents, may issue written authorization (CO-13.3/HECO-13.3), to the University to occupy the project, or applicable portion thereof, subject to any conditions or stipulations stated.

The University shall not occupy the facility until the certification from the State Fire Marshal that the project complies with the fire safety requirements and applicable codes and the Certificate of Use and Occupancy (CO-13.3/HECO-13.3) are received. Occupancy of the facility without approval is unlawful and is a misdemeanor under § 36-106, *Code of Virginia*, as amended.

The following material is required for consideration of a request for a Temporary or Partial Certificate of Use and Occupancy (Directive 564 applies):

1. Floor plans (small scale) that show areas requested for occupancy and the exits/egress routes;
2. Type of Occupancy requested - e.g. move furniture in for staff, set up/prepare for students, etc.;
3. HECO-13.1a with punch-list from A/E;
4. HECO-13.2a with any attachment from Contractor;
5. Fire Marshal's report and recommendation;
6. Document stating that the Asbestos Abatement, if any, is complete;
7. CO-13.3/HECO-13.3 Application For Certificate of Occupancy with data on entire project and separate sheet showing data on area requested to be occupied;

The University may take Beneficial Occupancy of a portion or unit of the project before completion of the entire project only with the prior written approval of the Building Official.

SECTION 9.19 BENEFICIAL OCCUPANCY – RENOVATIONS WITH NO CHANGE OF USE

For renovations or alterations to existing buildings or portions of buildings which do not constitute a change of use or occupancy classification for the whole building or any part of the building, the University shall prepare and submit Form CO-13.4/HECO-13.4 (Building Permit Closeout). The issuance by the Building Official of an approved CO-13.4/HECO-13.4 closes the permit and authorizes re-occupancy of renovated spaces for projects that required the renovation areas to be vacated during construction. If the work has been determined to be substantially complete, but still has work remaining which must be completed under the open permit, the University shall request re-occupancy of the building or specific spaces by submitting CO-13.5(Beneficial Occupancy). CO-13.5 permits temporary re-occupancy while the remaining work is completed under the open

permit between substantial completion and final completion, at which point the University shall submit CO-13.4/HECO-13.4 to close the permit.

The following material is required for consideration of a request for Beneficial Occupancy on projects that will not be issued a Certificate of Use and Occupancy:

1. Floor plans (small scale) showing areas requested for occupancy and exits/egress routes;
2. Type of Occupancy requested: move furniture in for staff, set up/prepare for students, etc.;
3. HECO-13.1a with punch list from A/E;
4. HECO-13.2a with any attachment from Contractor;
5. HECO-13.3b Checklist for Beneficial Occupancy;
6. State Fire Marshal's report and recommendation;
7. Document stating that the Asbestos Abatement, if any, is complete;
8. CO-13.5 Beneficial Occupancy with data on entire project and separate sheet showing data on area requested to be occupied.

SECTION 9.20 FINAL COMPLETION INSPECTION

When the items listed in the “punch list” have been completed and all Work is complete and ready for final testing and inspection, the University Project Manager will insure the requirements of section 44 of the General Conditions of the Construction Contract (CO-7) are complete. Upon completion of all Certificates of Completion, HECO-13.1 and 13.2, the Certificate of Use and Occupancy shall be issued.

SECTION 9.21 PROJECT CLOSE OUT

The A/E shall file with the University the Certificate of Completion HECO- 13.1. By filing the HECO- 13.1, the A/E is certifying that in his professional opinion all construction requirements have been met. After receipt of a Certificate of Use and Occupancy (HECO-13.3) the University Project Manager shall sign the CO-17 and file a CO-14/HECO-14.

SECTION 9.22 RECORD DRAWINGS AND SPECIFICATIONS

The A/E shall prepare “Record Drawings” showing the “As Built” conditions, locations and dimensions based on the Contractor's As Built set of drawings and specifications, and other data furnished by the Contractor to the Architect / Engineer. The Record Drawings shall include actual location of piping and utilities as well as all other changes specifically known to the Architect/ Engineer. These Record Drawings shall also include the depths of pilings or caissons if pilings or caissons were in the construction. Record drawings and specifications shall be prepared and provided to the University.

SECTION 9.23 MAINTENANCE AND OPERATING MANUALS

Two sets of operating and maintenance (O&M) instructions written for the specific project shall be provided to the University at the final inspection. (The General Conditions of the Construction

Contract (CO-7) section 49 apply. **Note:** Two copies of O&M manuals are generally required which should be listed in the specifications.

This shall consist of a compiled document prepared by the A/E team for the project and generally include the operation and control sequencing narrative, the control diagrams, an equipment chart indicating periodic maintenance requirements, and the operation and maintenance manuals for the equipment. All systems needing regular maintenance and/or requiring adjustments must be covered. The schedule for required minor and major maintenance must be included. Relevant design criteria and assumptions needed to understand the operation of the systems will be furnished in narrative form including the control systems settings and concept of operation manuals which provide the data by reference to drawings and specifications and manufacturers are not acceptable. The document, along with the Record drawings and specifications, shall be provided to the University at the time of final acceptance of the project.

SECTION 9.24 OWNERSHIP OF DOCUMENTS

Ownership of all materials and documentation including the drawings; specifications; copies of the calculations and; analyses originated and prepared pursuant to the Contract between the University and the Architect/Engineer, shall belong exclusively to the University. The drawings, specifications, analyses and calculations as prepared by the Architect/Engineer for the project, whether completed or not, shall be the property of the University, whether the work for which they are made is executed or not. The Architect/Engineer shall not use these materials on any other work or release any information about these materials without the express written consent of the University.

Such material may be subject to public inspection in accordance with the Virginia Freedom of Information Act. Security related documents and information are excluded from the Act unless a specific need to know can be shown. Trade secrets or proprietary information submitted by a bidder, offeror, or contractor in connection with a procurement transaction shall not be subject to disclosure under the Virginia Freedom of Information Act provided the bidder, offeror, or contractor invokes the protections of the University Procurement Policy prior to or upon submission of the data or other materials. Identify the data or materials to be protected and state the reason why protection is necessary.

The Architect/Engineer shall provide the following documents to the University at the completion of the A/E's work:

1. Original sealed and signed drawing tracings
2. Original copy of the specifications
3. Copy of analyses made for the project
4. Indexed copy of the calculations made by each discipline for the project
5. University copy of all shop drawings, submittals, cut sheets, operation and maintenance instructions, parts lists and other material related to the project.
6. Record set of drawings and specifications depicting as built conditions.

SECTION 9.25 CONTRACTUAL DISPUTES

The University's Procedure for Resolution of Contractual Claims is to be followed for construction claims submitted in accordance with the General Conditions of the Construction Contract, Section 47.

SECTION 9.26 DEBARMENT AND ENJOINMENT

Governing Rules § 18 allows for contractors to be debarred from construction contracts with the Commonwealth. A contractor may be debarred or enjoined only under the circumstances and by the procedures outlined in the DGS Debarment and Enjoinment Procedures for Construction. Debarment and enjoinder status of contractors and other vendors can be determined at the eVA website.

CHAPTER 10:

SPECIAL PROCEDURES

SECTION 10.1 GENERAL

In accordance with the Governing Rules § 5 the following special procedures may be utilized for construction projects of a highly specialized, or unique nature, as deemed appropriate by the University and, as approved, in writing by the Vice President of Facilities. These Design-Build and Construction Management Competitive Negotiation Procedures may be used for capital projects for the University. The University shall report on selected project delivery methods annually or as required by law or upon request by DGS.

SECTION 10.2 DESIGN-BUILD PROCEDURES:

1. **CRITERIA FOR USE OF DESIGN-BUILD CONTRACTS (D/B):** Design-Build contracts may be approved for but are not limited to use on building projects in the following general categories: warehouse/ storage buildings; garage/ maintenance shops; general mercantile buildings; single-story administrative buildings; recreational and concession buildings; exhibition and agricultural buildings; parking decks; and housing.
2. **PROCEDURE FOR APPROVAL TO USE D/B:** The University shall request authority, in writing, to use a D/B contract. The Vice President of Facilities is the approving authority for requests to use D/B procedures.

The request shall justify and substantiate that Design-Build is more advantageous than a competitive sealed bid construction contract with a general contractor and shall indicate how the Commonwealth will benefit from using D/B. The request shall also include a written justification that sealed bidding is not practical and/or fiscally advantageous. Construction cost, technical complexity, building use, project timeline, and the need for a single point of contact, and timeline are critical components to be considered when recommending Design Build procurement. Other components to be considered include when selecting a procurement method are the following:

- a. Required experience with specialty systems or equipment
- b. Schedule, schedule challenges, and critical completion dates
- c. Coordination of phased or fast track construction
- d. Potential for early packages to expedite overall project completion
- e. Early procurement of long lead time materials or equipment
- f. Continuity of university operations and utility systems
- g. Minimizing disruption to academic and research programs
- h. Campus security and limited access to restricted areas
- i. Prequalification for specialty systems, materials or equipment expertise
- j. Project staffing requirements
- k. Risk reduction
- l. Overall benefits to the university

Submission of the written justification and a completed Procurement Review Submittal Form identifying the project characteristics relevant to selected procurement shall be made to the Department of General Services (DGS) for review and recommendation of the construction procurement method if competitive sealed bidding is not selected once approved by the Vice President, Facilities. DGS shall make a recommendation based upon the information provided. The University shall respond to any comments. The DGS recommendation must be kept with the project file and the University must report to DGS the procurement method actually utilized.

3. DESIGN-BUILD SELECTION PROCEDURES: On projects approved for Design-Build, procurement of the contract shall be a two-step Request for Qualifications / Request for Proposals (RFQ/RFP) competitive negotiation process. The selection will be made with cost as a significant factor in the evaluation. The following procedures shall be used in selecting a firm and awarding a contract:
 - a. The University shall appoint an Evaluation Committee from the professional staff of Facilities Management which shall have a minimum of three members, including at least one licensed professional engineer or architect. A representative from the OUBO or Division of Engineering and Buildings may be invited to participate on the Evaluation Committee. Representatives of the university customer organization may be invited to participate as members of the committee.
 - b. Selection of Qualified Offerors (STEP ONE)
 - i. The University shall prepare and advertise a Statement of Interest and Request for Qualifications (RFQ) including University's Facility Requirements, building and site criteria, site and survey data (if available) in eVA for a minimum of thirty (30) days with one advertisement in a newspaper of general circulation in the area in which the contract. The RFQ for the DB Risk procurement shall include language to substantiate the selection of the construction delivery method. It shall include a justification to support why sealed bidding is not practicable and/or fiscally advantageous. The RFQ shall include evaluation criteria for contractor selection. Prior experience with the selected procurement method or DEB, cannot be a prerequisite for award.
 - ii. Statement of Interest and Request for Qualifications responses must be submitted by interested parties by the due date and time to the location stipulated in the solicitation. All offerors shall have a licensed Class "A" contractor and an Architect or Engineer registered in the Commonwealth of Virginia as part of the Project team.
 - iii. The Statement of Interest and Request for Qualifications responses will be evaluated based upon the information submitted and any other relevant information. The Evaluation Committee will conduct this evaluation.
 - iv. The University may request additional information from the Offerors, if needed.

- v. The Evaluation Committee will rank the firms based upon the overall merit of the information submitted and any other relevant information.
 - vi. The committee will select no fewer than two (2) and no more than five (5) Offerors deemed suitable for the project to proceed to Step Two; to receive the RFP.
 - vii. Written responses shall be sent to proposers that were not short listed. In the event that an Offeror is denied prequalification, the written notification shall state the reasons for such denial of prequalification and the factual basis of such reasons.
- c. Selection of Design Build Contractor (STEP TWO)
- i. The University will prepare a Request for Proposals (RFP) containing the University's facility requirements, building and site criteria, site and survey data, the criteria to be used to evaluate submittals and other relevant information.
 - ii. The University will solicit the selected shortlisted firms to submit proposals that include both technical and cost information by the date and time (a minimum of 30 days) to the location established in the RFP for receipt of the offers. The RFP shall be posted for no less than 30 days on eVA. The technical and cost data shall be submitted separately. The cost data shall include a lump sum cost to complete the requirements of the RFP. Separately sealed Cost Proposals shall be submitted to the University's Virginia Construction Contracting Officer (VCCO), and shall be secured and kept sealed until evaluation of the Technical Proposals and the design adjustments are completed.
 - iii. The Evaluation Committee will evaluate the proposals based on the criteria contained in the RFP and individually score each proposal. Clarifications and additional information may be requested by the committee from these offerors. The Evaluation Committee will inform the VCCO of any adjustments necessary to make the proposal from a selected D/B offeror fully comply with the mandatory requirements of the RFP. The VCCO shall obtain the clarifications from the offerors in writing. In addition, Mason may require that offerors make design adjustments necessary to incorporate project improvements and/or additional detailed information identified by the Evaluation Committee during design development.
 - iv. Based upon any adjustments requested by the Evaluation Committee, the offeror shall provide a revised Technical Proposal and Cost Proposal as necessary. In addition, an offeror may submit cost modifications to its original sealed Cost Proposal which are not based upon revisions to the Technical Proposals.
 - v. Offerors who submit a proposal in response to the RFP may be required to give an oral presentation of their proposal to the Evaluation Committee. This provides an opportunity for the offeror to clarify or elaborate on the proposal. This is a fact-

finding and explanation session only and does not include negotiation. The Evaluation Committee Chair will coordinate the schedule and the time and location of these presentations with the committee and the VCCO. The VCCO shall schedule the Oral Presentations with the offerors. Oral presentations are an option of the Evaluation Committee and may or may not be conducted. The Evaluation Committee shall score the proposals based on the evaluation criteria after the Oral Presentations.

- vi. At the conclusion of presentations, the Evaluation Committee will score the proposals based upon the technical merits. The VCCO will then open the cost proposals and complete the scoring. Based upon this scoring a selection can be made of the D/B Teams with the highest scores based to recommend for negotiations.
- vii. Negotiations will be held with two or more of the selected D/B teams. The University may require that offerors make design adjustments necessary to incorporate project improvements and/or additional detail identified by the Committee for design development. The University may make multiple requests for adjustments to the plans and approach and proposed personnel to provide the D/B services, and the requests may be customized for each proposal. Negotiations must also include discussion(s) about obtaining a reasonable price with all offerors and increasing the commitment for the utilization of small, women and minority-owned firms as subcontractors with all majority companies.
- viii. The contract shall be awarded to the offeror who is deemed fully qualified and has been determined to have provided the best value in response to the RFP. When so provided in the RFP, awards may be made to more than one proposer. The Committee shall make the recommendation on the selection of the Design Build contractor to the Vice President of Facilities. The Vice President of Facilities shall approve the selection of the Design Build contractor. This approval shall be submitted to the VCCO in writing.
- ix. The VCCO will post the Notice of Intent to Award to the selected Design Build contractor and facilitate executing the contract (HECO-9DB). The University shall notify all offerors who submitted proposals, which offerors were selected for the project. Upon request, documentation of the process used for the final selection shall be made available to the unsuccessful offerors. The University shall complete the Revised HECO-2 and supporting documents.

SECTION 10.3 CONSTRUCTION MANAGEMENT PROCEDURES

1. Construction Management (CM), also known as Construction Management at Risk or CM@Risk, contracts is an alternate construction delivery method to Competitive Sealed Bids. The University holds two contracts: a contract for professional A/E design services, and also a two-phase contract with the CM at Risk Contractor. The Construction Manager provides a Guaranteed Maximum Price (GMP) for the Construction and all related services

and is “At Risk” for constructing the entire project within the agreed upon GMP.

2. **CRITERIA FOR USE OF CONSTRUCTION MANAGEMENT:** Construction management (CM) contracts may be approved for use on projects. If competitive sealed bidding is not selected, the written recommendation shall justify why sealed bidding is not practicable and/or is not fiscally advantageous to the university. Project cost; technical complexity; building use; project phasing; design phase constructability analysis for cost savings and quality control; vendor prequalification; continuous value engineering to achieve budget; cost control; and timeline are critical components to be considered when recommending the use of CM procurement. Other components to be considered include when selecting a procurement method are the following:

- a. Required experience with specialty systems or equipment
- b. Schedule, schedule challenges, and critical completion dates
- c. Coordination of phased or fast track construction
- d. Potential for early packages to expedite overall project completion
- e. Early procurement of long lead time materials or equipment
- f. Continuity of university operations and utility systems
- g. Minimizing disruption to academic and research programs
- h. Campus security and limited access to restricted areas
- i. Prequalification for specialty systems, materials or equipment expertise
- j. Project staffing requirements
- k. Risk reduction
- l. Overall benefits to the university

3. **PROCEDURE FOR APPROVAL TO USE CONSTRUCTION MANAGEMENT:** The University shall request authority, in writing to the Vice President of Facilities, to use a CM contract. The Vice President of Facilities is the approving authority for requests to use CM procedures.

The request shall justify and substantiate that a CM contract meets the criteria found in paragraph 10.3.2 above and the use of CM is more fiscally advantageous than a competitive sealed bid construction contract with a general contractor.

Submission of the written justification and a completed Procurement Review Submittal Form identifying the project characteristics relevant to selected procurement shall be made to the Department of General Services (DGS) for review and recommendation of the construction procurement method if competitive sealed bidding is not selected once approved by the Vice President, Facilities. DGS shall make a recommendation based upon the information provided. The University shall respond to any comments. The DGS recommendation must be kept with the project file and the University must report to DGS the procurement method actually utilized.

4. **CM PROCUREMENT QUALIFICATION PROCEDURES:** On projects approved for CM, the University shall proceed as follows to qualify offerors who may submit proposals,

utilizing a two-step competitive negotiation process. The selection will be made with cost as a significant factor in the evaluation.

a. The University shall appoint an Evaluation Committee from the professional staff of Facilities Management which shall have a minimum of three members, including at least one licensed professional engineer or architect. A representative from the Division of Engineering and Buildings may be invited to participate on the Evaluation Committee. Representatives of the university customer organization may be invited to participate as members of the committee.

b. Selection of Qualified Offerors (STEP ONE) - RFQ:

- i. The University shall prepare and advertise a Statement of Interest and Request for Qualifications (RFQ) including University's Facility Requirements, building and site criteria, site and survey data (if available) in eVA and in a newspaper of general circulation in the area in which the contract is to be performed for a minimum of thirty (30) days. The RFQ for the CM procurement shall include language to substantiate the selection of the construction delivery method. It shall include a justification to support why sealed bidding is not practicable and/or fiscally advantageous. The RFQ shall include criteria for contractor selection. Prior experience with the selected procurement method or with DEB, cannot be a prerequisite for award.
- ii. Statement of Interest and Request for Qualifications responses must be submitted by interested parties by the due date and time to the location stipulated in the solicitation. All offerors shall have a licensed Class "A" contractor registered in the Commonwealth of Virginia as part of the Project team
- iii. The Statement of Interest and Request for Qualifications responses will be evaluated based upon the information submitted and any other relevant information. The Evaluation Committee will conduct this evaluation.
- iv. The University may request additional information from the Offerors, if needed.
- v. The Evaluation Committee will rank the firms based upon the overall merit of the information submitted and any other relevant information.
- vi. The committee will select no fewer than two (2) and no more than five (5) Offerors deemed suitable for the project to proceed to Step Two.
- vii. Written responses shall be sent to proposers that were not short listed. In the event that an proposer is denied prequalification, the written notification shall state the reasons for such denial of prequalification and the factual basis of such reasons.

c. Selection of CM Contractor (STEP TWO)

viii.

- i. The University will prepare a Request for Proposals (RFP) containing the University's facility requirements, building and site criteria, site and survey data, the evaluation criteria to be used to evaluate submittals and other relevant information.
- ii. The University will solicit the firms selected as specified above to submit proposals that include both technical and cost information by the date and time (a minimum of 30 days) to the location established in the RFP for receipt of the offers. The RFP shall be posted for no less than 30 days on eVA. The technical and cost data shall be submitted separately. The cost data shall include the cost of the general conditions to complete the construction phase based upon the schedule given, the CM fee as a lump sum, the pre-construction phase services as a lump sum, and the bonds and insurance as a percentage as noted in the RFP. Separately sealed Cost Proposals shall be submitted to the University's Virginia Construction Contracting Officer (VCCO), and shall be secured and kept sealed until evaluation of the Technical Proposals and the design adjustments are completed.
- iii. The Evaluation Committee will evaluate the proposals based on the criteria contained in the RFP and individually score each proposal. Clarifications and additional information may be requested by the committee from these offerors. The Evaluation Committee will inform the VCCO of any adjustments necessary to make the proposal from a selected CM offeror fully comply with the mandatory requirements of the RFP. The VCCO shall obtain the negotiation clarifications from the offerors in writing.
- iv. Offerors who submit a proposal in response to the RFP may be required to give an oral presentation of their proposal to the Evaluation Committee. This provides an opportunity for the offeror to clarify or elaborate on the proposal. This is a fact-finding and explanation session only and does not include negotiation. The Evaluation Committee Chair will coordinate the schedule and the time and location of these presentations with the committee and the VCCO. The VCCO shall schedule the Oral Presentations with the offerors. Oral presentations are an option of the Evaluation Committee and may or may not be conducted. The Evaluation Committee shall score the proposals based on the evaluation criteria after the Oral Presentations.
- v. At the conclusion of presentations, the Evaluation Committee will score the proposals based upon the technical merits. The VCCO will then open the cost proposals and complete the scoring. Based upon this scoring a selection can be made of the CM offerors with the highest scores based on the RFP evaluation criteria with whom to proceed to negotiations.
- vi. Negotiations will be held with two or more of the selected CM offerors. Negotiations must include discussion(s) about obtaining a reasonable price with all offerors and increasing the commitment for the utilization of small, women and minority-owned firms as subcontractors with all majority companies.

- vii. After negotiations the scoring is updated, if any modifications are necessary. Based upon the updated scoring a selection can be made of the CM offerors with the highest score based on the RFP evaluation criteria to recommend for a contract award.
 - viii. The Committee shall make the recommendation on the selection of the CM contractor to the Vice President of Facilities. The Vice President of Facilities shall approve the selection of the CM contractor. This approval shall be submitted to the VCCO in writing.
 - ix. The VCCO will post the Notice of Intent to Award to the selected CM contractor and facilitate executing the contract (HECO-9CM). The University shall notify all proposers who submitted proposals, which proposer was selected for the project. Upon request, documentation of the process used for the final selection shall be made available to the unsuccessful proposers. The University shall complete the Revised HECO-2 and supporting documents.
5. **REQUIRED CONSTRUCTION MANAGEMENT CONTRACT TERMS:** Any Guarantee Maximum Price construction management contract entered into by any department, University or institution of the Commonwealth will contain provisions requiring that (1) not more than 10% of the construction work (measured by cost of the work) will be performed by the CM with its own forces and (2) that the remaining 90% of the construction work will be performed by subcontractors of the CM which the CM must procure by publicly advertised, competitive sealed bidding to the maximum extent practicable. In extraordinary circumstances the Vice President of Facilities may grant a waiver of these contractual requirements in whole or in part.
6. **CONSTRUCTION MANAGER AT RISK CONTRACTS:** The CM at Risk contracts are structured into two phases:
- a. **Phase 1: Pre-Construction Phase Services:** These services are subject to the Terms and Conditions for Non-Professional Services and will be performed for a stipulated or fixed amount.
 - i. Use form HECO-9CM Part 1
 - ii. The Phase 1 contract is associated with the work of the CM at Risk prior to the start of construction activities.
 - b. **Phase 2: Construction Phase Services:** These services are contingent upon the CM at Risk providing an agreeable GMP to the Owner.
 - i. Use form HECO-9CM Part 2

- ii. The Part 2 contract is associated with the work of the CM at Risk during the construction portion of the project.
- c. In the event of phased permitting where the drawings and specifications are not complete for portions of the project, but where early release packages have been bid and permitted, the agency shall use form HECO-9CM (ER) for the release of the work for those packages. Early release packages shall be established based upon approved working drawings for the work of that package and the value of the early release shall serve as an interim GMP for the work pending the full GMP for the project. The intermediate packages shall correspond with the partial permits being issued (example: clearing & grubbing, grading, or site utilities) or shall be for long lead items that need to proceed in order to maintain the project schedule (example: mill orders for structural steel). The early release packages are allowed provided permission has been granted by the Vice President of Facilities.
- d. If a GMP cannot be agreed upon, the Contract for Phase 1 is concluded and the University will not enter into a Phase 2 contract with the CM at Risk. At this point in the process, the documents are substantially complete; and after review and approval by the Vice President of Facilities, the project may be bid using standard competitive sealed bidding to the short-listed CM at Risk proposers (including the CM at Risk proposer with whom a GMP was not agreed upon). If the project is bid using standard competitive sealed bid procedures, then the construction contingency of the CM process would no longer be applicable. Allowances and contingencies are not permitted using the standard Design-Bid-Build process.

SECTION 10.4 PUBLIC PRIVATE PARTNERSHIP (PPEA) SELECTION PROCESS

This type of procurement is handled by Mason's Purchasing Office. Guidelines for this are available from the Purchasing Office.

SECTION 10.5 ENERGY PERFORMANCE-BASED CONTRACT (ESCO)

Procedures for the ESCO procurement methods can be found on the DGS Website. Projects utilizing ESCO still require inspection by Building Official and must comply with the USBC.

SECTION 10.6 EMERGENCY CONSTRUCTION PROCUREMENT

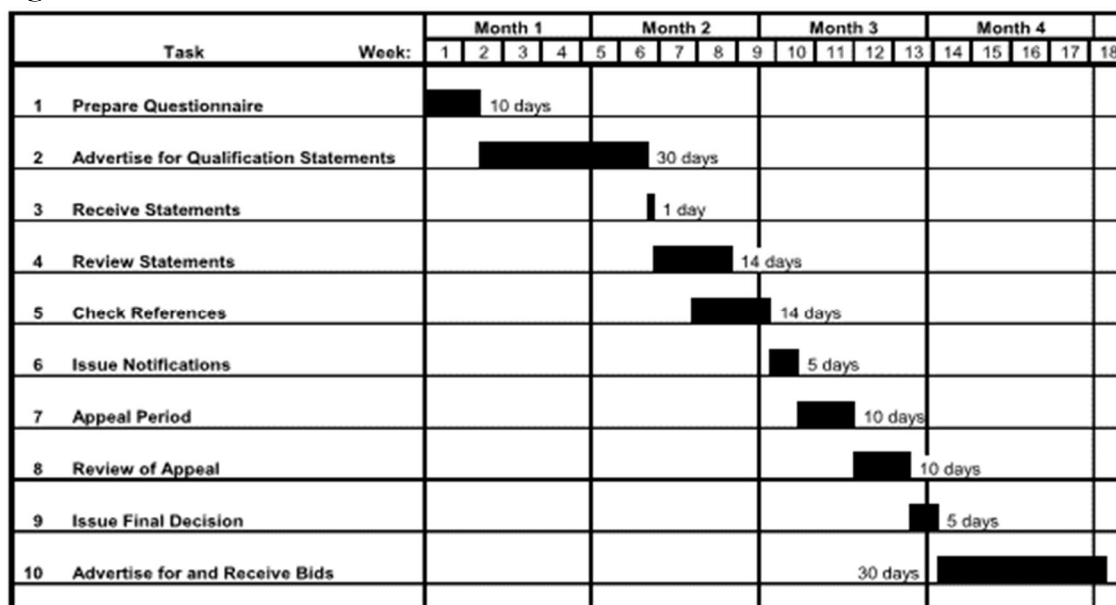
In case of an emergency, a contract may be awarded without competitive sealed bidding. However, such procurement shall be made with such competition as is practicable under the circumstances. A written determination of the basis for the emergency and for the selection of the particular contractor shall be included in the contract file. As a minimum, the agency shall post a written notice on eVA stating that the contract is being awarded on an emergency basis and identifying that which is being procured, the contractor selected, and the date on which the contract was or will be awarded. Refer to Governing Rules § 5 for the complete statutory requirements.

SECTION 10.7 PREQUALIFICATION PROCUREMENT

The University may prequalify contractors for a particular construction project and limit consideration of bids or proposals to prequalified contractors (Governing Rules § 14. The procedures contained in this section shall be used for prequalification of contractors for a particular construction project. The University may prequalify general contractors or selected subcontractors or both. Any prequalification of contractors and/or subcontractors shall be conducted in accordance with the procedures stipulated in this section and Governing Rules § 14, and sufficiently in advance of the bid receipt date to allow potential contractors a fair opportunity to complete the process.

10.7.1 Objective: For projects that will be procured via the IFB (Design-Bid-Build) method, the objective of prequalification shall be to identify as many fully qualified Offerors as possible to bid on the proposed work. For projects that will be procured via the CM at Risk or Design-Build methods as described in section 10.2 and 10.3, the objective of prequalification shall be to determine which Offerors' submissions demonstrate the greatest conformance with the requirements set forth in the RFQ, resulting in a "short list" of not less than 2 and not more than 5 Offerors. Prequalification is most frequently used for projects with sophisticated building systems, a unique site or constructability issue or where project scheduling or sequencing is critical. The bar chart in Figure 10.7.1.1 depicts reasonable timeframes for elements of the prequalification process. Shorter times may be used, provided they are consistent with the intent of the minimum time specified in Governing Rules § 14 The University will advertise for the prequalification (Request for Qualifications) in a newspaper of daily statewide circulation and on eVA, and shall post the advertisement in the public area where Invitations to Bid and Requests for Proposals are generally posted. The date set for receipt of the Standard Form for Contractor's Statement of Qualifications will be at least thirty (30) calendar days from the date of the initial newspaper advertisement.

Figure 10.7.1.1



10.7.2 Forms: The Standard Form for Contractor's Statement of Qualifications, DGS-30-168, Contractor's Statement of Qualifications (HECO-16) shall be the application form submitted by

contractors when applying to be prequalified for a particular construction project. The HECO-16, when completed by interested contractors, shall address the Qualification Criteria portion of the RFQ issued for the proposed construction contract.

10.7.3 Building Committee: The University will establish a committee (the Building Committee) of at least three (3) state employees to review the HECO-16 forms submitted by interested contractors and determine which, if any, of the contractors shall be prequalified. One member of the committee shall be an accredited Virginia Construction Contracting Officer (VCCO) of the agency, one shall be a registered architect or engineer and one shall be the project manager for the proposed project. A licensed architect or engineer from the OUBO or Division of Engineering and Buildings (DEB) may be a member of the committee. The A/E for the project may, at the discretion of the Committee, serve as an advisor to the Committee.

10.7.4 Denial of Prequalification: Governing Rules § 14, permits the University to deny prequalification to any contractor only if the University finds at least one of the following:

1. The contractor does not have sufficient financial ability to perform the contract. Evidence that the contractor can acquire a surety bond from a corporation included on the United States Treasury list of acceptable surety corporations in the amount and type required for the project shall be sufficient to establish financial ability;
2. The contractor does not have appropriate experience to perform the construction project in question;
3. The contractor or any officer, director or owner thereof has had judgments entered against him within the past ten years for the breach of contracts for governmental or nongovernmental construction;
4. The contractor has been in substantial noncompliance with the terms and conditions of prior construction contracts with a public body, without good cause. The University may not utilize this provision to deny prequalification unless the facts underlying such substantial noncompliance were documented in writing in the prior construction project file and such information relating thereto was given to the contractor at that time, with the opportunity to respond;
5. The contractor or any officer, director, owner, project manager, procurement manager or chief financial official thereof has been convicted within the past ten years of a crime related to governmental or nongovernmental construction or contracting;
6. The contractor or any officer, director or owner thereof is currently debarred pursuant to an established debarment procedure from bidding or contracting by any public body, agency of another state or agency of the federal government; and
7. The contractor failed to provide to the University, in a timely manner, any information requested by the University relevant to 1 through 6 above.

