

FORWARD

HIGHER EDUCATION CAPITAL OUTLAY

MANUAL

June 30, 2006

This Revision IV to the Second Edition of the Higher Education Capital Outlay Manual marks a significant milestone in the University of Virginia's achievement of delegated authority over its capital construction program and lease approval processes which began in 1996 when the General Assembly authorized delegation of post-appropriation management of non-general fund capital projects, and administration of real property leases to certain institutions of higher education as a two year pilot project. The General Assembly Session continually extended the pilot project. The 2005 General Assembly Session passed the Restructured Higher Education Financial and Administrative Operations Act Chapter 933 (the Act) which made permanent those pilot delegations as well as providing further autonomy to the University of Virginia for implementation of non-general fund and also general fund capital projects and administration of real property leases. The 2006 General Assembly Session passed legislation containing the Management Agreement By and Between the Commonwealth of Virginia and the University of Virginia (the Management Agreement) as required by the Act which further defined and specified the policy and rules governing the additional autonomy granted by the Act.

The 1996 General Assembly also separately legislated considerable autonomy to the University of Virginia Medical Center for implementation of non-general fund capital projects and administration of real property leases which remains in place.

This Revision IV to the Second Edition of the Higher Education Capital Outlay Manual incorporates all of the provisions of the Act and the Management Agreement and implements the policies and procedures of the University of Virginia.

The policies and procedures have also been written to permit editing for application to other institutions of higher education. University of Virginia representatives will continue to work with other institutions to improve and further this effort for the benefit of higher education.

**Colette Sheehy
Vice President for Management and Budget
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TABLE OF CONTENTS

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

CHAPTER 1: INTRODUCTION

- SECTION 1.1** GENERAL
- SECTION 1.2** DESIGN PHILOSOPHY
- SECTION 1.3** FORMS
- SECTION 1.4** INDEX

CHAPTER 2: TERMS AND DEFINITIONS

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 Businesses
- SECTION 3.3** PROFESSIONAL SERVICES
- SECTION 3.4** TAXPAYER IDENTIFICATION NUMBER
- SECTION 3.5** RELATIONSHIP OF ARCHITECT / ENGINEER TO UNIVERSITY
- SECTION 3.6** UNIVERSITY HIGHER EDUCATION CAPITAL OUTLAY MANUAL
- SECTION 3.7** "DESIGN-NOT-TO-EXCEED" COST AS RELATED TO A/E CONTRACT
- SECTION 3.8** CODE AND REGULATORY COMPLIANCE
- SECTION 3.9** A/E LIABILITY INSURANCE, DESIGN ERRORS AND/OR OMISSIONS AND RECORDS RETENTION
- SECTION 3.10** OTHER INSURANCE REQUIRED OF THE A/E
- SECTION 3.11** OWNERSHIP OF DOCUMENTS AND MATERIALS
- SECTION 3.12** STANDARD PLANS
- SECTION 3.13** REQUIREMENTS FOR A/E SEALS AND SIGNATURES
- SECTION 3.14** SUBCONTRACTS
- SECTION 3.15** MODIFICATIONS OF THE A/E CONTRACT (A/E CHANGE ORDERS)
- SECTION 3.16** PAYMENTS TO THE ARCHITECT / ENGINEER
- SECTION 3.17** PAYMENTS BY ARCHITECT/ 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**
- SECTION 3.23 ASSIGNMENT OF CONTRACT**
- SECTION 3.24 ANTITRUST**
- SECTION 3.25 ETHICS IN PUBLIC CONTRACTING (§2.2-4367 ET SEQ., CODE OF VIRGINIA)**
- SECTION 3.26 ANIT-DISCRIMINATION**
- SECTION 3.27 CONTRACTUAL DISPUTES (UNIVERSITY PROCUREMENT RULES)**
- SECTION 3.28 APPLICABLE LAW AND COURTS**
- SECTION 3.29 PROHIBITION OF ALCOHOL AND OTHER DRUG AT WORKPLACE**
- SECTION 3.30 DESIGN OF SECURITY SYSTEMS**
- SECTION 3.31 USE OF STANDARD FORMS AND FORMATS**
- SECTION 3.32 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**
- SECTION 4.3 PROJECT SCOPE OF WORK**
- SECTION 4.4 ADVERTISEMENT FOR PROFESSIONAL SERVICES**
- SECTION 4.5 REQUESTS FOR PROPOSAL (RFP)**
- SECTION 4.6 SMALL BUSINESS and BUSINESSES OWNED BY WOMEN and MINORITIES**
- SECTION 4.7 SWAM PROCUREMENT PLAN**
- SECTION 4.8 PROCEDURES FOR A/E SELECTION**
 - 4.8.1 Small Fees**
 - 4.8.2 Capital Projects**
- SECTION 4.9 TERM A/E CONTRACTS**
- SECTION 4.10 TERM PROJECT MANAGEMENT CONTRACTS**
- SECTION 4.11 CONTRACT FORMS TO BE USED**
- SECTION 4.12 GENERAL TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES**

CHAPTER 5: BASIC SERVICES AND RESPONSIBILITIES

- SECTION 5.1 RESPONSIBILITIES OF THE UNIVERSITY TO THE A/E**
- SECTION 5.2 QUALITY OF WORK**
- SECTION 5.3 BASIC SERVICES OF THE A/E**
 - 5.3.1 General**
 - 5.3.2 Special Consultants**
 - 5.3.3 Reimbursable Expenses**
 - 5.3.4 Meeting Notes**
 - 5.3.5 Project Initiation Phase**
 - 5.3.6 Preliminary Design Phase**
 - 5.3.7 Contract Document Phase**
 - 5.3.8 Bidding Phase**
 - 5.3.9 Construction Phase**
- 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**

CHAPTER 6: FEES AND PAYMENTS FOR A/E SERVICES

- SECTION 601.0 ARCHITECTURAL AND ENGINEERING FEES**
- SECTION 602.0 A/E FEE PROPOSAL STANDARDS AND GUIDES**
- SECTION 603.0 A/E FEE PROPOSAL WORKSHEET (DEPARTMENT OF GENERAL SERVICES FORM CO-2.3)**
- SECTION 604.0 PROPORTIONING OF THE A/E FEE AND PAYMENTS**
- SECTION 605.0 DETERMINING CHARGES FOR CHANGES IN THE SCOPE OF WORK**
- SECTION 606.0 CHANGES TO A/E CONTRACT**

CHAPTER 7: ENGINEERING AND TECHNICAL CRITERIA

PART 7A CODES AND POLICY

- SECTION 7A.1 BUILDING CODES**
- SECTION 7A.2 DESIGN STANDARDS FOR ACCESSIBILITY (State-Owned Facilities)**
- SECTION 7A.3 SPECIAL PROCEDURES FOR ASBESTOS ABATEMENT**
- SECTION 7A.4 SPECIAL PROCEDURES FOR LEAD BASED PAINT ABATEMENT**
- SECTION 7A.5 SEPARATE CONTRACTS FOR MATERIAL AND/OR EQUIPMENT**
- SECTION 7A.6 PROCUREMENT OF FURNISHINGS AND LOOSE EQUIPMENT**
- SECTION 7A.7 BUILT-IN EQUIPMENT**
- SECTION 7A.8 UNDERGROUND STORAGE TANK SYSTEMS (USTS) AND ABOVEGROUND STORAGE TANKS (AST)**
- SECTION 7A.9 CHESAPEAKE BAY PROGRAM**

PART 7B SPECIAL BUILDING PLANNING REQUIREMENTS

- SECTION 7B.1 GUIDELINES FOR OFFICE SPACE PLANNING**
- SECTION 7B.2 MINIMUM DESIGN LOADING FOR BUILDINGS**
- SECTION 7B.3 ADDITION OF LOADS TO EXISTING STRUCTURES**
- SECTION 7B.4 DESIGN CHECKLIST FOR CRIME PREVENTION**

PART 7C CIVIL & SITEWORK

- SECTION 7C.1 EARTHWORK**
- SECTION 7C.2 STORMWATER MANAGEMENT & EROSION AND SEDIMENT CONTROL REQUIREMENTS**
- SECTION 7C.3 ROCK EXCAVATION**
- SECTION 7C.4 MINIMUM STANDARDS FOR PARKING SPACES**
- SECTION 7C.5 POLICY FOR PARKING SPACE PLANNING**

PART 7D CONCRETE - Cast-in-Place

PART 7E METALS - Steel roof deck

PART 7F THERMAL & MOISTURE PROOFING

- SECTION 7F.1 WATERPROOFING & DRAINAGE FOR SUBSURFACE STRUCTURES**
- SECTION 7F.2 ROOFING POLICY**
- SECTION 7F.3 SPRAYED-ON FIREPROOFING DESIGN & SPECIFICATION**

PART 7G VERTICAL TRANSPORTATION - Elevators

PART 7H MECHANICAL

- SECTION 7H.1 MECHANICAL DESIGN STANDARDS**
- SECTION 7H.2 STEAM AND HOT WATER DISTRIBUTION SYSTEMS**
- SECTION 7H.3 CHEMICAL CLEANING & CHEMICAL WATER TREATMENT OF BOILERS & HVAC SYSTEMS**
- SECTION 7H.4 BUILDING AUTOMATION SYSTEMS AND PROCUREMENT PROCEDURES**
- SECTION 7H.5 FIRE AND SMOKE DAMPERS**
- SECTION 7H.6 FIRE SEPARATION FOR EQUIPMENT**
- SECTION 7H.7 PIPING & EQUIPMENT COLOR CODE SCHEDULES**
- SECTION 7H.8 PRESSURE VESSELS**

PART 7I ELECTRICAL

- SECTION 7I.1 TEMPORARY ELECTRICAL SERVICE**
- SECTION 7I.2 GROUND-FAULT CIRCUIT-INTERRUPTER(GFCI) PROTECTION**
- SECTION 7I.3 LIGHTING LEVELS**
- SECTION 7I.4 ELECTRICAL EQUIPMENT**
- SECTION 7I.5 BUS DUCT INSTALLATIONS**
- SECTION 7I.6 FIRE PUMPS**
- SECTION 7I.7 LIGHTNING PROTECTION SYSTEMS**
- SECTION 7I.8 CLASS 2 AND 3 ELECTRICAL CABLES**
- SECTION 7I.9 TELECOMMUNICATION CABLING STANDARDS**

CHAPTER 8: PROJECT DESIGN STANDARDS AND REQUIREMENTS

- SECTION 8.1 GENERAL**
- SECTION 8.2 DRAWING STANDARDS**
- SECTION 8.3 SPECIFICATION STANDARDS**
 - 8.3.1 General**
 - 8.3.2 Project Manual/Specification Arrangement**
 - 8.3.3 General Conditions of the Construction Contract**
 - 8.3.4 Instructions to Bidders**
 - 8.3.5 Types of Specifications**
 - 8.3.6 Virginia Manufactured Products**
 - 8.3.7 Use of Standard or Guide Specifications**
 - 8.3.8 Restrictive Specifications and Performance Requirements**
 - 8.3.9 Equal Materials, Equipment or Assemblies**
 - 8.3.10 Substitute Materials, Equipment or Assemblies**
 - 8.3.11 Unit Prices**
 - 8.3.12 Specifying New Types of Materials Equipment or Systems**
 - 8.3.13 Phraseology**
 - 8.3.14 Specifications on CD**
 - 8.3.15 Hardware Specifications and Schedules**

SECTION 8.4 COST ESTIMATE STANDARDS
SECTION 8.5 DESIGN INITIATION/PRE DESIGN CONFERENCE
SECTION 8.6 SCHEMATIC DESIGN/PROJECT CRITERIA
SECTION 8.7 PRELIMINARY DESIGN (DESIGN DEVELOPMENT PHASE)
SECTION 8.8 CONSTRUCTION DOCUMENTS PHASE
SECTION 8.9 BID FORMS AND PROCEDURES
SECTION 8.10 ADDITIVE BID ITEMS
SECTION 8.11 SUBMISSIONS
SECTION 8.12 UNIVERSITY REVIEW UNIT AND REVIEWS AND APPROVALS
SECTION 8.13 QUALITY CONTROL/QUALITY ASSURANCE
SECTION 8.14 VALUE ENGINEERING (VE)
SECTION 8.15 STRUCTURAL AND SPECIAL INSPECTIONS
SECTION 8.16 COMMISSIONING OF HVAC SYSTEMS
SECTION 8.17 FIRE PROTECTION SHOP DRAWINGS
SECTION 8.18 PARTNERING

CHAPTER 9: DESIGN COORDINATION AND QUALITY ASSURANCE

SECTION 9.1 DESIGN COORDINATION
SECTION 9.2 QUALITY ASSURANCE CHECKLIST

CHAPTER 10: CONSTRUCTION PROCUREMENT & ADMINISTRATION

SECTION 10.1 GENERAL

SECTION 10.2 CONSTRUCTION BIDS

10.2.1 Instruction to Bidders
10.2.2 Virginia Construction Contracting Officer
10.2.3 Authorization to Advertise for Bids and Building Permits
10.2.4 Preparation
10.2.5 Intentionally left blank
10.2.6 Advertising
10.2.7 Pre Bid Conference
10.2.8 Addenda to the Bid Documents
10.2.9 Receipt of Bids

SECTION 10.3 BID OPENING

10.3.1 Non Medical Center
10.3.2 Medical Center

SECTION 10.4 PROVISIONS FOR NEGOTIATING WITH LOW BIDDER

SECTION 10.5 AUTHORITY TO AWARD A CAPITAL OUTLAY PROJECT CONTRACT

SECTION 10.6 EXECUTION OF CONTRACT - Protests

SECTION 10.7 CONSTRUCTION CONTRACT ADMINISTRATION

10.7.1 General
10.7.2 A/E Construction Period Services
10.7.3 Construction Administration Management

SECTION 10.8 PRE CONSTRUCTION MEETING

SECTION 10.9 MONTHLY PAY MEETINGS

SECTION 10.10 OTHER MEETINGS

SECTION 10.11 SCHEDULE OF VALUES AND CERTIFICATION OF PAYMENT

SECTION 10.12 INSPECTION OF WORK

- 10.12.1 General
- 10.12.2 Commissioning Inspection of HVAC Systems
- 10.12.3 Start up/Acceptance of MECHANICAL AND ELECTRICAL Systems
- 10.12.4 Structural Inspections
- 10.12.5 Other Inspections
- 10.12.6 Fire Marshal Inspections

- SECTION 10.13 CONSTRUCTION CHANGE ORDERS
- SECTION 10.14 DOCUMENTATION OF "AS BUILT" CONDITIONS
- SECTION 10.15 INSPECTION FOR SUBSTANTIAL COMPLETION
- SECTION 10.16 BENEFICIAL OCCUPANCY
- SECTION 10.17 FINAL COMPLETION INSPECTION
- SECTION 10.18 PROJECT CLOSE OUT
- SECTION 10.19 RECORD DRAWINGS AND SPECIFICATIONS
- SECTION 10.20 MAINTENANCE AND OPERATING MANUALS
- SECTION 10.21 OWNERSHIP OF DOCUMENTS
- SECTION 10.22 CONTRACTUAL DISPUTES

CHAPTER 11: SPECIAL PROCEDURES

- SECTION 11.1 GENERAL
- SECTION 11.2 DESIGN BUILD PROCEDURES
- SECTION 11.3 CONSTRUCTION MANAGEMENT PROCEDURES
- SECTION 11.4 COMPETITIVE NEGOTIATION PROCEDURES
- SECTION 11.5 PRE QUALIFICATION PROCEDURES
- SECTION 11.6 EMERGENCY PROCEDURES

CHAPTER 12: THE BUILDING COMMITTEE

- SECTION 12.1 COMMITTEE MAKE UP
- SECTION 12.2 COMMITTEE RESPONSIBILITIES

CHAPTER 13: MASTER PLANS AND SITE AND UTILITY DRAWINGS

- SECTION 13.1 MASTER PLANS
- SECTION 13.2 SITE AND UTILITY DRAWINGS
- SECTION 13.3 OTHER MASTER PLANS AND REQUIREMENTS

CHAPTER 14: PLANNING AND PROJECT APPROVAL

- SECTION 14.1 GENERAL
- SECTION 14.2 PLANNING
- SECTION 14.3 PROJECT AUTHORIZATION
- SECTION 14.4 PROJECT EXECUTION
- FIGURE 14.1 ORDER OF PROCEDURES

CHAPTER 15: REPORTS

- SECTION 15.1 MAJOR CAPITAL REPORTING
- SECTION 15.2 MEASUREMENTS REPORTS
- SECTION 15.3 TRANSACTION COPIES

APPENDICES

- A** General Conditions of the Construction Contract (Form HECO-7), Supplemental General Conditions and Standard Instructions to Bidders (Form HECO-7A), General Conditions of the Design Build Construction Contract (Form HECO-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
- G** Roof Inspection Forms and Procedures
- H** Pre Construction Conference Agenda
- I** Parameters for Calculation of Life Cycle Costs and Energy Analyses
- J** Samples of Forms and Formats
- K** Construction Change Order Procedure Guidelines
- L** Art & Architectural Review Board and Board of Visitors
- M** Structural and Special Inspections
- N** Duties of the Project Inspector
- O** Project Types & Non Capital Outlay Project Procedures
- P** Building Permit Policy
- Q** University of Virginia Procedure for Resolution of Contractual Claims
- R** Determinations and Findings
- S** Not Used (Reserved)
- T** Not Used (Reserved)
- U** Not Used (Reserved)
- V** Real Property Transactions (Capital Outlay and Leases)
- W** Supporting Documents

CHAPTER 1: INTRODUCTION

SECTION 1.1 GENERAL

The University of Virginia Higher Education Capital Outlay Manual (hereafter referred to as the Manual) for capital projects contains guidance, procedures and policy that must be followed in the execution of 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. Supporting documentation concerning the enabling legislation and delegation of authority is in Appendix W.

The University of Virginia Higher Education Capital Outlay Manual sets forth the policies authorized by the Restructured Higher Education Financial and Administrative Operations Act, Chapter 4.10 (§23-38.88 et seq) of Title 23 of the Code of Virginia.

Deviations from the policy and procedures outlined within shall be requested by a Determination and Findings (D&F) and must have prior approval of the University of Virginia Chief Facilities Officer. The D&F shall justify and substantiate the need for the deviation. All deviations so provided shall be consistent with the authorities provided Agency 209 in the Medical Center Codified Autonomy of Virginia, VA Code §23-77.4 and by the Procurement Rules of the Management Agreement; and with the authorities provided Agency 207 and 246 by the Procurement Rules of the Management Agreement.

- 1.1.1** 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.
- 1.1.2** The Facilities Planning and Construction (FP&C) department, Facilities Management is responsible for maintenance of the Manual. Suggestions for changes, notification of conflicting guidance, questions and requests for copies should be addressed to:

Facilities Planning and Construction
Facilities Management
575 Alderman Road, Room 115, P. O. Box 400726
Charlottesville, Virginia 22904-4726
(434) 982-4621; FAX (434) 982-4628

The Manual including errata corrections will be posted on the University of Virginia FP&C Website and may be downloaded and printed by the users.

Revisions to the Manual will be issued electronically by posting on the UVA – FP&C Website. Changes or revisions will be marked or identified in the Manual where they occur. The revision package will contain a summary sheet generally describing the changes or revisions made and the summary sheet will describe the marking or identification used with that revision. The summary sheet will be numbered and dated. The summary sheet will become a permanent part of the Manual and is to be placed after the Table of Contents and before this chapter and before any previous summary sheet. Paper copies of the Revisions will not be issued.

SECTION 1.2 DESIGN PHILOSOPHY

The design goal is to create a capital investment that meets the user’s functional requirement 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, Facilities Design Guidelines, 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 of the surrounding buildings and site. 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 1.3 FORMS

University of Virginia 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 with electronic links and also on the FP&C Website. The address is "fm.virginia.edu/fpc/".