The University will deny prequalification to any contractor who does not have the requisite Virginia license issued by the Virginia Board of Contractors to perform work in Virginia pursuant to Code of Virginia § 54.1-1100et seq.

10.7.5 Written Notification: In accordance with the Governing Rules § 14, any contractor refused permission to participate, or disqualified from participation, in public contracts shall be notified in writing. Prior to the issuance of a written determination of disqualification or ineligibility, the University will (a) notify in writing each contractor that submitted the HECO-16 of the results of the evaluation (b) disclose the factual support for the determination, and (c) allow the contractor an opportunity to inspect any documents that relate to the determination, if so requested by the contractor within five (5) business days after receipt of the notice. The written notice to each contractor shall be delivered by U. S. mail.

Within ten (10) business days after receipt of the notice, the contractor may submit rebuttal information challenging the evaluation. The University will issue its written determination of disqualification or ineligibility based on all information in possession of the University, including any rebuttal information, within five (5) business days of the date the University received such rebuttal information. If the evaluation reveals that the contractor should be allowed permission to participate in the public contract, the University will cancel the proposed disqualification action.

If the evaluation reveals that the contractor should be refused permission to participate, or disqualified from participation, in the public contract, the University will so notify the contractor. The notice shall state the basis for the determination, which shall be final unless the contractor appeals the decision within ten (10) days after receipt of the notice by invoking administrative procedures meeting the standards of Governing Rules § 15, if available, or alternatively by instituting legal action as provided in Governing Rules § 54. If, upon appeal, it is determined that the action taken was improper, the sole relief shall be restoration of eligibility.

10.7.6 Establishing Contractor Qualification Criteria: Contractor experience qualification criteria shall be sufficiently general so that contractors with the qualifications and experience to satisfactorily complete the proposed project will not be arbitrarily excluded. For example, requiring a contractor to have constructed a two-story college dormitory is too restrictive. Therefore, experience criteria shall be expressed in terms related to the building's construction:

1. functional type (classroom, dining facility, maximum security prison, etc.);
2. job site access (dense urban location surrounded by multiple story buildings, open rural area, etc.);
3. height and physical size (14 stories with 4 below grade floors; 250,000 gross square feet);
4. foundation system (piles, spread footings, mat foundation, etc.);
5. structural system (reinforced cast in place concrete; structural steel; precast concrete members, etc.);

6. exterior wall system (granite panels; glass store front; brick with CMU back-up, etc.):
7. electrical service and distribution;
8. mechanical system (gas-fired package boilers; four pipe hot water/chilled water; centrifugal chiller, VAV box, etc.);
9. number of subcontractors used on a typical job;
10. roofing system (four-ply built-up; single-ply EPDM, etc.); and other similar criteria.

10.7.7 References: Verification of References supplied by the contractor in Sections VI: 1, 2, 3 & 5 of the HECO-16 shall be accomplished using the Contractor Reference Sheet found on the DGS Forms Center.

10.7.8 Advertisement for Bids: The Notice of Invitation for Bids for the project shall be posted in a public place normally used for posting Notices or published in a newspaper of statewide circulation or both, and on eVA, Virginia's central electronic procurement website. The advertisement shall appear no less than 30 days prior to the date of bid receipt, unless otherwise approved by the Vice President of Facilities. The advertisement shall state that bids will be accepted only from those contractors prequalified to bid on the project. Further, the contractor shall be a registered vendor with eVA.

CHAPTER 11:

BUILDING OFFICIAL REVIEWS, PERMITS AND APPROVALS

SECTION 11.1 GENERAL

11.1.1 Building Official: The Office of University Building Official (OUBO) is the Building Official for buildings and structures on state owned property in accordance with the Code of Virginia §36-98.1 and the OUBO Charter in Appendix P. It may provide for the (i) inspection of state-owned buildings or structures and for all buildings and structures built on state-owned property and (ii) enforcement of the Building Code and standards for access by the physically handicapped by delegating inspection and Building Code enforcement duties to the State Fire Marshal's Office, to other appropriate state agencies having needed expertise, and to local building departments, all of which shall provide such assistance within a reasonable time and in the manner requested.

SECTION 11.2 BUILDING PERMIT PROCEDURES FOR CONSTRUCTION – STATE OWNED BUILDINGS & STRUCTURES

This procedure supplements the Virginia Uniform Statewide Building Code by further defining scope of work and submittal requirements to the Building Official for state owned buildings and structures.

SECTION 11.3 ANNUAL PERMIT

11.3.1 Annual Permits are issued by the Building Official at the Building Official's sole discretion in accordance with the Virginia Uniform Statewide Building Code and the policies of the Building Official for the purpose of assuring that the code is met.

SECTION 11.4 TEMPORARY STRUCTURES (TENT, STAGE, PLATFORM, BLEACHERS, & OTHER STRUCTURES)

11.4.1 Application for Permit to erect and use temporary structures must be submitted to the Environmental Health & Safety (EHS) Office prior to the proposed use. Please reference the EHS website at [Temporary Structure Permit Guide website.pdf \(huddle.com\)](https://www.huddle.com/sites/default/files/2019-08/Temporary%20Structure%20Permit%20Guide.pdf)

11.4.2 Art and Architectural Review Board (AARB):

“Temporary Structures” are not temporary if proposed for more than 180 days. Any ‘non-permanent structure’ placed on state property for more than 180 days requires approval of the AARB. Tents erected for more than 5 days may require the concurrence of the AARB Chairman.

SECTION 11.5 INDUSTRIALIZED BUILDINGS:

11.5.1 Application for Permit to install, make utility connections, and occupy an Industrialized Building must be submitted to the Building Official at least 10 days prior to installation. See the

Virginia Uniform Statewide Building Code and Appendix P for Construction – State Owned Buildings & Structures for the scope of work that requires a permit. Industrialized Buildings used as construction trailers on a project construction site are exempt.

11.5.2 AARB Requirements: Industrialized Building must obtain AARB approval. Industrialized Building used as construction trailers on a project construction do not require AARB approval.

1. **Site Plan:** Indicate property lines, easements, roads, sidewalks, grading, parking (including handicapped spaces), site utilities (size and location: water, sewer, electric, and gas), distances to adjacent buildings or structures, and handicapped accessible route to the public way.
2. **Foundation:** Indicate soils bearing capacity, number and location of piers, and number and location of tie down anchors.
3. **Other Construction:** Indicate stairways, ramps, porches, hallways, sidewalks, paving, roofs, lighting, and other items that are not a part of the industrialized building delivered to the site.
4. **Inspection:** Inspection by the A/E Record and the Regional Fire Marshal Office are required. Submit inspection reports indicating compliance with approved documents.
5. **Additions, Renovations, and Alterations:** Changes to Industrialized Building are regulated in the same manner as changes to all existing structures. Do not make changes to any component of the building, or occupy any portion of a building without approval of the Building Official.

11.5.3 Industrialized Buildings without a Virginia Registration Seal: If the proposed building does not have a Virginia Registration Seal, the Owner must demonstrate that the building complies with the code. The following are required:

1. Signed and sealed documents shall be provided by a Virginia licensed architect or engineer showing the construction including structural, mechanical, electrical, and plumbing systems,
2. Fire Protection Information Plan shall be provided in accord with the CPSM.
3. Building shall be inspected by a Virginia licensed architect or engineer for compliance with the USBC, CPSM and UFAS, and a statement with seal, signature, and date, stating that the building conforms to these requirements.

11.5.4 Procurement Guidance: Define the use and occupancy of the building prior to procurement. Procure the building in accord with HECO requirements, Governing Rules or VPPA where applicable, or by a standard lease. Require Virginia seals and registration numbers on the industrialized building in accord with the Virginia Industrialized Building Safety Regulations, 13 VAC 5-91 et seq.

SECTION 11.6 TOWERS:

11.6.1 Application for Permit to install a Tower must be submitted to the Building Official prior to installation. See the Virginia Uniform Statewide Building Code and Appendix P for construction

that requires a permit. For leased facilities, applicant shall indicate the date when lease was approved by BRPM.

11.6.2 AARB Requirements: Towers require AARB approval. Adding antennae to existing buildings require AARB. Adding antennae to existing towers are exempt.

1. **Site Plan:** Indicate property lines, easements, roads, sidewalks, grading, site utilities, and distances to adjacent buildings or structures.
2. **Foundation:** Indicate soils bearing capacity and foundation design (size and reinforcement of footings, number and location of piers, and number and location of tie down anchors).
3. **Other Construction:** Indicate fences, storage structures, electrical service, lighting, sidewalks, paving
4. **Closed v. Open Engineered Systems:** Provide manufacturer data for manufactured tower construction that are constructed in the factory. If the structures are fabricated on site, provide construction documents signed and sealed by a Virginia licensed architect or engineer.
5. **Inspection / Certificate of Occupancy:** Inspection by the A/E Record and submission of the Statement of Structural & Special Inspections (for an antenna addition to existing tower, letter from A/E with signed and sealed stating that the tower will accommodate added loads) is required. Submit inspection reports indicating compliance with approved documents.
6. **Additions, Renovations, and Alterations:** Changes to a tower and the addition of antennae are regulated in the same manner as tower installations. Do not make changes to any component of the tower without approval of the Building Official.
7. **Permit Fees:** Contact the Office of University Building Officials (OUBO) for fee requirements. Fee required with application. Make Checks payable to George Mason University.

SECTION 11.7 OTHER STRUCTURES (FLAGPOLES, ANTENNAE, FENCES, AND MISCELLANEOUS)

11.7.1 Flagpole/Antennae:

11.7.1.1 Application for Permit to install a flagpole / antennae more than 30 feet tall, and flagpoles/ antennae to be attached to existing buildings must be submitted to the Building Official prior to installation. See the Virginia Uniform Statewide Building Code and the Building Permit Procedure for construction that requires a permit.

11.7.1.2 AARB Requirements: Flagpoles must be approved by the AARB prior to permitting / erection

1. **Site Plan:** Indicate property lines, roads, sidewalks, and distances to adjacent buildings or structures, or the location of the building to which the flagpole / antennae is to be attached.
2. **Foundation:** Indicate soil bearing capacity and foundation design including: connection details, foundation details, based on manufacturer's standard data and details, or calculations signed by a Virginia licensed architect or engineer.
3. **Other Construction:** Indicate paving, sidewalks, electrical service, and lighting.

4. **Closed v. Open Engineered Systems:** Provide manufacturer data. If the structures are fabricated on site, provide construction documents.
5. **Inspection:** Inspection by the Applicant or a Virginia licensed architect or engineer is required. For an antenna addition to an existing structure, provide a statement from the A/E with a signed, dated professional seal assuring that the structure will accommodate added loads. Submit inspection reports indicating compliance with approved documents.

11.7.2 Fences:

11.7.2.1 Application for Permit to install a fence that is required for (i) pedestrian safety or (ii) a barrier for a swimming pool shall be submitted to the Building Official prior to installation. See the Virginia Uniform Statewide Building Code and Appendix P for construction that requires a permit.

11.7.2.2 AARB Requirements: Fences must be approved by the AARB prior to permitting / erection.

1. **Site Plan:** Indicate property lines, roads, sidewalks, and distances to adjacent buildings or structures, Fire Department access, Exit discharge, Public Way
2. **Foundation:** Indicate VDOT standard details for the erection and stability of fences, manufacturer's details, or calculations signed by a Virginia licensed architect or engineer.
3. **Other Construction:** Indicate paving, sidewalks, electrical service, lighting, storage structures

11.7.3 Miscellaneous Structures: Contact the OUBO.

CHAPTER 12:

PROJECT COMMITTEES

SECTION 12.1 PROJECT COMMITTEES

Reserved

SECTION 12.2 ARCHITECT SELECTION COMMITTEE

Reserved

SECTION 12.3 BUILDING COMMITTEE

Reserved

SECTION 12.4 STEERING COMMITTEE

Reserved

CHAPTER 13:

MASTER PLANS, SITE, AND DESIGN GUIDELINES

SECTION 13.1 MASTER PLANS

Each capital project must conform to the University's Master Plan and a Site or District plan if one has been developed and approved by the Board of Visitors. Each capital project shall demonstrate compliance with the University's Municipal Separate Storm Sewer System (MS-4) Plan.

SECTION 13.2 OTHER MASTER PLANS AND REQUIREMENTS

Each capital project must conform to architecture guidelines if any have been developed for the site. An Environmental Impact Report (EIR) shall be prepared for each qualifying project with an expected construction cost of \$500,000 or more.

Utility Plans will be developed and maintained by Facilities Engineering and Construction in conjunction with Facilities Management to ensure utility capacities exist to support the Master Plan. Utility facility locations should be coordinated with the Master Plan. Current site and utility drawings are intended to depict the current condition of Mason's physical plant. Updates typically occur continually and are published annually. These updates show buildings completed, land acquired, utilities installed, etc.

CHAPTER 14:

PLANNING AND PROJECT APPROVAL

SECTION 14.1 GENERAL

This chapter describes the capital outlay process. It provides detailed guidance on documentation required for approvals at each milestone of the process. Unless specifically waived by the Vice President of Facilities, execution of all capital outlay projects shall follow approval procedures in Section 14.4.

On all university projects, the HECO-2 Form shall be submitted in the e-builder project management to be approved by the Executive Vice President for Administration and Finance or their delegate. In lieu of the CO-4, CO-5, CO-6, CO-8 submitted in the BITS system for legislatively approved capital projects, at each milestone of design (schematic, preliminary, construction documents, and construction award) for locally approved capital projects a revised HECO-2 will be submitted in the e-builder system to be approved by the Executive Vice President for Administration and Finance or their delegate. CO-4, CO-5 and CO-6 are only applicable to Design-Bid-Build General Funded projects

SECTION 14.2 CAPITAL PROJECT PLANNING

This process generally follows the following steps directly related to the Capital Outlay Program:

1. Mason develops its Six (6) year plan for Capital Projects.
2. DPB issues its Budget Instructions (usually in February) See the DPB website.
3. Mason submits their Capital Budget Requests (CBR) in the Performance Budgeting (PB) system, with project priorities indicated.
4. Capital Project submissions are reviewed by DPB and DGS for possible inclusion in the Governor's budget based on program guidance established by the Governor.
5. Capital Project submissions are reviewed and considered by the six-pack committee for possible inclusion in the Governor's budget based upon program guidance established by the Governor and input from DPB and DGS
6. The Governor presents his Budget to the money committees in December
7. "Part 2, Capital Project Expenses" of The Budget Bill contains those Capital Projects the Governor has selected for construction or planning in the coming biennium.
8. The General Assembly considers and passes the Acts of Assembly (the Appropriations Act).
9. The Governor signs the Acts of Assembly (the Appropriations Act).
10. Authorization to proceed with the projects must be granted by the Governor (or his designee) before any planning for or construction can begin.
11. Funds are not available to be spent until July 1 of the even numbered years or until action on the Acts of Assembly (the Appropriations Act) is completed.

SECTION 14.3 PROJECT AUTHORIZATION

Appropriated funds will be allotted and authority given to initiate a project, subject to interim approvals, reviews, and progress reporting, upon application from the agency but not before July 1 following General Assembly approval of the Biennial Budget which includes the project. In odd numbered years if a capital outlay project is added to the Budget during the short session, DPB may authorize the project after the Governor and veto session action on the amended Budget.

Architectural or engineering planning for or construction of, or acquisition of any capital project shall not commence or a revision be initiated without prior written approval of the Governor (§ 4-4.01 of the Appropriation Act (the Acts of Assembly)).

Under certain circumstances the Governor may authorize the initiation of Capital Projects under the conditions set forth in § 4-4.01 of the General Provisions of the Acts of Assembly. A project authorized under § 4-4.01 is subject to the Capital Outlay Process, including the submission of CO-2/ HECO-2 to request authorization to initiate the project.

SECTION 14.4 PROJECT EXECUTION

The following generally summarizes the capital outlay project implementation process:

1. Mason procures an Environmental Impact Report (or obtains letter from DEQ that EIR is not required for the project). Preparation and submission of an environmental impact report is required for each major state project (Code of Virginia § 10.1-1188). Regulatory authority is assigned to the Virginia Department of Environmental Quality (Va. DEQ) in the Code of Virginia § 10.1-1191. Submission requirements are described in the “Procedure for Environmental Impact Review of Major State Facilities”, prepared by the Va. DEQ.
2. [NOTE: Code of Virginia § 10.1-1190 provides that the State Comptroller shall not authorize payments of funds for major state projects unless the request is accompanied by written approval of the Governor after his consideration of the comments by DEQ on the environmental impact of the facility.]
3. Mason obtains authority to initiate a Capital Outlay Project by submitting Form CO-2/HECO-2 for approval.
4. Issue Notification of Initiation of Environmental Impact Report Process (HECO-2a)
5. Mason issues RFP for A/E services, interviews and selects A/E, negotiates fee, awards A/E Contract (Form HECO-3 and MOU) (See Chapter 3)
6. Mason and A/E attend Pre-Design Conference.
7. A/E develops and submits Schematic design for approval. Approve Schematic design and receive approval to proceed to Preliminaries. (Revised HECO -2 or CO-4, as applicable)
8. A/E develops and submits Preliminary design for approval.
9. Conduct VE Study if value of the project authorized construction cost exceeds \$5,000,000, as applicable.
10. Issue notice of availability of Preliminary design to local jurisdiction (HECO-5a)
11. Obtain approval of design from AARB

12. Approve Preliminary design and receive approval to proceed to Working Drawings. (Revised HECO -2 or CO-5)
13. A/E develops and submits Working Drawing submittal for approval. Review Working Drawings design. Receive approval of Working Drawings using Revised HECO -2 or CO-6, as applicable.
14. Advertise / Post Notice of Solicitation
15. Receive bids/proposals, open and evaluate.
16. If within Budget, submit Revised HECO -2 or CO-8 to Award Contract
17. If over budget but within range for negotiation, request approval to negotiate. If negotiations successful, prepare HECO-9b, Post Bid Modifications to Bid.
18. Use Form HECO-9 to Award Contract for Construction
19. Contractor submits Performance Bond using HECO-10 and Labor and Material Payment Bond using HECO-10.1
20. Submit Information for Building Permit, CO-17/HECO-17.
21. For Change Orders to A/E Contract use HECO-11AE
22. For Change Orders to Construction Contract, use Form HECO-11 and HECO-11a
23. Submit Certificate of Use and Occupancy, Form CO-13.3/HECO-13.3, or Beneficial Occupancy, CO-13.5/HECO-13.5 followed by Permit Closeout, CO-13.4/HECO-13.4
24. Submit Project Completion Report using CO-14/HECO-14

14.5 ORDER OF PROCEDURES

14.5.1 Acquisitions of Real Property: Acquisition of real estate shall be handled as a Capital Outlay Project and is governed by this manual. To initiate an acquisition, submit an HECO-2 approved by Executive Vice President for Administration and Finance. For projects which consist of acquisition and construction, the request to acquire the property must be submitted on a separate CO-2/HECO-2.

14.5.2 Demolition: Demolition of any building, regardless of size and type, shall be authorized by the Executive Vice President for Administration and Finance prior to proceeding. Demolitions which are required to permit construction shall be approved through Mason Facilities Planning Office before preliminary drawings are prepared. It shall be the policy of the University to consider the environmental and historical aspects of any proposed demolitions including any necessary reviews by the Department of Historic Resources and the Art and Architectural Review Board in accordance with state historic preservation requirements generally applicable to capital projects in the Commonwealth.

Further, for any property that was acquired or constructed with funding from a general fund appropriation of the General Assembly or from proceeds from state tax-supported debt, general laws applicable to state-owned property shall apply.

14.5.3 Temporary Facilities:

Though funding for the modular or industrialized building or prefabricated building may be proposed from maintenance and operating funds, such projects are essentially Capital in nature. Prior to submitting a requisition to the Division of Purchases and Supply (where purchase is involved) or before finalizing any contractual arrangements for lease of a temporary facility,

submit plans of the structure to OUBO for issuance of a building permit. The plans shall show that the structure meets the requirements of the Virginia Construction Code or the Virginia Industrialized Building Safety Regulations and Virginia Manufactured Home Safety Regulations and is accessible to the disabled. The plans shall include site location plan, proper anchorage, tie down and utilities for the structure. See Section 11.4.

Include a site plan indicating the proposed location of the facility. The location of the facility, as well as the aesthetics of the proposed structure, shall be presented to the Art and Architectural Review Board. Prior to occupancy, the applicant shall apply to the University Building Official (OUBO) for a Certificate of Occupancy for the facility. Form CO-13.3 IND shall be completed by the applicant, submitted to OUBO via eBuilder, and be accompanied by a letter of inspection recommending occupancy of the facility from the Regional State Fire Marshal's Office.

14.5.4 Construction Projects: The project code will be the basic project identifier. For projects under blanket or umbrella appropriations, or projects with work or acquisitions at multiple locations that will be accomplished by separate actions/contracts or a single project to be accomplished through two or more contracts must have a three-digit sub-project code for each undertaking. The sub-code must be used on all capital outlay forms and correspondence.

1. The Project Manager must possess an approved “Request for Authority to Initiate Capital Project, Form CO-2/HECO-2” on all capital projects. Before initiating work on the project an EIR should be completed at this point. At this point a procurement strategy planning session occurs to determine the preferred construction delivery method:
 - a. bid,
 - b. pre-qualification,
 - c. design build,
 - d. construction manager, or
 - e. other.
2. The University normally hires an A/E firm to prepare drawings and specifications (See Chapter 4) upon receipt of the approved CO-2/HECO-2. An advertisement for A/E services is issued and an RFP is issued to the responding firms. The selection committee reads and ranks proposals then meets to short list firms for interview. Interviews are held and a firm is selected. With the Vice President of Facilities’ approval, a fee proposal is received from the selected firm and final MOU is negotiated and a contract awarded on a HECO-3. See Chapter 4.
3. A pre-design conference is held from which the A/E develops and submits schematic designs for review by the Building Official and University stakeholders (Revised CO-2 or Form CO-4).

A University representative will present the project schematic design to the Art and Architectural Review Board (AARB) and Vice President of Facilities will present to the Board of Visitors for all construction and planning projects and any major repair or improvements project that affects that exterior appearance of a facility. Additional reviews may be required by the AARB. See Chapter 8 of this Manual for review requirements.

4. The A/E develops preliminary designs for review and approval (Revised CO-2 or Form CO-5). The Building Official, as outlined in Chapter 8 of this Manual, shall perform schematic, preliminary and contract document reviews. The local municipalities will be notified by the Project Manager of the availability of the documents for review. If the project construction costs exceed \$5 million, a formal Value Engineering review is required.
5. Completed working drawings and specifications shall be submitted by the Project Manager to other reviewing agencies as required by state law and noted in this manual. The University shall ensure comments of other reviewing Agencies are received and incorporated in the bid package no later than 10 days prior to bid opening. Some projects (e.g., work on historic landmarks, demolitions, water and wastewater treatment plants, central heating plants, etc.) may require the review of the Department of Health, Department of Historic Resources and Department of Environmental Quality at both preliminary and working drawing stages. The Project Manager shall be responsible for determining when these reviews are necessary and ensuring that the appropriate review agencies receive the plans and specifications and that their comments are incorporated.
6. Advertise the project via IFB or RFP at a time consistent with the procurement method. CM with design phase services and design build are typically advertised at the onset of the project. An approved revised HECO-2 or CO-8 is required before contract award and a CO-17/HECO-17 is also required before the construction start. For information on Construction Change Orders see Chapter 9 (Form HECO-11a and HECO-11).
7. A building or facility may be occupied when the project is substantially complete and a Certificate of Use and Occupancy has been issued for the building or facility. A new or renovated building may not be occupied until the University has applied for and a Certificate of Occupancy has been issued. Final inspection of all projects will be conducted by the Building Official and the responsible State Fire Marshal Office representative if applicable.

		Commonwealth Authorized		George Mason Authorized	
Function	Purpose	Form	Approval	Form	Approval
Authority to initiate Capital Outlay project.	Follows the approval of a project by the BOV and/or authorization in Budget Bill.	HECO-2 Submitted in e-builder then CO-2 submitted in bits	PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C VP, Facilities Executive Vice President for Administration and Finance (SVP) Division of Engineering and Buildings (DEB) Department of Planning and Budget (DPB)	HECO-2 Submitted in e-builder	PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C VP, Facilities EVP
	<p>Completion and approval of this form accomplishes the following:</p> <ul style="list-style-type: none"> • Identifies fund sources • Confirms appropriation • Establishes the budget • Establishes the scope • Establishes the construction time • Allows follow-on procurement steps to begin. <p>Revisions to this form are required to adjust the project budget if required as the project progresses. Adjustments to project scope or budget +/- 25% require advance approval of BOV.</p>				

Agreement between University and A/E	Prepared to allow award of design contract	HECO-3	PD&C Facilities Contracts Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP	HECO-3	PD&C Facilities Contracts Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP
Approval of Schematic Design	This approves the project concept at schematic design unless authorized to proceed directly to preliminary design was obtained previous in which case the BOV shall review at the end of preliminary design. The CO-4 form submission is not required in the case of CM at risk or design build delivery.	CO-4 submitted in bits	PD&C VP, Facilities BOV (program intent) Office of the University Building Official (OUBO) (Code) DEB (Budget)	Revised HECO-2 Submitted in e-builder	PD&C Capital Finance VP, Facilities BOV (program intent) Office of the University Building Official (OUBO) (Code) EVP (Budget)

		AARB (Design Context)		AARB (Design Context)	
Approval of Preliminary Drawings & Specifications	Approves the Preliminary Design and confirms the project budget, scope, & schedule. The CO-5 form submission is not required in the case of CM at risk or design build delivery.	CO-5 submitted in bits	PD&C Capital Finance VP, Facilities (OUBO) (Code) DEB (Budget) AARB (Design Context if directed during schematic design)	Revised HECO-2 Submitted in e-builder PD&C Capital Finance VP, Facilities OUBO (Code) EVP (Budget) AARB (Design Context if directed during schematic design)	
Approval of pool project construction budget	Funding memo is issued by DEB based upon the construction estimate and the approval of the preliminary design documents	Revised HECO-2 Submitted in e-builder then CO-2 submitted in bits	PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C	N/A	N/A

			VP, Facilities EVP DEB (Scope) DPB (Budget)	
Approval of Working Drawings & Specifications	Approves the working drawings allowing the project to be bid and reconfirms the project budget, scope, & schedule. The CO-6 form submission is not required in the case of CM at risk or design build delivery.	CO-6	PD&C Capital Finance VP, Facilities (OUBO) (Code) DEB (Budget)	Revised HECO-2 Submitted in e-builder PD&C Capital Finance VP, Facilities OUBO (Code) EVP (Budget)
Major Modification	Adjustments at any stage to the project scope or budget	Revised HECO-2 Submitted in e-builder Letter to DEB then CO-2 submitted in bits	PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C	Revised HECO-2 Submitted in e-builder PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C VP, Facilities

		VP, Facilities EVP DEB (Scope +/- 5%) DPB (Budget +/- 5%) BOV (Scope or Budget +/-25%)	EVP BOV (Scope or Budget +/-25%)
Authorizations to Award Contract	<p>Approval of this form allows the award of a construction contract</p> <p>Note: A HECO -17 Building Permit is required prior to contract award. Revisions to the authorized Project Budget total are required to be submitted on a revised CO2/HECO-2 to insure alignment.</p>	Revised HECO-2 Submitted in ebuilder then CO2 & CO-8 submitted in bits PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C VP, Facilities EVP DEB (Scope)	Revised HECO-2 Submitted in e-builder PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C VP, Facilities EVP

		DPB (Budget)	
Contract between Owner and Contractor	The actual contract to construct the facility or renovation.	HECO-9, PD&C HECO-9CM, Facilities Contracts HECO-9DB Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP	HECO-9, PD&C HECO-9CM, Facilities Contracts HECO-9DB Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP

Construction Contract Change Order	Authorizes a change in a construction contract. This form shall be prepared for each change in a construction contract. All changes involving contract cost or performance time will be included in an approved change order. Please also see note on the major modifications. Change orders exceed \$50K or 25% of the original contract values, whichever is greater, will need SVP approval regardless of the change value.	HECO-11, HECO-11a	PD&C Facilities Contracts Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP	HECO-11, HECO-11	PD&C Facilities Contracts Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP
Design Contract Change Order	Authorizes a change in a design contract. This form shall be prepared for each change in a design contract. Please also see note on the major modifications. Change orders exceed \$50K or 25% of the original contract values, whichever is greater, will need SVP approval regardless of the change value.	HECO-11ae	PD&C Facilities Contracts Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP	HECO-11ae	PD&C Facilities Contracts Capital Finance <\$100K – Dir. Contracts >100K&<\$250K – AVP PD&C >\$250K&<\$500K – VP, Facilities >\$500K - EVP

Substantial/ Final Completion Forms	<p>Certificate of Completion by A/E Certificate of Substantial Completion by A/E Final Report of Structural & Special Inspections Certificate of Substantial Completion by Inspector Certificate of Completion by Contractor Certificate of Substantial Completion by Contractor Checklist for Beneficial Occupancy</p> <p>These forms shall be prepared and/or approved by the project manager at the appropriate time. When completed and signed they shall be submitted in a package along with a form HECO -13.3 "Certificate of Use and Occupancy."</p>	<p>HECO-13.1 HECO-13.1a HECO-13.1b HECO-13.1c HECO-13.2 HECO-13.2a HECO-13.3b</p>	In accordance with instructions accompanying the forms	<p>HECO-13.1 HECO-13.1a HECO-13.1b HECO-13.1c HECO-13.2 HECO-13.2a HECO-13.3b</p>	In accordance with instructions accompanying the forms
Certificates of Use and Occupancy, Closeout of Building Permit, Beneficial Occupancy	These forms authorize use of the facilities.	<p>CO-13.3, CO-13.4, CO-13.5</p>	<p>PD&C SFMO OUBO (Code)</p>	<p>CO-13.3, CO-13.4, CO-13.5</p>	<p>PD&C SMFO OUBO (Code)</p>

Project Completion Report	Certifies completion of the project both physically and financially	CO-14	PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C VP, Facilities EVP BOV DEB (Scope) DPB (Budget)	HECO-14	PM, Planning Design & Construction (PD&C) Capital Finance AVP, Facilities PD&C VP, Facilities EVP BOV

Building Permit	<p>This form is prepared by the Code Review Team upon review of this working drawings and normally accompanies the HECO-6 for review by Building Official or his or her designee approval. Certifies design meets all applicable codes. It is required prior to award of any construction contract.</p>	<p>CO-17</p> <p>PD&C</p> <p>SFMO</p> <p>OUBO (Code)</p>	<p>CO-17</p> <p>PD&C</p> <p>SFMO</p> <p>OUBO (Code)</p>
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CHAPTER 15:

REPORTING

SECTION 15.1 MAJOR CAPITAL REPORTING

DGS is responsible for coordinating with, and collecting data from, other state agencies to compile five legislatively-mandated reports and DPB is responsible for one report. These reports are the Capital Outlay Progress Report, the Value Engineering Utilization Report, the Construction Management and Design-Build Procurement Report, the Completed Capital Projects Report, VEES Energy Report, and the Assessment of Institutional Performance.