Select "HECO Forms" from the FP&C Website. More specific instructions are on the form download page.

DGS Forms referenced in the Manual are available electronically at <http://forms.dgs.state.va.us/>

SECTION 1.4 INDEX

This Manual is posted on the UVA-FP&C Website, (URL is <http://www.fm.virginia.edu/docs/fpc/heco> and is fully text searchable. Therefore, no index is provided for the Manual.

CHAPTER 2: TERM AND DEFINITIONS

SECTION 201.0 GENERAL

This chapter is designed to acquaint UVA 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 University of Virginia's Higher Education 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.

SECTION 202.0 DEFINITIONS

Whenever used in the HECOM, 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. VBO/ eVA] and by "Posting the Notice" (University of Virginia Management Agreement).

A/E Contract: The Form of Agreement (HECO-3, HECO-3.1, HECO-3.2) 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 are no longer applicable. The A/E Manual, when printed in any document or manual shall refer to the University of Virginia Higher Education Manual HECOM, 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.

Agency: The University of Virginia, including Agency 207 (Academic Division), Agency 209 (Medical Center Division), and Agency 246 (The University of Virginia's College at Wise). Throughout this Manual, Agency, University of Virginia and owner are synonymous.

Agency 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 Agency. The University's Chief Facilities Officer has been delegated this authority.

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. Also referred to as the A/E.

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.

Architect/Engineer (A/E): The term used to refer to the architect and/or engineer who contracts with the Owner 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 Owner. This term also includes any associates or consultants employed by the A/E to assist the A/E in providing services.

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 Owner 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.

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. 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 Beneficial Occupancy, unless otherwise specified in the Supplemental General Conditions or by separate agreement.

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.

Building: Any roofed or occupiable structure.

Capital Project Committee: The group constituted by the University in accordance with the requirements of Chapter 12 of the Manual and with the authority and purpose to review and advise in the planning and design of capital projects and other professional services required by the University.

Building Official: The Building Official for all University of Virginia buildings (i.e. all buildings on state property) is the Deputy Chief Facilities Officer. The University's Deputy Chief Facilities Officer is also delegated authority by the Board of Visitors to issue building permits for construction work regulated by the VUSBC. Also referred to as the University Building Official.

Building Permit: All work on University buildings and structures will be done in accordance with the Virginia Uniform Statewide Building Code (VUSBC) and other applicable codes and standards. Accordingly all University projects will be reviewed and permits issued in accordance with the University Building Official's "Building Permit Policy for Construction, University Owned Buildings & Structures" as delineated in the University of Virginia Facilities Management Directive 562 series (Appendix P).

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, any of which meets the criteria in Chapter 14 of the Manual. (For the purposes of this manual, a capital project is defined as a project involving any acquisition or exceeding \$1,000,000 or exceeding new construction of 5,000 square feet. Projects less than the above are considered non-capital (ref: Appendix O).)

Change Order: A document (HECO-11) issued on or after the effective date of the Contract (CO-9) agreed to by the Contractor and approved by the Owner 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, (HECO-7). A Change Order, once signed by all parties, is incorporated into and becomes part of the Contract.

Chief Facilities Officer: The person designated in writing by the Agency Head as being delegated authority to award and sign contracts, change orders and other documents related to capital outlay projects for the University. This person is responsible for Facilities Management activities at the University of Virginia. May also be called the Contracting Officer.

Code Official: The person designated in writing by the Agency Head as being delegated authority to approve applications for Certificates of Use and Occupancy and Building Permits. Also referred to as the University Code Official. **Competitive Negotiations:** A method of Contractor selection that includes the following two elements (University Procurement Rules. See Chapter 11 of the Manual for further descriptions.):

- a. 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.
- b. 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 [VBO/eVA].

Competitive Sealed Bidding: A method of contractor selection that includes the following elements (University Procurement Rules:

- a. Issuance of a written Invitation to Bid (IFB) containing or incorporating by reference the specifications and contractual terms and conditions applicable to the procurement.
- b. Public notice of the IFB at least ten (10) days prior to the date set for receipt of bids by posting in a designated public area and by publication of the public announcement or “Notice” of the availability of the Invitation For Bids (i.e. bid documents or IFB) on the public e-procurement Web site designated by the Department of General Services [i.e. VBO/eVA]. Bids may be solicited solely from Contractors who have prequalified. (University Procurement Rules). In addition, bids may be solicited directly from potential contractors. Any additional solicitations shall include businesses selected from a list made available by the Department of Minority Business Enterprise (DMBE).
- c. Public opening and announcement of all bids received.
- d. Evaluation of bids based upon the requirements set forth in the invitation.

- e. Award to the lowest responsive and responsible bidder.
- f. Competitive sealed bidding shall not be used for procurement of Professional Services as defined in this Manual.

Competitive Sealed Bidding (Medical Center): A method of contractor selection which may include the following elements:

- a. Issuance of a written Invitation to Bid.
- b. Public notice of the Invitation to Bid at least ten days prior to the date set for receipt of bids, by posting in a designated public area and by publication in a newspaper of general circulation. In addition, bids may be solicited directly from potential contractors.
- c. Private opening and public announcement of final prices.
- d. Evaluation of bids based upon the requirements set forth in the invitation.
- e. Award to the lowest responsive and responsible bidder if within budgeted amount.
- f. This procedure shall not be used for procurement of professional services.

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 Administration (CA): As used in this Manual, this term means nonprofessional 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 Construction Administrator is the entity responsible to the University for providing 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.

Construction Management (CM): 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 11 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. Also called the CM/GC, or the 'Contractor' for the CM project, or CM-Agent (CMA) when used for administering the project.

Construction Administration Manager: The University employee 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: The duties and responsibilities normally performed by the A/E as his construction phase services during the construction phase of a project.

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 (CO-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 Invitation for Bid.

Contract Documents: As used in this Manual and General Conditions of the Construction Contract (HECO-7), this term shall mean the Contract (CO-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 modified by 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 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.

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 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 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).

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 11 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.

Determination and Findings (D&F): A document, usually prepared by the Project Manager, which justifies and substantiates the need for special procedures or actions. Typically this is for a deviation or waiver from standard policies or procedures which results in saving time and/or money and/or improving quality. The Chief Facilities Officer will consider D&F proposals after review and a recommendation by the Director, Facilities Planning and Construction. On Medical Center projects the approval of The Associate

Vice President for Planning and Facilities is required before submittal to the Chief Facilities Officer. See Appendix R for format.

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 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.

Emergency: Any unforeseen situation, combination of circumstances or a sudden occurrence or state resulting there from 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 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: Electronic procurement in VA. The eVA home page address is www.eva.state.va.us.

Extra service: 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 therefore, are authorized by a modification to the A/E Contract using the A/E Change Order, (HECO-11 a/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 Planning and Construction (FP&C): The department in Facilities Management at the University of Virginia responsible for planning, design and construction.

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.

Final Completion Date: The date of the Owner'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 (HECO-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's 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.

General Conditions (GC): The General Conditions of the Construction Contract, HECO-7, latest edition. Also, the General Conditions of the Design Build Contract, HECO-7DB for use with design build contracts.

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

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:

- a. 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;
- b. 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;
- c. 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.
- d. restoration of a facility or structure to the maximum extent possible to its former or original state (historic property);
- e. relocation from one site to another of a facility or structure either intact or by disassembly and subsequent reassembly; and
- f. 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.
- g. 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. (University Procurement Rules)

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. The IFB is the “Invitation to Bid” required by University Procurement Rules.

Landscape Architect: An individual certified by the Commonwealth of Virginia as a ‘Certified Landscape Architect’ by the APELSLA 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.

Liquidated Damages: See Section 43 of the General Conditions of the Construction Contract (HECO-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, costing less than \$1,000,000.
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 the University of Virginia passed by the 2006 General Assembly Session as required by the Restructuring Act and containing further defining controlling policy and rules governing the additional autonomy granted by the Restructuring Act.

Medical Center: For the purposes of this manual, Medical Center is defined as Agency 209.

Memorandum of Understanding (MOU): 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 unless such change has been approved in writing using a D&F by the Chief Facilities Officer and such written approval is attached to the MOU.

Minority-owned/controlled Business: A business enterprise that is owned or controlled by one or more socially or economically disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background, or other similar cause. Such persons are listed on the University of Virginia Procurement Services website or on that of the Department of Minority Business Enterprise, (DMBE) and are defined in detail by the DMBE on their current website.

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; structure
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. (University Procurement Rules)

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. Notice is effective upon such delivery. Notice shall also mean the Notice of Invitation for Bids included in the IFB.

Notice of Award: The written notification by the University to the apparent successful bidder notifying the bidder that it has been awarded the contract, pending the submittal and execution of all documents required in the IFB.

Notice of Intent to Award: The written public posting by the University Facilities Planning & Construction Office of Contract Administration announcing the apparent successful bidder and notifying the bidder and all other bidders that the University intends to award the contract to the apparent successful bidder pending completion of the verification that it is a Responsible Bidder and the receipt and acceptance of all executed documents required in the IFB.

Notice to Proceed: The written notification by the University to the apparent successful bidder notifying the bidder that it has been awarded the contract, pending the submittal and execution of all documents required in the IFB.

On Demand Construction: Procurement of construction services from a pre-selected list of contractors or from University Facilities Management forces; referred to colloquially as “make-buy”.

Owner: For purposes of the Manual, “Owner” shall mean the Rector and Visitors of the University of Virginia or other entity represented by the University of Virginia with whom the Contractor or the A/E has entered into a contractual agreement and for whom the Work or services will be provided, also referred to as “University.”

Owner/Agency/University: For the purposes of this manual, these terms are synonymous.

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 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 in which comments or questions concerning specifications or other provisions in the IFB or RFP can be received and considered (University Procurement Rules). Any response shall be in writing and distributed to all who requested/received the IFB and RFP.

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 (*University Procurement Rules*). See Chapter 11 of the Manual for further descriptions.

Professional Services: For the purposes of the Manuals, 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.

Project Inspector: 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).

project manager: The designated representative of the A/E or the Contractor through whom written decisions and notices are generally conveyed.

Project Manager: As used in the Manual, the “Project Manager” shall be the University’s designated representative for the Project.

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 offerers (University Procurement Rules).

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 (University Procurement Rules).

Responsive Bidder: A person or firm who has submitted a bid which conforms in all material respects to the Invitation to Bid (University Procurement Rules).

Restructuring Act: The Restructuring Higher Education Financial and Administrative Operations Act, Chapter 4.10 (§23-38.88 *et seq*) of Title 23 of the Code of Virginia and in particular §23-38.110 of the Act (See Appendix W).

Review Unit: A staff unit of University Facilities Management consisting of the Senior Review Architect, registered and licensed architects and engineers delegated authority by the Restructuring Act to perform reviews of the University's construction project drawings and specifications. Also referred to as University Review Unit.

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.

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 (University Procurement Rules).

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: As used in this Manual for procurement and reporting of Small Business, Women Owned Businesses and Minority Owned Businesses, Small Business shall mean a Corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit, which is independently owned and operated, has fewer than 100 employees and the average gross annual receipts for the preceding three years is less than \$2,500,000.

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.)

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 to determine Code Compliance.

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.

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, HECO-7. See DGS-30-377 Form for SWAM Supplemental General Conditions and DGS-30-376 for insurance and liquidated damages.

SWAM: The acronym used to refer to Small Business and Women-Owned and Minority-Owned Businesses. See Supplemental General Conditions DGS-30-377 form for detailed requirements.

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

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, e-mail, or other means. The bids are normally opened and recorded when received.

USBC: 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 VUSBC).

VCCO: The acronym used to refer to a University employee who has completed the necessary training and testing by the Bureau of Capital Outlay Management, 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.

Woman-owned/controlled Business: Business enterprise at least 50 percent of which is owned/controlled by women and where the woman is involved with the day to day operation of the business. In the case of a publicly owned business at least 51 percent of the stock of which is owned by women.

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 TERM 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.

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 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/or 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 businesses and businesses owned by women and minorities in the evaluation of proposals.

SECTION 3.3 PROFESSIONAL SERVICES

The architectural, 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, and are included herein by reference.

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 architectural and engineering services of every kind including, but not limited to, project studies, development of master 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 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 may be executed by the A/E at no additional cost to 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. 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 Chief Facilities Officer.

SECTION 3.8 CODE AND REGULATORY COMPLIANCE

The A/E is responsible for designing the project and administering the construction phase of the project in accordance with the Virginia Uniform Statewide Building Code (Code), this Manual and other regulatory requirements 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, 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, a Manual requirement, or a regulation is unclear as to meaning, he shall request a written opinion as to the applicable interpretation from the University or from the applicable regulatory agency, as appropriate, and the A/E shall be entitled to rely on the written opinion, if any, which he receives.

SECTION 3.9 A/E LIABILITY INSURANCE, DESIGN ERRORS AND/OR OMISSIONS and RECORDS RETENTION

The A/E shall carry professional liability insurance covering negligent acts, errors, and omissions in 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, but in no event shall the amount of professional liability insurance be less than \$100,000. The A/E shall maintain this insurance in force after completion of the services under the contract for a period of five years after completion of construction.

The form and amount of liability coverage will be negotiated with the A/E firm, and the cost and source of the coverage will be reflected in negotiated fees. The amount of any deductible must be acceptable to the University considering the design firm's financial capability, capacity and loss history.

As another option liability coverage may be provided at the option of the University in one of two ways. The University may provide the A/E firm liability coverage by:

- purchasing a Single Project Policy or,
- including the project on its Master Project Policy.

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 design error is clearly at fault, 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:

- Worker's Compensation -- Standard Virginia Workers Compensation Policy with statutory requirements and benefits;
- Employers Liability -- \$100,000;
- Broad Form Comprehensive General Liability --\$1,000,000 Combined Single Limit coverage. The University shall be named as an additional insured with respect to the services being provided. 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.);
- Automobile Liability -- \$500,000 Combined Limit for bodily injury and property damage per occurrence.

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, 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 in accordance with the University Procurement Rules. 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 Rules, provided the bidder, offeror, or contractor invokes the protections of the University Procurement Rules, 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:

- original sealed and signed drawings and specifications
- copy of analyses made for the project
- indexed copy of the calculations made by each discipline for the project
- the University copy of all shop drawings, submittals, cut sheets, operation and maintenance instructions, parts lists, and other material related to the project.

The University, as owner of the documents prepared for its projects, 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:

- the name of the Owner, i.e. University of Virginia
- the Title of the Standard Structure for which the design was developed,

- the name of the A/E, and
- the 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

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.

Each drawing to be reproduced shall show:

- the name of the A/E,
- the Project Title,
- the Project location,
- the 8 digit state Project Code,
- the Drawing / Sheet Title,
- the Drawing / Sheet number,
- the seal and signature of the responsible licensed professional,
- and the uniform date of the completed documents

The Title sheet drawing(s) shall also have:

- the Index of Drawings,
- the Project VUSBC data,
- the Seal and Signature of the A/E Principal-In-Charge of the project,
- and the uniform date of the completed documents.
- (A/E may also require the seal and signature of a principal of its consultants.)

The Specifications Table of Contents shall have:

- the Seal and Signature of the A/E Principal-In-Charge of the project,

- the uniform date of the completed documents, and
- the listing of specification sections included for the project.
- (A/E may also require the seal and signature of a principal of its consultants.)

“Contract Documents” submitted to the University for review is expected to be complete documents ready for bidding. All drawings except the cover sheet shall bear the seal of the responsible licensed professional. The Cover Sheet shall show a complete list of the drawings in the set, but a seal and signature are not required at this submission.

"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 set University Building Official
- 1 set Regional State Fire Marshal's Office
- 3 additional sets University

"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 8 digit State 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 Chief Facilities Officer or his designee.

Once the cumulative total of modifications exceeds 25% of the original contract amount, or \$50,000, whichever is greater, all succeeding 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 the University Procurement Rules and Chapter 6 of this Manual.

SECTION 3.16 PAYMENTS TO THE ARCHITECT/ENGINEER

1. The A/E shall submit its invoice to the University using the UNIVERSITY OF VIRGINIA FACILITIES MANAGEMENT PROFESSIONAL SERVICES STANDARD INVOICE form, HECO-12a/e. 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.

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 HECO-12a/e 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. The A/E may request payment for this software package as an additional service to a University A/E contract if it is not a part of the available computerized systems.

The A/E may submit the invoice electronically as an E-mail attachment to the Fiscal Technician Senior. Should the A/E decide to send the invoice by that method it should not send it postal delivery. Use one method or the other, not both.

Invoices for Work being performed on an hourly rate, not-to-exceed, basis shall show the, extended cost amount.

2. 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 within 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.

3. 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.
4. 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.
5. 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.
6. 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.

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.

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

The following procedures are established in conformance to the University Procurement Rules. 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:

- type of project or facility,
- size (area) and number of stories,
- types of materials,
- bidding requirements,
- IFB (document) source, and
- a project cost range (e.g. \$3,000,000 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:

General: 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.

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.

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.

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 diskettes or tapes, 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.

Compensation Due 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:

- 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.
- 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.
- 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.

- Payment for the Additional Services portion of the fee shall be any portion of those services provided up through the notice of termination.
- 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.

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 Rules which provide that:

In every contract over \$10,000, 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 CONTRACTUAL DISPUTES (University Procurement Rules)

The University of Virginia Procedure for Resolution of Contractual Claims, Directive 363A, attached herein as Appendix Q, constitutes the University's Resolution Procedures and is a part of the contract.

SECTION 3.28 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 3.29 PROHIBITION OF ALCOHOL AND OTHER DRUG AT 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 Rules, , 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 3.30 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 APESLA Board. (§9-183.2; 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 §9-183, Code of Virginia.

Any projects designed by the A/E which have such security systems shall include the licensing requirements of §9-183, 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 3.31 USE OF STANDARD FORMS AND FORMATS

The A/E shall incorporate in every construction contract the applicable HECO-7 (General Conditions of the Construction Contract) and HECO-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 Chief Facilities Officer prior to their incorporation in the construction contract.

The A/E shall use the applicable 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 Chief Facilities Officer. 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 3.32 REPORTS ON THE PARTICIPATION OF SMALL BUSINESSES AND BUSINESSES OWNED BY WOMEN AND MINORITIES:

An Actual Involvement Report is required for professional service contracts with a fee greater than \$100,000. 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 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 two (2) copies 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. A suggested format is as follows:

BUSINESS CLASS: (Small Business, Women-Owned Business or Minority-Owned Business)

FIRM NAME, ADDRESS AND PHONE NUMBER	TYPE GOODS/ SERVICES	ACTUAL DOLLARS	PLANNED DOLLARS	% OF TOTAL CONTRACT
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BUSINESS CLASS TOTALS =

CHAPTER 4: PROCUREMENT PROCEDURES FOR PROFESSIONAL SERVICES

SECTION 4.1 GENERAL POLICY ON PROCURING A/E SERVICES

The University Procurement Rules set 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 or it may be an Engineering firm or 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 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 either 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*.

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 "Construction Related" Nonprofessional Services and shall be procured by

the Office of Contract Administration using procedures contained in the University Policy Governing the Procurement of Goods, Services, Insurance, and Construction of the Management Agreement.

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, the University Facilities Design Guidelines, 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 HECO-2 (Refer Chapter 14).

SECTION 4.4 ADVERTISEMENTS FOR PROFESSIONAL SERVICES

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

Public notice of the request for Letters of Interest shall be given at least 21 days prior to the date set for receipt of proposals. When requested and justified by the Project Manager in writing, the Chief Facilities Officer 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 Letters of Interest shall be given by the following methods:

1. By posting a copy of the notice in a public area normally used by the University for posting such notices; and
2. By publication in a daily newspaper of statewide circulation; and
3. By publication of a notice on the On-Line Bids page of eVA, Virginia's electronic procurement website. The URL is <http://vbo.dgs.state.va.us>.
4. Where practicable, by publication in a newspaper of general circulation in the general area of the project and;
5. By posting a copy of the notice on the Office of the Contract Administration's Web page.