SECTION 15.2 CAPITAL OUTLAY PROGRESS REPORT

Section 4-8.01 of the 2003 Acts of Assembly requires the Department of General Services to submit an annual report to the Senate Finance and House Appropriations Committees on the status of capital outlay projects. Every Agency having a capital outlay project is required to submit a report listing all active capital outlay projects. Active projects are defined as those for which an approved CO-2/HECO-2 form has been issued. Projects are removed from the report the first reporting cycle following the submittal of the CO-14/HECO-14 form.

The report is required to be submitted annually. Individual agency reports are due to DEB by July 30 reporting data thru June 30 of the previous fiscal year.

The following are the general reporting instructions:

1. At least three weeks prior to the due date for the report, each agency will be provided via e-mail with an Excel spreadsheet of its portion of the most recent report submitted to the State Legislature.
2. The Agency shall edit this spreadsheet to show additions, deletions or changes in status as of the June 30th as noted above.
3. If a project shows no progress since the last report, an explanation must be given in the remarks column or on an attached sheet. Indicate the reason for lack of progress and what steps are being taken to get the project back on schedule.
4. E-mail the completed report to DEB at coforms@dgs.virginia.gov by July 30th

SECTION 15.3 VALUE ENGINEERING UTILIZATION REPORT

The Director of the Department of General Services is required by the Code of Virginia § 2.2-1133 to report to the Governor and the General Assembly on or before September 15 of each year, the following:

1. The number and value of the state capital projects where Value Engineering (VE) was employed;
2. The identity of the capital projects for which a waiver of the requirements of § 2.2-1133, B was granted, including a statement of the compelling reasons for granting the waiver.
3. The report is required to be submitted annually. Individual agency reports are due to DEB by July 15. This data reported shall encompass the previous fiscal year (July 1 through June 30).

SECTION 15.4 Construction Management and Design-Build Procurement REPORT

Per Chapter 760, 2015 Acts of the Assembly, the Director of the Department of General Services is required to report the results of the Construction Management and Design-Build Procurement Survey to the General Assembly, as follows:

The Director shall (i) report such information quarterly to the Chairmen of the House Committee on General Laws and the Senate Committee on General Laws and Technology and (ii) post such reports on the Department of General Services' central electronic procurement website. In addition, on or before December 1 of each year, the Director shall submit an annual report to the Governor and the Chairmen of the House Committee on General Laws and Senate Committee on General Laws and Technology that includes (a) the Director's evaluation of and findings regarding the methods of procurement used for such construction procured by design-build or construction management at risk method and (b) any recommendations for the improvement of (1) the method of procuring construction generally and (2) the Virginia Public Procurement Act (§ 2.2-4300 et seq. of the Code of Virginia).

SECTION 15.5 ASSESSMENT OF INSTITUTIONAL PERFORMANCE

Per Chapter 665, 2015 Acts of the Assembly, the Department of Planning and Budget is required to gather information to assess the institutional performance, as follows:

The institution will complete capital projects (with an individual cost of over \$1,000,000) within the budget originally approved by the institution's governing board for projects initiated under delegated authority, or the budget set out in the Appropriation Act or other Acts of Assembly. If the institution exceeds the budget for any such project, the Secretaries of Administration and Finance shall review the circumstances causing the cost overrun and the manner in which the institution responded and determine whether the institution shall be considered in compliance with the measure despite the cost overrun.

This is usually requested in June and the guidelines are the following:

Institutions of Higher Education will provide the following information for all capital projects with an individual project cost over \$1.0 million that were completed in the previous FY:

1. A 1-2 paragraph written explanation of why the completion total project cost is higher than the originally authorized amount of the project (for pool funded projects, this is the original CO-2 amount approved at the completion of detailed planning/preliminary design; for non-pool funded projects (ie, auxiliary-funded), this is the original amount approved by the institution's governing board) as compared to the completion total project cost. The completion total is made up of the total expended to date plus the costs intended to be expended on the project.
2. The Cost Savings Activities list for the project. This list will be used to evaluate the manner in which the institution responded to the cost overrun.
3. If an institution did not have any capital projects that were completed in FY2017 or no projects where the completion total costs exceeded the original authorized amount then please submit a statement to that effect.

What does "completed" mean? For purposes of this procedure, completed will be defined as:

1. The date of a permanent certificate of occupancy (CO-13.3) is when the project is considered complete for the purposes of this report.
2. For projects that do not require a certificate of occupancy, the project is complete on the date of the Certification of Completion (HECO-13.1) by the A/E firm or the Project Manager; OR the approval of the final payment to the contractor. (HECO-12).

15.6 Completed Capital Projects Report:

The Code of Virginia a § 2.2-4383 requires the Department of General Services to report to the Governor and the General Assembly on or before December 1 of each year, the following information from all Public Bodies for completed capital projects in excess of \$2 million:

1. the procurement method utilized,
2. the project budget,
3. the actual project cost,
4. the expected timeline,
5. the actual completion time,
6. any post-project issues.

The Director shall submit this report annually. Individual agency reports are due to DEB by October 15. The data reported shall encompass the previous fiscal year (July 1 through June 30).

The University shall report completed capital projects where:

1. The project was completed in the previous Fiscal Year
2. Total construction cost is greater than \$2 million
3. The initial solicitation (RFQ/IFB) was issued after July 1, 2017

15.7 VEES Energy Report

The Department of Engineering and Buildings is responsible for compiling all reports submitted by agencies to DEB by November 1 and make the final submission to the Governor in accordance with the CPSM Appendix V Section 401.3.2.4, Energy Reporting, on the Commonwealth of Virginia Agencies 'and Institutions' behalf.

CHAPTER 16:

FINANCIAL PROCESS

RESERVED

APPENDICES

A General Conditions of the Construction Contract and Supplemental General Conditions

B Standard Higher Education Capital Outlay Forms.

C Standard Higher Education Formats

D Basis of Design Narrative and Systems Checklist

E Cost Estimate

F Checklist for Receiving and Opening Bids

G Roof Inspection Forms and Procedures

H Reserved

I Parameters for Calculation of Life Cycle Costs and Energy Analyses

J Reserved

K Construction Change Order Procedure Guidelines

L Art and Architectural Review Board and Board of Visitors

M Structural and Special Inspections

N Duties of the Project Inspector

O Project Types and Non Capital Outlay Project Procedures

P Building Permit Policy

Q Record Document Standards and Formatting

R Reserved

S Reserved

T HECO Manual Revision History

U Reserved

V Real Property Transactions (Capital Outlay, Acquisitions and Leases)

APPENDIX A

GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT AND SUPPLEMENTAL GENERAL CONDITIONS

Standard DGS forms and formats are available for download from the DGS Form Center (<https://dgs.virginia.gov/search/documents-and-forms/>) and the Mason HECO/DGS Forms site (<https://facilities.gmu.edu/resources/forms/>).

GENERAL CONDITIONS (CO-7)

To view/download the latest version of CO-7 contract document visit one of the websites listed above.

SUPPLEMENTAL GENERAL CONDITIONS

Sample supplement general conditions for different deliverable types are available at the Mason HECO/DGS Forms site. These documents may be subject to modification based upon the specific project.

INSTRUCTIONS TO BIDDERS (CO-7a)

To view/download the latest version of the CO-7a contract document visit one of the websites listed above.

GENERAL CONDITIONS DESIGN BUILD (CO-7DB)

To view/download the latest version of the CO-7DB contract document visit one of the websites listed above.

GENERAL CONDITIONS CONSTRUCTION MANAGER AT RISK (CO-7CM)

To view/download the latest version of the CO-7CM contract document visit one of the websites listed above.

HECO-7DB
Revised (June 2017)

HIGHER EDUCATION COMMONWEALTH OF VIRGINIA
General Conditions for the Design Build Construction Contract for All Capital Outlay
Projects
Addendum Number One

The Commonwealth of Virginia General Conditions of the Design Build Contract Form DGS-30-056, CO-7DB (2017 Edition) are modified and supplemental as hereinafter described in this Addendum Number One.

a. Sections 2 (Contract Documents)

Delete Paragraph (a) and in its place add the following:

“(a) The Contract Between the University and the Design Build Contractor (HECO- 9DB), the Worker’s Compensation Certificate of Coverage (HECO-9a), the Standard Performance Bond (HECO- 10), the Standard Labor and Material Payment Bond (HECO- 10.1), the Schedule of Values and Certificate for Payment (CO- 12), the Affidavit of Payments of Claims (HECO- 13), the Contractor’s Certificate of Substantial completion (HECO-13.2a), and the Contractor’s Certificate of Completion (HECO-13.2) issued by the in its Higher Education Capital Outlay Manual (HECO) are forms incorporated in these Design Build General Conditions by reference and are made a part hereof to the same extent as though fully set forth herein. They must be used by the Contractor for their respective purpose.”

Delete Paragraph (d) and in its place add the following:

“(d) The Mason Design Manual, current edition is included by reference herein and shall be used by the Contractor’s A/E as guidelines for the design.”

Delete Paragraph (e) and in its place add the following:

“(e) Chapter 8, Project Design and Technical Criteria of the HECO current edition is included by reference and shall be used by the Contractor’s A/E as the referenced standards for design.”

b. Section 12 (“All Risk” Builder’s Risk Insurance)

In Paragraph (a) delete the words “and the Director, Division of Engineering and Buildings”

c. Section 15 Architects/Engineers Status

Delete Paragraph (c)

Delete Paragraph (e) and in its place add the following:

“(e) Chapter 8, Project Design and Technical Criteria of the HECO current edition is included by reference herein and shall be used by the Contractor’s A/E as the referenced standards for Design”

- d. For all forms referenced in the DGS Form E&B CO-7DB (07/2022 Edition) by “CO-,” replace “CO-“with “HECO-”.

*Crosswalk Table of Forms Referenced in CO-7DB to HECO Form Numbers:

DGS CO Form Reference	HECO Form Reference	Description of Form
CO-7DB	N/A	General Conditions of the Design Build Contract
CO-9DB	HECO-9DB	Design Build Contract
CO-10	HECO-10	Standard Performance Bond
CO-10.1	HECO-10.1	Standard Labor and Material Payment Bond
CO-11	HECO-11	Change Order (Construction Contract) and Change Order Justification
CO-12	HECO-12	Schedule of Values and Certificate for Payment
CO-13	HECO-13	Affidavit of Payment of Claims
CO-13.2	HECO-13.2	Certificate of Completion by Contractor
CO-13.2a	HECO-13.2a	Certificate of Partial or Substantial Completion by Contractor

APPENDIX B

STANDARD HIGHER EDUCATION CAPITAL OUTLAY FORMS

CPSM (CO) Forms are available direct from DEB at the following Web Site:

<https://dgs.virginia.gov/search/documents-and-forms/>

HECO FoDrms are available at the following location:

<https://facilities.gmu.edu/resources/forms/>

DESIGN CONTRACT MANAGEMENT FORMS

AE-1 – AE-6 – AE Firm Data Sheets;
HECO-2.3 - A/E Fee Proposal Worksheet;
HECO-3 - Contract Between University and A/E;
HECO-3MOU – Memorandum of Understanding Between University and A/E;
CO-3a – Terms and Conditions of A/E Contract (DGS-30-018);
HECO-3.1 - Term Contract Form for A/E;
HECO-3.1MOU - Memorandum of Understanding for Term Contract Between University and A/E;
HECO-3.1a – Project Order Term Contract for A/E;
HECO-11a/e - Architect/Engineer Contract Change Order;
A/E Payment Invoice

DEB DESIGN REVIEW FORMS

CR-1 – Project Panner (DGS-30-199);
CR-2 – Cost Review Questionnaire (DGS-30-198);
VE-1 – Summary of Value Engineering Recommendations (DGS-30-212);
DGS-30-219 – Area Calculation Worksheet;
DGS-30-224 – Building Cost Summary;
DGS-30-228 – Building Lifecycle Cost Summary;
DGS-30-238 – Hazardous Material Inventory;
DGS-30-299 – Request for Early Release Package for CM at Risk;
DGS-30-380 – Transmittal for DEB Review Services;
DGS-30-382 – VEES Checklist

AUTHORIZATION FORMS

CO-2/HECO-2 - Authority to Initiate Non-General Fund Capital Outlay Project;
HECO-2a – Notice of Initiation of Environmental Impact Report Process;
CO-4 - Approval of Schematic Design;
CO-5 - Approval of Preliminary Drawings and Specifications;
HECO-5a - Notification of Availability of Preliminary Drawings;
CO-6 - Approval of Working Drawings & Specifications;
CO-17 - Building Permit (e-Builder Process);

CO-17.1 – Permit for Demolition of a Building on State Property (DGS-30-176) (e-Builder Process)
CO-17TMP Attach. 1 – Building Permit Attachment for Amusement Device (DGS-30-190) (e-Builder Process)
CO-8 - Authorization to Award Contract;
CO-14/HECO-14 - Project Completion Report;
HECO-18 – Sole Source Procurement Approval Request;
DGS-30-456 – CM at Risk Authorization Request;
DGS-30-471 – Design Build Authorization Request;
DGS-30-218 – Annual Permit – Agency Representative Application

CONSTRUCTION CONTRACT MANAGEMENT FORMS

CO-6a - Statement of Structural and Special Inspections (DGS-30-048);
CO-6b - USBC Special Inspections (DGS-30-052);
CO-6c – Statement of Contractor’s Responsibility (DGS-30-053);
CO-7 - General Conditions Capital Outlay Projects (DGS-20-054);
CO-7DB - General Conditions Design Build Capital Outlay Projects (DGS-30-056);
CO-7CM - General Conditions Design Build Capital Outlay Projects (DGS-30-057);
CO-7a - Instruction to Bidders (DGS-30-055);
Supplemental General Conditions for CM at Risk Contracts;
Supplemental General Conditions for Energy Services Company (ESCO) Contracts;
HECO-9 - Commonwealth of Virginia Contract between University and Contractor;
HECO-9DB – Commonwealth of Virginia Contract Between University and Design Builder;
HECO-9CM(1) – Phase 1 (Precon Services) of CM Contract;
HECO-9CM(2) – Phase 2 (Construction Phase Services) of CM Contract;
HECO-9CM(ER) – Early Work Package Release/ Limited Notice to Proceed for CM Contractor;
HECO-9ESCO - Commonwealth of Virginia Contract Between University and Energy Performance Contractor;
HECO-9PO – Project Order Between University and Term Contractor;
HECO-9VANPS – Project Order for the Use of a Statewide Contract;
HECO-9a – Worker Compensation Certificate of Insurance;
HECO-9b – Post Bid Modification;
HECO-9.1 – Notice of Intent to Award;
HECO-9.1a – Notice of Award;
HECO-9.2 – Notice to Proceed;
HECO-10 - Commonwealth of Virginia Performance Bond;
HECO-10.1 - Commonwealth of Virginia Payment Bond;
HECO-10.2 – Standard Bid Bond;
HECO-11 - Contract Change Order;
HECO-11a - Change Order Justification;
HECO-12 - Commonwealth of Virginia Schedule of Values and Certificate for Payment;
HECO-13 – Affidavit of Payment of Claims;
HECO-13.1 - Certificate of Completion by A/E;
HECO-13.1-twr - Certificate of Completion of a Communication Tower by A/E;
HECO-13.1a - Certificate of Partial Completion by A/E;
HECO-13.1b - Final Report of Structural and Special Instructions;

HECO-13.1B-twr – Final Report of Structural and Special Instructions for a Communication Tower;
HECO-13.1c – Certificate of Partial Completion by Inspector;
HECO-13.2 - Certificate of Completion by Contractor;
HECO-13.2a - Certification of Partial Completion by Contractor;
HECO-13.3 - Certificate of Use and Occupancy;
HECO-13.3b – Checklist for Beneficial Occupancy;
HECO-14a – Contractor Performance Rating;
HECO-16 – Contractor’s Statement of Qualifications;
HECO-16 Attachment A – Pre-Qualified Bidders – Qualifications Criteria;
HECO-16 Attachment B – Additional Financial and Insurance Requirements for Self-Bonding;
DGS-30-166 – Transmittal for the Commonwealth’s Self-Bonding Program;
HECO-16 Attachment C – Crosswalk of Key Personnel Experience;
HECO-GC-1 – Change Order Estimate (General Contractor);
HECO-SC-1 – Change Order Estimate (Subcontractor);
HECO-SS-1 – Change Order Estimate (Sub-Subcontractor);
Contractor’s Claim Certification;
Supplemental Agreement for Off Site Storage of Materials or Equipment;
SWAM Quarterly Reporting Forms

APPENDIX C

STANDARD HIGHER EDUCATION FORMATS

RFQ for Construction Services
RFP for A/E Professional Services - Single Project
RFP for A/E Professional Services - Term Contract
RFP for Commissioning Services
RFP for Construction Manager at Risk
RFP for Construction Manager at Risk – CM Proposal Form
RFP for Construction Manager at Risk – General Conditions Fee Worksheet
RFP for Construction Manager at Risk – Small Business Participation
RFP for Construction Manager at Risk – Preconstruction Phase Scope of Services
RFP for Construction Manager at Risk – Terms & Conditions of the Preconstruction Services
RFP for Construction Manager at Risk – Construction Phase Scope of Services
RFP for Design/Build
RFP for Design/Build – DB Team’s Proposal Form
RFP for Design/Build – Small Business Participation
RFP for 3rd Party Testing
RFP for 3rd Party Testing – Pricing Schedule
RFP for Project Manager or Inspector
RFP for Project Manager or Inspector – Pricing Schedule
Non-Professional Services RFP – Data Form
General Conditions for Non-Professional Services
Notice (IFB) of Invitation For Bids Format
Standard Bid Form Format
Pre-Bid Question Form
Vendor eVA Registration Requirements
VCCO-1 – MOU for VCCO Services

Standard Versions of these forms are available for download at the Mason HECO/DGS Forms site:
(<https://facilities.gmu.edu/resources/forms/>).

APPENDIX D

BASIS OF DESIGN NARRATIVES

INTRODUCTION

The basis of design is a narrative description of the project and should be a bound presentation of facts sufficiently complete in accordance with the following format to expedite review of the Schematic and the Preliminary submittals. The Schematic Basis of Design narrative presents the basic information, criteria, logic, evaluations and considerations developed in each category to prepare the Schematic submittal. The Preliminary Basis of Design narrative expands upon the Schematic submittal to reflect the further analyses, evaluations and selections/decisions made to arrive at the Preliminary level of design.

Design computations, sizing of members or conductors, details of connections, etc., are not required to be submitted with the Schematic Basis of Design, but general computations supporting system selection, member depths, floor to floor heights, mechanical and electrical loads should have been made.

SCHEMATIC BASIS OF DESIGN INFORMATION

The Schematic submittal shall include a Basis of Design Narrative which as a minimum provides the following information in narrative or tabular format:

1. Type of occupancy/USBC Use Group
2. Estimated occupancy capacity and method or factor used for estimate
3. Functions to be housed in the building
4. Proposed building location on the site
5. Exterior Circulation (i.e. how this project may interface with other area facilities)
6. Areas and/or capacity required for various activities proposed for building and how this compares with the initial program requirements
7. Type of Construction proposed: i.e. fire resistive, protected or unprotected noncombustible, etc. and USBC Type #
8. Indicate the proposed Virginia Energy Conservation Code compliance path
9. Outline description of basic materials
10. Future construction or expansion to be accommodated, if any
11. Style and character of building desired
12. Structural Design Live Loads, Wind and Seismic Design Criteria
13. Types of structural framing evaluated and recommendation
14. General description of any proposed fire suppression systems (clean agent, chemical, etc.)
15. Provide a general description of any proposed fire sprinkler systems.
16. Identify applicable NFPA Standard (cited by the USBC) which provides the minimum requirements for the design, installation, testing, inspection, approval, operation, and maintenance of the proposed fire sprinkler or fire suppression system. Indicate the water supply to the proposed building and whether or not a fire pump will be required. (Calculations to support this position are desirable at this phase but are not required.)

17. Description of the types of HVAC systems being evaluated, estimated heating and cooling loads, fuels evaluated and fuel selected to be used
18. Description of all energy conservation and peak energy reduction methods being evaluated
19. Description of types of electrical systems evaluated, voltages, possible transformer locations and need for generator
20. Total square foot area per floor and per building
21. Total cubic foot volume
22. Number of beds, seats or parking spaces, where applicable
23. Total estimated construction cost based on the schematic documents
24. Total proposed project budget
25. Geotechnical report criteria
26. Describe Site Work issues such as site survey, geotechnical, utilities, parking, roads, sidewalks and grading

Provide description of Electrical Coordination Analyses process, installation and testing requirements.

Document requirement of In-Building Emergency Communications System.

PRELIMINARY BASIS OF DESIGN INFORMATION

The following format is for a new building type construction project but is applicable to renovation and addition projects by addressing those portions relevant to that particular project. When a project consists primarily of mechanical, electrical, structural, or another discipline, the basis of design shall provide more detailed information for the major discipline. The narrative shall address or list the factors indicated for each section. Data may be presented in tabular form where appropriate.

High Performance Buildings Act:

1. State whether the High Performance Buildings Act is applicable. If it is applicable to the project, describe the proposed compliance path (Refer to Section 7.2.8.1 *shown as Section 6.1.3.2 from the 2022 CPSM).
2. Provide narrative within each trade or as a separate section to describe energy conservation features and methods to be employed.
3. Provide VEES Checklist Form DGS-30-382.

Virginia Energy Conservation Code:

1. Describe the proposed Virginia Energy Conservation Code compliance path. (Refer to Section 7.2.7)
2. Provide narrative within each trade or as a separate section to describe energy conservation features and methods to be employed.

Architectural:

1. Describe functions to be housed in the building and the applicable USBC Use Group Classification(s). Include copy of the minimum space/area requirements and adjacency criteria used to develop the design.
2. Provide analysis of Virginia Uniform Statewide Building Code (VUSBC) and referenced standards (and NFPA 101, Life Safety Code, if applicable) requirements of all occupancies involved. Determine occupancy classifications and compute occupant load, number of units of exit and other requirements. Describe unusual or critical code requirements and indicate how such requirement will be met.
3. State the VUSBC Type of Construction selected with reference to the degree of fire resistance. Describe construction systems/materials proposed to achieve the construction type/fire resistance rating.
4. Computation of gross floor area in accordance with Form DGS-30-219, Area Calculation Worksheet guidance and of Building Efficiency factor/ratio. Gross floor areas should be indicated on the drawings.
5. Provide preliminary floor plans, elevations, building cross section and other drawings as required by Chapter 8 of the Manual. Floor plans should indicate the location of all built-in equipment and fire walls.
6. Statement as to the types of thermal insulation to be provided, where required, and the value of the "U" factors for the various portions of the structure, i.e., roof, walls, floors, etc. Also describe all architectural energy conserving features to be incorporated.
7. Provide a narrative description of the preliminary color design concept addressing architectural finishes and colors. Describe materials for all major items of construction and all interior and exterior finishes. The description of finishes (colors, textures, and patterns) shall be accomplished by the use of a finish schedule. The finish schedule (on the included drawings) shall identify spaces and interior building material finishes.
8. Provide furniture and equipment footprint drawings in preliminaries reflecting the University's updated equipment list which show the end result of the architect's space planning effort. The furniture footprint demonstrates the designer's plan for the various functions that are housed in the facility. The designer shall use standard furniture sizes to demonstrate adequacy of space and to communicate utility and service requirements to engineering disciplines.
9. A description of items not considered to be a permanent part of the structure, such as work benches, shelving, bins and removable partitions. (Show also on furniture footprint drawings.)
10. Where high-density file storage systems are proposed, provide data to demonstrate acceptable loading capacity.

11. Analyze the design for compliance with acoustical requirements. List areas of high noise and vibration and acoustic design principles applied. Is an acoustical consultant or specialist required for the project?
12. Design features to make facilities accessible to and usable by the physically handicapped. If not incorporated, appropriate reasons/justification shall be given.
13. Equipment rooms of ample size shall be provided with consideration being given to adequate allowances for access, maintenance, repair and easy removal of units. Room dimensions shall not restrict equipment items to the products of any single manufacturer.
14. The A/E should assure that equipment of more than one manufacturer can be accommodated in the space allocated. This policy will not be interpreted as sanctioning an increase in equipment space to accommodate some particular manufacturer's product when such would result in structural costs being greater than the probable resultant saving in equipment costs.
15. Describe special construction features incorporated into the facility such as barred windows, special wall/roof construction, etc.
16. The Art and Architectural Review Board (AARB) has been established to ensure architectural compatibility is maintained at each location. Presentation(s) of the design shall be presented to the AARB for comment and recommendation for approval after submittal to the University Review Unit for review and comment at the Schematic and Preliminary submittals.

Structural:

1. Description of foundation conditions, type of foundation to be used, method by which the allowable bearing values are to be determined, and maximum allowable bearing capacity for the foundations. Geotechnical information including field boring notes and foundation design recommendations shall be submitted with the preliminaries.
2. Statement of the type of construction adopted and reason therefore, with capacity, dimensions, or other size criteria. List of materials selected with design strengths and ASTM, AISC, ACI, etc. standards to be specified.
3. Special features to be included in the structure, which are not evident from the drawings.
4. Description of the structural floor and roof systems proposed, with length, spacing and size of principal members (for beam and girder, etc.).
5. Description of the Lateral Force Resisting System proposed with appropriate materials and dimensions.

6. Statement of live loading to be used, to include floor loads, wind, snow, earthquake, etc., with data to justify.
7. Statement of any special considerations that affect the design, (e.g., special corrosion resistance requirements, detention facilities, cranes, etc.).
8. The usual accepted means of structural system selection is economy. Demonstrate this with cost comparisons of various appropriate framing systems such as:
 - a. "Typical bay" member sizing and cost comparisons of alternate structural systems;
 - b. Horizontal force resisting system for wind and earthquake;
 - c. Consideration of unusual geometry (long span, high bay, deep cuts, etc.);
 - d. Consideration of heavy equipment supports.
9. Where high density file storage systems are proposed, provide data to demonstrate acceptable structural loading capacity.
10. Details using horizontal HSS tubes as beams: Do not recommend using HSS Tubes as horizontal beams where they are required to be fire rated. There is no UL Listing for this condition. HSS tubes used as columns and X-bracing can be UL Listed.
11. Helical piers: if the engineer wishes to use helical piers, a recommendation must be made by the soils engineer in the soils report or supplemental report for the correct design.

Plumbing:

1. Describe system to be utilized on each part of the project.
2. Determination/calculation of number of each type of fixture based on VUSBC occupancy load. Indicate types and quality standards in narrative and on preliminary drawings.
3. Estimated number of fixture units and water demand in gpm for all plumbing fixtures.
4. Estimated maximum and minimum water pressure at each building and indicate if booster pumping will be required.
5. Also, a statement as to whether heat recovery is contemplated for domestic water heating.
6. Type, size and design temperature of domestic water heater and distribution system. Also, a statement as to whether heat recovery is contemplated for domestic water heating.
7. Design temperature of domestic hot water distribution system and extent of recirculation system within building.

8. Indicate materials to be used for each piping system.
9. Address- any special needs such as sumps, interceptors, pumps, pipe guides, lift pumps for sewerage, etc., and indicate tentative sizes, capacities and quality standards to be specified.

Heating, Ventilating and Air Conditioning:

1. Design Conditions
 - a. Describe and/or list the indoor and outdoor design conditions to be used in the design of systems for this project.
 - b. Energy sources for heating and cooling systems shall be determined from an analysis of the efficiency of use and economy of those available for each project. Parameters for analysis should be obtained from the Division of Engineering and Buildings. The analysis shall be presented for review with preliminary submittal and shall be summarized on an Energy Analysis Summary sheet.
2. Heating
 - a. Describe the source of heat energy which will be used, such as extension of central high-pressure steam with meter, hot water with meter, or independent heating equipment with type of fuel to be utilized. Also explain why this source was selected in lieu of other available sources. Where there is a possibility of more than one type being economical a computerized analysis should be included to justify the selection.
 - b. Briefly describe and/or show on the drawings the type and routing of the system proposed to convey the heat source, if applicable; (for example, 100 psig low level, above ground steam and condensate lines on concrete support, inter connecting to the existing system at manhole no. 150 and traveling due north into the mechanical equipment room.) State if condensate return system is to be utilized. If condensate is to be wasted, heat reclaim shall be studied. If wasted, it should be cooled to 140°F maximum, then returned to the sanitary sewer system (unless specifically instructed otherwise). Indicate the maximum hourly production of condensate.
 - c. Describe and/or provide schematics of the type of heating medium and system to be used within the buildings. Also include reasons for selection of this system over others available.
 - d. Describe the HVAC Control System. A specific type of control system will be specified, i.e., pneumatic, electric or electronic.

3. Ventilation

- a. Indicate the quantity of outside air per person in all areas, the type of filtration, and whether OSHA requirements are applicable.
- b. State if smoke removal/control systems are to be employed.
- c. Describe the operation of the system in summer and winter modes.
- d. Describe any methods to reduce or minimize outside airflow

4. Air Conditioning

- a. Provide a complete description and/or schematics of the air conditioning system proposed including an explanation of why this system is preferred over others. Also indicate locations of major components of the system. For larger systems which qualify under Energy Conservation, a computerized comparison between at least two systems is required.
- b. Define areas to be air conditioned.
- c. Identify special humidification or de-humidification requirements, as well as special filtration requirements.
- d. Describe any special architectural features being incorporated to reduce cooling loads. Also, any features being incorporated in the mechanical system which would reduce energy consumption should be separately discussed.

5. Combination Systems

- b. For systems in which the heating, ventilating and/or air conditioning are combined, repetition may be eliminated by consolidating the aforementioned requested information.
- c. Describe changeover procedures and requirements.

6. Energy Conservation

- a. Computer energy analysis (block load type) for buildings larger than 8,000 square feet requiring heating and cooling and larger than 20,000 square feet requiring heating only shall be used to study energy conservation features. Concurrence of systems to be studied should be obtained prior to conducting study. If a valid computer analysis was prepared during the Budget Study Preparation for the project, this may suffice. When computer analyses are performed, the total annual energy consumption estimate should be clearly stated.

- b. Describe any methods to reduce energy usage and peak loads.
- c. Briefly describe the controls for each system and indicate intended sequence of operation.
- d. Briefly describe testing and balancing requirements to be required.
- e. Since the University has an Energy Management System, the preliminary submittal shall be prepared to conform to the requirements the Mason Design Manual.

Environmental Pollution Control:

Identify expected environmental pollution and the proposed method of control. A detailed description will be necessary for those facilities directly related to controlling air and water pollution such as sewage treatment plants, industrial treatment facilities, incinerators, smoke elimination facilities, and other similar projects. When subsurface tile filtration is being considered for sewage disposal, a soil percolation test will be required for each such disposal system. List all environmental control permits and notifications required.