The public notice will show the name, address, phone and fax number of the issuing office.

Provide in the notice/advertisement the following information as a minimum:

- name and address of the Agency;
- title of the project;
- scope of services;
- proposed Design-not-to-exceed construction budget;
- a brief description of the project;
- criteria for evaluation and selection of the A/E ;
- submittal of AE-1 to AE-6, AE Firm Data Forms required; and

- last date for submitting a response (i.e., a date which is not less than 21 days from date of advertisement).
- (for Term A/E Contracts), provision to extend the contract for four one year options at the sole discretion of the agency.
- (for Term A/E Contracts), provision to allow use of the contract for service orders by other state agencies at the sole discretion of the issuing agency.

SECTION 4.5 REQUESTS FOR PROPOSAL (RFP)

The Request for Proposal (RFP) will be provided to the A/E's short listed from review of the Letters of Interest. 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 the 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/E's 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 Rules, in the RFP response.

All A/E's should also have on file with the University, Forms AE-1 to AE-6, AE Firm Data Forms. URL is <http://forms.dgs.state.va.us/EO51/DGS-viewforms.aps?page=1&BO=BCOM>.

SECTION 4.6 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 agency 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.

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 (12) 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. URL is <http://forms.dgs.virginia.gov>).

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. See the University FP&C Contract Administration Manager for agency specific requirements.

SECTION 4.7 SWAM PROCUREMENT PLAN

(Small, Women-Owned, and Minority-Owned Businesses)

4.7.1 University Plan: In accord with Executive Order 29 (2002), 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.

4.7.2 Audits: In order to assure compliance with certification requirements of SWAM subcontracting plans, the contracting or certifying agency 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 4.8 PROCEDURES FOR A/E SELECTION

In the event of an emergency, selection may be made without regard to use of these procedures, but a determination and findings signed by the CFO explaining the circumstances shall be filed with the Office of Contract Administration Project Procurement File (See Directive 340).

4.8.1 Small Fees: For a project with a fee less than \$50,000 the Project Manager may use one of the following procedures.

4.8.1.1 For all Medical Center and Non-Capital University projects with expected fees less than \$10,000 the Project Manager will:

- 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, and appear to be qualified to render the required services, or use an established Term Type Contract, (See Section 4.9 below).
- 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.
- Negotiate a fee for services

- Complete a HECO-2.1a and obtain required approvals. The Office of Contract Administration will issue a Purchase Order incorporating this Manual and the University Facilities Design Guidelines.

4.8.1.2 For all Medical Center and Non-Capital University projects with expected fees exceeding \$10,000 the Project Manager will:

- Select 3 firms or professionals from a list of firms/professionals, which have expressed an interest in doing work for the University and have filed Forms AE1-6.
- Conduct a telephone or personal interview with the 3 firms to determine current workload and capability to meet proposed schedule and to determine personal qualifications, expertise and past performance on similar projects.
- Rank the 3 firms.
- Negotiate a fee for service with the number one ranked firm.
- Complete a HECO-2.1b and obtain required approvals. The Office of Contract Administration will issue a HECO-3.2 contract.

4.8.2 Capital Projects: For all capital projects, the Selection Board shall form two separate evaluation panels, a Screening Panel to evaluate Letters of Interest submittals and select a short list of qualified firms, and an Interview Panel, to conduct the interviews with short-listed firms and make the final selection. The Selection Board of the University shall notify the University Architect and the Chief Facilities Officer (CFO) of the Board's recommendation for selection of the Architect/Engineer. This information will be used to complete the Selection Board Report prepared by the Professional Services Contract Administrator. The University Architect will obtain the approval of the Board of Visitors.

4.8.2.1 The Screening Panel shall:

- Prepare an advertisement requesting that interested firms submit a letter of interest and statement of qualifications utilizing the AE-1 to AE-6, AE Firm Data Forms.
- Publish the advertisement of the project, at the least, in a daily newspaper which has statewide circulation, in a newspaper of general circulation in the area of the project and in the Virginia Business Opportunities (VBO/eVA) when the expected procurement exceeds Fifty Thousand Dollars (\$50,000), post the advertisement in a public area normally used for posting public notices.
- Draft a Request for Proposal (RFP), for issuance to only short-listed firms, which indicates in general terms the nature of the project and the architectural and/or engineering services which are sought, specifying the factors which will be used in evaluating the response, incorporating by reference the appropriate chapters of the this Manual, including any supplements thereto, and the contractual terms and conditions contained herein, and setting forth specifically any additional contractual terms and conditions not contained herein. The Request for Proposal shall also state any unique capabilities or qualifications which will be required of the Architect or Engineer. It shall require each respondent to submit an updated Statement of Qualifications, including qualifications of any Architectural or Engineering firm to be associated with it on the Project. It shall also require each

respondent to state that it will provide all the architectural and/or engineering services with respect to the project that are set out in this Manual and the RFP. The submission of AE-1 to AE-6, AE Firm Data Forms, is also required at this stage. 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 Offerors to furnish estimates of man-hours, labor rates, or the cost for services with their qualification proposals. If no method is specified, the respondents may propose methods for negotiating the fee amount.

- Recommend the top 5 to 7 firms for interviews. The CFO will approve the panel report in writing.

4.8.2.2 The Interview Panel shall interview the top-ranked, short-listed firms (preferably 5-7 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. For Medical Center Projects, no information regarding other firms' proposals or rankings will be made public at any time. The interview panel will determine, in writing, the top three firms, and rank them in order of preference. The Chief Facilities Officer will approve the panel report in writing.

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

4.8.2.4 The University's Negotiating Team 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, the third, etc. It is understood that at any time during the negotiations, they may be terminated and the project readvertised. 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 CFO, and the A/E.

4.8.2.5 Once the fee negotiations are complete, the University shall "Post" a Notice of Intent to Award at the Office of Contract Administration prior to contract award.

SECTION 4.9 TERM A/E CONTRACTS

The following policy governs the use of Term Contracts.

- 4.9.1** 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 procurement. 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 \$500,000, whichever comes first with the option to renew for one additional term. The University may procure Term Contracts for A/E Services up to \$1,000,000, only upon a determination and finding (D & F) approved by the CFO that services in excess of \$500,000 are expected to be needed.

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 CFO 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 may be renewable at the University's discretion up to four additional one year terms.

No A/E firm may at any time have in effect more than one (1) Term Contract with the University without approval from the CFO by D&F.

- 4.9.2** Advertisement/RFP: The advertisement/RFP public posting and announcement on the On-Line Bids page of eVA (<http://vbo.dgs.state.va.us>) 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 Chief Facilities Officer of a D & F 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 Contractors, based on its sole discretion, in consideration of its evaluation of each Contractor'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 RFP 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.

Selection, Negotiation and Award: The selection process described in section 4.8.2 above shall be followed except if more than one firm is to 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 the next firm for negotiation and possible Award of the Contract.

The University shall have 120 days from the RFP closing date to complete selection, award the Term Contract and issue the first service order. The Term Contract shall not be awarded unless accompanied by the first service order.

4.9.3 The University may offer additional "service 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.

4.9.4 The fee for the services on each "service 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 MOU. Should the University and the firm not agree on a fee for an additional "service order", negotiations shall be formally terminated. The "service 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.

4.9.5 Service Orders: Individual service orders or requests for services will be issued in the form of "service orders." Fee proposals by the firm will be negotiated and awarded on a "fixed

fee” amount for each service order. However, service 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 “service 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.

SECTION 4.10 TERM PROJECT MANAGEMENT CONTRACTS

The University may also award contracts to service firms for Construction Administration/Project Administration related services. Such services shall be procured using non professional services procedures as provided in the University Procurement Rules. These services may include (but shall not be limited to) claim analysis, constructability reviews, cost estimates and construction management/administration services.

SECTION 4.11 CONTRACT FORMS TO BE USED

The Standard Forms of Contract for Architect and Engineer Services, HECO-3, 3.1, 3.1a, and 3.2, shall be used for A/E Contracts. Copies of these forms are in Appendix B, and on the website. 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 CFO.

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). See Appendix C.

SECTION 4.12 GENERAL TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

The 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 CFO.

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.

- 5.1.1** Provide the Architect/Engineer a project report as well as any other relevant information and review comments 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 altered without prior written approval of the University of Virginia Board of Visitors.
- 5.1.2** Provide a budget cost, not to exceed the construction cost on the approved HECO-2, for the project to the A/E which will be the “Design to” cost.
- 5.1.3** 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 University Review Unit, the State Fire Marshal, the State Art and Architectural Review Board (AARB), The Department of Historic Resources, the University Board of Visitors (BOV), the Architect for the University, the State Council of Higher Education, 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.
- 5.1.4** Provide utility maps showing the location and size of all existing utilities, both public and private, which would interfere with or be connected to the project undertaken, together with a statement as to the characteristics of these utilities and their available capacity to serve the project.
- 5.1.5** Provide available “record” drawings.

- 5.1.6** On a case by case basis, the University may choose to obtain services of a professional 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.
- 5.1.7** 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.)
- 5.1.8** Unless negotiated otherwise, pay the invoice cost of all sets of plans and specifications for schematic, preliminary and contract document submittals. The A/E will bear the cost of any required resubmittals resulting from all agency review.
- 5.1.9** 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 statements and environmental impact reports. These extra services are apart from those normally required by the Project Committee, Architect for the University, State Fire Marshal, University Review Unit, 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.

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 University Review Unit for compliance with VUSBC and 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 University Review Unit 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.

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), Chapter 9 (Design Coordination and Quality Assurance) and Chapter 10 (Construction Procurement and Administration). The A/E shall adhere to the design policies outlined in the University Facilities Design Guidelines for Project Design, Chapter 7 and Chapter 8 in developing the Project Design.

The A/E must restrict himself to the authorized scope of work provided him 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.

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 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.

5.3.3 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 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 State Lodging, Meals and Incidentals Rate Table.

5.3.4 Meeting Notes: Provide meeting notes in writing for all meetings, direction, guidance, clarification, site visit observations, field orders, and such documenting significant items of discussion and/or agreement. These meeting notes shall be sent to those parties relevant to the issues, and structured to include all pertinent information. Also provide a proposed meeting agenda prior to each meeting. Project meetings include predesign, design, procurement, preconstruction and construction meetings discussed in Chapters 5, 8 and 10 of this Manual.

5.3.5 Project Initiation Phase: (study/scope/schematic)

5.3.5.1 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 Budget Request.

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

5.3.5.3 Provide analyses of the University's needs, planning surveys, site evaluations and comparative studies of prospective sites and solutions. Provide a survey 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.

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

5.3.5.5 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.

5.3.5.6 The necessary roof scans, structural, chemical, mechanical, and geotechnical investigations, tests and reports, including borings or load tests for soil bearing capacity shall be included in the A/E contract. The geotechnical services contract shall include testing, analysis of test results and design recommendations based on preliminary design parameters, and shall be included in the Architect/Engineer contract. The cost of the testing, analysis and design recommendations shall be included in the A/E contract. The

geotechnical services and preliminary design parameters provided by the Architect/Engineer for the University shall be considered part of the Architectural/Engineering service contract.

5.3.5.7 Schematic Design Phase: After written authorization to proceed with the Schematic Design Phase, the A/E shall:

5.3.5.7.1 Prepare and submit schematic design documents.

5.3.5.7.2 Prepare a detailed cost estimate.

5.3.5.7.3 Prepare submittal and make presentation to the Architect for the University, Arboretum and Landscape Committee, the Board of Visitors and AARB.

5.3.5.7.4 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.

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

5.3.6.1 Prepare and submit preliminary design documents.

5.3.6.2 Prepare a detailed cost estimate.

5.3.6.3 Prepare submittal and make presentation to the Architect for the University, the University Arboretum and Landscape Committee, the Board of Visitors and AARB.

5.3.6.4 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.

5.3.7 Contract Documents Phase: After written authorization to proceed with the bidding documents, A/E shall:

5.3.7.1 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 seventeen division format of the Construction Specifications Institute).

5.3.7.2 Prepare and submit completed working drawings/contract documents for approval.

5.3.7.3 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.

5.3.7.4 Make revisions to plans and specifications necessary to incorporate review comments and submit a written response to all review comments to the University Review Unit prior to bidding the project.

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

5.3.8.1 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.

5.3.8.2 Issue addenda as appropriate.

5.3.9 Construction Phase: After award of the construction contract the A/E shall provide the following services. The following services are also described in Chapter 10 of this Manual and in Section 15 (a) - (h) of the General Conditions of the Construction Contract, Form HECO-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 CFO:

5.3.9.1 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 agency's instructions to Contractor(s) will 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. Where the University has modified the A/E Contract to reduce the A/E's Construction Phase services, the following shall apply:
 - a. 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.
 - b. 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.

- (4) **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. 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.
- (5) **Equals:** The A/E shall evaluate and determine the acceptability of any equal materials or equipment proposed by Contractor.
- (6) **Structural and Special Inspections:** The A/E shall provide the services described in Chapter 10.12 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 Testing and Inspection entity.
- (7) **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.

5.3.9.2 Construction Visits, Inspection and Closeout Services

- (8) **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. Document in writing.
- (9) **Inspections of Work in progress by the A/E:** During his 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 Project inspector's Daily Report. Document in writing.

- (10) **Supplemental Inspections and Tests:** For Work not in compliance with the Contract Documents, the A/E shall, with the agency's approval, require additional or supplemental inspection or testing. The A/E shall receive and review all certificates of inspections, testings 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. Document in writing.
- (11) **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 Agency 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. Document in writing.
- (12) **Contractor Applications for Payment (CO-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.

- (13) **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 Chapter 10.15 - 10.17 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. Document in writing.
- (14) **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 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 10.17.
- (15) **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 Agency 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.
- (16) **Project Closeout:** A/E shall provide project closeout services as outlined in Chapter 10-18.
- (17) **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.

- 5.4.1** 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.
- 5.4.2** Where delinquency, insolvency or necessary change of the Contractor requires extraordinary demands on the time of the Architect or Engineer.
- 5.4.3** 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 Agency.
- 5.4.4** The University's requested changes to drawings and specifications after work is under construction, which might result in a change order.
- 5.4.5** Providing special or continuous on-site services for an approved period when required by unforeseen site conditions.
- 5.4.6** Preparation of the environmental impact report.
- 5.4.7** Provide special commissioning services for HVAC equipment design, submittal approval, point by point testing requirements, component testing, and systems testing.
- 5.4.8** 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 template 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 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 8-digit project identifier (3-digit agency code & 5-digit project code) and the PIMS (and/or Work Order) number on all project documents, correspondence, memoranda, invoices, submittals and other related material. The A/E shall require that the 8-digit project identifier 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 (CO-14a) 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 HECO-8a and CO-14a evaluations (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 agency 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, CO-14b, Opinion of Contractor's Performance, using the current edition posted on the Forms Center. An Evaluation may be completed by the 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. The A/E and University may also complete CO-14b evaluations on any individual Subcontractor performing work on the project to note above average or below average or poor performance by a particular subcontractor or supplier. The University shall provide a copy of this evaluation to the Contractor. If the Contractor wishes to comment on either evaluation, dispute any part of the evaluation or offer its side of the issue, the Contractor may submit a response to the University. The Contractor's response shall be attached to and made a part of the University evaluation form for future reference.

CHAPTER 6: FEES AND PAYMENTS FOR A/E SERVICES

SECTION 601.0 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 the 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. 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 602.01 A/E FEE PROPOSAL STANDARDS AND GUIDES

The A/E is expected to be thoroughly familiar with the 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.

602.1 Plans and Specifications:

The A/E should be aware and keep in mind that there are differences between private work and University of Virginia 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 Procurement Rules as clarified and expanded upon in the Manual.

602.2 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:

a) A/E Project Technical Personnel:

Technical personnel shall be constructed to mean the A/E's project manager /Coordinator, architects (licensed), engineers (licensed) by discipline, designers including non-licensed architects and 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.

b) 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 overheads 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 overheads and profit.

Generally review, negotiations, supervision and such 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.

c) 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:

A/E project manager / cCoordinator: 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.

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.

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.

CADD / 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 or have CADD skills.

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.

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.

Landscape Architect: A certified landscape architect who has the knowledge, skills and experience to provide the design and documents for the site landscaping for the project.

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.

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.

Typist / Clerical: Skills required include a 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.

602.3 Additional Services

Chapter 5 describes the Basic Services required of the A/E as well as the responsibilities of the Agency 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.

602.4 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 Owner 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 Commonwealth 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% for A/E overhead and profit.

602.5 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.

602.6 Reimbursable Expenses:

- (1) 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.
- (2) 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 resubmittals 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.

- (3) 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 mark up 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.
- (4) 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.
- (5) 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.
- (6) 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.
- (7) Each item / account planned for reimbursement should have a "budget" amount established and included in the 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.

602.7 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.

“Interior design” as used in this Manual as an additional service pertains to the design, selection, arrangement and color coordination of furniture, furnishings and accessories. These items include but are not limited to desks, chairs, lamps, tables, screens, planters, artwork, draperies and similar furnishings which are procured separately from the construction contract.

The “interior designer” shall verify the actual building surface finish colors applied by the Contractor and coordinate the selection of colors, fabrics and textures with the building colors. The “interior design” services also include the coordination with and preparation of procurement materials for the University of Virginia Procurement Services for the furniture, furnishings and accessories.

SECTION 603.0 A/E FEE PROPOSAL WORKSHEET (DEPARTMENT OF GENERAL SERVICES FORM CO-2.3)

The Architect/Engineer shall prepare a detailed fee proposal using the G.S. Form E&B CO-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:

- Disciplines / Classifications commonly used are indicated on the form. Additional classifications may be listed.
- Hourly rates should be the average for those persons in that skill level/discipline/classification.

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.

- Indicate the drawing size and proposed / estimated number of sheets for each discipline. Attach a proposed or estimated list of drawings.
- Enter the Estimated (proposed) number of hours for each discipline / skill level and multiply times the Hourly Rate to yield the Estimate Cost.
- 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.
- Spec / Report Writer effort includes the mark up and edit of standard and / or master specification sections and writing any required special sections.

- Typist effort includes typing new specification sections and editing masters on the word processing program.
- Cost Estimate effort includes the takeoff of quantities and the application of prices to produce the Cost Estimate in the required format.
- Bid Assistance service includes the effort of the Professional to conduct the Prebid 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.
- 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.
- Record Drawing Preparation includes the efforts of a Drafting level person to transfer data from the Contractor's "As Built" set of drawings and specs to the "Record Copy" reproduces. This work also includes the Professional / Technical Level effort to compare the "As Built" set to the "Record Copy" for correctness.
- Construction Observation and Administration includes the Professional / Technical level effort to perform the on site 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.
- 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 604.0 PROPORTIONING OF THE A/E FEE AND PAYMENTS:

604.1 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 Owner'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:

- **Predesign services (Additional Services such as studies and similar activities.)**
- **Design Phase services include**
 - Schematic phase
 - Preliminary phase
 - Working drawing phase
- **Bidding phases services**
- **Construction phase services include**
 - Shop drawing / submittal reviews and admin.
 - Site visits, inspections and admin.
- **Project Closeout**
 - Maintenance & Operations Manuals
 - Record Drawings
- **Budgeted Reimbursable Amounts**
- **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 Agency 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 CO-2.3 Fee Proposal Worksheet used for negotiation, the total negotiated A/E fee (excluding additional services and reimbursables) will be proportioned as follows:

Design Phase Services	=	75% of Total Fee
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:

DESIGN PHASE SERVICES

- (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.
- (2) **Preliminary Plans and Specifications (Design Development Phase)** – 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.
- (3) **Working Drawings and Specifications (Construction Documents Phase)** – 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 315 of this Manual.