Asbestos, Lead-Based Paint and Hazardous Material:

The A/E shall include a statement in the Basis of Design addressing asbestos, lead based paint, and other hazardous material (including leakage from underground storage tanks) presence or potential presence on the project. Indicate if University has secured an asbestos, lead based paint, or hazardous material investigation of the project area for renovation projects. Indicate how the presence of these materials will affect this project, (i.e., removed by separate project, removal included in this project, left in place and encapsulated, etc.) If work is by separate contract, indicate if phasing of work or a delay of this project is anticipated.

Special Mechanical Systems:

Provide a description of any special mechanical systems such as compressed air, hydraulic, nitrogen, etc., including an explanation of the medium source.

Central Heating Plants and Heating Plant Additions:

- d. Prepare an energy analysis and submit Energy Analysis Summary. Describe criteria and assumptions in narrative. Describe purpose and Justification of systems proposed.
- e. Describe environmental constraints such as applicable regulations, liquid wastes, gaseous emissions, treatments required, etc.
- f. Describe new boilers including rating, flow, temperature, pressure and type.
- g. Describe control systems.

- h. Describe any new auxiliaries to be added and what source of power will be used for their operation.

Refrigeration (Cold Storage):

1. Identify areas to be refrigerated, indicating their usage and temperatures to be maintained.
2. Describe type of refrigeration equipment and systems.

Thermal Storage:

1. Describe the type (static or dynamic) of storage being considered.
2. Provide preliminary cooling profile.
3. Provide preliminary equipment and tank sizes.
4. State how the A/E proposes to conform to University Procurement requirements when specifying thermal storage system and components.

Fire Protection Systems:

1. Describe type(s) of automatic sprinkler and gaseous extinguishing systems to be utilized and note locations to be protected.
2. Describe fire detection and alarm systems including location of detectors, manual stations, audible devices, control panels, etc.
3. On the drawings indicate location of water supply pipe location and main entrance to buildings. Also indicate location of gaseous extinguishing system equipment and supplies and location of fire department connection and post indicator valve.
4. Provide the following information about sprinkler systems:
 - e. Hazard classification of occupancy and applicable Code reference.
 - f. Water supply available at point of connection (static pressure and residual pressure at design flow). This data must be based upon flow tests at or near the point of connection and must appear in the Basis of Design. Indicate on drawings the location of flow test.
 - g. Describe fire pump operating parameters.
 - h. Approximate water demand for sprinkler system.
5. Statement of adequacy/inadequacy of water supply and planned upgrades by local jurisdiction, if any.

Electrical:

1. Provide the following about interior distribution systems:
 - a. Electrical characteristics (phase, voltage, and number of conductors in main distribution circuits).
 - b. Breakdown in tabular form of the *estimated* connected load to show:
 - i. Lighting load and convenience outlet load separately.
 - ii. Power load for building equipment such as heating, air conditioning, etc.
 - iii. Loads for special operating equipment such as compressors, generators, pumps, and for power receptacles being provided to energize special equipment. Apply an appropriate demand factor to each to compute total demand load.
 - b. Type of wiring system, such as rigid conduit, electrical metallic tubing, non-metallic sheathed cable, etc., and where proposed to use. **(Present criteria prohibits embedding aluminum conduit in concrete. Present products should be reviewed to make sure that conduit, pipe, bars, anchors or other aluminum parts are not embedded in concrete.)**
 - c. Type of conductors, such as rubber insulated, thermoplastic insulated, polyvinyl chloride jacket, etc., and where proposed to use.
 - d. A statement describing proposed pertinent standards of design, such as voltage drop (include calculations), lighting intensities (include calculations), and type of lighting fixtures, and a statement regarding the use of selective switching or other energy conserving features.
 - e. A determination of short-circuit duty required for all service entrance protective devices and switchgear (usually available from power company). Include cost premiums in cost estimate.
 - f. Type and arrangement of Cable Television Systems (CATV), Closed Circuit Television Systems (CCTV), Nurse Call, intercom, sound, signal, and fire alarm systems. Identify number and location of telecommunication outlets (telephone, computer, word processing, etc.). Obtain information from the University.
 - i. Space required for telecommunication equipment, point of connection to telephone utility, size of incoming duct/conduit and size of equipment mounting backboard to be provided.

- ii. Statement relative to interface provision for multi-use systems (i.e., intercom, telephone, etc.). A/E must provide all facility support for proposed telephone equipment installations, i.e., conduit, duct, and backboard. Design and procurement of telephone system to be accomplished by the University.
 - iii. A/E must provide an analysis of recommended assistive listening systems for all Special Occupancies.
 - g. Indicate interior lighting on lighting plans.
2. Outside distribution systems:
- a. Contact the appropriate utilities for location and characteristics of nearest service capable of meeting project supply requirement.
 - b. Statement relative to the adequacy of the primary supply at the point of take-off. If primary source is inadequate, state measures proposed to correct the deficiency.
 - c. Electrical characteristics of power supply to site including circuit interrupting requirements and voltage regulation.
 - d. Estimate of total connected load and resulting kilowatt demand load by applying proper demand and diversity factors and power factor, if a group of loads is involved.
 - e. Basis for selection of primary and/or secondary distribution voltage.
 - f. Type of conductors and where proposed to use.
 - g. A statement describing pertinent standards for design, such as voltage drop, physical characteristic of overhead or underground circuits, type of lighting units and lighting intensities.
 - h. Type and adequacy of signal and fire alarm systems, including a statement as to spare capacity on fire alarm circuit. **The importance of early resolution of the fire protection requirements cannot be overemphasized.**
 - i. Type, adequacy and routing of supporting structure(s) for telecommunication cable.

Electronic Systems:

1. System engineering concepts. Describe the proposed type of system, its functions and the interrelationships if the system is a multi-use system (i.e. security, etc.; See #13 below).
2. Indicate circuit requirements.

3. Indicate equipment selection in such categories as: University furnished equipment; standards manufacturers or commercially available items; and special equipment.
4. Describe site or location considerations.
5. Describe bonding and grounding requirements.
6. Describe in-building emergency communication systems, control cables, and radio links.
7. Identify test equipment, repair shop, and spare parts storage requirements.
8. Describe equipment, instrumentation, arrangement, and space requirements indicating requirements for racks, consoles, and individual mountings. Provide the most economical design in first cost, operation and maintenance costs, and operating conditions conforming to best engineering concepts.
9. Identify wiring and cabling requirements plus terminations.
10. Identify power and lighting requirements, including emergency or standby requirements.
11. Verify description of Electrical Coordination Analyses process, installation and testing requirements.
12. Describe air conditioning, including humidity and dust-control requirements.
13. Identify interference and clearance requirements.
14. State security requirements for Security/Entry Control System.
 - a. Identify separately from the other project elements the requirements for Intrusion Detection Systems (IDS). Any of the following items and their interconnecting circuits may be considered part of an ID:
 - i. Annunciation Panels and Cabinets
 - ii. Visual and Audible Enunciators
 - iii. Magnetic Switches
 - iv. Proximity Sensors
 - v. Volumetric Sensors
 - vi. Wire Grids
 - vii. Vibration Detectors
 - viii. Power Supplies Integral to Items on this List
 - ix. Closed Circuit Television Cameras and Monitors, and
 - x. Video Recorders used for Intrusion Detection Purposes
 - xi. Access Control Systems
 - b. IDS installation can be divided into three general functional categories:

- i. Sensitive compartmented information facilities.
 - ii. Conventional arms, ammunition, and explosives storage sites (AA & E).
 - iii. All other (including but not limited to communication facilities, special training facilities, special operational facilities, intelligence facilities, etc.).
- c. Describe access control equipment (versus IDS) when required and outline locations, function, and area of control.

Energy Monitoring and Control System (ECMS):

- 1. Indicate if any EMCS will be utilized.
- 2. Indicate if the EMCS will be stand alone or tied into central system.
- 3. Indicate if a sole source is required for tie in.
- 4. Describe the EMCS proposed to be used.

Site and Landscaping:

- 1. Describe site and facility location and give reasons for selection and orientation.
- 2. List and/or describe utilities available at the site.
- 3. Describe existing vegetation, bodies of water, topography, and soil conditions.
- 4. Describe existing site improvements to remain, to be altered, and to be demolished.
- 5. Describe existing pedestrian and vehicular access, roads, sidewalks, and parking to include accessibility for the disabled.
- 6. Describe proposed site improvements.
- 7. Describe proposed contours, bodies of water, and landscaping improvements.

Water Supply:

- 1. Describe the existing system including, but not limited to, the type, capacity, condition, present water use, and unsatisfactory elements.
- 2. State type of construction proposed, materials for water mains, type of well, etc.
- 3. State design factors with present and projected design population loads for sewage treatment plants. Coordination with appropriate state/local regulatory agencies is required.

4. State materials to be used for sewer systems and sewage treatment plants.
5. Identify standards (federal, state, local) governing the design.
6. Describe the impact of steam condensate and cooling water discharges on existing sewer lines and sewage treatment plants and the estimated cost of distribution and treatment of this additional loading.

Sewers and Sewage Disposal Systems:

1. Describe the existing system indicating particularly the type, capacity, condition, present flow and unsatisfactory elements.
2. State degree of treatment necessary by effluent requirements and units needed to treat.
3. State design factors with present and projected design population loads for sewage treatment plants. Coordination with appropriate state/local regulatory agencies is required.
4. State materials to be used for sewer systems and sewage treatment plants.
5. Identify standards (federal, state, local) governing the design.
6. Describe the impact of steam condensate and cooling water discharges on existing sewer lines and sewage treatment plants and the estimated cost of distribution and treatment of this additional loading.

Roads, Driveways, Parking Areas and Walks:

1. State general soil conditions, with a brief outline of soil exploration and testing performed.
2. Indicate CBR value and pavement recommendations. (Show typical paving section on the drawings.)
3. Describe the type and volume of traffic, controlling wheel loads and types or classes of roads under consideration. Justify any deviation from criteria thickness for these classes.

Dust and Erosion Control:

Dust and erosion control will be considered an integral part of all design and construction projects. Such controls will be generally limited to areas actually scarred or denuded in the process of constructing a project. Dust and erosion control will not be confused with landscaping. Preliminary submittal will contain the necessary design data, and costs for dust and erosion control measures where applicable. The Basis of Design will include a narrative regarding the type of treatment selected, affected areas, and reasons for selection of type and determination of areas.

Fencing:

State type, heights, and justification for fencing.

Stormwater Management:

Describe the measures to be taken and/or features/structures required to comply with Stormwater Management Regulations.

APPENDIX E

COST ESTIMATES

GENERAL

A cost estimate is required with each submittal. All estimates shall be prepared in the **systems format** and shall be summarized on a Building Cost Summary Form. Appropriate back-up data to support the costs shown on the Summary shall be provided. The estimate backup material for each submittal shall be consistent with the level of design required for that submittal. Accurate quantity take-off, inclusion of all appropriate standard systems, and accurate unit prices for the project's location are fundamental to the development of a good cost estimate. Appropriate contingencies for design phase and construction phase shall be included as separate line items in the cost estimate. In addition, appropriate escalation shall be included as a separate line item in the cost estimate. Properly prepared cost estimates provide a check of the plans and specifications for constructability, coordination, conflicts, discrepancies, and omissions. They are used to establish/verify budget costs, to develop historical data for future estimating, and for verification of the Contractor's proposed Schedule of Values on the HECO- 12.

The estimate at each submittal is expected to reflect the A/E's or Estimator's best information and experience. Pricing must reflect all requirements of the contract plans and specifications. Estimates may be prepared manually or by utilizing computerized estimating programs. A detailed breakdown of components of the System or Assembly shall be calculated, quantified and costed. A total system cost, a system quantity, a unit cost for the system and a unit cost per square foot of gross building area shall be calculated for each system and listed on the Building Cost Summary Form. The Building Cost Summary form (Form Number DGS-30-224) is available as an Excel spreadsheet template which may be downloaded from the DGS Forms Center (<http://dgs.state.va.us>).

Separate estimates will be prepared for each new non-identical building, structure, or addition costing over \$50,000 contract cost. Costs of alteration work to existing buildings will not be included with the building addition costs. When one construction contract contains more than one type of work (i.e., new construction, repair, equipment installation, etc.), the estimate shall be structured such that each type of work is identified separately. In addition to an overall or master summary sheet, each type of work requires a separate summary sheet. Costs from these separate summary sheets must be directly transferable to the master summary sheet. When the estimates exceed the approved or proposed construction budgets, the design and cost consultants will work with the University to create a narrative that describes how they will address this issue.

SCHEMATIC DESIGN/PROJECT CRITERIA PHASE ESTIMATE

The Schematic Design Construction Cost Estimate shall be developed in the "Systems" format. Each system shall include a description or listing of the components or items included in that unit cost. To the extent possible, major systems or commodities should be quantified. Where quantification is not reasonable, the assumptions and logic for the cost shall be shown.

PRELIMINARY PHASE ESTIMATE

The Preliminary Estimate shall be based on a materials take-off from the preliminary documents. The estimate for this submittal shall reflect cost based on reasonably accurate take-off of material/systems consistent with the level of design. For those elements of the project where the status of design does not permit a reasonably accurate take-off of quantities or firm pricing of individual items of work, system unit prices may be used. Lump sum costs are not acceptable. Use of empirical costs shall be minimized. The Preliminary Building Cost Summary backup shall use the systems format. If the difference in the A/E cost estimate and the Independent cost estimate is 10% or more, the University shall provide a reconciliation of the estimates.

FINAL/WORKING DRAWINGS PHASE ESTIMATE

The A/E shall provide a final estimate based on the working drawings and specifications. Full and accurate description of each system shall be provided in the estimate. Quotations must be obtained for all items of substantial quantity or cost. Documentation must be provided for all major items of equipment included in the project. "Estimated Prices" are considered to be quotations that are reasonable expectations of the price a Contractor will be expected to pay. Estimates that do not conform to these formats and information requirements will be returned for revision. Separate estimates must be prepared for each additive bid item included in the documents and shall be in the proper format.

COST ESTIMATING STANDARD SYSTEMS DESCRIPTIONS

Building Systems Description

Includes cost of construction of all work inside the line 5 feet from the building. Cost each system separately. Same systems were indicated for entry on Summary Sheet.

Foundation	Ground Floor	Sq. Ft.
------------	--------------	---------

Includes excavation and backfill for foundation and basement construction, pile caps, footings, grade beams, piers, foundation walls, basement walls, fill under floor slabs and all required construction to the first floor elevation, excluding all structural floor slabs, ground slabs, basement structural framing, piling, structural fill, and soil treatment. Special foundations such as compacted structural fill, piling, caissons, and other work required to prepare the site for the building construction should be included in the SITEWORK & UTILITIES portion of the estimate under "Special Building Foundations" category

Slab-on-Grade	Slab on Grade	Sq. Ft.
---------------	---------------	---------

Includes all ground slabs and vapor barrier, waterproofing, wire mesh, capillary fill and soil treatment. Includes ground slab, reinforcing steel, waterproofing and soil treatment for structural slab placed on fill where fill is used as form. Borrow fill under slab is included in Earthwork system.

Structural Frame	Gross Building Area	Sq. Ft.
------------------	---------------------	---------

Includes structural frame consisting of skeleton frame of building, i.e., columns, girders, cantilevered members extending beyond exterior walls, and fireproofing. Excludes framing in direct support of floor or roof construction.

Supported Floor	Supported Floor	Sq. Ft.
------------------------	-----------------	---------

Includes construction of structurally integrated or independently supported floors, i.e., steel decking, joists, beams, slabs, precast concrete decking with topping steel reinforcing and other related items to provide a complete structural floor. Excludes applied finishes which are part of "Interior Finishes.

Roof Structure	Roof Area	Sq. Ft.
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Includes construction of structurally integrated or independently supported roofs, i.e., precast concrete roof slabs, concrete topping, steel decking, joists, beams. Roofing system excluded.

Roofing	Roof Area	Sq. Ft.
----------------	-----------	---------

Includes roof curbing, roof insulation, roofing, gravel stops, gutters, and downspouts, flashing, skylights, roof-access hatches, and other related roofing items.

Stairs	Number of Risers	Each
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Includes interior and exterior building stairs, landings, platforms, and railings.

Elevators	Number of Stops	Each
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Passenger or freight elevators including conveyor cab, doors, controls and rails.

Exterior Walls	Exterior Wall Area	Sq. Ft.
-----------------------	--------------------	---------

Includes bearing or non bearing walls from inside rough wall to outside finish walls, parapet walls, damp proofing, flashing, insulation, waterproofing, balcony walls and handrails. Includes exterior finishes, caulking and painting.

Interior Walls	Interior Wall Area (I side)	Sq. Ft.
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Includes partitions, bearing or non bearing walls, extending from floor-to-floor or floor-to-ceiling excluding finishes. Includes masonry walls, steel or wood stud framing, blocking, acoustic material (insulation), bracing, and anchorage, **but excludes** painting, gypsum board or other applied finish.

Interior Finishes	Gross Building Area	Sq. Ft.
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Includes finishes applied to floors, walls, ceilings, stairs and ramps such as wall covering, resilient flooring tile, terrazzo, wood, carpeting, acoustical tile, plaster, paint, gypsum board, suspended ceiling systems, caulking, and all related trim work.

Doors & Hardware	Surface Area One Side	Sq. Ft.
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Includes all exterior and interior doors, frames, hardware, caulking and painting.

Windows Glazed Walls	Surface Area One-Side	Sq. Ft.
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Includes windows, glazed wall systems, glazing, caulking, and painting.

Specialties	Gross Bldg. Area	Sq. Ft.
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Includes chalk and tack boards, signs and plaques, flag poles, access flooring, telephone enclosures, ladders, storage shelving, toilet and bath accessories, fireplaces, compartments and cubicles, movable partitions, identifying devices, protective covers, postal specialties, scales, exterior sun control devices and wardrobe specialties, excluding special mechanical or electrical equipment.

Plumbing-Domestic	Number of Fixtures	Each
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Includes water supply and treatment, wastewater disposal and treatment, plumbing equipment, fixtures and trim, and insulation, i.e., hot and cold water pipes, waste, soil and vent pipes, water heaters, water coolers, floor drains, and roof drains. Fixture count shall include 1 fixture for each bathtub, shower, drinking fountain, water heater, water cooler, lavatory sink, slop sink, wash fountain urinal, water closet and roof drain. Also, 1/2 fixture shall be included for each rough-in without a fixture (i.e., ice maker rough-in), floor drain and wall hydrant.

Heating, Ventilation, and Air Conditioning	Capacity	MBTU or Tons
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Includes heating, ventilating and air conditioning systems, i.e., heat generating equipment, refrigeration, air distribution, piping, controls and instrumentation, and insulation.

Fire Protection	Gross Area Protected	Sq. Ft.
------------------------	----------------------	---------

Includes sprinkler pipe, fittings, valves, pumping equipment, tanks, sprinkler heads and controls. Also include carbon dioxide and other fire protection systems.

Power	Connected Load	KW
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Includes all interior distribution for power and special electrical systems, i.e., switchboards, transformers, motor controls, distribution switches, motor starters, feeders, branch-circuit wiring and devices, panels and lightning protection. Exclude all interior distribution for lighting fixtures and emergency lighting, i.e., light fixtures, branch circuit wiring and devices for lighting.

Lighting	Gross Bldg. Area	Sq. Ft.
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Includes all interior lighting fixtures, exit and emergency lighting, branch circuit wiring, conduit, and devices for light fixtures only.

Special Electrical	Gross Bldg. Area	Sq. Ft.
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Includes all special electrical systems such as Telephone, CATV, Direct Current, Uninterruptible Power Supply (UPS), Emergency Generators, Data Communications, Fire Alarm, Security Detection and EMCS.

Built-In-Equipment	Bldg. Gross Area	Sq. Ft.
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Includes contractor furnished and installed specialty equipment such as casework, shelving, exhaust hoods, coolers, freezers, kitchen equipment, and stage apparatus for hospitals, clinics, food services, chapels, theaters, rifle ranges, laboratories, libraries, etc.

Other Special Systems	Gross Bldg. Area	Sq. Ft.
------------------------------	------------------	---------

Includes systems such as Vacuum, Oxygen, Compressed Air, Vehicle Exhaust, Dust Collection, Bridge Cranes, Vehicle Lifts, Hoists, Monorails, Conveyors, etc. Cost each system individually in estimate and enter sum total on Summary Sheet.

Interior Demolition	Gross Building Area	Sq. Ft.
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Includes all interior building demolition connected with new construction or alternatives. Also includes any work on, or in, the exterior wall. Does not include complete building demolition.

HAZMAT Abatement	Total Cost	Lump Sum
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Includes costs for abatement of asbestos, lead based paint, and other hazardous materials in existing areas of buildings, as well as costs for sealing off areas, lead based paint removal, asbestos removal or encapsulation, monitoring, testing, disposal, change areas, protective clothing, respirators, and other related costs.

SITework, UTILITIES & IMPROVEMENT DESCRIPTIONS

Exterior Distribution	Electrical	Length of Run	Lin. Ft.
----------------------------------	-------------------	---------------	----------

Includes overhead power distribution, i.e., poles, crossarms, insulators, guying, terminations, lightning protection, wire and cable, and underground distribution, i.e., excavation and backfill, concrete encased duct bank, direct burial duct, manholes, handholes, cable, terminations, stress cones, and grounding. Also includes costs of transformers and substations for University-owned systems. Add in this total the costs of exterior Fire Alarm, EMCS, security and similar distribution lines.

Area Lighting	Number of Fixtures	Each
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Each Includes poles, fixtures, excavation and backfill, concrete work, wire, duct and conduit.

Exterior Mechanical Distribution	Length of Run	Lin. Ft.
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Includes overhead and underground mechanical distribution system such as steam, hot water, condensate, chilled water, natural gas, compressed air systems and piping, insulation, valves, trenches, excavation, backfill, manholes, supports, anchors, etc., as required to provide the systems outside the building 5' line.

Water Distribution	Length of Run	Lin. Ft.
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Includes complete potable water distribution system, i.e., utility service connections, fire hydrants, excavation and backfill, pipe, valves and fittings outside building 5' line. Also includes pump station and booster pump if required.

Sanitary Sewers	Length of Run	Lin. Ft.
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Includes complete sanitary sewer system, i.e., utility service connections, excavation and backfill, sheeting and shoring, dewatering, pipe and fitting, manholes, cleanouts, septic disposal and process and acid waste system outside the five-foot line. Also includes pump lift station if required.

Stormwater System	Length of Run	Lin. Ft.
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Includes utility service connections, excavation and backfill, sheeting and shoring, dewatering, pipe and fittings, manholes, catch basins, curb inlets, dry wells, ditches and culverts, retention ponds, detention ponds, underground detention structures, and headwalls. Also includes culverts, drainage facing materials, erosion control material and devices and slope protection from storm water runoff.

Paved Roads	Paved Area	Sq. Yd.
--------------------	------------	---------

Includes paving, tack and seal coats, curbs, curbs and gutters, sub-grade preparation, fine grading, compaction, sub-base course, base course, wearing course, finish course, rails and barriers, reinforcing, expansion control joints, wheel stops and pavement markings.

Paved Parking	Paved Area	Sq. Yd.
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Includes paving, tack and seal coats, curbs, curbs and gutters, sub-grade preparation, fine grading, compaction, sub-base course, base course, wearing course, finish course, rails and barriers, reinforcing, expansion control joints, wheel stops, and pavement markings.

Includes site grading, site excavation, soil stabilization, soil treatment, and site clearing. Also includes removal and disposal of unsuitable material; obtaining, placing, rolling, compaction, and proof rolling new/borrow material.

Landscaping	Area Planted	Sq. Yd.
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Includes trees, shrubs, ground covers, and planters. Also includes fine grading and leveling, fertilizer and limestone application, spreading and leveling topsoil, seeding, mulching and sodding.

Site Improvements	Area Developed	Sq. Yd.
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Includes retaining walls, terrace and perimeter walls, signs, site furnishings, fountains, pools and water course, flagpoles and other miscellaneous related items. Also includes recreational areas/playing fields, recreational equipment, walks, ramps, steps, restrooms and similar improvements.

Supporting Structures	Lump Sum	Each
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Includes treatment facilities, equipment buildings, pollution abatement structures, oil water separators, electro-static precipitators, wash platforms, guardhouses and similar structures. (Sum supporting structures with Site Improvements and enter as Site Improvements and Cost Summary sheet.)

Fencing	Length of Fence	Lin. Ft.
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Includes footings, posts, fencing materials, alarms, gates and turnstiles for perimeter fencing. Includes station perimeter and individual facility.

Special Foundations	Building	Length E- 3E- 2	Lin. Ft.
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Includes driven piling of wood, steel or concrete; caissons; pressure injected footings; cast-in-place piling; special or dynamic compaction; and other special building foundation systems required.

Demolition-Site	Lump Sum	Each
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Includes removal, hauling and disposal of utilities, buildings, roads, paving, slabs, foundations, structures and related existing site features.

APPENDIX F

CHECKLIST FOR RECEIVING AND OPENING BIDS

1. PAPER RESPONSES

The University shall assure that the person receiving bids, called the Bid Officer, is a VCCO, thoroughly trained / knowledgeable in the proper procedure for receiving and documenting bids.

PROCEDURES FOR RECEIVING BIDS

1. On the morning bids are due, check the time on the clock, the date/time stamp, and the FAX machine in the bid receipt area to assure the times are coordinated and correct. Assure the clock visible to bidders in the bid receipt area shows the correct time.
2. When bids or modifications are delivered on the bid receiving office, the bids shall be date stamped and the time noted or stamped on the envelope showing the time of receipt.
3. The bid receipt deadline must strictly comply with the specific time called for in the Invitation for Bids. It is suggested that the Bid Officer give a warning that the Bid Receipt Deadline is near such as **“The time is now 1:55 pm and all bids must be received by 2:00 pm”**

The Bid Officer shall be responsible for deciding when the Bid Receipt Deadline has arrived and shall announce **“The 2 pm deadline has arrived. All bids and bid modifications in our possession at this time are deemed to be timely. No further bids or bid modifications will be accepted.”**

4. When multiple bids are delivered just prior to the bid receipt deadline, the Bid Officer shall accept the bids up to the deadline without taking time to note the time on each bid. After announcing that the deadline has arrived, the Bid Officer or assistant should note on those bids which were timely but not stamped that the bids were received prior to the 2:00 pm deadline.
5. If a bidder wishes to change the amount of his bid, such change must be received by telegram, facsimile, letter or written on the outside of the bid envelope before the time set for receipt of bids. Methods for modifying the bids are further described in the Instructions to Bidders, CO-7a.
6. The bids, including any modifications, shall be kept in a locked security container by the Bid Opening Designee.

PROCEDURES FOR OPENING BIDS

1. Once the University Bid Opening Designee determines that the bid opening hour has arrived, a **statement should be made as to the number of bids received**. It is prudent to inquire whether any bidder has any question about the pending opening. After receiving either a negative reply or after answering questions, proceed to open the bids in alphabetical order. **Do not open work papers!**
2. Paragraph 4 of the Instructions to Bidders requires the Contractor to place its Contractor License Class and License Number on the envelope and on the bid documents. Para. 4(c) of the CO-7a gives instructions for action if not shown.
3. Prior to revealing any of the information in the bid, the Bid Opening Designee must verify that:
 - a. the Bid Bond or Certified Check in the amount of 5% is attached where required,
 - b. that the Form of Proposal is signed by the bidder, and
 - c. Bidder information complies with item 4(b) and (c) of the Instructions to Bidders.

Only then shall the other bid information be revealed. If the Bid Bond or Certified Check is not included or if the Bid is not signed, the bid shall not be read or considered.

4. If a modification to the bid has been received, check it to assure that it has been signed by one of the persons listed on the Bid Form as authorized to make such modifications. If the modification was not inside the envelope or written on the outside of the envelope, check the time received to assure that it was before the deadline.
5. After Opening the Bid envelope and checking for the information above, state the following items and record on the bid tabulation form:
 - a. Bidder / Contractor's Name
 - b. Virginia Registration No.
 - c. Work papers were _____ were not _____ submitted.
 - d. Receipt of Addenda 1 thru _____ is acknowledged.
 - e. Bid Bond or Certified Check is _____ is not _____ included.
 - f. Bid Form is signed.

THEN

g. Read Bid Information

- i. Any proper Bid Modification received,
- ii. Part A. Building Base Bid Amount,
- iii. Part B – Sitework Base Bid Amount,
- iv. Any other Parts of the Base Bid,
- v. The TOTAL BASE BID AMOUNT, and
- vi. Then any Additive Bid Item Amounts in order.
- vii. (days for completion if Bidder was allowed to state such on the Bid Form)
- viii. Any **qualification** to the requested information on the Bid Form shall be noted as the bid is read.

AFTER BID OPENING IS COMPLETE

1. Keep all bids, work papers, etc. until **2 hours** after bid opening to allow the Bidders to state he made a mistake. **Do not open Work Papers unless low bidder claims an error!**
2. After two hours, return all Bid Bonds, checks, etc., to all but 3-lowest bidders. Work papers can be returned to all.
3. Keep bids and bid bonds or checks from 3-lowest bidders until Contract is signed.
4. Contract Department of Professional and Occupational Regulation, Contractor's Section, and verify Contractor Class and Registration No. of the 3 lowest bidders (and listed subcontractors, if any).
5. Prepare an official tabulation of bids indicating:
 - a. Name and Project Code of project as on the specifications
 - b. Time and date of bid receipt and opening
 - c. Exact Name, address, telephone & FAX numbers of Bidders
 - d. Bidder's Virginia Registration Number (non-requirement statement).
 - e. All amounts bid for Base Bid(s), Parts, the Total Base Bid Amount, any Bid Modification and Additive Bid Items.
 - f. Completion time stated, if Bidder was given the option.
 - g. Acknowledgement of receipt of all addenda and number of addenda issued.
 - h. Whether or not sealed work papers were submitted.
 - i. Name of University's Bid Opening Designee.

2. Electronic Responses through Mason's Construction Management Software Program, e-Builder (Using the Bidding Portal)

The University shall assure that the person receiving bids, called the Bid Officer, is a VCCO, thoroughly trained / knowledgeable in the proper procedure for receiving and documenting bids.

PROCEDURES FOR RECEIVING BIDS

1. When stipulated in the solicitation, bids will be received electronically through Mason's construction management software program, e-Builder using the Bidding Portal on or before the date and hour stipulated in the Invitation for Bid and may be modified by subsequent Addenda.
2. The e-Builder system automatically time dates and stamps bids submissions through the system. It is the responsibility of the bidder to ensure that his/her bid and any bid modifications are submitted through Mason's Construction Management Software, e-Builder, for receipt of bids by the date and hour (deadline) set forth in receipt of bids. Therefore, it is the bidder's responsibility to consider all factors which may impact bid submission and to implement whatever actions are necessary to have the bid submitted

prior to the bid receipt deadline. No bids or bid modifications submitted or offered after the date and hour designated for receipt of bids will be accepted or considered

3. The official time used for the receipt of responses is determined by Mason's Construction Management Software, e -Builder. The software will not allow for bids to be submitted after the time stated and that no further bids or bid modifications will be accepted. All bids and bid modifications in the possession of the Bid Officer and his or her assistants at the time the announcement is completed are deemed to be timely. In the event the bid receipt occurs during a period of suspended state business operations, the receipt and opening will be delayed one (1) business day.
4. If a bidder wishes to change the amount of his bid, such change must be received by written or telefaxed notice before the time set for receipt of bids. Methods for modifying the bids are further described in the Instructions to Bidders, CO-7a.

PROCEDURES FOR OPENING BIDS

1. Bids will be opened electronically, through the e-Builder system, and at the time and place stated in the Invitation for Bids or as modified by subsequent Addenda, and their contents. The Bid Officer shall decide when the specified time for bid opening has arrived. No responsibility will be attached to any officer or agent for the premature opening of a bid not properly addressed and identified.
2. Once the University Bid Opening Designee determines that the bid opening hour has arrived, a **statement should be made as to the number of bids received**. It is prudent to inquire whether any bidder has any question about the pending opening. After receiving either a negative reply or after answering questions, proceed to open the bids in alphabetical order. **Do not open work papers!**
3. Paragraph 4 of the Instructions to Bidders requires the Contractor to place its Contractor License Class and License Number on the bid documents. Para. 4(c) of the CO-7a gives instructions for action if not shown.
4. Prior to revealing any of the information in the bid, the Bid Opening Designee must verify that:
 - a. the Bid Bond or Certified Check in the amount of 5% is attached where required,
 - b. that the Form of Proposal is electronically signed by the bidder, and
 - c. Bidder information complies with item 4(b) and (c) of the Instructions to Bidders.

Only then shall the other bid information be revealed. If the Bid Bond or Certified Check is not included or if the Bid is not signed, the bid shall not be read or considered.

5. If a modification to the bid has been received, check it to assure that it has been signed by one of the persons listed on the Bid Form as authorized to make such modifications and modified prior to the bid receipt due date and time through the e-Builder system.

6. After Opening the Bids in the e-Builder system and checking for the information above, state the following items as part of the bid opening process:

- j. Bidder / Contractor's Name
- k. Virginia Registration No.
- l. Work papers were _____ were not _____ submitted.
- m. Receipt of Addenda 1 thru _____ is acknowledged.
- n. Bid Bond or Certified Check is _____ is not _____ included.
- o. Bid Form is signed.

THEN

Read Bid Information

- a. Any proper Bid Modification received,
- b. Part A. Building Base Bid Amount,
- c. Part B – Sitework Base Bid Amount,
- d. Any other Parts of the Base Bid,
- e. The TOTAL BASE BID AMOUNT, and
- f. Then any Additive Bid Item Amounts in order.
- g. (days for completion if Bidder was allowed to state such on the Bid Form)

Note: Any **qualification** to the requested information on the Bid Form shall be noted as the bid is read.

AFTER BID OPENING IS COMPLETE

1. Keep all bids, work papers, etc. until **2 hours** after bid opening to allow the Bidders to state he made a mistake. **Do not open Work Papers unless low bidder claims an error!**
2. After two hours, return all Bid Bonds, checks, etc., to all but 3-lowest bidders. Work papers can be returned to all.
3. Keep bids and bid bonds or checks from 3-lowest bidders until Contract is signed.
4. Contact Department of Professional and Occupational Regulation, Contractor's Section, and verify Contractor Class and Registration No. of the 3 lowest bidders (and listed subcontractors, if any).
5. Official Tabulation is prepared by the e-Builder system and contains the following:
 - a. Name and Project Code of project as on the specifications
 - b. Time and date of bid receipt and opening
 - c. Exact Name, address, telephone & FAX numbers of Bidders
 - d. Bidder's Virginia Registration Number (non-requirement statement).
 - e. All amounts bid for Base Bid(s), Parts, the Total Base Bid Amount, any Bid Modification and Additive Bid Items.
 - f. Completion time stated, if Bidder was given the option.
 - g. Acknowledgement of receipt of all addenda and number of addenda issued.

- h. Whether or not sealed work papers were submitted.
- i. Name of University's Bid Opening Designee.

APPENDIX G

ROOF INSPECTION FORMS AND PROCEDURES

The Roof Inspector:

The minimum qualifications below serve as criteria for the University if selecting an outside, full-time roofing inspector:

1. The Inspector should have a thorough knowledge of roofing details, flashing, and systems employing single-ply, built-up, metal, shingle, slate, or other membranes as the main weatherproof barrier.
2. The Inspector should have attended at least three formal schools / seminars (for example: AIA, BURSI, RCI, CSI, NRCA or RIEI seminars) providing no less than a total of four (4) continuing education units, have a registered roof observer registration from RCI (or a Quality Assurance Observer Certificate from RIEI for the roof system to be observed) or have equivalent training as approved by the University.
3. He should be thoroughly familiar with the latest edition of the NRCA Roofing and Waterproofing Manual.
4. The Inspector should have a minimum of five years of full-time, practical roofing experience or approved equivalent experience.
5. He should identify, in writing, at least three projects where he has been the full-time roofing inspector. He should provide names, addresses, and telephone numbers of roof University's and Architects / Engineers for the roof projects.
6. He should be trained and competent in the services he is providing.
7. Roof Inspector's Scope of Work:
 - a. The Inspector shall monitor the work continuously during installation of the roof.
 - b. He shall monitor the work for compliance with the contract documents.
 - c. He shall immediately report any deviations from the contract documents, the University's Policy, or good roofing practice to the Architect and University. A written report shall follow an oral report.
 - d. The Inspector may recommend suspension of work or rejection of non-complying work to the A/E and University.
 - e. He shall not:
 - i. Allow roofing materials to be installed until the manufacturer's certification that the roofing materials comply with specified ASTM or other approved standards are received. He shall notify the University so that appropriate action can be taken.
 - ii. Authorize deviations from the contract documents.
 - iii. Enter the area of responsibility of the Contractor's superintendent.

- iv. Issue orders on any aspect of construction means, methods, techniques, sequences, procedures, or safety in connection with the work.
- f. The Inspector shall keep a daily log (refer to the form at end of this appendix) for each project and shall give a copy of the log to the roofing contractor. The Inspector shall record all pertinent information such as weather, daily progress, workmen on the job, material storage, deck condition, bitumen temperature, installation procedures, quality of workmanship, job-related visitors, and so forth.

The Roof Consultant:

The Consultant should have the following qualifications:

1. Roof consulting and testing services should be the Consultant's full-time occupation.
2. He should have a minimum of five years of field experience in providing the service.
3. He should have completed at least three service contracts in the recent past. Work for each of the completed contracts should be roughly equivalent in size and complexity to the proposed work.
4. He should be required to submit three complete surveys of roofs that were repaired, recovered, or replaced; names, addresses and telephone numbers of roof University's; and Architects or Engineers responsible for preparing the drawings and specifications.
5. He should have attended at least three formal roofing schools / seminars (RIEI, BURSI, RCI, NRCA, AIA, CSI Seminars, for example). The seminars should be the type that gives CEU (Continuing Education Unit) credits. A minimum total of four (4) CEU credits should have been received.
6. He should be trained, experienced and competent in performing required services.
7. If testing is required, he shall be appropriately trained, certified, licensed in the testing procedures (infrared, nuclear, electrical capacitance surveys; core sampling; ASTM procedures; gravimetric analysis; and so forth) required for the service.
8. He should submit resumes of his firm and all employees participating in the service.
9. His resume should describe other related services and contributions, such as writing, lecturing, and serving as an expert witness that he has provided. He should list any professional qualifications or licenses.
10. The resume form must be submitted with the roof Consultant's response to the University's request for proposal. It will be used with other requested items to evaluate the applicant.

Non-Destructive (NDE) Roofing Surveys

A non-destructive (NDE) Survey uses infrared or nuclear and electric capacitance moisture detection equipment to locate unacceptable moisture within a roofing system. An infrared or nuclear survey may be used alone; electric capacitance is acceptable only if it issued with infrared or nuclear surveys.

An NDE survey is mandatory before a newly constructed roof may be accepted. Depending on the size and condition of an existing roof, a survey may or may not be required before the University may repair or replace the roof. The following outlines requirements for NDE surveys:

1. Equipment, subject to the University's approval, shall be equal to the following:
 - a. Infrared: AGA 720 system or Inframetrics 520 system
 - b. Nuclear: Seaman Troxler 3216 Roof Reader, Nuclear Model R-50 or later model
 - c. Electrical Capacitance: As approved by the University
2. Surveys:
 - a. Infrared: Provide a complete survey of the roof or roofs. Outline all anomalies with spray paint. Provide a thermogram showing the outlines and daylight photographs of all anomalies. If video thermogram imaging is used, provide the University with the video tape of the survey. Roof markings, thermogram, and photographs shall be numbered so that features can be readily identified.
 - b. Walkover surveys shall be performed in a pattern of 20'-0" maximum (20-foot maximum distance between walk paths), however the distance between walk paths shall not exceed the sensitivity of the instrument being used. Instrument sensitivity shall permit recognition of areas of wet insulation as small as 6 inches on a side. Surveys, inspection procedures, reports, etc. shall be conducted in accordance with the requirements and procedures in ASTM C1 153, "Standard Practice for the Location of Wet Insulation in Roofing Systems Using Infrared Imaging", except of otherwise noted in this Appendix.
 - c. Nuclear: Provide a grid, comprising 5'-0" on-a-side grid unit, to completely cover the roof or roofs. Mark each grid intersection with spray paint. Take readings at the intersections and record them on a roof plan. Provide daylight photographs of anomalies.
3. Core Samples

Since NDE surveys are not able to measure moisture in roofs directly – nuclear equipment responds to hydrogen emissions, infrared to heat changes – core samples to measure actual moisture content must be taken from surveyed roofs and correlated with NDE readings. The samples shall be taken as follows:

- a. One is required on roofs showing no anomalies. Additional cores are not required if the Consultant can show that moisture is not causing detected anomalies. The Consultant shall identify such anomalies and explain their cause in a written report to the University.
- b. On all other roofs a minimum of one dry and one wet core shall be taken from each roof surveyed.
- c. As many cores as needed should be taken to establish moisture counts and changes, but no more than five cores shall be taken from any roof.

4. Gravimetric Analysis:

As soon as possible after samples are taken, cores should be sealed in air tight containers and taken to the laboratory for analysis.

- a. Analyze samples gravimetrically to determine percent of moisture in any required core sample taken from new roofs and, unless waived for justifiable reasons, from existing roofs.
- b. Identify all materials – surfacing, membrane (and number of plies), insulation, vapor barriers, adhesives, etc. – in the cores.

5. Moisture Conditions:

The Surveyor shall correlate survey reading results with actual moisture conditions determined by core samples gravimetrically analyzed. The correlation shall be shown or tabulated on the drawings.

6. Report:

The Consultant shall submit a written report explaining what the problems are, what to do about them, and what the costs are. Specifically, the report shall:

- a. Identify and describe all anomalies.
- b. Identify and describe any visual survey defects that may be harmful to the roof.
- c. Give the causes for each anomaly and defect.
- d. Recommend alternate courses of corrective action for defects and anomalies harmful to the roof.
- e. Provide the cost for correcting the defects and anomalies.

7. Drawings:

The consultant hired to survey roofs shall provide plans complying with the following:

- a. General Requirements are:

- i. Print size, preferably, should be 24" X 36"; but in no case larger than 36" X 46".
 - ii. Minimum drawing scale is 1/8" = 1'0" for roofs or portions of roofs surveyed.
 - iii. Provide one reproducible print (Mylar, etc.) and two non-reproducible prints, as a minimum, for each sheet of drawings.
 - iv. A legend defining all symbols and explaining abbreviations.
- b. Drawings shall show the following as a minimum:
- i. All roofs surveyed
 - ii. State identification, title, and date
 - iii. An orientation north arrow and drawing scale
 - iv. The area of each roof and approximate overall dimensions.
 - v. All existing features, equipment, and roof penetrations of whatever nature (such as vents, stacks, drains, hatches, skylights, screens, railings, mechanical equipment, etc.) shall be accurately indicated, identified, and drawn to scale.
 - vi. All roof slopes and valleys noted with drainage arrows. If there is no slope, state that the roof is dead level.
 - vii. Where flashing is carried to a vertical surface, identify the surface (roof vent, masonry parapet, etc.) and give its height from roof level.
 - viii. For a visual survey, show and explain all roofing defects and anomalies. Show interior damage (to the roof system) by dotted line.
 - ix. For an infrared survey, accurately delineate moisture anomalies with contour lines; for a nuclear survey, show all grid point readings and define areas having unacceptable moisture by contour lines. Show where core samples were taken. Correlate nuclear grid point readings and infrared contour changes to percent of moisture. Dimension areas recommended for removal and locate them with respect to fixed identifiable features (such as parapets).
 - x. Provide at least one detail section (3/4" = 1'0" minimum) showing roof construction where core samples were taken; more if there are differences in construction from core to core. Identify surfacing material, membrane product, insulation type and thickness, vapor barrier if used, and deck construction.

ROOFING FORMS

Standard DGS forms and formats are available for download from the DGS Forms Center (<https://dgs.virginia.gov/search/documents-and-forms/>).

For a listing of current DGS forms applicable to the design and construction process, download Form DGS-30-000 (Capital Outlay Management Forms Available for Download from the DGS Forms Center).

The following roofing forms are available for download from the Forms Center:

Form Number	Description	File Type
DGS-30-328	Roofing – Installation History	Word

DGS-30-332	Roofing – Built-up Roofing Data	Word
DGS-30-336	Roofing – Metal Roofing Data	Word
DGS-30-340	Roofing – Shingle Roofing Data	Word
DGS-30-344	Roofing – Single Ply Roofing Data	Word
DGS-30-348	Roofing – Inspection Checklist	Word
DGS-30-352	Roofing – Daily Inspection Log	Word
DGS-30-356	Roofing Consultant / Inspector Resume	Word

To view / download the latest version of a form, visit the website listed above and enter the Form Number (e.g., “DGS-30-328”) in the search box on the Forms Center.

Additional instructions for viewing and downloading forms are available in the Help Guide on the DGS Forms Center.

APPENDIX H

CONSTRUCTION OUTREACH PROCESS

Jobs that should always have Community Outreach include:

(Outreach can include emails, community forums, community advisory boards, elected officials, HOAs/Civic Associations, etc. as appropriate)

1. Work at the perimeter of the any of the Campuses (i.e. Building, Paving/Roads/Traffic, Sidewalks, Tree Removal, Lights, Noise, Sports Fields/Baseball Stadium etc.)
2. Exterior work at Arlington
3. Exterior work at Point of View or any work that would have additional traffic on Belmont Bay Blvd.
4. Exterior work at Potomac Science Center
5. Projects by external organizations taking place on our campus that may impact community (i.e. Water Tower, Water Main etc.)

Community Outreach and/or Engagement during the Capital Project Process (over \$3M)

1. Initiate Project
 - a. Inform the appropriate community advisory board of any projects in the six-year plan which were approved and funded by the Commonwealth
2. Schematic Design
 - a. University initiates the Environment Impact Report and completes the HECO-2a requesting feedback on the environment impacts of the proposed project.
 - b. Present preliminary design through appropriate community venues and solicit input/feedback for consideration
 - c. Present final schematic design to the community through appropriate community advisory board and Forums
3. Construction
 - a. University communicates with community through regular emails about construction process and impacts
 - b. Invite community to tour the building

Community Outreach and/or Engagement during the Non – Capital/Maintenance Reserve (MR) Project Process (under \$3M)

(Only if it meets the criteria noted above)

1. Initiate Project
 - a. Inform appropriate community advisory board of any relevant projects as per criteria below.

2. Schematic Design
 - a. If appropriate, present preliminary schematic design to the community
3. Construction
 - a. If appropriate University communicates with community through regular emails about construction process and impacts
 - b. If appropriate invite target community to tour project

APPENDIX I

PARAMETERS FOR CALCULATING FOR LIFE CYCLE COSTS AND ENERGY ANALYSES

Parameter for Calculation of Life Cycle Costs and Energy Analyses

1. General Instruction for All Life Cycle Costs Analyses:
 - a. Costs are to be computed over a 30-year period, except as noted in Paragraph II below.
 - b. Costs for each alternative must be shown on the Life Cycle Cost Worksheet or an exact facsimile. Specific instructions for completing the worksheet are provided in Paragraph III below.
 - c. Include appropriate backup to support the summary figures shown on the worksheet (i.e., include how the various costs were calculated and note the basis or source of cost data.)
2. Additional Instructions for Calculating Life Cycle Costs for Energy Analyses
 - a. Use the following periods for energy-related life cycle cost studies:
 - i. Building Envelope Studies: 30 years
 - ii. Central Heating System Plants: 30 years
 - iii. Building HVAC Systems: 20 years
 - iv. Fuel Selection Studies 20 years
 - b. Average service lives of mechanical equipment shall be based upon the Average Service Life shown in the ASHRAE Applications Handbook.
 - c. Indoor and outdoor design conditions shall be as stated on the Life Cycle Cost Worksheet.
 - d. The type of system and the energy source shall be clearly noted on the Life Cycle Cost Worksheet
 - e. The supporting backup shall clearly show how the various fuel/energy rates (i.e., \$/gallon, \$/kwh, etc.) and the data source for each.
3. Specific Instructions for Completing Worksheets:
 - a. Use a new Worksheet for each alternative.
 - b. Complete all general information at the top of the Worksheet.

- c. Fill in Columns “a” thru “f” for each year. Use escalated costs. On the Worksheet, specify the annual escalation rate used for each cost category. In the supporting documentation, identify the source basis for the chosen escalation rates.
- d. Sum Columns “a” thru “e” for each year; subtract Salvage Value (Column “f”) and place results in Column “g”.
- e. Multiply the Column “g” figures by the corresponding discount factor in column “h” and replace results in column “i”.
- f. Sum Column “i” and place results in the box at the bottom of the Worksheet.

4. Building Life Cycle Cost Summary Worksheet

Standard Department of General Services (DGS) forms and formats are available for download from the DGS Forms Center (<https://dgs.virginia.gov/search/documents-and-forms/>).

To view/download the latest version of the Building Life Cycle Cost Summary (aka, Form “DGS-30-228”), visit the website listed above and enter “DGS-30-054” in the search box on the Forms Center. Additional instructions for viewing and downloading forms are available in the Help Guide on the DGS Forms Center.

APPENDIX J

UTILITY MARKING PROCESS

Contractor is ultimately responsible for contacting Miss Utility and coordinating all associated utility work with Mason's Project Manager and Mason's Project Inspector. If work is completed in house the responsible party will be a Mason employee. If work is contracted, the selected contractor will be the responsible party.

Responsible party ensures Miss Utility ticket requested and, in some site-specific situations a VDOT ticket.

Responsible party notifies Mason's Customer Service Center (CSC) with work order request and clear map of area and clear contact information.

Mason's CSC generates work orders to appropriate shops and notifies responsible party that IT needs to be engaged for markings.

Mason's Facilities Shops will contact identified contact with acknowledgement and notes on work order as to identify risks. (Shops will complete these within three (3) working days unless circumstances require a quicker response or the responsible party is notified and an extension is required).

Responsible party verifies that all three (3) of the requirements have been acknowledged (Miss Utility, Shops, and IT. Also, in the case of roadway work with a VDOT permit, VDOT.

Responsible party ensures that proper digging protocol is used at the marked areas.

If remarking is required, responsible party ensures the marking takes place (see above).

APPENDIX K

CONSTRUCTION CHANGE ORDER PROCEDURE GUIDELINES

OVERVIEW

The Contractor and the A/E shall use the following procedures in the development of change orders to any construction project. The procedures are based on requirements of Section 38 of the General Conditions.

Construction change orders may be necessary during the course of construction to deal with unforeseen construction conditions, user-directed changes, or for other reasons. All changes involving a modification to contract cost or time for completion must be documented with a Contract Change Order (HECO-11). Procedures outlined herein will generally begin once a change in the work is identified by the University, A/E, or Contractor.

PROCEDURE

In order to ensure compliance with Paragraph 38 of the General Conditions, the following Change Order procedures are recommended:

1. Where the University desires to modify the requirements of the Contract Documents to add, to delete from, or to alter the sequence or timing of the Work, the University will have the A/E prepare a Request for Proposal (RFP), Architectural Supplement Instructions (ASI), Construction Change Directive (CCD), Request for Information (RFI) response or Bulletin to the Contractor describing the requested change and asking that the Contractor submit a price proposal for accomplishing said change in the Work. Changes in work can also be directed by a Field Change Order (FCO) directly from the University.
2. Where the A/E determines that a change to the Contract Documents is necessary or desired, the A/E will obtain approval from the University to prepare an RFP, ASI, CCD, RFI response, or Bulletin to the Contractor describing the requested change and asking that the Contractor submit a price proposal for accomplishing said change in the Work.
3. Where the Contractor desires to delete a requirement for Work described in the Contract Documents, or where the Contractor determines that the direction provided by the University or the A/E constitutes a change in the Work required by the Contract Documents, the Contractor shall prepare a price proposal for same and request that the University issue a Change Order.
4. Should the Contractor desires to make a substitution, that request shall be in writing to the architect and owner. Upon review and acceptance by both the architect and owner, the Contractor shall prepare a price proposal and request that the University issue a Change Order.

5. Where unit prices for Work were requested in the Bid Form and included in the Contract [reference General Conditions Section 38(a)(2)], the Contractor and the A/E will agree upon the actual quantity of the Work performed and multiply by the unit price included in the contract to determine the value of such work accepted. If the value of such Work is more than or less than the value for such Work included in the Contract Price, a Change Order will be prepared by the A/E to increase/decrease the Contract Price to reflect the Work performed and accepted.
6. Where Work or changes in the Work are to be performed under the procedures described in General Conditions Section 38(a)(3), the A/E shall prepare a Change Order describing the Work to be performed and directing the Contractor to keep an accounting of all labor, material and associated costs of performing the Work. The Change Order shall cite General Conditions Section 38(a)(3) as the basis for determining the cost of such Work and shall identify any specific requirements or formats not specified in Section 38(a)(3) which the Contractor will be required to use. One or more subsequent Change Orders will be issued to adjust the Contract Price and/or Time and each shall cite or reference the initial Change Order authorizing such Work to be done using this method for determining price and time compensation.
7. If the work is to progress prior to having a completed HECO-11 form, a FCO must be issued by the University.
8. The Contractor will send his pricing proposal for the Change Order to the A/E and University. To facilitate analysis by the University and A/E, this estimate shall be prepared using the following forms:

HECO-GC-1, General Contractor's Estimate for Change Order
HECO-SC-1, Subcontractor's Estimate for Change Order
HECO-SS-1, Sub-Subcontractor's Estimate for Change Order
Back-up shall be provided for all material and equipment charged

The general contractor and each affected subcontractor and sub-subcontractor must sign these forms. Standard Versions of these forms are available for download at the Mason HECO/DGS Forms site: (<https://facilities.gmu.edu/resources/forms/>).

9. When a mutually agreed price has been determined, the A/E shall make his written recommendation to the University for acceptance by signing the bottom of Form GC-1. A statement as to how any differences were reconciled shall be provided by to the University by the A/E.
10. If the Change Order proposal is acceptable and an FCO has not already been issued, the University will issue a FCO noting the agreed upon price, scope of work and potential schedule delay. The University will also have a Change Order prepared.
11. The University shall prepare the Change Order form (Form HECO-11).

12. The A/E will complete the Change Order Justification (Form HECO-11a) accompanied by a full description of the change, including drawings if applicable, and copies of the estimate sheets used to reach the mutually agreeable price.
13. The Contractor will sign Form HECO - 11 and send to the University. All backup material must be provided with each copy of the change order.
14. **No work on any change order shall be accomplished without the approval of the University.**
15. The University will distribute approved Change Orders to the A/E and Contractor.

APPENDIX L

ART AND ARCHITECTURAL REVIEW BOARD, AND MASON BOARD OF VISITORS

1. ART & ARCHITECTURAL REVIEW BOARD (AARB)

PURPOSE OF THE AARB

The AARB consists of six members appointed by the Governor, plus a representative of the Department of Historic Resources, to advise him on the "artistic character" of buildings and works of art which are to be paid for by the state, or to be located on or over state property. In practice, the AARB recommends approval or disapproval to the Director of General Services, to whom the Governor has delegated this authority.

The AARB interprets its mandate from the Commonwealth in straightforward terms: to encourage the design of buildings and works of art which are both aesthetically and functionally appropriate to the University for which they are intended. While no rigid prescriptive standards exist, the AARB generally requires each submission to demonstrate:

- a. A resolution of basic functional and organizational requirements.
- b. A command of the fundamental principles of good design, including refinement of color, form, scale, material and craft.
- c. A positive contribution to the order and aesthetic of the physical setting.
- d. Due consideration of its environmental, historical and cultural factors.
- e. Concern for the greater public good.

AARB MEETING SCHEDULE

The AARB meets at 10:00 AM on the first Friday of each month of the year, unless the Friday or the following Monday is a state holiday, in which case the meeting will occur on the second Friday of the month. Meetings shown on the agenda.

SUBMITTALS

All requests for a place on the AARB Review Agenda will be made in writing via a Fact Data form and must arrive in the office of the AARB Chairman no later than 4:00 PM on the Friday two weeks before the date of the meeting at which the University wishes to make its presentation. University requests should also include, where possible on 11" x 17" sheets, the location and general form of the building, complete with north arrows and graphic scales. These documents will comprise the Board agenda and are the basis for the recording of the AARB actions.

In addition, a Consent Agenda is available for minor reviews and for demolition considerations. These items should include enough information to allow Board deliberation without University representation at the meeting. Submission should include a site plan, proposed building plan and elevations and photographs at a minimum.

Two submittals are normally required for most projects. The first submittal will occur at the Schematic Design phase. The second submittal will be made during the Preliminary Design phase and should include samples of materials and colors. Presentations during the Working Drawings phase may be required in unusual circumstances. If necessary, special arrangements can be made to review projects at intermediate stages.

PRESENTATIONS TO THE AARB

In general, University presentations should be organized so that they may be completed with 15 minutes, in order to allow adequate discussion within a 30-minute time frame. However, the Chairman will make a reasonable effort to accommodate the request of any University which feels that additional time may be required because of the complexity of a particular project if this request is made at the time of the University's initial submittal.

The following items should be addressed (and well-illustrated) by the University and its Architect/Engineer at each presentation to the AARB:

- a. **Program:** A brief description of the building program, including the purpose for the project and primary internal relationships.
- b. **Relationship to the Surrounding Community, Adjacent Sites, and University Master Plan:** Include discussion of land use policy, pedestrian and vehicular circulation systems, landforms, and architectural character.
- c. **Site Plan Strategy:** Discuss the relationships of the proposed design to existing topography and plantings, adjacent structures, service and pedestrian access, surface drainage, and orientation to the sun and wind. Photographs or slides and site diagrams are essential.
- d. **Mass, Scale, Form and Architectural Character:** Discuss the impact of the proposed design on existing views and the mass and scale of nearby structures. Explain how the proposed design conforms to the architectural and planning principles embodied in the Master Plan or in precedent examples. Describe and illustrate proposed materials, colors, finishes and constituent details. Include a brief description of the proposed site development, including grading, site drainage, paving, lighting, landscaping and site furniture.

The architect/engineer project managers should be organized and well prepared. Presentations should not be elaborate and overly formal. Sketches and study models are often more useful than finished professional renderings and highly detailed models.

SUBMITTALS TO THE AARB

Submittals and presentations to the AARB will be coordinated by the Architect for the University with support from the University Project Manager. Generally, submittals for the AARB shall be completed three weeks in advance of the presentation and will include the following:

- a. University Name (include address, telephone and fax, contact person)
- b. Project Title (include project code and location)
- c. Current Project Status and Schedule (preplanning study, schematics, etc.; next milestone date)
- d. Project Description (area, number of stories, building and roof forms, predominant exterior materials)

- e. Brief Program Description
 - f. Relationship to Approved Master Site Plan (include date of master site plan)
 - g. Contextual Issues and Design Intent
 - h. Previous History with AARB (dates and actions)
 - i. Names and Titles of Those Appearing for the University and Architect/Engineer.
 - j. Estimate of Time Required for this Presentation: Action This Date (for use by AARB)
- Note: Attachments to this data sheet submittal are required.

2. BOARD OF VISITORS (BOV)

ROLE OF THE BOV

The BOV is composed of sixteen members appointed by the Governor of the Commonwealth of Virginia, subject to confirmation by the General Assembly, for terms of four years. In addition, a non-voting student member is appointed to serve a one-year term each year before the annual meeting of the BOV. The Rector and Visitors serve as the corporate board for the University, and are responsible for the long-term planning of the University. The BOV approves the policies and budget of the University, and is entrusted with the preservation of the University's many traditions, including the Honor System.

As such, the BOV approves construction projects at the University and requires presentations at various stages of project execution. The Vice President of Facilities coordinates these BOV reviews.

BOV approval of Project Plans: is required and will be coordinated by the Vice President of Facilities. These presentations will be similar to the AARB presentations noted above and may include:

- a. An aerial photo (whenever possible),
- b. A site plan demonstrating relationship with other buildings and major topographical and landscape features,
- c. Simple plans with the basic functional organization clearly portrayed,

Rendered elevations with shadows and in color,

- a. Cross sections (often necessary to explain how additions are connected to their parent buildings),
- b. And either a rendered perspective or a model or one or more photographs of a model

APPENDIX M

STRUCTURAL AND SPECIAL INSPECTIONS

Part I of the Virginia Construction Code (VCC) (2015 or subsequent editions) Chapter 1, Section 113, "Inspections," prescribes minimum inspections to be performed on a project, and requirements for Special Inspections, Chapter 17, Section 1704 (of the adopted model International Building Code) as modified in Part I of the VCC, Chapter 17 for procedural requirements. These inspections have been, heretofore, provided on University projects by a combination of the University's project inspection, the A/E and the University's independent testing lab. Chapter 8 describes the procedures assuring that the structural, special and other associated inspections are provided for the project. The concept of the process is that:

1. The A/E will determine in the design the materials, strengths, configurations, quality and standards applicable to the work and describe that information to the Contractor in drawings and specifications;
2. The A/E will specify the submittals (i.e., shop drawings, manufacturer's data, and certificates of conformance), required from the Contractor and review the submittals.
3. The A/E and the University shall review the list of Special Inspections for the applicable code, make appropriate notations on the list and forward the marked-up list with the completed Statement of Structural & Special Inspections, HECO Forms 6a and 6b, to the Building Official for review and approval.
4. The Contractor shall review the submittals from its subcontractors, suppliers, fabricators and vendors to assure conformance with the contract documents and assure that materials, sizes, and configurations proposed are compatible with other trades and the space provided;
5. The fabricator, supplier, vendor or production plant shall secure and/or have ongoing the required testing and quality control/assurances program to meet the requirements specified and shall submit certificates of conformance to the applicable standards of practice and quality assurance;
6. The A/E will perform on-site observations of erections, placements, and installations to ascertain the intent of the contract documents and shop drawings are met;
7. The University's CFR or Project Inspector will observe day-to-day operations and report deviations/discrepancies in the materials and/or work versus contract documents and approved submittals;
8. The University's independent test lab will for the indicated items make on-site inspections, measurements, tests and sample collections, make applicable laboratory tests and submit copies of the reports to the University, the Contractor, the A/E and the Project Inspector;
9. The Contractor will have other tests made as specified and as necessary to assure conformance with the applicable regulations and standards of practice and workmanship.
10. The A/E's Structural Engineer shall complete the Final Report of Structural & Special Inspections, Form HECO-13.1b, and submit to the University as soon as completed but prior to the substantial completion inspection report.