CONSTRUCTION PHASE SERVICES

- (4) **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.
- (5) **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) **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 10.

604.2 Payments to the A/E

Payments to the A/E shall conform to the requirements in Section 315 of the Manual.

604.2 Payments by the A/E

Payments by the A/E to its consultants, subcontractors and suppliers shall conform to the requirements in Section 316 of the Manual.

SECTION 605.0 DETERMINING CHARGES FOR CHANGES IN THE SCOPE OF WORK:

605.1 Changes to the Scope of Services:

605.1.1 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 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.

605.1.2 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.

605.1.3 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 Rules 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 HECO-6 has not been issued as of the date printed on the revision.

Prior to approval of Preliminaries and issuance of the HECO-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 HECO-5 is issued and before the HECO-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.

605.2 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. Acceptable categories are indicated in Section 602.2.

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.

605.3 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.

605.4 Invoices for Changes in Work:

Invoices or statements of expenses incurred by the A/E for reimbursables 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.

605.5 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 606.0 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-11a/e, A/E Contract Change Order. Any A/E contract change order which increases the original contract amount by more than 25 percent or \$50,000, whichever is greater, must have the prior approval of the Chief Facilities Officer or his designee. The first Change Order which causes the cumulative total of Change Orders to exceed \$50,000 or 25 percent of the original Contract Price, whichever is greater, and all subsequent A/E Change Orders which increase the Contract Amount must have the prior approval of the Chief Facilities Officer or his designee.

CHAPTER 7: ENGINEERING AND TECHNICAL CRITERIA

SECTION 7A.0 GENERAL

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

Chapter 7 prescribes standards and requirements that may be higher than the minimum requirements for the private sector owner but are necessary to meet energy, performance, maintenance, safety, and accessibility standards for public buildings. The Architect/Engineer must design to meet the standards and requirements stated in this chapter.

PART 7A CODES AND POLICIES

7A.1.1 Code Administration: The University Building Official is the designated building official for University owned buildings, including Agency 209, University of Virginia Medical Center buildings. The University Building Official is charged with granting modifications, and establishing rules and regulations as may be necessary to carry out its function as building official (Management Agreement).

The University of Virginia Review Unit is delegated authority by the University Building Official under the provisions of Management Agreement to perform reviews of the University's construction project drawings and specifications for conformance with the requirements of the Virginia Uniform Statewide Building Code, Management Agreement, and this Manual. In accordance with the provisions of the University of Virginia Review Unit shall perform fire safety reviews for all projects involving new construction, additions, or renovation that involves a change of use projects involving new construction, additions, or renovation that involves a change in use of a facility. The responsible State Fire Marshal Office shall perform fire safety reviews for other renovation and conduct fire safety inspections of all construction.

7A.1.1.1 Review Procedures: In accordance with 7A.1.1 the University of Virginia Review Unit reviews documents for compliance with the Virginia Uniform Statewide Building Code and the University of Virginia Facilities Design Guidelines during its normal review of capital outlay or other projects. Such review does not relieve design consultants from responsibility for designing in accord with these standards and Federal Law.

7A.1.2 Codes

7A.1.2 1 The following codes and regulations apply to University of Virginia projects on State property:

- Virginia Uniform Statewide Building Code, Volume I (except Standards for the Disabled), latest edition, including the referenced model codes and standards adopted.
- Americans with Disabilities Act Accessibility Standards (ADAAG), published July 23, 2004 (excluding the Architectural Barriers Act [ABA] Scoping Requirements) and other standards promulgated by the U. S. Dept. of Justice Under ADA-90 and the Department of General Services under the provisions of the Code of Virginia, Sections 2.1-514 thru 2.1-521. Standards of VUSBC Chapter 11 and IPC Section 405 do not apply to University facilities on State property. In addition, Non-Discrimination Under State Grants and Programs promulgated by the Rights of Virginians with Disabilities, effective October 1, 1990, implement §51.5-40, Code of Virginia.
- Virginia Uniform Statewide Building Code, Volume II including the referenced model codes and standards adopted.
- Virginia Public Building Safety Regulations for pre-1972 buildings.
- Industrialized Building and Mobile Home Safety Regulations
- Liquefied Petroleum Gas Regulations
- Amusement Device Regulations
- Virginia Statewide Fire Prevention Code, including the referenced model codes and standards adopted
- Certification of Tradesmen Standards
- Dept. of Conservation and Recreation - Erosion and Sediment Control Regulations (VR 625-02-00)
- Dept. of Conservation and Recreation - Stormwater Management Regulations (VR 215-02-00)
- Applicable Department of Health Regulations
- Applicable Dept. of Environmental Quality, Water Division, Regulations

7A.1.2.2 The requirements of the Life Safety Code, NFPA 101, apply only to the University Hospital and Primary Care facility accredited by the Joint Commission on Accreditation of Health Organizations (JCAHO) and Center and accepting federal Medicare and Medicaid funds. In case of conflict, the most stringent requirements apply. Should there be a conflict between VUSBC that critically affects accreditation by JACHO this will be resolved with the University Building Official for Agency 209 (University of Virginia Medical Center).

7A.1.2.3 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 VUSBC, 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 University Building Official.

7A.1.3 Code Implementation: Typically, the VUSBC is adopted every three years. Such adoption incorporates specified editions of model codes (such as 2000, 2003 International Building Code, etc.) along with Virginia modifications to these codes. The Department of Housing and Community Development posts notice/announces the effective dates of the VUSBC editions as well as the dates of referenced standards and amendments.

7A.1.3.1 New Work:

- (1) The applicable code shall be the VUSBC edition in effect at the time outstanding issues have been resolved, preliminary drawings are approved (HEC0-5), and authorization is given to proceed with development of the working drawings.
- (2) If preliminary drawings are approved during the four (4) months prior to the effective date of a new edition of the VUSBC, the applicable code shall be designated by the University, subject to the University Building Official.

7A.1.3.2 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 shall determine which code applies. The plans and specifications shall be revised as necessary to comply.

7A.1.4 Modifications or Variances of Code Requirements: If a modification or variance to the code is thought to be necessary, the A/E shall request such modification or variance 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 or variance. All requests to waive or grant a variance to the requirements of the VUSBC will be addressed to the University Building Official.

7A.1.5 Use Group Classifications: The following guidance shall be used for buildings and structures at the University:

- (1) Buildings for business training and vocational training shall be classified and designed for the Use Group corresponding to the training taught.
- (2) Academic buildings having classroom-type education functions (including associated professor / teacher office spaces) where large groups of students must change classes on a schedule shall include the following:
 - (a) Provide a Fire Protection Signaling System in the building
 - (b) Provide 72" minimum corridor widths in the classroom corridors
 - (c) Calculate the occupant load for each space based on VUSBC Chapter 10 and the type of occupancy (not Group) of the space
- (3) Buildings housing research, testing and science laboratories shall include a Fire Protective Signaling System.
- (4) Dormitories, Fraternity and Sorority Houses, and similar dwelling units with sleeping accommodations shall provide one of the following:
 - (a) Written University policy that prohibits the use of these residences as lodging for persons / groups / occupants for periods less than 30 days, or
 - (b) Design that complies with the most stringent requirements of both R-1 (Hotels) and Group R-2 (Dormitory)
- (5) Grounds buildings with other specific uses, doubtful uses, and mixed occupancy uses shall be classified in accordance with appropriate sections of Chapter 3 of the VUSBC.

7A.1.5.1 Residences for Rent: Cabins, beach houses, lodges and similar dwelling units with sleeping accommodations rented to family groups:

- (1) Residences for rent less than 30 days with a maximum occupant load of 16 shall comply with the requirements for Use Group R-3
- (2) Residences for rent for less than 30 days with a maximum occupant load of more than 16 shall comply with the requirements for Use Group R-1

7A.1.6 State Building Construction in Flood Plain: Executive Memorandum 2-97 prohibits the construction of new state-owned buildings within the 100-year flood plain unless a variance is granted by the University Building Official University-owned buildings, and after consultation with the State Coordinator for the National Flood Insurance Program (the Department of Conservation and Recreation (DCR)).

7A.1.7 Fire Safety Reviews

7A.1.7.1 Fire Safety reviews will be conducted by the University Review Unit for all new construction projects, projects with both additions and renovations, and projects with a change of

use. All other renovation projects will be submitted to the appropriate Regional State Fire Marshal's office for review.

7A.1.7.2 Fire suppression, fire detection, and fire alarm shop drawings shall be reviewed and approved 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 is 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 Fire Safety reviewer (University Review Unit and/or responsible State Fire MarshalOffice) for final review and approval.

7A.1.7.3 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 Owner'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 7A.2 DESIGN STANDARDS FOR ACCESSIBILITY

7A.2.1 Abbreviations

ADA	Americans with Disabilities Act of 1990
ADAAG	Americans with Disabilities Act Accessibility Standards (ADAAG), published July 23, 2004 (excluding the Architectural Barriers Act [ABA] Scoping Requirements)
ATBCB	Architectural and Transportation Barriers Compliance Board
DOJ	U. S. Department of Justice

7A.2.2 Design Standards for Providing the Disabled with Accessibility and Usability:

The following standards and regulations shall be used in planning and designing state facilities:

1. Any standard in Section 7A.2 that is more stringent than a standard promulgated in and by the *Americans with Disabilities Act* (ADA), 1990.
2. The *Americans with Disabilities Act*, 1990: Title II, Subtitle A, (and not Title III) of the Act applies to state facilities.

3. Department of Justice Final Rule on Title II of ADA-90, identified in the Federal Register as 28 CFR Part 35.
4. Americans with Disabilities Act Accessibility Guidelines, July 23, 2004.
5. *Non-Discrimination Under State Grants and Programs*: These regulations, promulgated by the Board for Rights of Virginians with Disabilities and effective on October 1, 1990, implement § 51.5-40, *Code of Virginia*.

7A.2.3 Conflicting Standards: Where standards conflict, the most stringent standard shall be used in designing accessible facilities. That is, the standard most favorable or advantageous to the disabled shall be used.

7A.2.4 Clarifications for University of Virginia Owned Buildings:

Accessible facilities must be provided at the completion of construction. Adaptable facilities do not meet the requirements for accessibility unless demonstrated to the University Building Official to be readily implemented on demand.

7A.2.4.1 Elevator Access: As clarification of ADAAG Section 206.2.3, Accessible Routes, Multistory Buildings and Facilities, all passenger elevators shall be accessible to the disabled and residential facilities shall include at least one accessible route to each floor level and each mezzanine in multistory buildings. Exception 4 does not apply for residential facilities.

7A.2.4.2 Stairways: Section 210.1, Stairways – General: All stairways shall be accessible to the disabled. Exception 4 for stairways for assembly areas does not apply. Aisles for assembly areas shall comply with Section 504.

7A.2.4.3 Handrails: Section 505.10 Handrails – Handrail Extensions: As a clarification handrail extensions shall not be turned to the side or back. Handrail extensions shall continue straight and parallel to the stair run.

SECTION 7A.3 SPECIAL PROCEDURES FOR ASBESTOS ABATEMENT

7A.3.1 General Asbestos Requirements: Buildings constructed prior to 1980 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.

7A.3.1.1 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.

7A.3.1.2 Asbestos drawings and specifications shall be submitted to the University Department of Environmental Health and Safety with the Contract Documents for review and approval.

7A.3.1.3 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.

7A.3.1.4 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.

7A.3.2 Use of Asbestos or Asbestos Containing Materials: The use of materials that contain asbestos shall be prohibited in any new construction or renovations.

7A.3.3 Removal and Replacement of Sprayed-on Fireproofing: The A/E in consultation with the University shall verify early in the design phase with the appropriate Fire Marshal 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 Fire Marshal, 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 Fire Marshal, indicate the construction date, original and present uses, height in floors and feet, whether sprinkled and any other information that may assist the Fire Marshal in his determination. If sprayed-on ACM is to be replaced, 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.

7A.3.4 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. The University of Virginia, 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 the University of Virginia 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.

7A.3.5 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 7A.4 SPECIAL PROCEDURES FOR LEAD BASED PAINT ABATEMENT

7A.4.1 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 Department of Environmental Health and Safety shall 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.

7A.4.2 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:

- A lead-based paint inspection was performed and no lead-based paint was found.
- 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.
- 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.
- 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.
- 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.

7A.4.3 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.

7A.4.4 The contractor shall establish a schedule with the agency for abatement and containment in buildings that are to remain occupied during construction.

7A.4.5 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 7A.5 SEPARATE CONTRACTS FOR MATERIAL AND/OR EQUIPMENT

7A.5.1 General: All procurements must be made in accordance with the University Procurement Rules. All assignment of contracts or materials must be done with the full prior knowledge of all parties to the contract. The use of 'allowances' is not competitive and has been deemed not to conform to the University Procurement Rules. Work 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.

7A.5.2 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.

7A.5.3 Contractor purchased (materials contract assigned by the Owner)/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.

7A.5.4 Owner 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 is existing or pre-purchased laboratory or kitchen equipment. The University shall pay the supplier directly for the materials.

A Determinations & Findings Report approved by the CFO is required to use this method of Owner Procurement.

7A.5.5 Owner purchased/Owner installed (or installed by Owner'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 owner and other contractors. An example of this is medical equipment.

SECTION 7A.6 PROCUREMENT OF FURNISHINGS AND LOOSE EQUIPMENT

Loose equipment and furnishings are generally items moveable or portable versus permanently installed. It includes such items as residential refrigerators; unattached residential stoves; unattached furniture; and other similar furnishings or loose equipment. For Agency 207 and 246 the University shall purchase loose equipment in accordance with the University Procurement Rules through the University's Department of Procurement Services.

SECTION 7A.7 BUILT-IN EQUIPMENT

Built-in equipment comprises special purpose equipment or furnishings that are permanently built in or attached to general building construction. It includes such items as laboratory fixtures, 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 Rules.

SECTION 7A.8 UNDERGROUND STORAGE TANK SYSTEMS (USTS) AND ABOVEGROUND STORAGE TANKS (AST)

Technical standards related to USTS and AST are contained in the Department of Environmental Quality, Water Division, Regulations: VR 680-13-02, *Underground Storage Tanks: Technical Standards and Corrective Action Requirements*; VR 680-14-12, *Facility and Aboveground Storage Tank Registration Requirements*; and VR 680-14-13, *Aboveground Storage Tank Pollution Prevention Requirements*.

7A.8.1 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 VR 680-13-02; VR 680-14-12; and VR 680-14-13

7A.8.2 The University shall request the services above from the nearest local building department on all USTS and AST projects/actions. 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.

SECTION 7A.9 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.

PART 7B 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.

SECTION 7B.1 GUIDELINES FOR OFFICE SPACE PLANNING

See University Facilities Design Guidelines for space planning requirements.

SECTION 7B.2 MINIMUM DESIGN LOADINGS FOR BUILDINGS

7B.2.1 The minimum design loadings indicated in the current VUSBC shall be modified and/or supplemented as hereinafter indicated for the design of University buildings.

7B.2.2 The minimum design roof live or snow load for flat roofs and roofs with a slope of less than four (4) inches per foot shall be as indicated on Figure 7B.2.2.A, Minimum Superimposed Loads for Design of Low-Sloped Roofs and Figure 7B.2.2.B, Ground Snow Loads, which supplements the Virginia Uniform Statewide Building Code (VUSBC) requirements for designing University of Virginia buildings. Areas west of the Blue Ridge Mountains shall have a minimum design roof live load of 30 pounds per square foot. Areas east of the Blue Ridge Mountains shall have a minimum design roof live load of 20 pounds per square foot. Ground snow loads west of the Blue Ridge Mountains are determined by case studies and other VUSBC requirements.

SECTION 7B.3 ADDITION OF LOADS TO EXISTING STRUCTURES

Prior to mounting any antennae, microwave dishes, HVAC equipment or other items on the roof of an existing building, the adequacy of the structural framing to support the additional live, dead, wind and lateral loads shall be checked by a licensed structural engineer. Consideration must be given to deflection from the added load(s), to potential for vibration, to potential for ponding water, and to the consequences of overturning moments on stressed attachments and construction.

Rooftops equipped as described above are subject to the approval of the Architect for the University and the Art and Architectural Review Board as determined by the Architect for the University.

SECTION 7B.4 DESIGN CHECKLIST FOR CRIME PREVENTION

The following considerations shall be applied to site and building design to meet the intent of Facilities Design Guideline GENERAL REQUIREMENTS, GR.3.16, unless precluded by the siting of buildings per the effective University Master Plan. These considerations are in addition to mandatory site lighting requirements found in Facilities Design Guidelines SITE WORK SW.20.2 Site Lighting.

7B.4.1 Street and Site Planning

1. The siting of building(s) and the landscape design shall optimize lines of sight for police surveillance around all sides of the building(s) and where crowds can congregate.
2. Offsets in building(s) or courtyards are discouraged where they cannot optimize public or police surveillance. Video camera surveillance with monitoring capability shall be considered where sightlines do not provide this surveillance.
3. Where dictated by University site selection, buildings sited adjacent to wooded areas or properties not under University ownership shall consider appropriate measures to discourage unlawful entry and endangerment of University personnel, students and public visitors.

7B.4.2 Parking

1. Parking areas shall be readily observed with landscaping that screens vehicles without preventing surveillance.
2. Siting for parking areas intended for night activities shall be optimized to reduce isolation from building entrances serving the night activities.
3. Parking structures shall be fenced/secured at grade levels, excluding required vehicular entrances and exits. If video camera surveillance is not provided, conduit shall be installed to accommodate future installation with provisions for adequate electrical power in the original design. Dead areas adjoining or in stairs or elevator lobbies shall be avoided.

4. Elevator and stair towers associated with parking structures shall be located on the perimeter of the structure adjacent to a traveled walkway or street, with optimum glazing or openings to optimize police surveillance.

7B.4.3 Walkways

1. Landscape planting shall not obscure lines of sight from adjoining streets, public areas and occupied buildings in order to optimize security by police and public surveillance. Walkways that cannot accommodate these criteria may require additional width to improve sightlines and/or permit surveillance using bicycles and/or low-horsepower vehicles.
2. Landscape planting, walls, and fencing along walkways shall not provide hiding places for would be assailants.

7B.4.5 Buildings and Structures

1. In addition to criteria for Street and Site Planning, and Parking, buildings and structures shall discourage unplanned access to other buildings through basements, underground utility structures, attics, corridors that do not lend themselves to security surveillance, or across roofs.
2. Underground utility structures (tunnels) required to have fire and emergency ingress or egress shall be alarmed to send signals to the police, or a manned security post, and to Facilities Management Systems Control Center as well to audible devices at the point of entry and elsewhere within building or on the building exterior. These alarmed points of entry shall be keyed so that authorized personnel can interrupt and reactivate the alarm circuit when the opening is closed.

PART 7C CIVIL & SITEWORK

SECTION 7C.1 EARTHWORK

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

7C.1.1 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 are 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.

7C.1.2 Earthwork specifications shall be definite, not general.

1. Coordinate Specifications with the Drawings.
2. 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.
3. Specifications for materials and instructions shall state whether they are included in the base bid or will be an extra cost item.
4. Rock excavation shall be included in the base bid to the extent that locations are sufficiently identified in the geotechnical/soils report. See Section 702C.

7C.1.3 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:

7C.1.3.1 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.

7C.1.3.2 General fill/backfill - Includes all classifications of materials noted in (a) above.

7C.1.3.3 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.

7C.1.3.4 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.

7C.1.3.5 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.