APPENDIX N

DUTIES OF THE CONSTRUCTION FIELD REPRESENTATIVE (CFR)

The Construction Field Representative (CFR) must have the following minimum qualifications to perform the duties listed below:

1. Have education, trade related training, and experience in a design or construction related field;
2. Have the ability to read and understand the requirements of building Plans & Specifications;
3. Have some knowledge of construction means, methods and procedures;
4. Be knowledgeable of and have reasonably convenient access to the codes and standards referenced in the Contract Documents which stipulate the requirements for installation and workmanship on the trades involved in the Work. (e.g. ACI, SMACNA, NFPA, NEC, ICC, USBC, ASHRAE, etc.)
5. Have an understanding of the General Conditions of the Construction Contract;
6. Have the ability to read and understand a construction bar chart schedule; and
7. Have the ability to communicate effectively orally and in writing.

The following is a detailed listing of the duties, services, functions and responsibilities of the CFR. This listing supplements and expands upon the duties, functions and responsibilities generally described in Chapter 9 of the **Manual** and in Section 16 of the **General Conditions of the Construction Contract**. The CFR is an employee of the University and is responsible to the University for performing the duties, observations, and services described. The CFR will be assigned in writing. This in no way relieves the Architect/Engineer from providing and being responsible for his contractual obligations as described in the **Manual**, the A/E contract, and the **General Conditions of the Construction Contract**.

The CFR shall perform the following services unless modified by the contract for services:

1. Monitor and inspect all construction materials, equipment, and supplies for compliance with the contract documents, shop drawings, and submittals.
2. Inspect installation and workmanship for compliance with the approved plans, specifications, shop drawings and referenced standards. (e.g. ACI, SMACNA, NFPA, NEC, ICC, USBC, ASHRAE, etc.) Verify compliance prior to cover or close-in of work.
3. Monitor quality and coordination of trade contractors' work at all times. Recommend to the University ways to alleviate identified problems. Identify all work not done in accord with the Contract Documents and report it to the University and A/E.
4. Immediately report all discrepancies in the Contractor's work to the Architect/Engineer and the University. Also, report any **discrepancies noted in plans and specifications to the Architect/ Engineer (A/E)** for clarification or resolution. The CFR shall not interpret or change approved plans and specifications.
5. Keep a record or records, including a daily log of construction activity, roofing, tests, inspections, reports, photographs, and annotated drawings, in order to show the progress of

and changes in the project during its construction. Keep records of the designer's and designer's representatives' site visits. Maintain these records.

6. Provide full-time inspection of the roof during its application. The Inspector shall not permit the Contractor to install roofing materials without first having obtained from the A/E a copy of the manufacturer's certification confirming that roofing materials delivered for use on the project meet specified ASTM standards. During 'Roofing Operations,' the inspector shall maintain a daily written roofing report covering such items as: weather conditions, deck conditions, materials stored, and installation procedures including, bitumen temperature at kettle and point of application, etc. A copy of the daily report shall be given to the Contractor.
7. Notify the A/E and University if work begins before required shop drawings, product submittals, or samples have been approved by the A/E. Receive and log samples required to be furnished at the site; notify the A/E when they are ready for examination; record the A/E's approval or other action; and maintain custody of approved samples.
8. Report to the A/E and the University when in his judgment the Work being performed does not conform to the requirements of the Contract Documents or safety requirements are not being followed and, if appropriate, recommend suspension of the Work,
9. Notify the University of any Safety Violations, OSHA visits, accident reports, and corrective actions observed. Such reports do not relieve the General Contractor of responsibility for safety under terms of the Contract for construction.
10. Observe tests required by the Contract Documents. Record and report, to the A/E and University, the Contractor's test procedures and, where applicable, results of the tests.
11. Observe and report on all tests performed by the Contractor and note results in daily reports.
12. Report presence of and activities performed by University's Testing & Inspection agents.
13. Verify invoices for on-site tests/site visits of independent testing entities, which are to be paid by the University.
14. Submit to the University and the A/E a weekly report in an approved format summarizing the significant activities and occurrences at the project site. Include copies of the Daily Reports with the report.
15. The Inspector shall record, maintain, and submit with the Weekly Report a running record of outstanding, unresolved issues. The record shall include the issue, date of occurrence, and date of resolution. After an item is reported to be corrected, it shall be deleted from the list in the weekly report.
16. The Inspector shall report, in writing, to the University and A/E any notifications from the Contractor of dates and times that services will be disrupted.
17. The Inspector shall participate in progress **and monthly pay meetings with the** University's representative, Architect, Contractor, and other designated representatives, to review the current status of Work and any action needed to keep the project within budget and on schedule. The University may assign the Inspector other duties related to these scheduled meetings.
18. The Inspector shall record, maintain, and submit with the weekly report a running record of outstanding discrepancies / deficiencies noted by the Inspector. The record shall include the item, the date observed, and the date corrected. After an item is reported to be corrected, it shall be deleted from the list in the weekly report.
19. The Inspector shall maintain, on site, a complete set of minutes of meetings as a "Running Record" of evolution of problems and solutions during progress of the work.
20. The Inspector shall maintain current copies of the following at the job site:

- a. Current set of Contract Documents (addenda, contracts, drawings, specifications, change orders, proposed change orders, request for clarification, construction change authorizations, A/E's supplemental instructions, etc.
 - b. all correspondence and reports of site conferences
 - c. Shop drawings
 - d. Samples and product data
 - e. University's purchases, including material and equipment
 - f. Supplementary drawings
 - g. Color boards, schedules and samples
 - h. Names and addresses of Contractors, Sub-contractors, and Principal Material Suppliers
 - i. Contractor's Applications For Payment
 - j. Running list of discrepancies/deficiencies and dates
 - k. Running list of Unresolved Issues
 - l. A/E punch lists with date of issue indicated on each
 - m. Any other documents and revisions resulting from issues concerning the Contract or Work
 - n. Maintenance and operating manuals and instructions when received from Contractor
21. The Inspector shall review and provide a recommendation to the University on the acceptability of all proposals submitted by the Contractor for changes initiated by the University or Architect, and the acceptability of all claims for change orders initiated by the Contractor.
 22. The Inspector shall confirm to the University that changes required by approved change orders are incorporated in the work at a time deemed appropriate by the Contractor, and are reflected in the Contractor's progress schedule.
 23. The Inspector shall keep a record of all Proposal Requests from the Architect, change order proposals from the Contractor, and executed change orders from the Architect. He shall file copies with the University monthly.
 24. Throughout construction, the Inspector shall review the Contractor's detailed schedule and advise the University on the Contractor's progress and all other construction scheduling issues. He shall monitor the schedule, notify the University of any slippage in critical path time, make recommendations on accepting the Contractor's proposed schedule recovery plan, and maintain an annotated copy of the schedule that reflects actual progress of the work.
 25. The Inspector shall maintain, at the site, a copy of the project **schedule with notations**, highlighting, etc., that show work to date and any changes made in the CPM schedule. Where a schedule shows early/late start and finish dates for various activities, the CFR shall note actual dates of each occurrence on a copy of the CPM listing. The Inspector shall make recommendations to the University as appropriate concerning the Contractor's conformance to the schedule and/or recovery plans.
 26. When the Contractor is directed to make changes based on unit costs, the Inspector shall verify accuracy of quantities of material and labor (or other units of measure) attributable to change orders. The Inspector shall verify that all change orders are complete.
 27. The Inspector shall observe the Contractor's Record Drawings at intervals appropriate to the state of construction and shall notify the Architect of any apparent failure by the Contractor to maintain up-to-date records.

28. The CFR shall review each certificate and application for payment and advise the Architect and University if they accurately represent progress of the work and values of each line item in the Schedule of Values. He shall verify that stated quantities of stored materials are accurate. Based on such review and verification, he shall make recommendations to the University and Architect to approve or to revise the Certificate and application for payment.
29. The University may assign the CFR other duties related to the project. The CFR has no authority to and shall not:
- a. Authorize deviations from the Contract Documents;
 - b. Enter into areas of responsibility of the Contractor's superintendent;
 - c. Issue directions regarding construction means, methods, techniques, sequences or procedures, or safety precautions and programs in connection with the Work; or
 - d. Authorize or suggest that the University occupy the project in whole or in part;

CHECKLIST OF CONSTRUCTION FIELD REPRESENTATIVE (CFR)

REPORTS/RECORDS (See Sample Formats for Reports)

- Photographs (progress and non-conforming work).
- Daily reports (prepare and maintain standard form).
- Weekly reports (prepare and maintain summary of daily report).
- Monthly reports (prepare and maintain summary of weekly report). Record drawings (review periodically).
- Notify A/E and University of Contractor's failure to keep up-to-date changes.
- Notice of defective or non-conforming work with resolution space at bottom of form (to GC, A/E, University).
- Safety notification (to GC, A/E, University).
- Understands and maintains clarification requests.

MEETINGS (ATTEND, REVIEW MINUTES AND MAINTAIN COPIES)

- Preconstruction meeting
- HVAC Pre-installation meeting
- Monthly pay request
- Interim A/E Inspection
- Substantial Completion Inspection
- Final Inspection
- Coordination meetings

SUBMITTALS (RECEIVE, USE, KEEP TRACK)

- Shop drawings/Samples.
- Response to notice of Non-conforming work
- Responses to Contractor's requests for clarification
- A/E field orders
- Request for proposals
- Change order
- Names, addresses, and Telephone Numbers of Contractor(s), subcontractors, materialmen, University, superintendent, Architect/Engineer, consultants, special inspectors
- Special inspection reports
- Construction Field Representative/Project inspector reports

- Minutes of meetings
- Operation and maintenance manuals and instructions
- Any other documents and revisions resulting from issues concerning work

INSPECTIONS/QUALITY CONTROL

- Inspects all work and materials for conformance to Contract Documents, shop drawings, change orders
- Coordinates structural and special inspections.
- Coordinates structural observations.
- Judges clean-up effectiveness. If ineffective, notifies A/E and University of problems
- Verifies approved erosion & sediment control plan is on site and is being followed daily
- Notifies A/E and University of deficiencies
- Verifies Contractor's disposal site has been approved
- Verifies that offsite storage for Contractor materials is approved
- Verifies Contractor records proper disposal of hazardous material.

SCHEDULING/PAYMENTS

- Assists A/E to verify accuracy of HECO- 12 quantities.
- Compares work progress to scheduling.
- Notifies A/E and University of Contractor's failure to comply with schedule
- Verifies Contractor time and materials for change orders and unit prices
- Advises University and A/E if separate Contracts are being executed

PROJECT CLOSE OUT

- Verifies readiness for substantial completion inspection
- Verifies readiness for final inspection
- Turns over complete and organized submittals, reports, records to University
- Provides list of unresolved issues
- Reports status of separate contracts at substantial completion inspection
- Coordinates Contractor's training of University's forces
- Receives and keeps track of punch list

APPENDIX O

PROJECT TYPES AND NON-CAPITAL OUTLAY PROJECT PROCEDURES

PROJECT TYPES

Those projects with total project costs less than \$3,000,000 are considered non-capital outlay projects. When the funding source is operating budgets, grants, gifts, a revenue source, or (Mason) bonds, the funding is referred to as non-general funding. Additionally, maintenance reserve projects, although a special category of general funds, are considered non-general fund projects. Otherwise, if any portion of the project funds are general funds the project is considered a general fund project. All capital projects are managed in accordance with the HECO Manual. A summary of the various project types typical at Mason follows:

CAPITAL PROJECTS (>\$3,000,000)

General Fund

Funding and authority from the General Assembly. Requires project specific capital budget submittal for funding and authority. Manage in accordance with the HECO.

Non General Fund (with State supported debt)

Funding and authority from the General Assembly. Requires project specific capital budget submittal for funding and authority. Manage in accordance with the HECO.

Non General Fund (without State supported debt)

Authority from the Board of Visitors. Requires project specific capital budget submittal for authority. Uses Mason non-general funds. Manage in accordance with the HECO.

NON CAPITAL PROJECTS (<\$3,000,000)

Non General Fund

Funding and authority from Mason. Manage as non-capital HECO project.

Maintenance Reserve Blanket

Funding and authority from the General Assembly. Requires capital budget submittal for the blanket funding and authority. Manage as non-capital HECO project.

NON-CAPITAL HECO PROJECT PROCEDURES

In general, the HECO procedures for non-general fund non-capital outlay projects are the same as those for non-general fund capital outlay projects. Contracting Requirements may differ from a Capital project. Code requirements, building permits, and safety requirements are identical for all non-general fund projects. However, non-capital HECO projects do not require the same level of reviews and approvals as a standard capital outlay HECO project.

The following capital project HECO reviews and approvals are not required:

CO 4 "Approval of Schematic Design"

CO 5 "Approval of Preliminary Drawings & Specifications"

CO 8 Approval to Award

The following HECO forms and approvals are required:

HECO 2 "Project Authorization" - use the Work Order with appropriate fund code citation

HECO 3 series - A/E contracts

CO 7 series - General Conditions and Instruction to Bidders

CO 9 series - formal contract documents

CO 10 series - formal bond documents

HECO 11 series - change order documents

CO 12 - Schedule of Values & Certificate for Payment

HECO 13.2 series - Certificates of Completion

HECO 13.3 series - Certificate of Use and Occupancy - if required

HECO 17 – Building Permit

APPENDIX P

Office of University Building Official Charter

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Purpose

This document outlines the policies and procedures covering the University Building Official office at George Mason University and serves as a charter for the department.

Policy

It is the policy of the Board of Visitors and the administration of George Mason University that University projects are designed and constructed in compliance with the Virginia Uniform Statewide Building Code (USBC), standards and the applicable accessibility codes, as well as related laws and regulations promulgated by the Commonwealth of Virginia.

Scope of the Building Official and Department

The construction and/or renovation of any facility on university owned property shall be reviewed by the Office of University Building Official for compliance with the USBC. The University reserves the right to request the services of the Department of General Services as appropriate. Specific functions of the Office of University Building Official may include, but not necessarily be limited to:

- Coordinate with other University departments and staff to ensure an understanding and compliance with the building code requirements.
- Review of construction drawings and details for conformance to the requirements of the building code.
- Issue and manage building permits for construction activities where applicable.
- Conduct construction phase inspections as required by the building code.
- Issue certificates of occupancy for new structures following successful inspections.
- Provide support to University staff to determine building safety and condition in the event of fire, flood or other structural failure to University owned facilities or structures.
- Temporary assignments and/or special projects as allowed under the Management Agreement between the Commonwealth of Virginia and the University pursuant to the Restructured Higher Education Financial and Administrative Operations Act (“Management Agreement”).

Organizational Structure

The Finance and Land Use Committee has the responsibility to oversee and evaluate the construction, renovation, and maintenance of the buildings, structures, and facilities of the university. Accordingly, the University Building Official has a reporting and policy relationship to the Committee and also serves in a staff role to the Committee. For administrative oversight of the University Building Officials’ office function, the University Building Official reports to the University’s Vice President for Strategic Initiatives and Chief of Staff.

University Building Official Qualifications

The University Building Official shall be a full-time employee of the University, a registered professional architect or engineer, and certified by the Department of Housing and Community Development to perform the Building Official function.

Independence

Independence is essential to enable the University Building Official function to accomplish its purpose. Accordingly, the University Building Official has direct and unrestricted access to the Vice President for Strategic Initiatives and Chief of Staff and the BOV Finance and Land Use Committee. The University Building Official shall be functionally independent of all University operations.

The University Building Official, as well as review/inspection staff, shall not be assigned to routine university operating duties unrelated to the building code function. In accordance with the Management Agreement, no individual licensed professional architect or engineer hired under the University’s personnel system as a member of the review unit or contracted with to perform these functions shall also perform other building code-related design, construction, facilities-related project management or

facilities management functions for the University. In addition, members of the University Building Official Office will not develop and install procedures, prepare records, make management decisions, or engage in any other activity which could be reasonably construed to compromise their independence. The University Building Official or members of the department shall not be assigned any additional supervisory or oversight responsibilities which could be reasonably construed to compromise their independence. Therefore, the University Building Official and appraisal procedures do not in any way substitute for the responsibilities assigned to other persons in the organization.

Authority

The University Building Official has unrestricted access to all University building records, reports, activities and property. Access and information shall be related to issues related to building code enforcement and construction necessary to discharge their enforcement responsibilities. The University Building Official will exercise discretion in the review of records to assure the necessary confidentiality of matters that come to its attention.

Responsibilities of the University Building Official

The University Building Official has primary responsibility for the proper management for, and enforcement of, the USBC to ensure that construction projects conducted on property owned by the university are completed in compliance with the code, related laws and regulations, and this Policy Statement. The University Building Official is specifically charged with, but not limited to, the following responsibilities:

- Coordinating and hiring department management and personnel for the Building Official department, and ensuring the Office is staffed with licensed professional architects or engineers who are certified by the Department of Housing and Community Development in accordance with the Code of Virginia.
- Developing, submitting for approval, and executing comprehensive annual and long- range plans to carry out departmental responsibilities.
- Establishing a program for selecting and developing the human resources of the department.
- Establishing and maintaining a review program to evaluate the operations of the University Building Official's department.
- Establishing and maintaining a program to maintain staff education, certification, and competency in their fields of expertise.
- Establishing written policies and procedures for the University Building Official Office and directing its technical and administrative functions.
- Issuing building and trade permits for each capital project as required by the USBC to have a building or trade permit.
- Issuing building and trade permits to non-capital projects when required by the USBC to have a building or trade permit.

- Establishing a program of permit inspection and compliance verification in accordance with the USBC.
- Documenting appropriately the results of all reviews, permits, inspections, reports, and evaluations performed.
- Determining the suitability for occupancy issuance of certifications and building occupancy for all projects required.
- Coordinating and maintaining contact with the State Fire Marshall, The Department of Housing and Community Development, other municipal building officials, other university/college building officials, the state building official and other state agencies as required to insure inspections and approvals as required by the building code and related laws.
- Such other duties as required to fulfill the office of the Building Official as required by the USBC.
- Reporting to and coordinating with the Board of Visitors and University's Vice President of Strategic Initiatives and Chief of Staff with respect to the duties, responsibilities, and progress of the Office of University Building Official on a regular basis.
- Issuing an annual summary report of activities to the Finance and Land Use Committee of the Board of Visitors.
- Communicating directly with the Finance and Land Use Committee any matters considered to warrant its attention.

Annual Reports

The University Building Official will issue an annual report at the September Board of Visitors Meeting that identifies the code enforcement and building permit activities performed during the prior year. The format and style of the report will be developed by the University Building Official, depending upon the nature and conditions surrounding the activities.

The Annual Report, as well as most reports on special projects, will be issued to the members of the Finance and Land Use Committee, the President, the appropriate Vice Presidents of the university or their designee, and other appropriate management personnel, as deemed necessary by the University Building Official. In addition, reports approved at open meetings of the Board of Visitors shall be made available to the public in accordance with State statutes. In certain circumstances, the University Building Official may decide, with the approval of the Chair of the Finance and Land Use Committee, to restrict the issuance of an audit report to certain members of management and/or the Committee.

Responsibility for Corrective Action

In the event a project, building or trade permit results in nonconforming work that is in violation of the Building Code, the University Building Official may issue a Notice of Violation as detailed in the appropriate section of the USBC. The Notice of Violation

will be issued to the Project Manager or responsible party who requested and was granted a building or trade permit for construction. A copy of the Notice of Violation will be sent to the Vice President for Facilities or designee.

The department to whom the Notice of Violation was issued is responsible for taking remedial steps to achieve compliance and to provide, or have provided, a written response to the conditions reported. The responses should be submitted to the University Building Official within 30 calendar days of the issuance of the Notice of Violation.

Coordination with External Agencies

The University Building Official will coordinate the department's efforts with those of other state and local building code and related regulatory agencies by participating with, and coordinating with, the agencies to provide comprehensive, cost-effective building code enforcement of the university. Duplication of work will be avoided as much as possible. The University reserves the right to request the services of the Department of General Services as appropriate.

Special Projects

The University Building Official is empowered to conduct special projects, reviews, or investigations at the request of the University President or his designee, or the Finance and Land Use Committee. All special projects shall be reported to the Chair of the Finance and Land Use Committee.

Procedures

The University Building Official shall be empowered to establish department policies and procedures in keeping with university policy, the building code and the laws related to the building code. The department policies and procedures shall provide for a consistent process of project review, client communication, permit issue management, and inspection issue management. The policies and procedures are subject to revision as changes are made in the building code or improvements in the process are recognized.

Definitions

Virginia Uniform Statewide Building Code (USBC): The Virginia Uniform Statewide Building Code (USBC) is a state regulation promulgated by the Virginia Board of Housing and Community Development, a Governor-appointed board, for the purpose of establishing minimum regulations to govern the construction and maintenance of buildings and structures. The provisions of the USBC are based on nationally recognized model building and fire codes published by the International Code Council, Inc. (ICC). The ICC model codes are made part of the USBC through a regulatory process known as incorporation by reference. The USBC also contains administrative provisions governing the use of the model codes and establishing requirements for the enforcement of the code

by the local building departments and other code enforcement agencies.

References

- The Virginia Uniform Statewide Building Code VAC 36-97 through 36-119.1
- The Management Agreement Between George Mason and the Commonwealth of Virginia
- BOV Resolution Approved September 30, 2021

Approval and Revisions

APPENDIX Q

RECORD DOCUMENT STANDARDS & FORMATTING

February 2017 Version

The Standards listed below are the minimum deliverables from the A/E for record required by the Mason Facilities Archives for any project Completed on Mason property. **These deliverables MUST be turned in to the appropriate Mason Project Management and Construction project manager project manager within 90 calendar days of receiving the temporary Certificate of Occupancy, or final payment may be withheld.** All electronic requirements may be turned in on a CD or flash drive. Please contact Mason Facilities Archives for any clarification.

FINAL RECORD DRAWINGS/AS-BUILTS

PRINT: (1) complete full drawing set

- Each drawing in the set should be labeled “RECORD DOCUMENT”
- Must be on paper or bond (no Mylar or Sepia will be accepted)

ELECTRONIC:(1) complete drawing set in EACH of the following formats (see naming below):

DWG

- DO NOT include X-REF on any drawings
- Must be purged of all layers, blocks, etc.
- Do not use the color yellow on any drawings
- There must be a continuous and closed “polyline” around each room. This line should extend from inside wall to inside wall within the room.

This layer’s color should be “(3) Green” and line type should be “Continuous”

- All other layers should be based upon the AIA CAD Layer Guidelines

PDF

- All drawings should be black/white (monochrome)
- All drawings should be to the scale designated on the set
- When printed from Adobe Acrobat, all drawings should be the exact size of the printed set

NAMING CONVENTION FOR ALL ELECTRONIC DRAWINGS:

Each drawing sheet shall be one electronic file

Sheet Number-Sheet Name

Example: A001-Partition Schedule

SPECIFICATIONS, O&M MANUALS, WARRANTY INFORMATION

The project architect/engineer is responsible for ensuring that all specific deliverables stated in the contractor’s contract are included in the Specifications/O&M Manual upon deliverance to the Mason project manager. Final Specifications (Project Manual) shall be labeled “Record Documents” on cover.

PRINT: (1) complete set of each, printed and bound on 8.5”x11” paper

ELECTRONIC: (1) CD/flash drives, containing a complete set in PDF format

FINAL APPROVED SUBMITTALS AND SHOP DRAWINGS

ELECTRONIC: (1) CD/flash drive, containing a complete set in PDF format

FINAL COMMISSIONING REPORT AND FINAL TAB REPORT

ELECTRONIC: (1) CD/flash drive, containing a complete set of each in PDF format

CALCULATIONS

To include, but is not limited to: mechanical, structural, electrical/lighting, hydraulic/sprinkler, and storm water.

ELECTRONIC: (1) Complete set of each in PDF format

STUDIES AND MASTER PLANS

To include, but is not limited to: Pre-Design Studies/Narratives, Geotechnical Reports, Environmental Impact Reports, Hazmat Reports, Master Plans, etc.

ELECTRONIC: (1) Complete set in PDF format

*All graphics used in study or Master Plan must be included in TIFF format, minimum 300dpi resolution

CONSTRUCTION PHOTOS

ELECTRONIC: (1) Complete set in TIFF format, minimum 600dpi resolution

PROPERTY AND SITE SURVEYS (Must be on State Plane Virginia North Coordinate Systems)

PRINT: (1) Complete full size drawing set

ELECTRONIC: Complete drawing set in EACH of the following formats (see naming below):

DWG

DO NOT include X-REF on any drawings

Must be purged of all layers, blocks, etc.

Do not use the color yellow on any drawings

All other layers shall be based upon the AIA CAD Layer Guidelines

PDF

All drawings shall be black/white (monochrome)

All drawings shall be to the scale designated on the set

When printed from Adobe Acrobat, all drawings shall be the exact size of the printed set

NAMING CONVENTION FOR ALL ELECTRONIC SURVEY SHEETS:

Each survey sheet will be one electronic file

Sheet Number-Sheet Name

APPENDIX R

ARCHIVING DOCUMENTS STANDARDS

In addition to the deliverables noted in Appendix Q to be provided by the Architect of Record, the following items listed below are the minimum deliverables required by the Mason Facilities Archives for any project Completed on Mason property. **These items may be provided during the course of the project to farcgis@gmu.edu.** Upon completion of the project the Archive Deliverables process within e-builder will be completed to convey the documents to Mason Facilities Archives. Please contact Mason Facilities Archives for any clarification.

Facilities Archives Deliverables:

A/E Contract and Certificates/Affidavits (Prime A/E for Capital Projects Only)

Original fully executed (signed) contract with all attachments and including the below:

- HECO/CO-3 A/E Contract for Professional Services
- Memorandum of Understanding (MOUs)
- HECO/CO-11a/e Change Order
- HECO/CO-13.1 Certificate of Completion by A/E or Project Manager
- HECO/CO-13.1b Final Report of Structural Special Inspection
- HECO/CO-13.1c PM or PI Certificate of Substantial Completion

Design Development

- Pre-Design Studies/Design Narrative (PDF)
- Geotechnical Reports (PDF)
- Calculations – Structural (PDF)
- Calculations – Mechanical (PDF)
- Calculations – Electrical/Lighting (PDF)
- Calculations – Hydraulic/Sprinkler (PDF)
- Calculations – Storm water (PDF)
- Environmental Impact Reports (PDF)

Construction Contract and Certificates/Affidavits (Prime Contractor for Capital Projects Only)

Original fully executed (signed) contract with all attachments [2] and including the below:

- HECO/CO-7 General Conditions
- HECO/CO-9 Contract Between Owner and Contractor
- HECO/CO CO-9a Workers Compensation Certificate of Insurance
- HECO/CO-9b Post Bid Modification
- HECO/CO-9.1 Notice of Intent to Award
- HECO/CO-9.1a Notice of Award
- HECO/CO-9.2 Notice to Proceed
- HECO/CO-10 Standard Performance Bond
- HECO/CO-10.1 Standard Labor and Material Payment Bond
- HECO/CO-11 Change Orders[3]
- Final HECO/CO-12 Schedule of Values and the Certificate for Payment

- HECO/CO-13 Affidavit of Payment of Claims
- HECO/CO-13.2 Certificate of Completion by Contractor
- HECO/CO-14 Project Completion Report

Close-Out Phase

- Operations and Maintenance Manual – Combined Discipline (General) (Hardcopy/PDF)
- Operations and Maintenance Manual – HVAC (Mechanical) (Hardcopy/PDF)
- Operations and Maintenance Manual – Electrical (Hardcopy/PDF)
- Operations and Maintenance Manual – Elevator (Hardcopy/PDF)
- Operations and Maintenance Manual – Equipment (Hardcopy/PDF)
- Operations and Maintenance Manual – Fire Sprinkler (Hardcopy/PDF)
- Operations and Maintenance Manual – Fire Alarm (Hardcopy/PDF)
- TAB – Test Adjust Balance Reports (PDF)
- Submittals and Shop Drawings (PDF)
- Warranty or Closeout Manuals (PDF)

Record Documents

- Record Drawings (Printed/PDF/CAD/BIM or whatever original design file/technology used)
- Record Specifications (Printed/PDF)
- Fire alarm System Shop Drawings (PDF)
- Sprinkler Shop Drawings (PDF)
- Construction Photos (TIFF)

Other Files – Project Manager may add other material that they deem essential to project's permanent records (PDF)

Additional Documents

- Elevator Certificate (PDF)
- Final Commissioning (PDF)
- Hazmat Reports/Inspections (PDF)
- Certificate of Occupancy (PDF)

All other Files will be boxed and sent to University Library Archives in accordance with the instructions noted at the following link:

<https://recordsmanagement.gmu.edu/recordtrans.php>

APPENDIX S

PROJECT CLOSEOUT REQUIREMENTS

The following items shall be completed and where applicable passed before the milestone noted will be approved:

Fire Marshal's Completion of Letter Recommending Occupancy

- Fire Damper and Smoke Damper Final Inspection
- Fire Barrier and Through Penetration Firestop Inspection
- Fire Rated Door and Hardware Inspection
- Emergency Power System Demonstration and Inspection
- Smoke Control System Demonstration and Final Inspection
- Fire Alarm Record of Completion Form by FA Contractor
- Contractor's Material and Test Certification for Above Ground Piping by Sprinkler Contractor
- Contractor's Material and Test Certification for Underground Piping by Sprinkler Contractor

DEB's Substantial Completion Inspection

- HECO-13.1a A/E Certificate of Substantial Completion with A/E Punch List attached
- HECO-13.2a Certificate of Partial or Substantial Completion by Contractor
- HECO-13.1c Certificate of Partial or Substantial Completion by Const Inspec (if applicable)
- HECO-13.3b Checklist for Occupancy
- HECO-13.1b Final Report of Structural and Special Inspections
- State Fire Marshal's Construction Inspection Report (CIR) approving project for occupancy
- Elevator Inspection Certificate(s)
- Approved Test and Balance Report
- Potable Water Test Approval
- Letter stating asbestos abatement complete with final report (if applicable)
- Punchlist completed by architect to include all areas
- UL Master Label
- CO-13.3 Certificate of Occupancy (Temporary) – Filled out in BITS

George Mason University's Acceptance of Substantial Completion

- Hydronic Piping Chemical Treatment Report
- Final Roof Inspection Report
- Boiler and Pressure Vessel Certifications
- Department of Health Final Inspection and Certification
- Local AHJ's final inspection for underground/above ground fuel tank
- DEQ permits for Air Quality

DEB's Final Completion Inspection

- HECO-13.1 Certificate of Completion by A/E or Project Mgr
- HECO-13.2 Certificate of Completion by Contractor
- Fire Marshal's acceptance report that project is safe to occupy (required only if previous Fire Marshal acceptance letter is for temporary or partial occupancy only)
- Letter from Agency on Agency Letterhead stating that all BCOM Substantial Completion Punch list items and items listed on Temporary Certificate of Use and Occupancy are resolved.
- CO-13.3 Certificate of Occupancy (Final) – Filled out on BITS

George Mason University's Acceptance of Final Completion

- PDF of Full LEED Submission Documentation transmitted to Sustainability
- All Floorplans in CAD Format to Space Management
- All Building Specific Keys to Warranty Department
- All Required Attic Stock turned over to and accepted by Facilities Management

George Mason University's Close Out and Inactivation of a Project

- All items above are completed
- All required training is completed
- The CO-14/HECO-14 is completed
- All Project Orders are Paid and Closed; and Leading 9 Funds Inactivated.
- Required Documents in Appendix R are sent to Facilities Archives
- Emails and Electronic Files Saved to Flash Drive
- Hard Copy Documents are Boxed with Flash Drive and Sent to Library Archives
- E&S Permit Closed
- VSMP Permit Closed

APPENDIX T

RESERVED

APPENDIX U

OUBO ELECTRONIC DOCUMENT REVIEW (EDR) PROCESS DOCUMENT SUBMITTAL REQUIREMENTS

BACKGROUND

The purpose of the OUBO Electronic Document Review (EDR) process is to facilitate the document submittal and review processes.