7C.1.3.6 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 7C.2 STORMWATER MGMT AND EROSION AND SEDIMENT CONTROL

7C.2.1 Disturbance of land exceeding 10,000 square feet (or lesser area if adopted by the Local Soil and Water Conservation District) requires submission of an erosion and sediment control plan and narrative to the Department of Conservation and Recreation, Division of Erosion and Sediment Control for approval at the working drawings stage of plan development. Preparation and submission of the plan and narrative shall follow the requirements of the Virginia Erosion and Sediment Control Handbook, latest edition. Approval of the plan shall be secured prior to bid advertisement. Contact the regional or central Division office for clarification of the regulations. [*Erosion and Sediment Control Regulation* - VR 625-02-00].

7C.2.2 Disturbance of land exceeding one acre requires submission of a stormwater management plan with calculations to the Department of Conservation and Recreation, Division of Stormwater Management. This is not a substitute for the erosion and sediment control plan, but is an additional requirement to manage the runoff and quality of the stormwater collected on the site. The regional or central Division office should be contacted for information on the required calculations and submissions for approval of the stormwater management plan or clarification of regulations. Approval of the plan shall be secured prior to the bid advertisement. [*Stormwater Management Regulations* - VR 215-02-00]. In addition the soil disturber must provide notification to DEW two days prior to disturbance. The contract documents shall reflect this requirement. See Section 7C.2.3.B.

7C.2.3 Any disturbance of land requires calculation of net changes in impermeable areas and must be reported to the University in order to be in compliance with regional storm water master plans approved by DCR. Facilities Management Directive 523 (pending) addresses the responsibilities involving review and approval of a project use of regional University storm water facilities (use of current capacities and/or alternative resolutions.

- A. Disturbance of land exceeding five acres requires a discharge permit issued by the Department of Environmental Quality. This is not a substitute for the erosion and sediment control plan or the stormwater management plan, but an additional requirement. Contact the Department for permit applications and clarification of the regulations. The permit shall be approved prior to bid advertisement.
- B. Disturbance of land exceeding one acre but less than five acres requires contractor to file, or cause responsible soil disturber to file, a Virginia Pollutant Discharge System General Permit Registration Statement for Storm Water Discharges from

Construction Activities with DEQ on DEQ-Water Form swgp99-004-req and provide a copy of registration statement to the University of Virginia.

7C.2.4 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 owners 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 control (EC) 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 the Regional Office of the Division of Soil and Water Conservation to determine what EC and SWM measures are necessary. The Contractor shall completely satisfy all requirements of the Division of Soil and Water Conservation 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.)

7C.2.5 COMPUTATION AND RECORDATION

Computation and recordation of all new impermeable areas must be calculated. These quantities shall be highlighted when submitting plans and specifications for University Review Unit approval.

SECTION 7C.3 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 \$

SECTION 7C.4 MINIMUM STANDARDS FOR PARKING SPACES

The following minimum parking space dimensions are standards for use in the design of parking decks, parking garages and parking lots on University of Virginia property. Parking configurations, aisles widths, etc., shall be designed to meet or exceed the minimum dimensions recommended by recognized standards for parking designs. Consideration shall be given to the duration of parking/turnover rate in the sizing of spaces and aisles and to the protection of columns and walls by the use of wheel stops, bollards or guardrails, if applicable.

Type vehicle	Minimum width	Minimum length	Minimum area
7C.4.1 For Parking Decks and Garages Utilizing Self Parking			
Standard Cars	8'-6" min.	18'-0"	153 sf
Compact Cars*	8'-0"	15'-0"	120 sf
Handicapped Spaces**	-See ADAAG 502		
7C.4.2 For Parking Lots Utilizing Self Parking			
Standard Cars	8'-6" min.	18'-0"	153 sf
Compact Cars*	8'-6"	15'-0"	127.5 sf
Handicapped Spaces**	-See ADAAG 502		

- Compact care spaces may be incorporated/designated where restrictions by walls, columns, piers, or other restraints impede the use of standard size spaces. ** Locate H/C spaces to minimize H/C users exposure to crossing traffic.

SECTION 7C.5 POLICY FOR PARKING SPACE PLANNING

The following Parking Space Planning Policy applies to all new buildings, additions, and conversions. Buildings that undergo major renovations should comply to the greatest extent possible. Parking on site and/or off site in designated University parking lots or structures may be considered in meeting parking requirements when committed to employees, students, and public visitors using the building(s). Determination of site parking shall be achieved in programming, but not later than preliminary design, as coordinated through the University Project Manager in consultation with the Office of the Architect for the University.

All projects that renovate or alter accessible facilities must provide an adequate number of parking spaces for disabled people in accordance with ADAAG 209. Adequate number of parking spaces means a minimum of 2 percent of the spaces required by this policy but no less than one space for each renovation or alteration project.

Spaces provided in the agency’s Transition Plan would not necessarily have to be included in the renovation but would have to be constructed as scheduled in the plan.

VUSBC

Use	Minimum Parking Spaces Required
A-1	One parking space for every four fixed seats.
A-2, A-3	One parking space for every 100 gross square feet or one parking space for every four occupants.
A-5	One parking space for every four fixed seats, special parking plans will be considered.
B	One parking space for every 250 gross square feet.
E	One parking space for every two employees, plus one parking space for every 10 students on an urban campus OR for every two students on a commuter campus.
S, U	One parking space for every two employees.
I-2	One parking space for every two employees, plus one parking space for every 10 resident beds OR for every two patient beds (no additional spaces are required for Day Care occupancies).
R-2	One parking space for every two employees, plus one parking space for every five beds.

NOTES:

1. Parking spaces for the disabled shall be located closest to the nearest accessible entrance on an accessible route and no more than 250 feet from the accessible entrance.
2. If it is impossible to comply with the requirements, a waiver from the CFO is required. The Determinations & Findings Report shall explain in detail why compliance is impossible and shall provide an alternative proposal for parking. Parking plans may be developed for an entire complex that address the total parking spaces available for all buildings and their associated Use Groups. Where insufficient parking is provided on site, the Parking Plan shall address the availability of off site parking for the building / facility occupants.

PART 7D CONCRETE**SECTION 7D.1 SPECIAL REQUIREMENTS FOR CAST-IN-PLACE CONCRETE**

The specifications shall contain the following requirements in Section 03300 - Cast-in-Place Concrete:

1. ACI 301, Specification for Structural Concrete for Buildings (current edition) shall be incorporated by references as the standard unless otherwise modified.
2. Field tests of fresh concrete shall include Sampling - ASTM C172, Slump - ASTM C143, Making and Curing Test Specimens - ASTM C31, Air Content - ASTM 231 or ASTM C173, and Unit Weight - ASTM C138.
3. The University shall engage the services of the concrete testing laboratory to perform the sampling, cylinder preparation and delivery, testing and reporting. The Contractor shall be responsible for adequate advance notice to the testing laboratory for the contractor's concrete pours/placement.

Individuals performing the field tests of fresh concrete shall have proper training, qualifications, and be certified as a Concrete Field Testing Technician-Grade I by the American Concrete Institute or other recognized certification conforming to the minimum requirements of the American Concrete Institute's certification which requires the successful completion of a written and performance examination on the applicable ASTM test methods of this section.

PART 7E METALS**SECTION 7E.1 STEEL ROOF DECK**

Corrosion protection is critical to maintain the structural integrity of the roof deck from moisture leaks through the roofing membrane. NRCA Bulletin 15-91 provides guidance on protection. 'Primer paint' coated deck is not allowed on University projects. Require the steel roof deck to be Factory Galvanized, G-60 or G-90 (ASTM A924-94) or Factory coating with aluminum zinc alloy (ASTM A792).

PART 7F THERMAL & MOISTURE PROOFING

SECTION 7F.1 WATERPROOFING & DRAINAGE FOR SUBSURFACE STRUCTURES

University buildings for human or equipment occupancy shall be designed with basement floor levels below the water table without specific authorization premised upon need.

Varying degrees of subsurface water content require the following minimal waterproofing and drainage techniques:

7F.1.1 Soils with little or no obvious water content:

- (1) Waterproof walls and provide any suitable waterproofing protection board.
- (2) Provide perforated type drainage pipe with gravel surrounding.
- (3) Backfill with suitable material that has some porosity.

7F.1.2 Damp to wet soils with no obvious water source:

- (1) Waterproof walls and provide protection board. Note: If geotechnical type drainboard is used, protection board may not be required.
- (2) Provide perforated type drainage pipe and (if necessary) surround with full height gravel to the underside of the impervious soil or material. An approved geotechnical type drainage board may be used in lieu of the full height gravel at the contractor's option.
- (3) Provide impervious soil or material at finish grade.

7F.1.3 Walls or floors below the groundwater table:

- (1) Delete the lowest floor or space below the highest calculated groundwater table possible, or
- (2) Raise the level of the lowest top of floor structure above the top of the highest calculated groundwater table possible.

7F.1.4 The use of a geotechnical filter fabric is recommended for protection board and perforated drainage pipe.

SECTION 7F.2 ROOFING POLICY

7F.2.1 General: The University requires that first priority be given to the roofs of its facilities. As determined by the University Board of Visitors and the Architect for the University, steep slope roofs are typically applicable to University buildings including at the University of Virginia College at Wise. The Facilities Management Facilities Design Guidelines address steep slope, low slope and metal roofing, and may be more restrictive than requirements of this manual.

The provisions of Sections 7F.2.1 through 7F.2.15 shall govern the design of all low-slope, flexible-membrane (built-up and single-ply) roofs.

Consultation with the University Roofing Project Manager is mandatory for all roofing or re-roofing projects.

7F.2.2 Roofing Abbreviations

BUR:	Built-up Roofing
EPDM:	Ethylene Propylene Diene Monomer
FM:	Factory Mutual
NDE:	Non-Destructive Evaluation
NRCA:	National Roofing Contractors Association NRCA Manual: The NRCA Roofing and Waterproofing Manual (latest edition)
RCI:	Roof Consultants Institute
RIEI:	Roofing Industry Educational Institute
SPM:	Single-ply Membrane
SPRI:	Single-ply Roofing Institute
UL:	Underwriters Laboratories

7F.2.3 Acceptable Roofing Membrane: The following types of membrane are acceptable on low-slope roofs for University owned facilities:

1. EPDM, Single-ply, 60-mil minimum thickness. Fully adhered system is preferred. See Facilities Design Guidelines (FDG) or other criteria.
2. Built-up Roofing, Hot Bitumen, 4-ply minimum. See FDGuidelines for limited application.
3. Hybrid 4 ply system with reinforced Modified Bitumen cap sheet. See FDG for specific cap sheet requirements.

7F.2.3.1 Other Roofing Membrane: The University Roofing Project Manager, subject to CFO approval, will consider a request for the use of membranes other than EPDM, BUR, and Hybrid 4-ply system only in accordance with the Facilities Design Guidelines. The request must be received and approved before working drawings are submitted for review and shall provide the following:

1. The reasons for using other membrane(s).
2. A description of the system(s) and membrane(s).
3. A summary of evaluated design criteria listed in Section 7F2.11.
4. The A/E shall confirm in writing:
 - A. That the roofing membrane and systems have been investigated and in the A/E's opinion are suitable for use on the proposed project roof(s);
 - B. That at least three installations have had at least five years of successful service in Virginia or contiguous states with project names, owner, approximate roof sizes, locations, contact names and telephone numbers.
5. That the A/E has personally investigated at least three installations of the proposed system(s) and is satisfied that they will have a service life meeting requirements of the Facilities Design Guidelines under existing conditions.

7F.2.4 Existing Roofing Systems

7F.2.4.1 Before reroofing a facility or making major repairs, the University must procure a roof survey performed by an experienced and qualified inspection service. The roof survey shall use infrared or nuclear NDE moisture detection methods. For roofs repairs or replacement, an asbestos survey shall be performed and the findings reported in writing.

Exception: For roofs that are very small or that have reached an advanced stage of deterioration and where a roof survey does not appear cost effective, an Agency may, after determining the conditions by visual inspection, request a waiver of the roof condition survey. The request must be accompanied by a roof plan sketch with features noted, a written description of the problems cross referenced to the plan, an approximate area of the roof, and photographs showing the conditions which support the request. An asbestos assessment is required.

7F.2.4.2 If the survey indicates a need for complete reroofing, the A/E shall specify new construction guarantees.

7F.2.4.3 If complete reproofing is required, then insulation for thermal resistance of the building shall be provided in the roof covering assembly in accord with the requirements of new construction.

7F.2.5 **Owner's Roofing Inspection:** The University shall have a full-time inspector on the job while the roof is being applied. The inspector can be the project inspector or someone qualified to inspect a roof installation but, preferably, a RIEI Certified Quality Assurance Observer, RCI Registered Roof Observer or one who has attended Roof Consultants Institute Seminars.

The Roofing Inspector shall check all materials and application procedures and prepare a daily written report covering such items as: the weather conditions, the deck conditions, the materials

stored, the materials installed, and the installation procedures used including bitumen temperature at kettle and point of applications, etc. A copy of the daily report shall be given to the Contractor. The inspector shall not permit installation of roofing materials without having first obtained from the Design Architect a copy of the manufacturers certification confirming that the materials delivered for use on the project meet the specified ASTM Standards or other approved Standards. The University shall inspect the roof(s) semiannually, as a condition of the roofing guarantee and states maintenance policy. The University shall also inspect the roof(s) before the two-year guarantee expires. (See roof inspection form in Appendix G.)

Appendix (G) provides criteria and qualifications for selecting (1) full time roof inspectors and (2) roof consultants. It, also, provides (3) criteria for non-destructive evaluation (NDE) roofing surveys and (4) criteria for drawings to accompany NDE surveys. Forms used with (1), (2), and (3) are included in Appendix G.

7F.2.6 Roofing Conferences: A prebid conference is not required but is strongly recommended for reroofing or roofing repair projects. A pre-roofing conference is required and shall be specified.

7F.2.6.1 Prebid Conference: If specified, bidders shall not be required to attend. They may question or comment on the specified roofing system, materials, details, and any other details thought to affect the roof. Response to comments shall be in writing or by addendum if bid documents need changing.

7F.2.6.2 Pre-roofing Conference:

- (1) A conference shall be required and held before ordering roofing materials.
- (2) Representatives of the University (including the Roofing Inspector), Architect, General Contractor, Roofing Contractor, Deck Contractor, Mechanical Contractor, and Roofing Manufacturer will attend.
- (3) Review plans, specifications, flashing details, work scheduling, and workmanship standards required. Resolve problems and discrepancies.
- (4) Prepare a written record of proceedings and make it a part of the job record.

7F.2.7 Guarantees: Specify guarantees and warranties for new construction or reroofing in the Special Conditions or General Requirements (Division 1) as follows:

7F.2.7.1 For New Construction

- (1) The (General) Contractor shall submit a written guarantee in which he agrees to maintain the entire roof system(s) in a completely watertight condition at no cost to the Owner for two (2) years from date of final acceptance; except the water tightness guarantee shall not be enforced when the Contractor can prove water damage was caused by the University.

The guarantee shall cover the roofing membrane and flashing, metal flashing, parapet coping, and all properly detailed penetrations of the roofing membrane for such things as stacks, curbs, expansion joints, etc., which exist when the work is performed.

- (2) Provide the following Roofing contractors guarantee on the General contractors guarantee form:

“The roofing contractor shall guarantee its materials and workmanship associated with the roofing, flashings, and sheet metal work incidental to the work required under the roofing subcontract, against defect due to faulty materials or workmanship for a period of two (2) years from the date of completion of such work. It is understood and agreed by all parties hereto that the responsibility of the roofing contractor under this guarantee form or any contract document shall be limited to the limited guarantee herein expressed by said roofing contractor.”

- (3) Provide the following Owners Agreement on the Contractors guarantee form:

“The undersigned named University of Virginia agrees, from the date of acceptance of the project, to maintain the roof in accordance with the manufacturers written requirements and agrees to avoid damage to the roof surface by any parties under his control working or walking on the roof. The University recognizes his responsibility to inspect the roof semiannually.”

- (4) Authorized agents of the General Contractor, Roofing Contractor, and University shall execute the guarantee form.
- (5) The General Contractor shall furnish, as a minimum, a manufacturers standard 15-year warranty/ guarantee.

7F.2.7.2 For Reroofing

- (1) The Contractor shall guarantee the materials and workmanship associated with the roofing, flashings, and sheet metal work incidental to the reroofing project against defects due to faulty materials or workmanship for a period of two (2) years from the date of completion.
- (2) Also, include wording in paragraph 7F.2.7.1 (3) on the contractors guarantee form.
- (3) Authorized agents of the Contractor and University shall execute the guarantee form.
- (4) The Contractor shall furnish, as a minimum, a manufacturers standard 15-year warranty/guaranty.

7F.2.8 NRCA Roofing and Waterproofing Manual: Use the latest edition of the *NRCA Manual* as a guide in preparing plans and specifications for all new roofing projects and for reroofing projects to the extent practicable unless:

1. The *NRCA Manual* conflicts with provisions of this section, or
2. The A/E documents needs for and obtains University Roofing Project Manager approval to use different details and provisions.

7F.2.9 Bidding Roofing Systems: Specifications shall include bids for only one type of roofing system either built-up roofing or fully adhered single-ply roofing, for example, but not both unless approved by the CFO. If more than one is approved, the systems shall be specified as options permitting the bidder to select the system he wishes to use. The systems shall not be bid as alternates.

7F.2.10 Materials Certification

7F.2.10.1 Specify that at the pre-roofing conference, the Contractor shall give to the A/E the roofing manufacturers certification that the roofing materials being furnished comply with specified ASTM and approved standards.

7F.2.10.2 Specify that such certification shall be received with roofing materials delivered to the job site.

7F.2.10.3 Specify that the A/E must receive a copy of the certification and give it to the University's full-time roof inspector before roofing materials may be installed.

7F.2.10.4 The A/E shall give a copy of the certification to the University representative at the final inspection.

7F.2.11 System Evaluation: The A/E responsible for roofing design shall evaluate and specify the roofing system(s) for:

- Fire Resistance Rating
- Wind Uplift Resistance
- Warranty
- Tear Resistance
- Attachment
- Resistance to harmful local chemicals
- Membrane compatibility with insulation
- Type of membrane seams and joints

7F.2.12 Single-ply Membrane (SPM) Specifications

7F.2.12.1 Specify SPM completely with latest listed ASTM and performance criteria.

7F.2.12.2 SPM, if specified with either manufacturer or brand-name products, shall be specified with three manufacturers and three equivalent products.

7F.2.12.3 Use the latest edition of Roofing Materials Guide, published by National Roofing Contractors Association, to determine equivalent SPM.

7F.2.12.4 Where ballast is permitted the single-ply membrane manufacturers representative shall check installation procedures at start-up and inspect the completed membrane installation before ballast is applied. See Facilities Design Guidelines limitations on application of ballasted membrane roofing.

7F.2.13 Built-up Roofing (BUR) Membrane Specifications

7F.2.13.1 Specify BUR and each BUR system component with latest available ASTM standards.

7F.2.13.2 Specify, minimally, a built-up four-ply hot bitumen system.

7F.2.13.3 Hybrid four ply systems shall have a reinforced Modified Bitumen cap sheet at least 150 millimeters thick with a mineral granule surface applied with hot asphalt over a three ply (minimum) hot bitumen system. See Facilities Design Guidelines for other applicable criteria. Since Modified Bitumen systems vary significantly, the A/E shall contact the University Project Manager to verify that other requirements proposed to be specified are satisfactory.

7F.2.13.4 If manufacturers are specified, specify three manufacturers and three systems.

7F.2.13.5 Specify Equipment-Viscous temperature (EVT) for bitumen application.

7F.2.14 General Requirements: The following requirements are generally applicable to all low-slope roofs. They shall be specified as indicated unless waived by the University Roofing Project Manager, subject to approval by the CFO, for justifiable reasons:

7F.2.14.1 Roof Slope

- (1) Specify that all roofs shall slope 1/4" per foot, minimum, to drains on all new roofs.
 - (2) If a 1/4" slope is impractical on replacement roofs, the A/E may request authority to use a lesser slope from the University Roofing Project Manager through the University Project Manager.
- * Dead level valleys are unacceptable. Valleys shall slope a minimum of 1/8" per foot unless impractical. In such case a waiver may be requested by the A/E to the University Roofing Project Manager through the University Project Manager to allow a slope of 1/16" per foot.

7F.2.14.2 Wind Uplift: Rating of complete roof assemblies shall be Class 1-60 (1-90 for open coastline locations) designed in accord with FM P7825; alternatively, loose laid, ballasted applications shall be designed to withstand wind uplift in accord with requirements in SPR1 RP-4 (or FM Technical Advisory Bulletin 1-29).

If the above design methods are not used, roof-covering assemblies shall be designed to withstanding an uplift pressure as determined by criteria in:

- (1) Factory Mutual (FM) Loss Prevention Data Sheets 1-7 and 1-28S or
- (2) Single-ply Roofing Institutes (SPRI) SPRI RP-4 Wind Design Guide

7F.2.14.3 Insulation: Unless otherwise required to comply with a Manufacturers roofing system, specify insulation to comply with Facilities Design Guideline criteria. Specify as follows:

- (1) C or R (per inch) factor
- (2) Compatible Insulation: The A/E shall assure the University that the specified type of insulation has been investigated and is entirely compatible with contiguous, specified roofing materials system,

7F.2.14.4 Rooftop Equipment

- (1) Avoid if possible. See Facilities Design Guidelines.
- (2) Comply with NRCA Manual recommendations.
- (3) Design clearances and details for easy re-roofing. See Facilities Design Guidelines.
- (4) Provide prefabricated walks to and around equipment that requires servicing; walks must not block roof drainage. See Facilities Design Guidelines.

7F.2.14.5 Approved Applicator: Specify that the roofing and base flashing applicator shall be approved by the materials manufacturer.

7F.2.14.6 Roof Protection: All specifications must state that before moving equipment or materials over a roof, the University, General Contractor, Roofing Contractor, and any of their agents must protect the roof from damage during and following roofing work. Movement of equipment and materials without roof protection shall be cause for the University, General Contractor, Roofing Contractor or A/E to stop work until protection is provided and any damage is corrected. The University's roofing inspector shall record all such violations.

7F.2.14.7 Pre-Final Inspection Survey: Unless the Owner, on advice of his A/E, requests a waiver of the survey for justifiable reasons given in writing and the CFO approves the waiver, specifications shall include the following survey provisions:

- (1) The A/E shall notify the University, Contractor, and Roofing Contractor (in writing) that he has inspected the roof(s) and finds it (them) sufficiently complete to permit a roofing survey. In no case shall the survey be made earlier than forty days before the Substantial Completion Inspection.
- (2) The University shall engage the services of an experienced, independent roof survey inspection service or laboratory, to survey the roof(s). The service shall use infrared or nuclear moisture detection methods, except if the method used requires roof probes or cuts, it shall not void the Contractors two-year guarantee and the Manufacturers standard warranty/guarantee.
- (3) The Roofing Contractor shall cooperate and assist the inspection service by making and repairing any required cores, test cuts, or probes in such a way that Manufacturer's and Contractor's warranty/guarantees are not voided.
- (4) A copy of the survey report shall be delivered to the University Project Manager no later than ten days before the Substantial Completion Inspection. Also, copies of all survey reports shall be delivered to the A/E, Contractor, and Roofing Contractor.
- (5) The University shall pay for the service except that if the survey shows roofing deficiencies caused by improper materials, poor workmanship, or Contractor negligence, the Contractor, at his expense, shall repair or replace the roof(s) and provide additional surveys until the roofing work complies with the contract documents. All corrective work shall be completed before the final inspection.
- (6) Acceptance of the roofing system shall be contingent on a roofing survey report that indicates the presence of no detrimental amount of moisture; for example, moisture that would cause a significant lowering of the thermal resistance of the roof; separation of the roofing plies; blisters; etc.
- (7) Insulation that has lost more than 20% of its dry thermal resistance (R-value) and any materials covering the insulation shall be replaced by the Contractor at no cost to the University.

7F.2.15 Final Inspection

7F.2.15.1 The following items must be given to the University's representative at the Final Inspection:

- (1) A copy of the (general) contractors and roofing contractor's two-year guarantee.
- (2) A copy of the roofing manufacturers standard warranty/guarantee.
- (3) A copy of the manufacturers certification that roofing materials comply with specified ASTM standards.

- (4) Copies of the History of Roofing Installation, Sample Form A; Roof Information Worksheet - Built-Up Roofing, Sample Form B, or Roof Information Worksheet - Single Membrane Roofing, Sample Form E. The A/E shall obtain forms from the Owner and complete all applicable items. (The Forms may be found in Appendix G.)

7F.2.15.2 Representatives of the University and the A/E, the Contractor, the Roofing Subcontractor, and the Membrane Manufacturer shall inspect the roof(s) between nine months and one year before the closing of the General Contractors one-year guarantee. The University shall also have the roof inspected at least three months before the two-year guarantee expires and notify the Contractor in writing of any defects noted. The University shall require that any defects be corrected at least 30 days prior to expiration of the guarantee.

SECTION 7F.3 SPRAYED-ON FIREPROOFING DESIGN & SPECIFICATION

The A/E shall determine which members are required to be fireproofed and indicate the minimum thickness of the sprayed-on fireproofing to be applied. The bid documents shall clearly show the scope of work for the sprayed-on fireproofing on the drawings, on typical and special details, and in the specifications. Shop drawings may be required to further clarify requirements for the Applicator and the Inspector, if necessary.

In order to assure that beams, decks and columns are properly fireproofed, include the requirements hereinafter indicated in all applicable specifications for capital outlay projects.

7F.3.2 Where structural steel members having different thicknesses of sprayed-on fireproofing intersect or connect, provide sprayed-on fireproofing equal to the greater thickness on all members for a distance of two (2) feet minimum from the junction of the members.

7F.3.3 Metal attachments such as miscellaneous angles, light gage framing, and hangers shall be covered in the areas of the attachment with the same thickness of sprayed-on fireproofing as the structural member.

7F.3.4 Validation Testing Requirements: All sprayed-on fireproofing shall be tested after installation according to ASTM E-605 and ASTM E-736, latest editions. An independent testing laboratory shall make these tests. The University 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.

The location and number of tests of the sprayed-on fireproofing shall conform to the requirements below:

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.

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.

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.

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.

7F.3.5 Removal and Replacement of Sprayed-on Material: University and/or A/E shall contact the University Review Unit and the State Fire Marshal early in the design phase to verify 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 as required in Chapter 8 to the Fire Marshal which will include any bidding documents, addenda or change orders which may relate to the fire resistive characteristics of the structure. Submission shall include the construction date, original and present uses, height in floors and feet, whether sprinkled and any other information that may assist the University Review Unit and the responsible State Fire Marshal Office in a determination of need.

7F.3.6 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 University and State Fire Marshal.

PART 7G VERTICAL TRANSPORTATION

SECTION 7G.1 ELEVATORS

7G.1.1 Final Acceptance: Include the following statement in all Elevator Specifications: "As a part of final acceptance of the project and in accordance with the General Conditions, the Contractor shall have a Qualified Elevator Inspector (QEI) conduct a full Acceptance Inspection and Test in accordance with ASME/ANSI A17.1 before final acceptance by the Owner. The Contractor shall obtain from the elevator contractor and/or manufacturer and furnish to the Owner all data affecting the elevator installation or modification, including 'as-installed' circuit and control wiring diagrams and maintenance manuals."

7G.1.2 Microprocessors: See Facilities Design Guidelines.

7G.1.3 Elevator Cab Size: All new buildings provided with elevator service shall have at least one elevator sized and configured to accommodate an ambulance type stretcher (76 inch x 24 inch)

in the horizontal position. See the applicable VUSBC and University Facilities Design Guidelines Sections on elevators and conveying systems for additional requirements. Where existing elevators are being replaced, the above criteria shall be met where possible.

7G.1.4 Application of ANSI/ASME A17.1, Rule 102.2(c)(4): In order to prevent people from being trapped in an elevator when power is automatically disconnected in accord with the requirements of ASME/ANSI A17.1, Rule 102.2 (c)(4), the policy below shall be applicable for all new and remodeled state building elevator systems

7G.1.5 Before power is automatically disconnected in accord with ASME/ANSI A17.1, Rule 102.2 (c)(4), provide controls necessary to accomplish the following:

1. Heat detectors required by Rule 102.2 (c)(4) shall provide a signal to initiate Phase I Fireman's Service Emergency Recall Operation Rule 211.3a. The activation sequence shall be similar to requirements for smoke detectors in Rule 211.3b. No additional heat detectors are required other than those called for by Rule 102.2(c)(4).
2. Provide an elevator travel time delay, equivalent to the elapsed time for an elevator to travel from its farthest stop to the designated recall level plus ten (10) seconds before power to the elevator equipment is disconnected and pre-action sprinkler is activated as required by Rule 102.2(c)(4). [Elevator Travel Time Delay = The time for an elevator to close its doors, under Phase I conditions, return to the designated recall level, and open its doors. If there are multiple elevators, the elevator having the greatest travel time shall be used in determining the time delay.] See Sample Circuitry Diagram in Figure 7G.1.5.

PART 7H MECHANICAL

SECTION 7H.1 MECHANICAL DESIGN STANDARDS

The criteria contained in this section supplements VUSBC to assure minimum standards as indicated and applies to all appropriate projects in the Capital Outlay Program. Its purpose is not to limit architectural and engineering freedom, but to create awareness that all designs must effectively minimize the use of energy. The development of these standards/guidelines has demonstrated that energy efficient designs provide very significant energy savings and reductions in life cycle costs. Compliance with these standards/ guidelines is mandatory.

Energy efficiency considerations are a function of building design. All projects financed by the state will be evaluated for energy conservation and life cycle costs.

Computerized energy budget analysis, forecasting energy consumption in BTU/GSF/year is mandatory for all projects with greater than 8,000 gross square feet which have heating and cooling and with greater than 20,000 gross square feet which have heating only.

7H.1.1 Building Design

7H.1.1.1 All construction shall be designed in conformance with ASHRAE 90.1-1989.

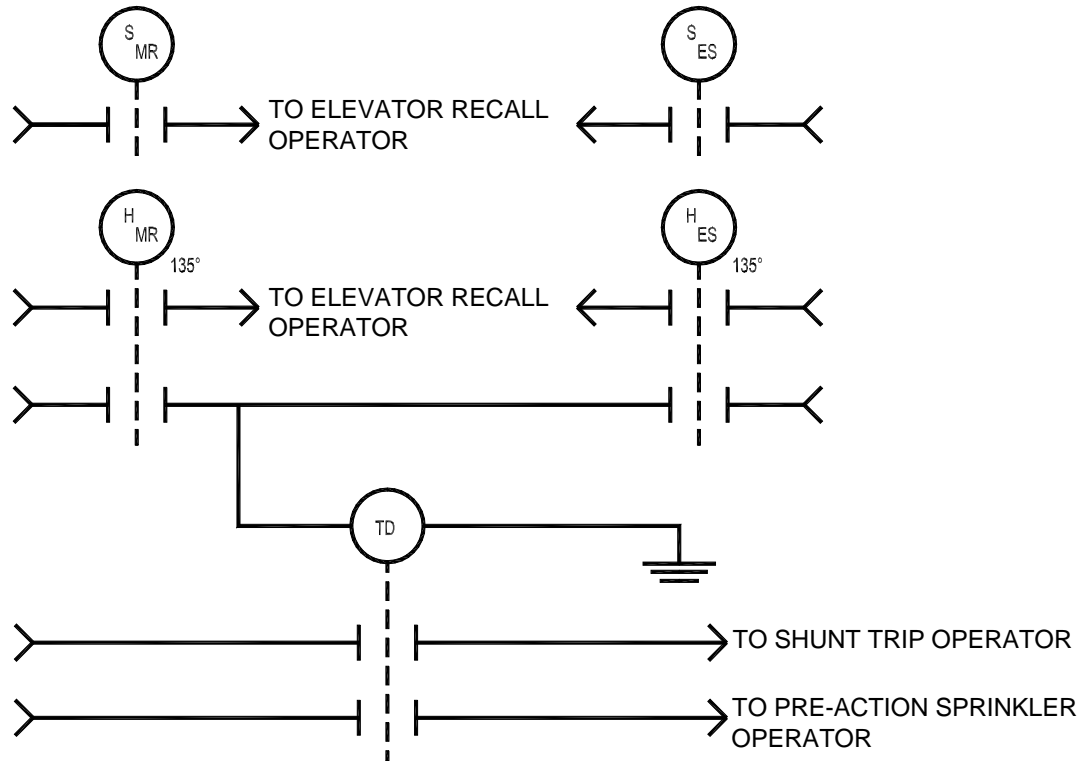
7H.1.2 Heating, Ventilating, and Air Conditioning

7H.1.2.2 Design Conditions: Design heating and cooling systems using the following criteria:

- (1) Heating - Use the median of annual extremes for outside temperature included in the most recent ASHRAE Handbook Fundamentals data. Use Inside Design Condition Criteria in Figure 7H.1.1 for inside temperatures.
- (2) Cooling - Use 2-1/2% figures for outside Wet Bulb and 2-1/2% figures for Dry Bulb temperatures included in Figure 7H.1.1 or the most recent ASHRAE Handbook Fundamentals data. Use Inside Design Condition Criteria in Figure 7H.1.1 for inside design temperature.
- (3) For any Occupancy/Use not shown in the Inside Design Condition Criteria, Figure 7H.1.1, consult ASHRAE Handbooks or other applicable references for suggested criteria and obtain CFO approval of conditions proposed for use in design.

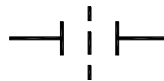

7H.1.2.3 Methods of energy conservation, such as energy recovery from exhaust air shall be evaluated.

FIGURE 76.1.5



LEGEND

- S_{MR} = SMOKE DETECTOR IN MACHINERY ROOM
- H_{MR} = HEAT DETECTOR IN MACHINERY ROOM
- S_{ES} = SMOKE DETECTOR IN ELEVATOR SHAFT
- H_{ES} = HEAT DETECTOR IN ELEVATOR SHAFT
- TD = TIME DELAY RELAY

-  = CONTACT
-  = ELECTRICAL POWER

OPERATION

AFTER ENERGIZATION OF HEAT DETECTOR THE TIME DELAY RELAY PICKS UP WHEN PRESET TIME HAS EXPIRED. THIS TIME IS DETERMINED BY THE TOTAL ELEVATOR TRAVEL TIME IN THE LONGEST RUN TIME SCENARIO, WITH AN ADDITIONAL 10 SECONDS ADDED. WHEN THIS TOTAL TIME IS SATISFIED THE TIMER CONTACTS ARE CLOSED, AND THAT WILL RESULT IN THE SHUNT TRIP OPERATOR BEING ENERGIZED, AND THE PRE-ACTION SPRINKLER OPERATOR BEING ENERGIZED.

SAMPLE CIRCUITRY DIAGRAM

7H.1.2.4 System shutdown and night setback or reduction of outside airflow shall be provided for all systems to reduce energy use during periods of non-use.

7H.1.2.5 Ventilation rates and total air circulated shall be kept to the minimum as required by VUSBC, ASHRAE Standard 62-1989, or recognized special space requirements. Each mechanical ventilation system (supply and/or exhaust) shall be equipped with a readily accessible means for either shutoff or volume reduction when ventilation is not required, including morning warm-up.

7H.1.2.6 Use outdoor air for cooling as defined by the VUSBC. **7H.1.2.7** Humidification for human comfort will not be allowed. **7H.1.2.8** The use of electric resistance as the primary source of heat is not allowed without a waiver from the CFO. If electric resistance heat is the only option for heating, documentation justifying the same shall be submitted to the CFO for approval. **7H.1.2.9** Use activated charcoal filters or other efficient systems as approved by the CFO when odor control is required. **7H.1.2.10** Use hot water temperature reset controls. **7H.1.2.11** Size pumps, fans, chillers etc. to design load; do not oversize. **7H.1.2.12** Use variable speed drives on VAV fans.

7H.1.2.13 Use electric ignition instead of pilots.

7H.1.2.14 Provide means to shut-off HVAC distribution to unoccupied areas. Exceptions will be granted to hospitals, health care facilities, and other specialized construction, i.e., labs, computer rooms etc.

7H.1.2.15 Avoid the use of reheat systems. **7H.1.2.16** Use primary/secondary pumping and/or variable volume pumping. **7H.1.2.17** Avoid supplying simultaneous heating and cooling to a zone.

7H.1.2.18 Evaluate the use of energy management control and/or direct digital control systems.

7H.1.2.19 Evaluate thermal storage for electrical demand reduction, if current utility rates justify this technology. **7H.1.2.20** Evaluate the potential for co-generation. **7H.1.2.21** Evaluate the use of high efficiency, ground coupled, water source (geothermal) heat pumps.

INSIDE DESIGN CONDITION CRITERIA

Occupancy/Use	Summer (Cooling)	Winter (Heating)
Offices/Business	78°Fdb	70°Fdb
Classrooms/Lecture	78°Fdb	70°Fdb
Residential	78°Fdb	70°Fdb
Libraries *	78°Fdb	70°Fdb
Archival Storage in Libraries	Special	Special
Art Storage in Museums	Special	Special
Kitchens ***	85°Fdb or spot cooling	70°Fdb
Warehouse, Mechanical Rooms, Storage Rooms and Electrical Rooms	Ventilate with outside air unless otherwise approved	40-55°Fdb for freeze protection
Pools **	82°Fdb 50-60% RH Pool Water: 80°F	82°Fdb 50-60% RH Pool Water: 80°F
Hospitals	Consult the ASHRAE Guide or other applicable references	
Laboratories * 78°Fdb 70°Fdb (Educational)	30-60% RH	30-60% RH
Laboratories * 75°Fdb 72°Fdb (Research)	30-60% RH	30-60% RH
Gymnasiums/Recreation, Indoor Tennis and Racquetball Courts, Weight Rooms and Aerobic Rooms ***	80°Fdb	68°Fdb
Locker Rooms/Showers ***	80°Fdb	70°Fdb

- * Conditions may vary depending upon actual user justified requirements. Deviations must be approved by the CFO.
- ** Cooling for type occupancy/use must be justified to and approved by the CFO.
- *** These occupancies/use types are not normally provided with cooling unless justified to and approved by the CFO. Where approved, design conditions shall not exceed those indicated.

Figure 7H.1.1

7H.1.3 Domestic Hot Water 7H.1.3.1 See University Facilities Design Guidelines for requirements. 7H.1.3.2 Use chemical sterilization and/or booster heater systems for dishwashing needs instead of higher temperature supply hot water.

7H.1.3.3 Maximum water use rates for showerheads, faucets, water closets and urinals shall meet the requirements of the VUSBC.

7H.1.3.4 Provide temperature control devices and time clocks for domestic water heaters.

7H.1.3.5 Consider instantaneous units for heating domestic hot water.

7H.1.3.6 Maximum water use rates for showerheads, faucets, water closets and urinals shall meet the requirements of the VUSBC. 7H.1.3.7 The use of domestic water for process cooling is prohibited.

7H.1.4 Building Energy Requirements

The preliminary submittal shall include calculations along with the Basis of Design per Appendix D to assure that the design complies with the VUSBC requirements and the Energy Conservation standards of this Manual.

SECTION 7H.2 STEAM AND HOT WATER DISTRIBUTION SYSTEMS

The basic requirements for these systems are as follows:

7H.2.1 See University Facilities Design Guidelines for requirements.