Electronic Submittals:

The submission of electronic documents to the OUBO for review is required.

Shop Drawing Submittals:

Shop Drawings shall be submitted to the OUBO for review as electronic documents through the EDR process.

PROCEDURE

To make the electronic submittal process effective, efficient and economical, the following are required:

Electronic Drawings:

Submit the drawings in searchable vector PDF format, flattened, and generated from the source program (i.e. AutoCAD, Revit) and combined into a single electronic document.

DO NOT SUBMIT FILES IN ZIPPED (.zip) FORMAT.

Text shall be PDF text elements (Real Text, Truetype) and recognizable as text in all documents. It is important for the PDF documents submitted to contain recognizable text. This recognizable text allows the documents to be “pre-processed” creating bookmarks and detail links that facilitates navigation by the reviewer and allows the review to be completed in a timely manner. Graphic programs such as AutoCAD typically produce text as vector characters. However, these characters can be converted to recognizable text when the PDF is created. See the links at the end of this Appendix for more details.

OUBO standard symbols shall be provided for all elevations, sections and details. Text includes all standard symbols referencing sections, details, enlarged plans or other relevant information. When images are inserted, such as photographs or UL listings for example, add the text standard symbol below the image, when the image must be referenced to another sheet or detail.

Provide a unique sheet number, to include the discipline for the work (i.e. A1.00), for each drawing in the set (including all volumes- do **not** use the same sheet number in multiple volumes, such as T1.0.)

The sheet title block and sheet number shall be in a consistent location on all sheets and across all disciplines.

A 2" H X 2" W area shall be reserved in a consistent location in the title block of ALL drawings for the OUBO ELECTRONIC APPROVAL STAMP. This area shall be completely blank on all sheets with exception of the borderline. This is applicable to all sheet sizes.

Drawings shall be generated at a defined scale (i.e. $\frac{1}{4}" = 1'$, $\frac{1}{2}" = 1'$, etc...) to allow reviewers to calibrate the drawings for measuring distances and calculating areas for code and cost review. Each sheet shall illustrate a typical graphic scale. If more than one scale is used on a sheet, an independent graphic scale shall accompany the applicable detail.

Project Manual:

Submit the Project Manual as a single document in searchable PDF format generated from the source program (i.e., not scanned). DO NOT SUBMIT FILES IN ZIPPED (.zip) FORMAT.

Document shall include "bookmarks" to facilitate locating document sections.

A 2" H X 2" W area shall be reserved in a consistent location on the project manual cover for the OUBO ELECTRONIC APPROVAL STAMP. This area shall be completely blank with exception of the borderline.

Other documents:

Submit other supporting documentation (such as calculations, cost estimates, etc.) in PDF, Word, or Excel format.

Submit comment responses in Excel format.

OTHER REQUIREMENTS

Responsible Design Professional's Electronic Seal and Signature:

The responsible design professional (RDP) shall electronically seal, sign and date each drawing and each volume of the Project Manual on the cover page or first page (or applicable pages if an RDP is responsible for parts of the specifications) of the project manual table of contents.

Electronic seals, signatures, and dates shall comply with Section 3.13.

Security:

Some digital signature software affects the document security and limits the OUBO's ability to process the documents. Document security must allow the OUBO to electronically mark-up drawings and the Project Manual, and to add or remove sheets.

Page Orientation:

All drawings shall be set to landscape orientation with the top of the page at the top of the monitor. A north arrow shall be included on all plans. Other submittal types (project manuals, calculations, cost estimates etc.) may be set to either landscape or portrait orientation with the top of the page at the top of the monitor. Batched documents are preferred.

MANDATORY REQUIREMENTS FOR ACCEPTANCE

While all of the requirements of Appendix U apply, submittals that fail to meet certain requirements will not be accepted. These mandatory requirements for acceptance are:

Drawings:

1. Submitted in searchable, PDF format with drawings combined into a single document or volumes. (No .zip files.)
2. Text shall be recognizable as text in all documents.
3. Each drawing shall have a unique sheet number (to include the discipline for the work), including all volumes of drawings.
4. The title block and sheet number shall be in a consistent location on all sheets.
5. Document security must allow the OUBO to electronically mark-up drawings.

Project Manual/Narrative:

1. Submitted as a single document or volumes in searchable, PDF format. (No .zip files.)
2. Text shall be recognizable as text in all documents.
3. Document security must allow the OUBO to electronically mark-up drawings.

Calculations:

1. Submitted as separate files organized by trade.

The links below are provided as a reference for use in creating PDF documents with recognizable text:

AutoCAD:

<https://knowledge.autodesk.com/support/autocad/learn-explore/caas/sfdcarticles/sfdcarticles/How-to-create-selectable-and-searchable-text-in-a-PDF-from-AutoCAD.html>

Bluebeam:

<https://support.bluebeam.com/articles/autocad-pdfs-dont-contain-searchable-text/>

<https://support.bluebeam.com/blog/ocr/>

Revit:

<https://knowledge.autodesk.com/support/revit/learn-explore/caas/CloudHelp/cloudhelp/2019/ENU/Revit-Documents/files/GUID-8B7424DD-C07A-4FD7-B4DB-5F7F6F14D8E8-htm.html>

Note: Choose a PDF print driver that will convert to recognizable text. See additional information on PDF print drivers below:

<https://knowledge.autodesk.com/support/revit/troubleshooting/caas/sfdcarticles/sfdcarticles/Revit-PDF-export-print-options.html>

<https://knowledge.autodesk.com/support/revit/learn-explore/caas/CloudHelp/cloudhelp/2018/ENU/Revit-Documents/files/GUID-33DAC17F-8E51-4E46-B4C7-1F9DDC54068C-htm.html>

APPENDIX V

VIRGINIA ENERGY CONSERVATION AND ENVIRONMENTAL STANDARDS (VEES)

CHAPTER 1 ADMINISTRATION

SECTION 101 GENERAL

101.1 Short Title

The *Virginia Energy Conservation and Environmental Standards* may be cited as the VEES.

101.2 Incorporation by reference

Chapters 2-11 of the 2018 *International Green Construction Code*, published by the International Code Council, Inc., are adopted and incorporated by reference to be an enforceable part of the VEES. The term “IgCC” means the 2018 *International Green Construction Code*, published by the International Code Council, Inc. Any codes and standards referenced in the IgCC are also considered to be a part of the incorporation by reference, except that such codes and standards are used only to the prescribed extent of each such reference.

101.3 Arrangement of VEES provisions

The VEES is comprised of the combination of (i) the provisions of Chapter 1, Administration, which are established herein, (ii) Chapters 2 – 11 of the IgCC, which are incorporated by reference in Section 101.2, and (iii) the changes to the text of the incorporated chapters of the IgCC that are specifically identified. The terminology “changes to the text of the incorporated chapters of the IgCC that are specifically identified” shall also be referred to as the “VEES amendments to the IgCC.” Such VEES amendments to the IgCC are set out using the corresponding chapter and section numbers of the IgCC numbering system.

101.4 Code Conflicts

Where there is a conflict between the *Virginia Uniform Statewide Building Code* and the provisions of chapters 2-11 of the IgCC as amended herein the most restrictive requirement is to apply.

101.5 Order of Precedence

The provisions of the VEES shall be used as follows:

1. Where differences exist between the provisions of the VEES and the provisions of chapters 2-11 of the IgCC, the provisions of the VEES shall apply.

2. Where differences exist between the provisions of the VEES and the provisions of standards referenced in chapter 11 of the IgCC, the provisions of the VEES shall apply.
3. Where differences exist between the provisions of the IgCC and the provisions of standards referenced in chapter 11 of the IgCC, the provisions of the IgCC shall apply.

101.6 Low-energy buildings

101.6.1 Low-energy buildings

The following low-energy buildings, or portions thereof separated from the remainder of the building by *building envelope* assemblies complying with this section, shall be exempt from the *building envelope* provisions of VEES:

1. Those with a peak design rate of energy usage less than 3.4 Btu/h*² or 1.0 watt/ft² of floor area for space conditioning purposes.
2. Those that do not contain conditioned space.
3. Greenhouses.

101.7 Alterations to existing buildings

Alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the *Virginia Energy Conservation and Environmental Standards*. The alterations shall conform to the requirements of the *Virginia Energy Conservation and Environmental Standards* as they relate to new construction only.

CHAPTER 2

RESERVED

CHAPTER 3

DEFINITIONS, ABBREVIATIONS AND ACRONYMS

Add the following definition to Section 301.2 of the IgCC to read:

Agency. Any of the departments, agencies and institutions of the Commonwealth of Virginia, including state-supported institutions of higher education.

CHAPTER 4

APPLICATION

Replace Chapter 4 of the IgCC with the following:

401.1 Scope

The provisions in this chapter are applicable to buildings and their sites.

401.2 Compliance

Buildings and their sites shall comply with Section 401.3, “Mandatory Provisions,” and one of the following:

- a. The requirements of IgCC Chapters 5 through 11 as herein amended and applied in accord with IgCC Section 101.4 Application
- b. Achieve certification using the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) green rating standard
- c. Achieve certification using the Green Building Initiative’s “Green Globes” Building Standards.

401.3 Mandatory Provisions

401.3.1 Electric Vehicle Parking Spaces/Charging Stations

Comply with the minimum requirements for Electric Vehicle Parking Spaces/Charging Stations of the Construction and Professional Service Manual (CPSM) Appendix G as published by the Commonwealth of Virginia, Department of General Services, Division of Engineering and Buildings.

401.3.2 Minimum Energy Monitoring, Tracking, and Reporting

401.3.2.1 Basic Building Information for Energy Reporting

The design documents shall identify the following basic building information for Energy Reporting and record this information in the project VEES Checklist DGS Form DGS-30-382.

- a. Institution / Agency
- b. Project Title
- c. Project Number
- d. Date
- e. A/E of Record
- f. Contractor
- g. Building gross floor area
- h. Each energy supply source provided to the building
- i. Building function
 1. Broad category
 2. Primary function
 3. Detailed function
- j. Median source U.S. energy use intensity (Median Source EUI) for the building type in kBtu/ft²
- k. Median site U.S. energy use intensity (Median Site EUI) for the building type in kBtu/ft²

The building function, median source EUI, and median site EUI shall be determined from the “U.S. Energy Use Intensity by Property Type” technical reference published by energystar.gov on April 2021 unless otherwise documented values are approved.

<https://portfoliomanager.energystar.gov/pdf/reference/US%20National%20Median%20Table.pdf?902f-6480>

401.3.2.2 Energy Monitoring

Measurement devices shall be provided to collect energy consumption data for each energy supply source to the building (including all electricity, gas, water, and other utilities)

401.3.2.3 Energy Tracking

Data acquisition system shall be provided to:

- a. Electronically store the data from the measurement devices for a minimum of 36 months.
- b. Compute the annual building site energy use intensity (Source EUI) in kBTU/ft².
- c. Compute the annual building source energy use intensity (Site EUI) in kBTU/ft².
- d. Compute the annual carbon dioxide equivalent emissions (CO₂e) in metric tons.
- e. Compute the weighted annual carbon dioxide equivalent emissions (CO₂e/ft²) in metric tons/ft².

Source-site ratios by energy type used to calculate the source energy use intensity shall be determined from the “Source Energy” technical reference published by energystar.gov on April 2021 unless otherwise documented values are approved.

<https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf?6297-372e>

Carbon dioxide equivalent emissions (CO₂e) shall be determined using the factors determined from the “Green House Gas Emissions” technical reference published by energystar.gov on October 2020 unless otherwise documented values are approved.

<https://portfoliomanager.energystar.gov/pdf/reference/Emissions.pdf?8157-b23c>

401.3.2.4 Energy Reporting

Commonwealth of Virginia Agencies and Institutions shall submit an annual report to the Governor. The report shall encompass the complete twelve (12) month building operating period commencing on July 1 immediately following completion of the VEES certification and ending on the subsequent June 30. The report shall be provided to the Governor no later than January 1 immediately following the twelve (12) month building operating period.

The report shall include:

- a. The project title/building name
- b. The project code
- c. The date of the report
- d. The begin and end dates of the twelve (12) month building operating period
- e. The building gross floor area

- f. Each energy supply source provided to the building
- g. The building function as recorded in the project VEES Checklist DGS Form DGS-30-382
 - 1. Broad category
 - 2. Primary function
 - 3. Detailed function
- h. The median source U.S. energy use intensity (Median Source EUI) for the building type in kBTU/ft² as recorded in the project VEES Checklist DGS Form DGS-30-382
- i. The median site U.S. energy use intensity (Median Site EUI) for the building type in kBTU/ft² as recorded in the project VEES Checklist DGS Form DGS-30-382
- j. The annual building site energy use intensity (Source EUI) in kBTU/ft²
- k. The annual building source energy use intensity (Site EUI) in kBTU/ft²
- l. The annual carbon dioxide equivalent emissions (CO₂e) in metric tons
- m. The weighted annual carbon dioxide equivalent emissions (CO₂e/ft²) in metric tons/ft²

401.3.2.4.1 Energy Reporting Tool Option

Commonwealth of Virginia Agencies and Institutions may use the ENERGY STAR® Portfolio Manager® tool to generate the required energy report.

https://www.energystar.gov/buildings/benchmark/portfolio_manager_login

401.3.2.4.2 Energy Reporting Through Division of Engineering and Buildings Option

Commonwealth of Virginia Agencies and Institutions may submit the required report to the Division of Engineering and Buildings no later than October 1 immediately following the twelve (12) month building operating period. The Division of Engineering and Buildings will compile all reports so-submitted and make the final submission to the Governor on the Commonwealth of Virginia Agencies' and Institutions' behalf.

401.3.3 Documentation

401.3.3.1 VEES Verification

At the completion of construction after all requirements have been met with the exclusion of ongoing operation and maintenance, submit to the authority having jurisdiction the VEES Verification DGS Form DGS-30-381.

VEES Verification DGS Form DGS-30-381 shall be completed and signed by:

- a. Agency's Project Manager
- b. CFR/Project Inspector
- c. A/E of Record
- d. Contractor

401.3.3.2 Supporting Documentation

The following documents shall be provided with the VEES Verification DGS Form DGS-30-381:

- a. Where compliance is achieved via Chapters 5 through 11, the project VEES Checklist DGS Form DGS-30-382.
- b. Where compliance is achieved via certification using the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) green rating standard, a copy of the Leadership in Energy and Environmental Design (LEED) certification issued by the U.S. Green Building Council. Include VEES Checklist DGS Form DGS-30-382 for Mandatory Provisions in Section 401.3.
- c. Where compliance is achieved via certification using the Green Building Initiative's "Green Globes" Building Standards, a copy of the "Green Globes" Building Standards certification issued by the Green Building Initiative. Include VEES Checklist DGS Form DGS-30-382 for Mandatory Provisions in Section 401.3.

CHAPTER 5

SITE SUSTAINABILITY

Add exception to Section 501.3.1 of the IgCC

Exception: Where building project sites are exempted in writing by the Authority having jurisdiction (AHJ).

Change Section 501.3.1.2(a) of the IgCC to read:

- a. Previously undeveloped land within the 100 year floodplain or 500 year floodplain as defined in the Virginia Flood Risk Information System.

Exception: VEES shall not restrict development of low-impact trails anywhere within a flood zone.

Add to Section 501.3.5.4(c) of the IgCC

- c. A default SRI value of 35 for new concrete without added color pigment is allowed to be used instead of measurements.

Change Section 501.3.7.1.1 of the IgCC to read:

Each primary building entrance shall be provided with a pedestrian walkway that extends to either a public way or a transit stop. Walkways shall not be less than 48 inches (1.22 meters) in width and shall be clearly delineated.

Add exceptions 3 and 4 to Section 501.3.7.2.1 of the IgCC

3. For any building with an occupant load greater than five-hundred (500), bicycle parking spaces shall be provided for at least 2% of the occupant load plus an additional fifteen (15) spaces.
4. For any building classified as I-2 or I-3, the number of bicycle parking spaces may be determined using a modified occupant load that is reduced by the number of persons confined or receiving care at the facility.

Change Section 501.3.7.3(b) of the IgCC to read:

Provisions for electric-vehicle charging infrastructure. The building project shall comply with the minimum requirements for electric Vehicle charging infrastructure of the Construction and Professional Service Manual (CPSM) Appendix G as published by the Commonwealth of Virginia, Department of General Services, Division of Engineering and Buildings.

CHAPTER 6

WATER USE EFFICIENCY

Change Section 601.3.1.1 of the IgCC to read:

A minimum of 50% of the area of *improved landscape* shall be in *biodiverse planting of native plants*.

Exceptions:

1. The area of dedicated athletic fields, golf courses, driving ranges, and areas dedicated for production of food for human consumption, shall be excluded from the calculation of the improved landscape for schools, residential common areas, or public recreational facilities.
2. Landscape areas irrigated solely with alternate on-site sources of water shall be exempt from these requirements.

Change exception to Section 601.3.1.2 of the IgCC to read:

Exception: Potable water is allowed to be temporarily used on such newly installed landscape during the landscape establishment period.

Add exception to Section 601.3.1.2.2.1 of the IgCC:

Exception: Where the settings and schedule for irrigation control systems are maintained in a manual located in the grounds maintenance office and the controllers are permanently labeled with a unique identification, posting the settings and schedule on or adjacent to the controller shall not be required.

Change Section 601.3.2.1(h) of the IgCC to read:

1. **Showerheads.** Maximum Flow rate shall not exceed 2.0 gpm (7.6 L/min) when tested in accordance with ASME A112.18.1/CSA B125.1. Showerheads shall comply with the performance requirements of the USEPA WaterSense Specification for Showerheads.

Exception: Emergency use showerheads shall be exempt.

Change the following areas in Table 601.3.2.1 of the IgCC to read:

PLUMBING FIXTURE	MAXIMUM
Showerheads	Flow rate—2.0 gpm (7.6 L/min)

Add exception to Section 601.3.2.3(d) of the IgCC:

Exception: Buildings without cooling towers or evaporative coolers.

Delete Section 601.3.2.5 f. of the IgCC.

Change Section 601.3.8.1 of the IgCC to read:

Where sufficient supply of *reclaimed water* or *alternate on-site sources of water* is available, the water supply system within the building shall be installed to allow the supply of reclaimed or alternative water to all urinals and water closets.

CHAPTER 7

ENERGY EFFICIENCY

Delete Section 701.3.4.1(c) of the IgCC.

Add the following to Section 701.3.4.3 of the IgCC.

Lighting power adjustments shall not decrease the means of egress illumination below the means of egress illumination levels specified in Virginia Construction Code.

CHAPTER 8

INDOOR ENVIRONMENTAL QUALITY (IEQ)

Change Section 801.3.1 of the IgCC to read:

Buildings shall comply with the design requirements of ANSI/ASHRAE Standard 62.1, Sections 4 and 5, including applicable normative appendices, with the modifications and additions indicated herein. Ambulatory care facilities and Group I-2 occupancies shall comply with the design requirements of ANSI/ASHRAE/ASHE Standard 170, including applicable normative appendices, with the modifications and additions indicated herein. R-5 occupancies shall comply with the design requirements of ANSI/ASHRAE Standard 62.2, Sections 4 through 8, with the modifications and additions indicated herein.

Requirements provided in Sections 801.3.1.1 (8.3.1.1) through 801.3.1.7 (8.3.1.7) where more stringent supersede such requirements in ASHRAE Standard 62.1, ASHRAE Standard 62.2, and ASHRAE/ASHE Standard 170.

Change Section 801.3.1.1 of the IgCC to read:

In Ambulatory care facilities and Group I-2 occupancies, the ventilation requirements of ASHRAE/ASHE Standard 170 shall apply. In R-5 occupancies, the dwelling unit ventilation rates and local exhaust airflow rates as required by ASHRAE Standard 62.2 shall apply. ASHRAE Standard 62.2, Section 4.1.2, shall not apply. In all other cases, Virginia Mechanical Code Section 403 shall be used to determine minimum zone and intake outdoor airflow rates. Virginia Mechanical Code Section 402 shall not apply.

Add exception 3 and 4 to Section 801.3.4 of the IgCC:

3. Buildings located in Radon Zone 3 counties according to USEPA
<https://www.epa.gov/sites/production/files/2015-02/documents/r3-va-riskmap-largefont.pdf>
4. Buildings located in Radon Zone 1 or Zone 2 counties where an agency has multiple existing buildings within 550 feet of the proposed building location such that at the two closest buildings have been tested and found to have a radon level less than 1.5 pCi/L and none of the agency's buildings at that location have ever been found to have a radon level at 2.7 pCi/L or greater.

Change Section 801.3.4.1.2.2 of the IgCC to read:

Exhaust vent piping, as specified in Section 801.3.4.1.3 (8.3.4.1.3), shall connect to soil-gas inlet configurations within the gas-permeable layer and extend not less than 2 ft (0.6 m) above the top of the slab or membrane. Such pipes shall be temporarily capped or otherwise closed during construction to prevent debris from entering the pipes. The pipe that extends above the slab or membrane shall be labeled with the words "soil-gas vent."

Change Section 801.3.4.1.3 (a) of the IgCC to read:

- a. **Pipe Placement.** Nonperforated Schedule 40 pipe, as defined by ASTM D1785, shall extend from within the gas-permeable layers to the point of exhaust above the *roof*. The vent pipe size shall not be reduced at any point between its connection to the gas permeable layers and the exhaust terminal above the roof. Such piping shall be labeled on each floor level of the building with the words "soil-gas vent."

CHAPTER 9

MATERIALS AND RESOURCES

CHAPTER 10

CONSTRUCTION AND PLANS FOR OPERATION

Change Section 1001.3.1.2.3(b) of the IgCC to read:

- b. The *owner* shall be provided with a preliminary Cx report per compliance with Section 1001.3.1.3 (10.3.1.3). A copy of the Cx preliminary report shall be submitted to the AHJ.

Change Section 1001.3.1.3.5(a)(3) of the IgCC to read:

3. ANSI/ASHRAE/IES Standard 90.1, Section 5.4.3.1.3(a), Exception (1), is not allowed.

Change Section 1001.3.1.3.5(a)(4) of the IgCC to read:

4. ANSI/ASHRAE/IES Standard 90.1, Section 5.4.3.1.3(a), Exception (2), is allowed where the measured air leakage rate exceeds 0.25 cfm/ft²(L/s-m²) but does not exceed 0.40 cfm/ft²(L/s-m²).

Delete Section 1001.3.1.4 of the IgCC. Erosion and Sedimentation Control is governed by DEQ

regulations.

Change the following areas of equation 10-1 in Section 1001.3.1.5(b)(1) of the IGCC to read:

V_{ot} = system design outdoor air intake flow, cfm (L/s) (according to Virginia Mechanical Code Section 403)

Add exception to Section 1001.3.1.9 of the IgCC.

Exception: Commonwealth of Virginia buildings in Radon Zone 1 or Zone 2 counties according to USEPA, with funding authorized prior to January 1, 2022.

CHAPTER 11

NORMATIVE REFERENCES

APPENDIX W

HECO MANUAL REVISION HISTORY

2016 – Original Publication
2023-Version 2.0

Revision Package – Dated February 02.03.2023 Summary of Revisions for HECO Manual Version 2.0

*** Major Revisions are notated in Red below.**

Minor formatting, editing, grammar changes or updates to Personnel Titles or Agency names are not individually notated in this Revision Package.

CHAPTER 1: INTRODUCTION

Section 1.0 Authority for Manual

1.0.1 Enabling Legislation

- Added content concerning Enabling Legislation

Section 1.1 General

- Revised and added content concerning the Manual

Section 1.2 Capital Outlay Verses Non-Capital Outlay

1.2.1 Capital Outlay Projects

- Added References to the HECO Forms and clarified capital outlay threshold.

1.2.2 Non-Capital Outlay Projects

1.2.3 Construction

- Added Section 1.2.3 “Construction”.

Section 1.3 Design Philosophy

Section 1.4 Forms

- Added additional instructions on submitting requests to facontract@gmu.edu

Section 1.5 Index

CHAPTER 2: TERMS AND DEFINITIONS

- Added additional definitions and revised definitions to correct terminology throughout.

CHAPTER 3: GENERAL TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

Section 3.1 General Terms and Conditions for Professional Services

Section 3.2 General Policies on Architectural and Engineering Services

3.2.1 License/Registration

3.2.2 Prime Design Professional

3.2.3 Associations

3.2.4 Disadvantaged Business

Section 3.3 Professional Services

- Added “Fire Protection”.

Section 3.4 Taxpayer Identification Number

Section 3.5 Relationship of Architect/Engineer to University

Section 3.6 University Higher Education Capital Outlay Manual

- Added “Development of Master Site Plans”.

Section 3.7 “Design-not-to-Exceed” Cost as Related to A/E Contract

Section 3.8 Code and Regulatory Compliance

Section 3.9 Liability Insurance, Design Errors and/or Omissions and Record Retention

- Added additional requirements around A/E Insurance limits and policies.

Section 3.10 Other Insurance Required of the A/E

- Changed Item 3. Comprehensive to Commercial General Liability and updated limits.
- Added content, Paragraph 4 concerning “minimum limits”

Section 3.11 Ownership of Documents and Materials

Section 3.12 Standard Plans

Section 3.13 Requirements for A/E Seals and Signatures

3.13.1 General

- Added additional content concerning the VAC code requirements.

3.13.2 “Contract Documents”

- Added additional content, Paragraphs 3 and 4 concerning AIA contract documents.

3.13.3 “Final Documents”

3.13.4 “Addendum”

Section 3.14 Subcontracts

Section 3.15 Modifications of the A/E Contract (A/E Change Orders)

Section 3.16 Payments to Architect/Engineer

- Added additional content concerning submission of invoices through e-Builder.

Section 3.17 Payments by Architects/Engineer

Section 3.18 Audit

Section 3.19 Conflicts of Interest

Section 3.20 Release of Information Pertaining to Project Design

Section 3.21 Default

Section 3.22 Termination of Contract

3.22.1 Termination for Cause

3.22.2 Termination for Convenience

3.22.3 Delivery of Materials

- Added REVIT files to this section.

3.22.4 Compensation Due to the A/E

Section 3.23 Assignment of Contract

- Added language requiring AE-16 forms, proof of licensure/registration, etc.

Section 3.24 Antitrust

Section 3.25 Ethics in Public Contracting (§2.2-4367 ET SEQ., Code of Virginia)

Section 3.26 Anti-Discrimination

Section 3.27 Applicable Law and Courts

Section 3.28 Prohibition of Alcohol and Other Drug at Workplace

Section 3.29 Design of Security Systems

Section 3.30 Use of Standard Forms and Formats

Section 3.31 Reports on the Participation of Small Business and Businesses Owned by Women and Minorities

CHAPTER 4: PROCUREMENT PROCEDURES FOR PROFESSIONAL SERVICES

Section 4.1 General Policy on Procuring A/E Services

Section 4.2 Procurement of Related Consultants

4.2.1 Professional

4.2.2 Non-Professional

- Added language concerning procurement of these services under the Governing Rules.

4.2.2.1 Preplanning Studies

- New Section and new content concerning procurement of non-professional services for Preplanning Studies.

Section 4.3 Project Scope of Work

Section 4.4 Advertisement for Professional Services

4.4.1 Request for Qualifications (RFQ)

4.4.2 Request for Proposals (RFP)

Section 4.5 Small Business and Business Owned by Women and Minorities

Section 4.6 SWAM Procurement

4.6.1 University Plan

4.6.2 Audits

Section 4.7 Procedures for A/E Selection

4.7.1 Non-Capital Projects

4.7.2 Capital Projects

- Revised “Selection Committee” process extensively.

Section 4.8 Term A/E Contracts

4.8.1 Applicability

- Revised Paragraph 4 concerning Term Contract limits.

4.8.2 Advertisement/RFP

4.8.3 Selection, Negotiation and Award

- Removed requirement concerning the University “having 120 days from the RFP closing date to complete selection.....”

4.8.4 Project Orders

- Added language concerning contractual limits on projects (last sentence of section).

Section 4.9 Term Project Management Contracts

Section 4.10 Contract Forms to be Used

Section 4.11 General Terms and Conditions for Professional Services

CHAPTER 5: BASIC SERVICES AND RESPONSIBILITIES

Section 5.1 Responsibilities of the University to the A/E

- Item 1. Added (>+/-10%)
- Added Item 9. Delegated Design

Section 5.2 Quality of Work

Section 5.3 Basic Services of the A/E

5.3.1 General

5.3.2 Delegated Design

- Added Section 5.3.2 and content concerning “Delegated Design”.

5.3.3 Special Consultants

5.3.4 Reimbursable Expenses

- Added that “The University shall reimburse the A/E for the actual costs and no more than a **10%** markup for handling of blueprinting or other reproductions of drawings, specifications, and other documents required for submittals.”

5.3.5 Meeting Notes

- Additional content added concerning meeting minute requirements.

5.3.6 Project Initiation Phase

5.3.7 Schematic Design Phase

- In Item 3, changed Building Committee to Steering Committee.

5.3.8 Preliminary Design Phase

- In Item 3, changed Building Committee to Steering Committee

5.3.9 Contract Documents Phase

5.3.10 Bidding Phase

5.3.11 Construction Phase

5.3.11.1 Submittal Review and Construction Administration Services required to be performed by the A/E

- Added to Item, 3 Field and Change Orders that, “When the change order (HECO-11) the A/E shall affirm the reason category noted on part 3 of the HECO-11a.”

5.3.11.2 Construction Visits, Inspection and Closeout Services

Section 5.4 Extra Services

Section 5.5 Interior Design Services for Furniture, Furnishings and Decorations for Building Projects

Section 5.6 Identification of Documents and Materials

Section 5.7 A/E Performance Evaluation

- Removed and/or updated references to HECO-14a, HECO-14b and HECO-8a including the last 3 sentences referencing the requirements for completing the HECO-14b.

CHAPTER 6: FEES AND PAYMENTS FOR A/E SERVICES

Section 6.1 Architectural and Engineering Fees

Section 6.2 A/E Fee Proposal Standards and Guides

6.2.1 Plans and Specifications

6.2.2 Personnel Classifications and Hourly Rates

6.2.2.1 A/E Project Technical Personnel

- Added “individuals who have received an architecture education and/or have experience working in the office of an architect.”

6.2.2.2 Hourly Rates

6.2.2.3 Technical Personnel Classifications

- Revised the definition/content of Item 5. Designer (Architects and Engineers).
- Revised Item 7. Landscape Architect by changing “certified” to “licensed”.