7H.2.2 Underground piping systems distributing steam, condensate, low and high temperature water and other heating media above 180 F shall be installed in box trenches or tunnels. A direct burial system shall not be permitted without approval of the CFO. Construction shall be designed to prevent the intrusion of water and other substances into box trenches or tunnels for a minimum of 25 years.

7H.2.3 Pipe shall be properly supported, anchored, and guided to allow for expansion/contraction. Expansion loops, slip joints, and/or ball joints may be applied (to be packed and lubricated under full line pressure). Bellows type joints are not acceptable. Systems must be ventable and drainable.

7H.2.4 The drawings for the distribution system shall include both a plan view and a profile view of the system indicating points of connection, anchorage points, loops, points of support, elevations (on profile view), junctions and crossovers/crossunders with other utilities or obstructions and other pertinent data required for construction. Drawings shall also include typical and special details of supports, anchors, connections and other similar conditions.

7H.2.5 Materials of construction and fabrication must lie within allowable stress values specified by the ASME Code. Design life will be 30 years.

7H.2.6 Pipe systems at elevated temperatures (greater than 150°F.) will be designed to stay dry, be corrosion protected, and to have economic heat loss rates.

7H.2.7 Above-ground steam and hot water distribution systems should be used where they are feasible.

7H.2.8 Insulation materials must have high compressive strength, low permeability, low conductivity; must be non-corrosive, and vermin-proof. Insulation must be dryable if wetted, and withstand repeated or extended boiling without damage or loss of insulating qualities. Pre-molded types are to be used; loose fill and blanket types are unacceptable.

7H.2.9 The piping shall be hydrostatically tested before insulating and before field joints are backfilled.

SECTION 7H.3 CHEMICAL CLEANING & CHEMICAL WATER TREATMENT OF BOILERS & HVAC SYSTEMS

7H.3.1 See University Facilities Design Guidelines for requirements.

7H.3.2 The boilers, the HVAC systems, all system piping, and all system related equipment shall be thoroughly flushed out with precleaning chemicals designed to remove construction related deposits such as pipe dope, oils, loose mill scale, and other extraneous material. Systems shall be cleaned and/or boiled-out in accordance with the manufacturer's instructions and the recommendations of the University's Water Treatment Consultant. The products used shall inhibit corrosion of the various metals in the system and shall be safe to handle and use.

7H.3.3 The A/E shall consult with the University and his Water Treatment Consultant to determine the proper cleaning and water treatment requirements for boilers, piping, and other HVAC systems.

7H.3.4 The A/E shall specify the standards and requirements applicable to the chemical cleaning and water treatment of the system. The following should be addressed:

- The standards to be met by the Contractor in flushing, cleaning and treating the system;
- That the Contractor is responsible for providing all equipment, fittings, tubes, valves, connections, labor, chemicals, and miscellaneous hardware for the boiler boil-out, for the flushing, cleaning and associated water treatment, and for the initial chemical water treatment for the boilers and HVAC systems; and
- The chemicals to be used for the initial treatment of the system after flushing and cleaning have been completed;

- That the chemical formulation used shall be compatible with system materials;
- That the chemicals used shall conform to DEQ regulations and requirements; and
- That the chemical mixtures do not exceed DEQ or local effluent limits.

7H.3.5 The A/E must specify that the Contractor notify the Owner (approximately) 30 days before the boil-out/cleaning of the system and the application of the chemicals are started. The University's Water Treatment Consultant shall observe and monitor the boil-out/cleaning of the system and the initial charge of chemicals required for placing the equipment in normal service.

7H.3.6 The contract documents shall require that after cleaning and chemically treating boilers and HVAC systems, the Contractor shall furnish the University, in writing, the following information:

- (1) Date of initial treatment.
- (2) Type of chemical(s) used for treatment.
- (3) Estimated date that further treatment or testing will be required.

7H.3.7 The University and University Water Treatment Consultant shall continue monitoring and treating the water after initial treatment.

SECTION 7H.4 BUILDING AUTOMATION SYSTEMS AND PROCUREMENT PROCEDURES

7H.4.1 See University Facilities Design Guidelines for requirements.

SECTION 7H.5 FIRE PROTECTION INFORMATION

7H.5.1 Specific requirements are listed in SECTION 8.7 and SECTION 8.8 of this manual.

7H.5.2 Where a change of occupancy is intended for an existing building full compliance with VUSBC or VUSBC 3410 Compliance Alternatives is required. For consideration of seeking code variances for an existing building the level of fire safety shall be factored into a request to the University Building Official. A variance for a condition that decreases the level of fire safety shall be offset by modifications that increase the fire safety level. Consideration shall be given to the use of VUSBC 3410 Compliance Alternatives to support the proposed variance.

SECTION 7H.6 FIRE DETECTION AND ALARM SYSTEMS

7H.6.1 The A/E shall provide project specific drawings and specifications that define a code compliant fire alarm system. Performance criteria do not meet this intent. Construction documents shall indicate that changes to the design during construction shall be considered substitutions in accord with Section 26 of the General Conditions for the Construction Contract. Changes shall be

documented by Change Order and shall be submitted to the University Building Official for review. The A/E shall confirm that the fire detection and alarm systems are complete, functional and code compliant.

7H.6.2 Drawings shall provide the following minimum information to demonstrate compliance with the requirements of the code:

- 1) Location and identification of all fire alarm system initiating and notification appliances, including protective covers where applicable. As related the same is required for an existing fire alarm system.
- 2) Location and identification of all fire alarm control and trouble signaling equipment. As related the same is required for existing fire alarm control and trouble signaling equipment.
- 3) Location and identification of interface requirements for all devices provided by other trades such as HVAC duct smoke detectors, kitchen hood fire suppression equipment, and fire sprinkler flow and tamper switches.
- 4) Location and identification of 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,
- 5) Identify the primary and secondary power supplies and connections.
- 6) Identify clearly the candela output levels for all visual alarm notification appliances.
- 7) Matrix defining the interface of the fire safety control functions, including the alarm initiating device activated, the action of the control and signaling equipment, the resulting alarm notification appliance actions, and the resulting operation of interfaced equipment.
- 8) Fire alarm riser diagram showing all system components, including zones to be protected, location of constantly attended location supervising fire alarm system, and the interface between the fire alarm systems and the constantly attended location.

7H.6.3 Specifications shall provide:

- 1) Wording that the Contractor shall not alter the location and type of fire alarm system initiating appliances, control and trouble signaling equipment, location of major components without written approval by the A/E and University Building Official.
- 2) Description of the acceptance testing requirements and which of the acceptance tests are to be witnessed by the responsible State Fire Marshal Office.

7H.6.4 Provide the following calculations to demonstrate compliance with requirements of code:

- 1) Quantity and location of the audible alarms as indicated on the drawings to achieve the code defined sound pressure levels in each of the respective spaces.
- 2) Required capacity of the secondary power supply attained.
- 3) Candela performance for alarm notification devices, including any provided with protective covers.

7H.6.5 Shop drawings are to be reviewed by the A/E of record for compliance with the project contract documents and the code. The A/E shall:

- 1) Verify the Underwriters Laboratories (UL) listings and classifications for the materials, components, and equipment provided for the specific project resulting in a code compliant fire alarm system.
- 2) Provide a “sealed” statement, attached to the reviewed shop drawings, indicating that the fire alarm shop drawings (working plans, product data, and calculations) satisfy the requirements of the contract documents and the code (citing applicable NFPA criteria).
- 3) Provide the responsible State Fire Marshal Office with copy(s) of the approved complete fire alarm shop drawings. 4) Provide the University Building Official a copy of the “sealed” statement and transmittal to the responsible State Fire Marshal Office.

7H.6.6 Fire alarm systems are to be acceptance tested in accord to code requirements. The responsible State Fire Marshal Office shall observe the installed fire alarm system and witness the fire alarm system performance tests. The A/E and Contractor shall certify that the fire alarm system is complete.

SECTION 7H.7 FIRE SUPPRESSION SYSTEMS - SPRINKLERS

7H.7.1 The A/E shall provide project specific drawings and specifications that define a code compliant fire sprinkler system. Performance criteria do not meet this intent. Construction documents shall indicate that changes to the design during construction shall be considered substitutions in accord with Section 26 of the General Conditions for the Construction Contract. Changes shall be documented by Change Order and shall be submitted to the University Building Official for review. The A/E shall confirm that the fire sprinkler system(s) is (are) complete, functional and code compliant.

7H.7.2 Drawings shall provide the following minimum information to demonstrate compliance with the requirements of the code:

- 1) Identification of the occupancy hazard classification and location of sprinklers for each of the spaces on each floor.
- 2) Location of fire department valves and risers (standpipe, combined standpipe and sprinkler, wet pipe) within the building.
- 3) Sprinkler piping and standpipe layout including 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 not shown.
- 4) Table summarizing the characteristics of the sprinkler system(s).
- 5) Small scale drawing showing locations of water hydrants, test and flow hydrants (for water flow tests) and routing of underground pipe. Indicate the water flow tests results, the date and time taken, and who conducted the test.
- 6) Identification of all existing sprinkler systems and standpipe systems, including any new connections to existing systems.
- 7) Sprinkle riser diagram with appropriate fittings, accessories, sizes, alarms, valves, etc. noted.
- 8) Location of all system drains, inspector's test station(s) and associated discharge/draining piping.
- 9) Location of fire department connection(s) with all interconnecting piping to the sprinkler and standpipe systems.
- 10) Sprinkler head type, K-factor and temperature ratings.

7H.7.3 Specifications shall provide the following minimum information to demonstrate compliance with code requirements:

- 1) Wording that the type of systems, the location of major components, the quantity, type, coverage, location of sprinklers, and distribution systems are not to be altered by the Contractor without approval of the A/E and University Building Official.
- 2) Description of the acceptance testing requirements, and which of the acceptance tests are to be witnessed by the responsible State Fire Marshal Office.

7H.7.4 Provide the following minimum calculations to demonstrate compliance with code requirements:

- 1) Final hydraulic calculations for each of the sprinkler systems and the standpipe system.

- 2) Demonstration of performance of the system with an automatic water supply for the most hydraulically demanding zone(s) on each floor of the building per NFPA 13 and NFPA 14.
- 3) Performance of the sprinkler and standpipe system as connected to the manual water supply (fire department pumper truck) by the fire department connection and interconnecting piping.

7H.7.5 Shop drawings (working plans, product data, and calculations) are to be reviewed by the A/E of record for compliance with project contract documents and the code. At the conclusion of the shop drawing review the A/E shall:

- 1) Verify the Underwriters Laboratories (UL) listing and classifications for the materials, components and equipment provided for the project result in a code compliant fire suppression sprinkler system.
- 2) Provide a “sealed” statement, attached to the reviewed shop drawings, indicating that the fire suppression sprinkler shop drawings (working plans, product data, and calculations) satisfy the requirements of the contract documents and the code (citing applicable NFPA criteria).
- 3) Provide the responsible State Fire Marshal Office with copy(s) of the approved complete fire suppression sprinkler shop drawings.
- 4) Provide the University Building Official a copy of the “sealed” statement and transmittal to the responsible State Fire Marshal Office.

7H.7.6 Fire suppression sprinkler systems are to be acceptance tested in accord to code requirements. The responsible State Fire Marshal Office shall observe the installed fire suppression sprinkler system and witness the fire suppression sprinkler system performance tests. The A/E and Contractor shall certify that the fire suppression sprinkler system is complete.

7H.7.7 Similar requirements to the above are required for fire suppression systems utilizing clean agents.

SECTION 7H.8 FIRE AND SMOKE DAMPERS

7H.8.1 Fire and Smoke Dampers: The A/E shall provide project specific drawings and specifications that locate, identify and define code compliant fire and smoke dampers. Performance criteria do not meet the intent of this section. Construction documents shall indicate that changes to the design during construction shall be considered substitutions in accord with Section 26 of the General Conditions for the Construction Contract. Changes shall be documented by Change Order and shall be submitted to the University Building Official for review. The A/E shall confirm that the fire and smoke dampers are complete, functional and code compliant.

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 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.
- 4) Notation stating that each shall be installed in accordance with the conditions of their listing and the manufacturer's installation instructions.

Specifications shall provide the following minimum to demonstrate compliance with requirements of the code:

- 1) Complete specifications respective of the project scope of work
- 2) Description of the acceptance testing requirements with requirement that tests are to be witnessed by the responsible State Fire Marshal Office.

7H.8.2 Validation of Fire and Smoke Dampers: Fire and smoke dampers are to be acceptance tested in accord with requirements of the VUSBC. The responsible State Fire Marshal Office shall observe the installed fire and smoke dampers and witness the fire alarm system performance tests. The A/E and Contractor shall certify that the fire alarm system is complete.

SECTION 7H.9 FIRE SEPARATION FOR EQUIPMENT

7H.9.1 Fire Separation of Equipment: Direct fired heating equipment and make-up air heating equipment shall be separated from other air handling equipment by a one hour fire-resistance rated wall. Exceptions:

- (1) Combination heating and cooling equipment need not comply with the above if the heating and cooling equipment is an approved single package or tandem unit.
- (2) Buildings of Use Group R-3.

SECTION 7H.10 FIRE PUMPS

7H.10.1: The A/E shall provide project specific drawings and specifications that define a code compliant fire sprinkler system that includes an automatic fire pump(s) as referenced in NFPA 13 to NFPA 20, and National Electric Code NFPA 70. Performance criteria do not meet this intent. Where the building characteristics are such that the water supply requirements of a fire sprinkler system/standpipe system cannot be reliably provided by a public water system then the incorporation of an automatically controlled fire pump into the fire suppression system.

Construction documents shall indicate that changes to the design during construction shall be considered substitutions in accord with Section 26 of the General Conditions for the Construction Contract. Changes shall be documented by Change Order and shall be submitted to the University Building Official for review. The A/E shall confirm that the fire and smoke dampers are complete, functional and code compliant. The A/E shall perform shop drawing reviews, observe the progress and quality of the installation, and confirm that the fire pump installation is complete resulting in a code compliant fire sprinkler system.

7H.10.2: Working drawings shall:

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 part of each of the sprinkler systems supplied by the fire pump, and factors considered in the resulting safety factor in psig for each sprinkler system.
4. Provide information regarding locations of fire hydrants, test and flow hydrants, including underground pipe routing, water flow test results, the date and time tests taken, and who conducted the test.
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 location of fire department connection(s) with all interconnecting piping back to the pump(s).
8. Show the location of the fire pump test header and all interconnecting pipe.
9. Show the location of electrical components of the fire pump, driver, fire pump controller, and ancillary electrical components, and provide details.
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 that defines all of the applicable components and sequence of operation.

7H.10.3: Specifications shall provide the following minimum to demonstrate compliance with the requirements of the code:

1. Complete specifications to reflect the systems that are defined on the drawings.
2. Wording that

7H.10.4: Provide calculations to demonstrate compliance with the most hydraulically demanding zone(s) of the fire sprinkler system(s) is satisfied by the water supply plus fire pump in compliances with NFPA 13, NFPA 14 and NFPA 20.

7H.10.5: Where an existing fire pump is to be used in the project, the performance and condition is to be established and validated. Submit a copy of the recent Report of the Fire Pump Inspection, Testing and Maintenance compliant with Section F-516.6 of the Virginia Statewide Fire Prevention Code.

7H.10.6: Shop drawings (product data, sketches and certified shop test pump curves) are to be reviewed by the A/E of record for compliance with the contract documents and code, including verification of the Underwriters Laboratory (UL) listings and classifications for the materials, components and equipment provided. A copy of the approved shop drawings, with a sealed statement that they satisfy the requirements of the contract documents and code, shall be provided to the responsible State Fire Marshal Office, and a copy of the transmittal to the University.

7H.10.7: Fire pump(s) is (are) to be acceptance tested in accord with code requirements. The responsible State Fire Marshal Office shall observe the installed fire pump(s) and ancillary components, and shall witness the fire pump(s) performance test. The A/E and Contractor shall certify that the fire pump installation is complete.

SECTION 7H.11 SMOKE CONTROL SYSTEMS

7H.11.1: The A/E shall provide project specific complete drawings and specifications that define a code compliant smoke control system(s), and assure that code compliant smoke control system(s) are provided through the review of shop drawings and the observation of the progress and quality of the work. Performance criteria do not meet the intent of this section.

Construction documents shall indicate that changes to the design during construction shall be considered substitutions in accord with Section 26 of the General Conditions for the Construction Contract. Changes shall be documented by Change Order and shall be submitted to the University Building Official for review. The A/E shall confirm that the smoke control system(s) is (are) complete, functional and code compliant.

7H.11.2: The VUSBC requires smoke control systems to be designed in accordance with the applicable sections of the VUSBC and the generally accepted and well-established principles of engineering relevant to the design. The “generally accepted and well-established principles of engineering” recognized by HECOM for this purpose are the current editions of NFPA 92A

Recommended Practice for Smoke Control, NFPA 92B Guide for Smoke Management Systems in Malls, Atria and Large Areas, and The Principles of Smoke Management (AASHRAE/SFPE).

7H.11.3: The University and the A/E shall early in the design phase obtain the approval of the University Building Official and responsible State Fire Marshal Office of the specific method of smoke control to be applicable to the project. The University and the A/E shall submit a narrative that compares and contrasts the three methods defined in the VUSBC (pressurization method, airflow design method, or exhaust method) to the project conditions that results in a recommended method. Provide conceptual floor plans that identify the locations of the major components, pertinent calculations, sequence of operations and any other information that may assist in the evaluation of the methods.

7H.11.4: Drawings shall provide the following minimum to demonstrate compliance with code requirements:

- 1) Location and identification of all walls, floors, and ceilings that define the perimeter of the space(s) to be protected.
- 2) Location and identification of HVAC system components respective to the smoke control system(s).
- 3) Location and identification of all smoke dampers and/or motorized dampers respective to the smoke control system(s).
- 4) Location and identification of the interface requirements with the fire alarm system.
- 5) Location and identification of the interface requirements for all devices whose operation is required by the smoke control systems (such as door hold open devices, smoke dampers, fire shutters, motorized ventilation dampers, fans, air handlers, and smoke detectors).
- 6) Identification of primary and secondary power supplies and connections where code required.

7H.11.5: Specifications shall be project specific and provide a description of the acceptance testing requirements. Specifications shall state that components of and their locations that make up the smoke control system are not to be altered by the Contractor without prior written approval of the A/E and University Building Official.

7H.11.6: Provide calculations that:

1. Demonstrate compliance with requirements of the code.
2. Demonstrate the volume of the spaces respective of the smoke control system.

3. Are defined by the “generally accepted and well-establish principles of engineering” relevant to the design.

7H.11.7: The A/E of record shall review the shop drawings for compliance with code and shall:

1. Verify the Underwriters Laboratory (UL) listings and classifications for the materials, components and equipment provided for the project result in a code compliant smoke control system.
2. Provide a sealed statement indicating that the shop drawings submitted for the smoke control systems satisfy the requirements of the contract documents, the VUSBC, and the “generally accepted and well-established principles of engineering” relevant to the design.

The University and the A/E shall provide the responsible State Fire Marshal Office with the approved shop drawings and a copy of the sealed statement. A copy of the sealed statement and transmittal to the responsible State Fire Marshal Office shall be on record with the office of the University Building Official.

7H.11.8: The smoke control system(s) are to be acceptance tested with the requirements of the VUSBC. The responsible State Fire Marshal Office shall observe the installed components of the smoke control system(s) and witness the smoke control system(s) performance tests. The A/E and Contractor shall certify that the smoke control system(s) is complete.