6.2.3 Additional Services

6.2.4 Computer Services

6.2.5 Special Consultants

6.2.6 Reimbursable Expenses

6.2.7 Interior Design

Section 6.3 A/E Fee Proposal Worksheet

Section 6.4 Proportioning of the A/E Fee and Payments

6.4.1 Phases of Work

6.4.2 Design Phase Services

6.4.2.1 Schematic Design Phase

6.4.2.2 Preliminary Plans and Specifications

- Changed the value of the Preliminary Phase from 15% to 30%.

6.4.2.3 Working Drawings and Specifications

- Changed the value of the Preliminary Phase from 65% to 50%.

6.4.3 Construction Phase Services

6.4.3.1 Bidding Phase

6.4.3.2 A/E Construction Period Services

6.4.3.3 Project Closeout Phase

6.4.4 Payments to the A/E

6.4.5 Payments by the A/E

Section 6.5 Determining Charges for Changes in the Scope of Work

6.5.1 Changes to the Scope of Service

- Added that “a lump sum fee will normally be negotiated based upon a completed HECO-2.3...”

6.5.2 Hourly Rates for Changes in Work

6.5.3 Overtime for Changes in Work

6.5.4 Invoices for Changes in Work

6.5.5 Audit of A/E’s Records

Section 6.6 Changes to A/E Contract

- Added, as the last sentence, “Changes will be submitted and executed within the University’s web-based project management software, e-builder. Instructions on the use of e-builder can be found at the following link” and a link to e-builder site.

CHAPTER 7: ENGINEERING AND TECHNICAL CRITERIA

Note: Entire Section has been revised to reflect the policies/procedures of the George Mason University Office of University Building Officials (OUBO) and most references to DEB have been replaced with OUBO where they are acting as the Building Official under Mason's University Management Agreement with the Commonwealth.

Section 7.1 General

Section 7.2 Building Codes

7.2.1 Code Administration

- Revised to reflect that "The OUBO is the Building Official for all Projects" and references to DEB removed.

7.2.2 Review Procedures

7.2.3 Virginia Uniform Statewide Building Code (USBC)

- New Section and content added breaking out the requirements of the Virginia Uniform Statewide Building Code (USBC).

7.2.4 Additional Codes

- New Section and content added concerning "Additional Codes" in addition to the USBC that apply to projects on Mason property.

7.2.5 Energy Conservation and Environmental Performance

- New Section and content added concerning "Energy Conservation and Environmental Performance."

7.2.6 High Performance Buildings Act – Design

- New Sections (7.2.6, 7.2.6.1 and 7.2.6.2) and content added concerning "the "High Performance Buildings Act for Design requirements, submittal procedures and compliance statement.

7.2.6.1 High Performance Buildings Act – Submittal Procedure

7.2.6.2 High Performance Buildings Act – Compliance Statement

7.2.7 Virginia Energy Conservation Code Compliance Statement

- New Section and content added concerning "Virginia Energy Conservation Code Compliance Statement" which includes a new figure "6.1.5.1, 2018 Virginia Energy Conservation Code Compliance Flow Chart."

7.2.8 Clarifications to Climate Zone for University and State-Owned Buildings and Buildings on University and State-Owned Property.

- New Section and content added concerning "Clarifications to Climate Zone for University and State-Owned Buildings and Buildings on University and State-Owned Property."

7.2.9 Reactivated Projects

7.2.10 Modifications or Variances of Code Requirements

7.2.11 Code Clarifications

- New Section and content added concerning "Code Clarifications".

7.2.11.1 Buildings at Colleges and Universities

- New Section and content added concerning "Buildings at Colleges and Universities".

7.2.11.2 Baby Changing Facilities in State-Owned or Leased Buildings

- New Section and content added concerning "Baby Changing Facilities in State-Owned or Leased Buildings."

7.2.12 State Building Construction in Flood Plain

- New Section and content added concerning “State Building Construction in Flood Plain.”

7.2.13 Fire Safety Review

- Section updated throughout to replace DEB with OUBO.

Section 7.3 Accessibility Standards for State-Owned Buildings

- Section Title and Content has been updated/modified throughout. Removed Abbreviations and added new Narrative to Section 7.3. Revised/Removed original section 7.3.2 “Design Standards for Providing the Disabled with Accessibility and Usability” and added that revised content to Section 7.3.

7.3.1 Conflicting Standards

- Revised content and added new requirements concerning when codes and standards conflict

7.3.2 Clarifications of Owned Buildings

7.3.2.1 Site Elements

- New Section and content added concerning “Site Elements”.

Section 7.4 Special Procedures for Asbestos Abatement

- Updated throughout to reference OUBO.

7.4.1 General Asbestos Requirements

7.4.2 Asbestos Removal

7.4.3 Use of Asbestos or Asbestos Containing Materials

7.4.4 Removal and Replacement of Sprayed-on Fireproofing

7.4.5 Asbestos Related Work Insurance Requirements

7.4.6 Conflict of Interest Policies

Section 7.5 Special Procedures for Lead based Paint Abatement

Section 7.6 Underground Storage Tanks Systems (USTS) and Above Ground Storage Tanks (AST)

- Section Title changed to Underground Storage Tanks Systems (USTS) and Above Ground Storage Tanks (AST)
- “Separate Contracts for Material and/or Equipment” (original title of section) moved to Section 9.3.10

Section 7.7 Chesapeake Bay Program

- Section Title now “Chesapeake Bay Program”
- “Procurement of Furnishings and Loose Equipment” moved to Section 9.3.11

Section 7.8 Special Building Planning Requirements

- Section Title now “Special Building Planning Requirements”
- “Built-in Equipment” moved to Section 9.3.12

Section 7.8.1 Guidelines for Office Space Planning

Section 7.9 Earthwork

7.9.1 Structural fill/backfill

7.9.2 General fill/backfill

7.9.3 Unsuitable Materials

7.9.4 Aggregates

7.9.5 Moisture content of soil materials

7.9.6 Quality Assurance/Testing

Section 7.10 Stormwater Management and Erosion and Sediment Control Requirements

- 7.10.1 Plans and Specifications
- 7.10.2 Computation and Recordation

- Additional requirements added to this section for computation and recordation.

Note: Sections 7.11 -7.13 have been heavily revised to reflect the policies, requirements and procedures from the OUBO. Some content has been moved to Chapter 8.

Section 7.11 Fire Protection and Life Safety Systems

- “Rock Excavation” Moved to Section 9.3.13
- Title and Content Now Fire Protection and Life Safety Systems

7.11.1 Fire Detection and Alarm Systems

- Content and requirements updated.

7.11.2 Mass Notification System (Emergency Communication Systems)

- Content and requirements updated.

7.11.3 Fire Suppression Systems – Water-based: Fire Sprinkler/Standpipe

- Content and requirements updated.

7.11.4 Fire Suppression Systems – Alternate Automatic Systems

- Content and requirements updated.

7.11.5 Fire Pumps (Electrical or Diesel-Driven)

- Content and requirements updated.

7.11.6 Smoke Control/Management Systems

- Content and requirements updated.

7.11.7 Spray-Applied Fire-Resistant Materials (SFRM) and Fire-Resistant Coatings

- Content and requirements updated.

7.11.8 Fire Protection Openings and Fire/Smoke Dampers

Section 7.16 Fire Separation of Equipment

- Content moved under Section 7.11 and Chapter 8
- “Rock Excavation” Moved to Section 9.3.13

Section 7.17 Fire Pumps

- Content moved under Section 7.11 and Chapter 8

Section 7.18 Smoke Control Systems

- Content moved under Section 7.11 and Chapter 8

Section 7.12 Pressure Vessels

- Content and requirements updated.

Section 7.13 Temporary Electrical Service

- Content and requirements updated.

CHAPTER 8: PROJECT DESIGN STANDARDS AND REQUIREMENTS

Note: Entire Section has been revised to reflect the policies/procedures of the George Mason University Office of University Building Officials (OUBO) and most references to DEB have been replaced with OUBO where they are acting as the Building Official under Mason’s University Management Agreement with the Commonwealth. Some Content from Chapter 7 has been moved to Chapter 8.

Section 8.1 General

- Added to 3rd Paragraph: “Existing landscape and utility conditions shall be overlaid with proposed utilities locations and site improvements. Architect to indicate all vents, penetrations, stacks, equipment, etc. on elevations.”

8.1.1 Project Aesthetics

8.1.2 LEED Certification

8.1.3 Project Identification on Documents

8.1.4 Capital Project Initiation

8.1.5 Non-Capital Projects

Section 8.2 Drawing Standards

8.2.1 General Requirements

8.2.2 Drawing Requirements & Specifications

8.2.2.1 Arrangement of Drawings

- Added “AC – Access Controls” requirement.

8.2.2.2 Sizes of Drawing Sheets

- Removed “microfilming” and added “optical scanning”.

8.2.2.3 Drafting Media

- Added “Revit” as an acceptable drawing system.

8.2.2.4 Orientation

8.2.2.5 Lettering

8.2.2.6 Section and Detail Designation

- Added “Figure 8.2-2 Standard Section, Elevation or Detail Symbol.”

8.2.2.7 Scales

8.2.2.8 Drawing Numbers

8.2.2.9 Relation of Drawings and Specifications

8.2.2.10 Boring Log Presentation

- Removed “microfilming”.

8.2.2.11 Seals

- Removed “yellow-out”.

8.2.2.12 Date

8.2.2.13 Limits of the Work

Section 8.3 Specification Standards

8.3.1 General

8.3.2 Project Manual/Specifications Arrangement

- Added “shall be suitable for scanning” and Removed “be suitable for microfilming”.
- Added/clarified additional HECO forms throughout and additional Appendices requirements in Item 30.
- Added new requirement in Item 31 that “All blank pages should be removed from the final version of the project manual.”

8.3.3 General Conditions of the Construction Contract

- Added Paragraph 3 content concerning “Liquidated Damages.”

8.3.4 Supplemental General Conditions

8.3.5 Special Conditions

8.3.6 Instructions to Bidders, CO-7a(s)

8.3.7 Types of Specifications

8.3.8 Virginia Manufactured Products

- Revised to remove “BUY VIRGINIA” watermark requirement (last sentence of Section).
- 8.3.9 Use of Standard or Guide Specification
- 8.3.10 Restrictive Specifications and Performance Requirements
 - 8.3.10.1 Bidder Experience
 - New Section (content originally in Section 8.3.10)
 - 8.3.10.2 Prequalification of Special Systems
 - New Section and content concerning “Prequalification of Special Systems”.
- 8.3.11 Equal materials, equipment or assemblies
- 8.3.12 Substitute materials, equipment or assemblies
- 8.3.13 Unit Prices
- 8.3.14 Specifying New Types of Materials Equipment or Systems
 - Added “new to the market within the last five (5) years”.
- 8.3.15 Phraseology
- 8.3.16 Specifications on CD, DVD, Bluray, or Flash Drive
- 8.3.17 Hardware Specifications and Schedules
- Section 8.4 Cost Estimate Standards
- Section 8.5 Design Initiation /Pre-design Conference
 - Updated to include latest requirements and Capital Strategy & Planning Department.
- Section 8.6 Schematic Design Project Criteria
 - 8.6.1 General Requirements
 - 8.6.1.1 Verification of Existing Conditions
 - 8.6.2 Basis of Design Narrative
 - 8.6.3 Schematic Drawings
 - Content revised and edited to reflect new requirements for “Title Sheet & Code Compliance (G) Plans (G), Architectural Drawings (A), and Life Safety Drawings (G).
 - 8.6.4 Cost Estimate
- Section 8.7 Preliminary Design
 - 8.7.1 General Requirements
 - 8.7.1.1 Verification of Existing Conditions
 - Moved “Verification of Existing Conditions” and content to this Section (was previously in Section 8.6).
 - 8.7.2 Preliminary Cost Estimate
 - 8.7.3 Value Engineering
 - 8.7.4 Review Process
 - Revised to reflect OUBO instead of DEB.
 - 8.7.5 Preliminary Submittal Requirements
 - 8.7.6 General Requirements for Preliminary Drawings
 - Content revised and requirements added for “Title Sheet(s)”, “Site Plans”, “Demolition Drawings”, “Architectural Drawings”, “Exterior Elevations”, “Building Cross-Sections”, “Wall-Sections”, “Structural Drawings”, “Code Compliance and Life Safety (G) Plans”, “Fire Suppression (FX) Plans”, “Fire Alarm, Detection and Signaling System (FA) Plans”, “Plumbing Drawings”, “Mechanical (HVAC) Drawings”, and “Electrical Drawings”.

Section 8.8 Working Drawings Phase (Construction Document Phase)

8.8.1 General Requirements

8.8.1.1 Verification of Existing Conditions

- Added “Verification of Existing Conditions” as a requirement.

8.8.2 Plans, Sections and Details of Equipment or Systems

8.8.3 Cost Estimate

8.8.4 Permits and Utilities

8.8.5 Calculations

- Added Calculation guidance and requirements for “Plumbing Calculations”, “HVAC Calculations”, “Electrical Calculations”, and “Structural Calculations.”

8.8.6 Submittal Documents

8.8.7 Working Drawings – Significant changes to requirements

- Content revised and requirements added for “Title Sheet(s)”, “Site Plans”, “Demolition Drawings”, “Architectural Drawings”, “Exterior Elevations”, “Building Cross-Sections”, “Wall-Sections”, “Structural Drawings”, “Code Compliance and Life Safety (G) Plans”, “Fire Suppression (FX) Plans”, “Fire Pump Design Supporting Material”, “Spray-Applied Fire-Resistant Materials (SFRM) and Fire Resistant Coatings”, “Fire Protection Openings and Fire/Smoke Dampers”, “Fire Alarm, Detection and Signaling System (FA) Plans”, “Access Control Plans”, “Plumbing Drawings”, “Mechanical (HVAC) Drawings”, “Electrical Drawings”, “Lighting Plans”, “Power Plans”, “Site Plan”, “Electrical Coordination Analyses”, “Control Systems”, and “Rock Excavation”.

Section 8.9 Bid Forms & Procedures

Section 8.10 Additive Bid Items

Section 8.11 Project Submission Requirements

- Title changed from “Submissions” to “Project Submission Requirements”
- Figure 8.11.2 has been added and requirements concerning paper copies has been revised.

8.11.1 Other Document Submissions

Section 8.12 Authority Having Jurisdiction Reviews and Approvals

- Authority having jurisdiction has been updated throughout to OUBO.

8.12.1 General

8.12.2 Annual Permit Work

8.12.3 Review Comments

8.12.4 Resubmittals

8.12.5 Revised Submittals

8.12.6 Print and Release of Bid Documents

8.12.7 Advance Advertisement/Notice

8.12.8 Review Time

- Has been updated to reference the OUBO Plan Review website and update the link and requirements.

8.12.9 Approvals

Section 8.13 Quality Control/Quality Assurance

Section 8.14 Value Engineering (VE)

8.14.1 General

8.14.2 Scope of VE Study

- **Removed requirement for “15 copies unless otherwise shown in the RFP”.**

8.14.3 Procurement of the VE Study

8.14.4 Qualification of VE Team

8.14.5 Certified Value Specialist (CVS) Responsibilities

8.14.6 VE Report Requirements

8.14.7 Oral Presentation

8.14.8 A/E Participation

8.14.9 Criteria Challenge

8.14.10 A/E Action on VE Study

Section 8.15 Structural and Special Inspections, & Structural Observations

- **Added to title and content “Structural Observations”**
- **Updated Section to refer to VCC instead of VUSBC.**
- **Added new content and requirements in Sections 8.15.1 – 8.15.1.7**

8.15.1 Application to State-Owned buildings

- **New section and new content.**

8.15.1.1 A/E Responsibilities

- **New section and new content.**

8.15.1.2 Construction Field Representative (CFR) Responsibilities

- **New section and new content.**

8.15.1.3 University’s Independent Test Lab

- **New section and new content.**

8.15.1.4 Statement

- **New section and new content.**

8.15.1.5 Final Report

- **New section and new content.**

8.15.1.6 Listing of Structural and Special Inspections

- **New section and new content.**

8.15.1.7 Additional Information

- **New section and new content.**

Section 8.16 Structural Observations

- **Added Structural Observations Title and Content**

Section 8.17 Commissioning of HVAC Systems

Section 8.18 Electrical Coordination Analyses (Shop Drawings) Review

- **New section, content and requirements concerning “Electrical Coordination Analyses (Shop Drawings) Review.”**

Section 8.19 Fire Protection Shop Drawings

- **Content and Title moved from Section 8.17 to 8.19**

CHAPTER 9: CONSTRUCTION PROCUREMENT & ADMINISTRATION

Section 9.1 General

- **Removed Original Paragraphs 1-7 related to Mason’s Tier II status (now Tier III) as this information is no longer relevant/out of date.**

Section 9.2 Methods of Construction Procurement

9.2.1 Reciprocity

Section 9.3 Construction Bids

9.3.1 Capital Outlay Construction Projects

- **Removed references to VPPA and replaced with Governing Rules.**

9.3.2 Instructions to Bidders

9.3.3 Virginia Construction Contracting Officer

9.3.4 Authorization to Advertise for Bids

9.3.5 Preparation

9.3.6 Small Business Set Asides

9.3.6.1 Total Construction Cost Less than \$10,000

9.3.6.2 Total Construction Cost From \$10,000 to \$100,000

9.3.6.3 Total Construction Cost More Than \$100,000

9.3.7 Small Project Procurement Procedures

- **New Section and Content added concerning “Small Project Procurement Procedures”.**

9.3.7.1 Minor Construction Costing \$10,000.00 or Less

- **New Section and Content added concerning “Minor Construction Costing \$10,000 or Less.”**

9.3.7.2 Minor Construction Costing More Than \$10,000 Up To \$100,000

- **New Section and Content added concerning “Minor Construction Costing More Than \$10,000 up to \$100,000.”**

9.3.8 Use of DEB Contracts

9.3.9 Construction up to \$1,000,000

- **Added “When utilizing the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors the requirements of section 9.3.6 do not apply.”**

9.3.10 Separate Contracts for Material And/Or Equipment

- **Moved Section and Content from Section 7.6 to Section 9.3.10**

9.3.11 Procurement of Furnishings and Loose Equipment

- **Moved Section and Content from Section 7.7 to Section 9.3.11**

9.3.12 Built-In Equipment

- **Moved Section and Content from Section 7.8 to Section 9.3.12**

9.3.13 Rock Excavation

- **Moved Section and Content from Section 7.14 to Section 9.3.13**

9.3.15 Pre-Bid Conference

9.3.16 General Requirements

9.3.17 Addenda to the Bid Documents

- **Removed in Paragraph 3 “which can be covered in a one page Addendum.”**

9.3.18 Political Contributions Prohibited During Procurement Process

9.3.19 Receipt of Bids

- **Added requirements and updates concerning receiving of bids in the University’s e-builder system.**

Section 9.4 Bid Opening

9.4.1 Bid Opening

- **Added requirements and updates concerning opening of bids in the University’s e-builder system.**

Section 9.5 Provisions for Negotiating with Low Bidder

Section 9.6 Authority to Award Capital Outlay Project Contract

- Revised 15% to 25%.

Section 9.7 Execution of Contract

9.7.1 Protest of Award or Decision to Award

- Removed reference to Code of Virginia and updated it to “Governing Rules § 50”.

9.7.2 Stay of Award During Protest (Rules § 52):

9.7.3 Notices to Proceed

- Updated to state, “Will be issued by the VCCO after the execution of the Construction Contract. Bonds and insurance certificates will have to be submitted and reviewed by Legal Counsel before the first payment is requested. No construction can begin until the Building Permit has been issued.”

Section 9.8 Construction Contract Administration

9.8.1 General

9.8.2 A/E Construction Period Services

9.8.3 Construction Program Management

Section 9.9 Bonds & Insurance

- Added “Insurance” to Section Title.

9.9.1 Bid Bonds

9.9.2 Performance Bond and Labor and Materials Payment Bond

9.9.3 Commonwealth Self-Bonding Program

9.9.4 Builder’s Risk Insurance

- Added new section and requirements for “Builder’s Risk Insurance”.

Section 9.10 Pre-Construction Meeting

Section 9.11 Monthly Pay Meetings

Section 9.12 Other Meetings

Section 9.13 Schedule of Values & Certification of Payment

- Added Requirement and link for e-builder, “The HECO-12 submission is required to be made within the University’s web-based project management software, e-builder. Directions on this process can be found at the following link: <https://gmufacilities.freshdesk.com/support/solutions/folders/33000208553>.”

9.13.1 GCPay

- GC-Pay is now “optional” for pool-funded projects that include funds provided by the Six-Year Capital Outlay Plan Advisory Committee.

9.13.2 Payment for Stored Materials

- Provided link to Facilities website for a sample format for a Supplementary agreement for off-site storage of materials or equipment.

Section 9.14 Inspection of Work

9.14.1 General

- Added references to Construction Field Representative (CFR) throughout (in lieu of Project Inspector).

9.14.2 “Commissioning” Inspection of HVAC Systems

9.14.3 Structural Inspections

9.14.4 Other Inspections

9.14.5 Fire Marshal Inspections

Section 9.15 Construction Change Orders

- Revised percentage for Board of Visitors approval from 10% to 25%.

- Added e-Builder requirements.

Section 9.16 Documentation of “As Built” Conditions

Section 9.17 Inspection for Substantial Completion

Section 9.18 Beneficial Occupancy

Section 9.19 Beneficial Occupancy – Renovations with no Change of Use

Section 9.20 Final Completion Inspection

Section 9.21 Project Close Out

Section 9.22 Record Drawings and Specifications

Section 9.23 Maintenance & Operation Manuals

Section 9.24 Ownership of Documents

Section 9.25 Contractual Disputes

Section 9.26 Debarment and Enjoinment

- Removed Code Reference and replaced with “Governing Rules 18”.

CHAPTER 10: SPECIAL PROCEDURES

Section 10.1 General

- Replaced VAPPA references with Governing Rules references throughout.
- Added last sentence to section, “The University shall report on selected project delivery methods annually or as required by law or upon request by DGS”.

Section 10.2 Design Build Procedures

- Added additional requirements to Item 2. Procedure for Approval to Use D/B.” Including new considerations when selecting the procurement method and submission requirements.
- Added additional requirements to Item 3b. Selection of Qualified Offeror (Step One).
- Added additional requirements to Item 3c. Selection of Design Build Contractor (Step Two).

Section 10.3 Construction Management Procedures

- Added Definition of Construction Management (CM) contract to Item 1.
- Added additional requirements to Item 2. Criteria for Use of Construction Management. Including new considerations when selecting the procurement method and submission requirements.
- Added Additional requirements to Item 3. Procedure for Approval to Use Construction Management regarding submission requirements.
- Added Additional requirements to Item 4 CM Procurement Qualification Procedures.

Section 10.4 Public Private Partnership (PPEA) Selection Process

Section 10.5 Energy Based Contracts (ESCO)

Section 10.6 Emergency Construction Procurement

Section 10.7 Pre-Qualification Procedures

10.7.1 Objective

10.7.2 Forms

10.7.3 Building Committee

10.7.4 Denial of Prequalification

10.7.5 Written Notification

10.7.6 Establishing Contractor Qualification Criteria

- Removed “Qualification Criteria I, II, III V and VI.....” below Item 10.

10.7.7 References

10.7.8 Advertisement for Bids

CHAPTER 11: BUILDING OFFICIAL REVIEWS, PERMITS AND APPROVALS

Note: This Chapter has been extensively edited to reference the policies, procedures, and requirements of Mason's OUBO department. Most references to DEB are replaced by OUBO throughout.

Section 11.1 General

11.1.1 Building Official

- Revised to add OUBO as the Building Official in accordance with the Code of Virginia and OUBO Charter in Appendix P.
- Removed references to DEB and language concerning DEB acting as University's building official.
- Removed section and content (originally 11.1.2 of prior version of HECO Manual) concerning "Building Maintenance Official" as this has been replaced by the OUBO.

Section 11.2 Building Permit Procedure for Construction – State Owned Buildings & Structures

- Changed Title from "Building Permit Policy for Construction – State Owned Buildings & Structures" to "BUILDING PERMIT PROCEDURE FOR CONSTRUCTION – STATE OWNED BUILDINGS & STRUCTURES"

Section 11.3 Annual Permits

11.3.1 Annual Permits

~~11.3.2 Agency Representative~~ ~~Removed in its entirety~~

Section 11.4 Temporary Structures (Tent, Stage, Platform, Bleachers, & Other Structures)

11.4.1 Application for Permit

- Updated to state that applications must be submitted to the "Environmental Health and Safety (EHS) Office" instead of the Building Official.

11.4.2 Art and Architectural Review Board (AARB)

- Section 11.4.2 Seasonal/Multiple Function Permit has been struck in its entirety and this section is now "Art and Architectural Review Board (AARB)."

~~11.4.4 Tent Permit Requirements~~ ~~Removed in its entirety~~

~~11.4.5 Stage/Platform/Bleachers Permit Requirements~~ ~~Removed in its entirety~~

~~11.4.6 Permit Exceptions~~ ~~Removed in its entirety~~

~~11.4.7 Other Temporary Structures~~ ~~Removed in its entirety~~

Section 11.5 Industrialized Buildings

11.5.1 Application for Permit

11.5.2 AARB Requirements

11.5.3 Industrialized Buildings without a Virginia Registration Seal

11.5.4 Procurement Guidance

- Updated to "Procure the building in accord with HECO requirements, Governing Rules or VPPA where applicable, or by a standard lease."

Section 11.6 Towers

11.6.1 Application for Permit

11.6.2 AARB Requirement

Section 11.7 Other Structures (Flagpoles, Antennae, Fences, and Miscellaneous)

11.7.1 Flagpole/Antennae

11.7.1.1 Application for Permit

11.7.1.2 AARB Requirements

11.7.2 Fences

11.7.2.1 Application for Permit

11.7.2.2 AARB Requirements

11.7.3 Miscellaneous Structures

- **References to DEB replaced with OUBO.**

~~Section 11.8 Codes and Standards Compliance Disputes~~ **Removed in its entirety**

CHAPTER 12: PROJECT COMMITTEES

Note: Held in Reserve – Currently no content

Section 12.1 Project Committees

Section 12.2 Architect Selection Committee

Section 12.3 Building Committee

Section 12.4 Steering Committee

CHAPTER 13: MASTER PLANS, SITE, AND DESIGN GUIDELINES

Section 13.1 Master Plans

Section 13.2 Other Master Plans & Requirements

CHAPTER 14: PLANNING AND PROJECT APPROVAL

Section 14.1 General

- **Updated to include e-builder submission requirements. “In lieu of the CO-4, CO-5, CO-6, CO-8 submitted in the BITS system for legislatively approved capital projects, at each milestone of design (schematic, preliminary, construction documents, and construction award) for locally approved capital projects a revised HECO-2 will be submitted in the e-builder system to be approved by the Executive Vice President for Administration and Finance or their delegate. CO-4, CO-5 and CO-6 are only applicable to Design-Bid-Build General Funded projects.”**

Section 14.2 Capital Project Planning

- **Added the 10 Steps (Process) related to the Capital Outlay Program.**

Section 14.3 Project Authorization

Section 14.4 Project Execution

Section 14.5 Order of Procedures

14.5.1 Acquisitions of Real Property

14.5.2 Demolition

- **Added requirement, “It shall be the policy of the University to consider the environmental and historical aspects of any proposed demolitions including any necessary reviews by the Department of Historic Resources and the Art and Architectural Review Board in accordance with state historic preservation requirements generally applicable to capital projects in the Commonwealth. Further, for any property that was acquired or constructed with funding from a general fund appropriation of the General Assembly or from proceeds from state tax-supported debt, general laws applicable to state-owned property shall apply.”**

14.5.3 Temporary Facilities

14.5.4 Construction Projects

- **Moved procurement strategy requirements from Item 3 (in original manual) to Item 1. Item 1. now has procurement strategy and associated points a.-e.**

- Removed “Division of Soil and Water Conservation” from Point 5.
- Updated Table outlining “Authority to Initiate Capital Outlay Project” including HECO Forms, Titles/Roles, and BOV (Scope or Budget) from 10% to 25%.

CHAPTER 15: REPORTING

- **Updated Title from “Reports” to “Reporting”**

Section 15.1 Major Capital Reporting

- **Added “the Assessment of Institutional Performance” to reporting requirements.**

Section 15.2 Capital Outlay Progress Report

- **Added Paragraph 2 and reporting instructions 1-4.**

Section 15.3 Value Engineering Utilization Report

- **Added Item 3. Requirement concerning report submission deadlines.**

Section 15.4 Construction Procurement Report

Section 15.5 Assessment of Institutional Performance

- **New Section and new content/requirements.**

Section 15.6 Completed Capital Projects Reports:

- **New Section and new content/requirements.**

Section 15.7 VEES Energy Report

- **New Section and new content/requirements.**

CHAPTER 16: FINANCIAL PROCESS

- **New Chapter held in reserve for outlining Financial Processes**

APPENDICES

A General Conditions of the Construction Contract and Supplemental General Conditions

- **Added a Crosswalk Table to crosswalk the DGS forms to the HECO forms referenced in the CO-7DB.**

B Standard Higher Education Capital Outlay Forms.

C Standard Higher Education Formats

D Basis of Design Narrative and Systems Checklist

E Cost Estimate

F Checklist for Receiving and Opening Bids

- **Added Item 2. “Electric Responses Through Mason’s Construction Management Software Program, e-Builder (Using the Bidding Portal).**

G Roof Inspection Forms and Procedures

H Construction Outreach Process

- Added Content for Construction Outreach Process (Appendix was originally “Reserved”)

I Parameters for Calculation of Life Cycle Costs and Energy Analyses

J Utility Marking Process

- Added Content for Utility Marking Process (Appendix was originally “Reserved”)

K Construction Change Order Procedure Guidelines

L Art and Architectural Review Board and Board of Visitors

M Structural and Special Inspections

N Duties of the Construction Field Representative (CFR)

- Changed title from “Duties of the Project Inspector” and adjusted to “Duties of the Construction Field Representative (CFR). New roles/responsibilities added and content updated.

O Project Types and Non Capital Outlay Project Procedures

P Office of University Building Official Charter

- Content and chapter modified to incorporate the Charter and Procedures of the Office of University Building Official (OUBO).

Q Record Document Standards and Formatting

R Archiving Documents Standards

- Added Content for Archiving Documents Standards (Appendix was originally “Reserved”)

S Project Closeout Procedures

- Added Content for Project Closeout Requirements (Appendix was originally “Reserved”)

T RESERVED

- Held in Reserve. Moved HECO Manual Revision History to Appendix W.

U OUBO Electronic Document Review (EDR) Process Document Submittal Requirements

- Added Content for OUBO EDR Process Document & Submittal Requirements (Appendix was originally “Reserved”)

V Virginia Energy Conservation and Environmental Standards (VEES)

- Added Content for Virginia Energy Conservation and Environmental Standards (VEES) and removed language/Appendix for “Real Property Transactions (Capital Outlay, Acquisitions and Leases).

W HECO Manual Revision History

- Moved from Appendix T to Appendix W. Captured all major changes from Original 2013 version of HECO Manual up until current publishing (02/04/2023).