SECTION 7H.12 SPRINKLER HEAD DATABASE

7H.12.1 The University shall compile information and maintain the University of Virginia Sprinkler Head Database for all sprinkler heads installed in each University building. The database will be furnished to the Division of Engineering and Buildings (DEB) web based database. (URL is <http://deb.dgs.virginia.gov/brpm/sprinklersystem>).

7H.12.2 To facilitate timely responses to a manufacturer’s recall for repair or replacement due to malfunctions it is essential that State agencies maintain the DEB sprinkler head database for all sprinkler heads installed in its facilities, both existing and new. The database should be updated whenever a new building is ready to occupy; whenever the fire protection system is added to, upgraded, or replaced in existing facilities; and whenever sprinkler heads in an existing system are replaced for whatever reason.

7H.12.3 Sprinkler head information shall be recorded and maintained by the University using the DEB web based application as the sole vehicle for compliance to the DEB database mandate. Data on replacement heads shall be entered to update the inventory per 7H9.2. The University shall maintain a record copy of the sprinkler head inventory for each of its buildings.

SECTION 7H.13 PIPING & EQUIPMENT COLOR CODE SCHEDULES

7H.13.1 See University Facilities Design Guidelines for requirements.

SECTION 7H.14 PRESSURE VESSELS

7H.14.1 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.

7H.14.2 Comply with the Boiler and Pressure Vessel Rules and Regulations issued by the Virginia Department of Labor and Industry.

PART 7I ELECTRICAL

SECTION 7I.1 TEMPORARY ELECTRICAL SERVICE

7I.1.1 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.

SECTION 7I.2 GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION

GFCI Protection is required in the following instances:

1. Where required by the latest version of the National Electrical Code in effect.
2. For all power outlets within six (6) feet of water sources.
3. Where the presence of water or grounded surfaces contributes to a hazardous environment.

SECTION 7I.3 LIGHTING LEVELS

7I.3.1 The levels of illumination (interior), as recommended in IESNA Lighting Handbook, 8th edition, shall be used as the basis for designing maintained foot-candle levels in applicable areas. Overall watts per gross square foot shall meet the provisions and requirements in ASHRAE 90.1 - 1989, section 401.3. The use of task lighting is to be maximized.

7I.3.2 The following energy conservation measures shall be used wherever possible:

1. Building designs shall take maximum advantage of natural light. Ambient light sensors, dimmers and programmable controllers are to be used where cost effective.

2. Occupancy sensors shall be used in rooms such as restrooms, single person offices, storage rooms, custodial rooms, etc.
3. Unless impractical, occupancy sensors shall be used in conference rooms and classrooms.
4. Multiple circuits/switching shall be provided in classrooms and other large rooms to permit reduced power consumption.
5. Fluorescent or metal halide lamps shall be used for lighting. The use of incandescent lamps shall be limited to applications approved by Facilities Management.
6. Fluorescent fixtures shall use T-8 or compact fluorescent lamps. All fluorescent ballasts shall be electronic except in areas where the usage requirements take precedence (i.e. vivarium).
7. Exit signs shall be LED type.

7I.3.3 The recommendations of IESNA Lighting Handbook, 8th edition, shall be used as the basis for exterior lighting. Exterior lighting shall be controlled through the use of photocells, time clocks or other programmable means.

7I.3.4 Minimize glare in offices or office areas where computers are used by implementing such methods as low-brightness luminaries, indirect lighting and/or minimizing luminance ratios between different surfaces.

7I.3.5 The illuminance ratio for maximum to minimum light levels shall not exceed 10:1 in any occupied space.

7I.3.6 Fluorescent lamps shall have a minimum CRI of 75. Lamp temperatures shall be 3500° K unless approved by the CFO.

7I.3.7 Recessed light fixtures are to be supported from the structure and not solely from the ceiling suspension system.

SECTION 7I.4 ELECTRICAL EQUIPMENT

7I.4.1 Dry-type Transformers

Transformers shall have copper windings.

K-factor transformers shall be used where large quantities of harmonic producing loads are present.

Transformers shall meet the requirements of NEMA TP 1 – 1996, Guide for Determining Energy Efficiency for Distribution Transformers.

7I.4.2 Panels and Switchgear:

Bussing shall be copper. Separate neutral and equipment-grounding busses shall be provided.

Schedules shall be provided for all electrical construction involving panel boards and switchboards.

7I.4.3 Motors shall be high-efficiency type, and shall conform to the requirements of NEMA MG 1-1993, Table 12-10. All motors between 1 and 200 hp shall exceed these standards where possible.

SECTION 7I.5 BUS DUCT INSTALLATIONS

Include the following paragraph in specifications for bus ducts:

“The bus duct shall not be energized until the A/E has received and reviewed a letter from the Contractor and a Commonwealth of Virginia Licensed Professional Engineer provided by the Contractor, certifying that the installation was inspected and it was determined that the entire bus duct system has been properly installed in accordance with the bid documents, including approved shop drawings and/or manufacturer’s instructions for this project.”

The certification of this work shall include the torqued pressure used to tighten bolts at all spliced joints in the bus duct system.

SECTION 7I.6 LIGHTNING PROTECTION SYSTEMS

The A/E shall evaluate the building to determine if a lightning protection system is required. Lightning protection systems shall be provided on structures with risk factor of 4 or greater as determined by NFPA 780, Appendix H.

SECTION 7I.7 CLASS 2 and 3 ELECTRICAL CABLES

All cables including but not necessarily limited to data, voice, alarm, and security system cables and wires, installed in University-owned facilities shall be self-supported with an approved hanger device when cables or wires are not installed in an electrical raceway. Cables shall be supported at no greater than twelve-foot intervals and securely fastened to the building structure. Installation to be in accordance with NEC 725.

SECTION 7I.8 TELECOMMUNICATION CABLING STANDARDS

7I.8.1 The Council on Information Management has adopted Standards for Telecommunications Cabling that shall be used when preparing designs related to telecommunications wiring for University owned buildings.

71.8.2 The following standards of the Electronic Industries Association, Engineering Department, 2001 Pennsylvania Avenue NW, Washington, DC 20006 are referenced in the Telecommunications Cabling Standard:

ANSI/EIA/TIA-568-A. Commercial Building Telecommunications Cabling Standard

ANSI/EIA/TIA-569. Commercial Building Telecommunications Pathways and Spaces

ANSI/EIA/TIA-570. Residential and Light Commercial Telecommunications Cabling Standard

ANSI/EIA/TIA-606. Administration Standard for the Telecommunications Infrastructure for Commercial Buildings

ANSI/EIA/TIA-607. Commercial Building Grounding and Bonding Requirements for Telecommunications

CHAPTER 8: PROJECT DESIGN STANDARDS AND REQUIREMENTS

SECTION 8.1 GENERAL

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

8.1.1 The Commonwealth cannot limit bidding to a selected list of contractors known to do good work. Unless contractors are prequalified for the project in accordance with Section 1103.0, 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.

8.1.2 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.

8.1.3 Project design is the sole responsibility of the A/E. Specifications that require the contractor to provide engineering design are not acceptable unless the products 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 Chief Facilities Officer (CFO).

8.1.4 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.

8.1.5 Project Aesthetics: Good architecture can be achieved simply by good design which implies sensitivity to scale, massing, proportion, materials, detail and even color - none of which necessarily cost more 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.

8.1.6 Project Identification on Documents: The University and the A/E shall show the 8digit Project Identification Code (PC # = Agency Code + Project Code) and University PIMS number 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.

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 Project Identification PC# and University Work Order or PIMS number on all submittals including invoices, schedules, shop drawings, change order proposals, correspondence and other project documentation.

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

- Schematic Design/Project Criteria
- Preliminary Design/Design Development
- Working Drawings/Construction Documents/Contract Documents
- Revised Working Drawings
- Yellow-out 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.

8.1.8 Non-Capital Outlay Construction Projects: This Chapter applies to all General funded, Non-general funded, and Maintenance Reserve projects at the University of Virginia. 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 University Building Official for conformance to the Virginia Uniform Statewide Building Code including its referenced standards, for the technical and procurement requirements of the Manual, and University of Virginia Facilities Management Facilities Design Guidelines. “Changes in Use Group Classification” of existing University owned buildings also require the

submittal of information for the review and approval, and issuance of a new Certificate of Use and Occupancy.

8.1.9 Projects/Work shall be designed by and the documents sealed and signed by Virginia licensed Architect(s) and/or Engineer(s). Working drawings ready for bidding and an Application for Building Permit (CO-17a) shall be submitted to the University Building Official (Review Unit) for review and issuance of a Building Permit.

Many interior renovation or modification projects which do not involve a Change in Use Group Classification, or subdivision of rooms, or alteration of exit access requirements, or additional/redistribution of electrical loads, and projects to alter or relocate portions of mechanical systems may be permitted as authorized by the University Building Official . Submit 2 copies of the plans and specifications or sketches with a description of the Work to the Regional Fire Marshal for approval. The University shall follow the procedures and keep records of such work as set forth in the University Project Permit procedures.

8.1.10 The Work shall be inspected by a licensed Architect or Engineer, or by other qualified and approved inspector, for conformance with the VUSBC as shown on the approved plans and specifications. The University shall submit the HECO-13.1a, the HECO-13.2a, the Fire Marshal's report and recommendation, and other applicable certificates or reports along with the Form HECO-13.3a, Application for a Certificate of Use and Occupancy, to the University Building Official when requesting that a Certificate of Use and Occupancy be issued.

8.1.11 If the University proposes to change the Use Group Classification of a building or a portion thereof, the VUSBC requires that a new Certificate of Use and Occupancy be obtained. The project shall be in compliance with the current VUSBC requirements for the new use or, alternatively, shall have the building evaluated by a licensed Architect or Engineer for conformance with the requirements of Chapter 34 of the VUSBC. A copy of the Chapter 34 evaluation signed by a licensed Architect or Engineer shall be submitted along with copies of small-scale floor plans, a Fire Marshal's report, and a Form HECO-13.3a, Application for a Certificate of Use and Occupancy, to the University Building Official requesting issuance of a Certificate.

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

8.2.1.1: The Title sheet(s) shall clearly indicate the following:

- Project Title and identification per 8.1.3
- Activity or function(s) to be performed in the facility
- Version (date) of VUSBC on which the design is based
- Other major code used as a basis for design
- Use Group classification(s)

- Maximum VUSBC occupancy for each level and total for building
- VUSBC classification of construction type
- Area for each floor and entire building; volume of building
- Location and Vicinity Maps;
- Seals of the responsible Architect and Engineers, signed and dated

8.2.1.2 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.

8.2.1.3 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.

8.2.2 Building floor plans and drawings for all disciplines shall be oriented the same to avoid confusion and to facilitate overlaying of drawings.

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

- T - Title Sheet and Index
- C - Plot and/or Site plans
- C - Sanitary and Civil
- B - Boring logs
- L - Landscaping
- D - Demolition
- A - Architectural
- S - Structural
- FP- Fire Protection Information
- SP- Sprinkler Systems, Standpipes, and Accessories
- P - Plumbing M -Mechanical (heating, cooling, ventilation, etc.)
- E -Electrical R -Asbestos Abatement

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

8.2.4.1 Drafting Media: All drawings will be done in AutoCAD version currently in use by Facilities Management. Completed computer generated working drawings shall be in ink on vellum or on drafting film (as selected by the A/E) suitable for reproduction. Record drawings showing the As Built conditions shall be provided to the Agency/Owner on polyester drafting film with a minimum base thickness of 0.004 inch (4 mil) matted both sides.

8.2.5 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.

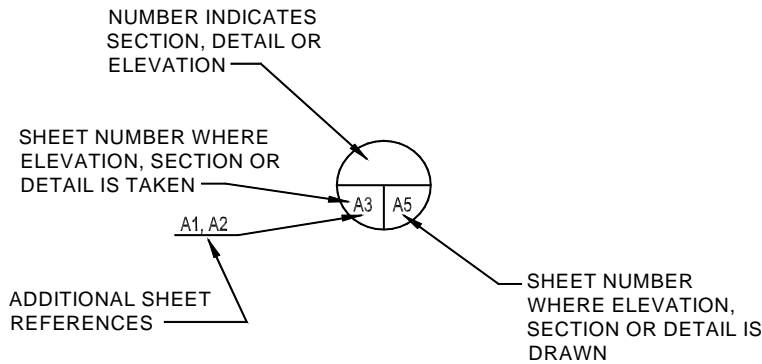
8.2.6 Lettering: Mechanical (typed or CADD) lettering shall be 1/10" minimum and in all caps. Make minimum gap between lines equal to one-half the letter height. Lettering and line weight must be in accordance with the above.

8.2.7 Section and Detail Designation: The standard section symbol (Figure 8.2 - 1) will be shown both where the section or detail is cut and where the section or detail is drawn.

8.2.8 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.

FIGURE 8.2-2

STANDARD SECTION SYMBOL



ELEVATION, SECTION OR DETAIL SYMBOL

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

8.2.9 Drawing Numbers: Drawings shall be sequenced by discipline letter (as indicated in paragraph 802.2) and number, i.e., A-1, A-2, A-3.1, A-3.2, S-1, S-2, etc.

8.2.10 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.

8.2.11 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 and suitable for microfilming.

8.2.12 Seals: Since working drawing submittals are, in the opinion of the A/E, complete and ready for bid, all drawings submitted for final (yellow-out) working drawing Contract Document 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.

8.2.13 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.

8.2.14 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

8.3.1.1 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.

8.3.1.2 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 be avoided unless the requirements are specific, or specific prior written approval of the University is obtained.

8.3.1.3 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 microfilming 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:

- Notice of Invitation to Bid (Format in Appendix C)
- Instructions to Bidders (HECO-7a) (located in Appendix A)
- Prebid Question Form (located in Appendix J)
- Bid Form (Format in Appendix C)
- The current University of Virginia Addendum Number One of the General Conditions of the Construction Contract (HECO-7) (located in Appendix A) (See Section 8.3.3 below.)
- The current edition/revision of the General Conditions for the Construction Contract (DGS-30-054) (CO-7)
- Supplemental General Conditions DGS-30-377 SWAM, and DGS-30-376, if applicable
- Contract Between Owner and Contractor (GS Form E&B CO-9)
- Workers Compensation Insurance Certificate (GS Form E&B CO-9a)
- Standard Performance Bond (GS Form E&B CO-10)
- Standard Labor and Material Payment Bond (GS Form E&B CO-10.1)
- Change Order blank (HECO-11)
- Schedule of Values and Certificate for Payment (GS Form E&B CO-12)
- Affidavit of Payment of Claims (GS Form E&B CO-13)
- Final Report of Structural Special Inspections (HECO-13.1b)
- Certificate of Completion by Contractor (HECO-13.2) and Certificate of Partial or Substantial Completion by Contractor (HECO-13.2a).
- List of Drawings
- Submittal Register Format (Sample in Appendix J)
- Structural and Special Inspections List (Samples in Appendices I and M)
- Division 1 - General Requirements, Special Conditions, etc.
- Technical Specifications (Divisions 2 - 17 Applicable Sections)
 - (a) Technical Specification Sections shall be numbered with appropriate five digit section numbers corresponding to the CSI Masterformat Broadscope numbering system.
 - (b) Technical Sections should, where possible, be subdivided into the Part I - General, Part II - Products, Part III - Execution format.
- Appendices containing Soils Report, Asbestos 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.

(See Sample Specification Table of Contents in Appendix C.) (Note: CSI Masterformat numbering is subject to changes under consideration as may be in use by the A/E at this time.)

8.3.2.1 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”: CO-9, CO-9a, CO-10, CO-10.1, HECO-11, CO-12, HECO-13.2, and HECO-13.2a.

8.3.3 General Conditions of the Construction Contract: Addendum Number One to The General Conditions for the Construction Contract (Form HECO-7) and 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 Chief Facilities Officer (CFO).

8.3.3.1 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.

8.3.3.2 “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 Chief Facilities Officer. Excluding those specific modifications provided in Appendix J 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 by the CFO.

Supplemental General Conditions DGS-30-377 shall be incorporated in all documents that require the General Conditions of the Construction Contract form HECO-7. The Supplemental General Conditions provide for the inclusion of Small Businesses and Women –Owned and Minority Owned (SWAM) Business.

8.3.3.3 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.

8.3.4 Instructions to Bidders, HECO-7a(s) (Medical Center 7a and Other 7a): The Instructions to Bidders, -7a, included in this Manual is a standard document which has been written to conform to the requirements and procedures of the Virginia University Procurement Rules. 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 CFO.

The Architect/Engineer for the project shall be familiar with and conform to the requirements of the Instructions to Bidders, Form HECO-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 10.2.

8.3.5 Types of Specifications

The following three types of specifications are used on University Agency's 207 and 246 projects, but do not apply to Agency 209.

8.3.5.1 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 a minimum of three manufacturers with 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 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 three 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.

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 Chief Facilities Officer to list only those two manufacturers but consider equals if proposed by the Contractor.

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.”

8.3.5.2 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:

- when only two manufacturers or suppliers provide an acceptable product or system, when there are no equals and when no substitutions are allowed; or
- 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 Chief Facilities Officer (CFO) to use a proprietary specification. The 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.”

8.3.5.3 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 of Virginia 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 CFO to use a Sole Source specification. The 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:

1. Explain why this is the only product or service that can meet the needs of the University.
2. Explain why this vendor is the only practicably available source from which to obtain this product or service.
3. Explain why the price is considered reasonable.
4. 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 Owner 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 Rules.

8.3.6 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. To further focus on the Commonwealth's "BUY VIRGINIA" emphasis, the Invitation to Bid (or Project Manual) cover shall be printed on the "BUY VIRGINIA" watermark/graphic available from website <http://www.forms.dgs.state.us>

8.3.7 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 other sources for use with various PCs and word processing programs.

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 CE 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.

8.3.8 Restrictive Specifications and Performance Requirements

8.3.8.1 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.

8.3.8.2 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.

8.3.9 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.

8.3.10 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.

8.3.11 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 \$

8.3.12 Specifying New Types of Materials Equipment or Systems: Projects for the University are not testing grounds for new type of materials or equipment; however, the fact that a

material is newly developed does not preclude its use if documentation of independent laboratory tests clearly show that the material will meet the applicable requirements for the project. The CFO 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 CFO may, where justified, authorize use of a new material, equipment or system for a particular project on a trial basis for observation/evaluation.

8.3.13 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.

- 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...”
- 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.....”
- 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.
- Do not use “etc.” This term is too indefinite for bidding and inspection purposes.
- 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).
- Do not set up a paragraph in the various sections entitled “Work not included.”
- Describe the work that is included under the respective sections.
- 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.
- Do not confuse any and all; “Correct any defects” should read “correct all defects”

- Do not confuse either or both; e.g., “Paint sheet metal on either side” should read “Paint sheet metal on both sides”. “Either” implies a choice.
- 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.
- 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.
- Use statements that are definite and contain no ambiguous words and phrases.
 - “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”.
 - “Reinstall” implies put existing back in 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.
 - “Replace” implies removal of old material and furnish and install new material. The preferred wording would be to “remove” and “provide”
- “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.

8.3.14 Specifications on Diskette or CD-ROM: The University requires the A/E to provide one copy of the final completed Divisions 1 thru 16 specifications including addenda on diskette or CD-ROM in Microsoft Office Word (2003 or later). All specifications shall be written in the current version of Microsoft Word.

8.3.15 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. Sample types of acceptable Hardware Specifications and Schedules are included in Appendix J. See University Facilities Design Guidelines 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 / PREDESIGN CONFERENCE

The University shall arrange for a Predesign Conference. Participants should include the University's Capital Outlay/Construction Representative, University Project Manager, the University Review Unit, the Project Committee and the A/E's project manager and responsible designer in each discipline (architect, civil, structural, mechanical, 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 Predesign 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 Predesign 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 Predesign Conference agenda:

- Introduction of Attendees
- Role of University Review Unit
- Authorized Communications
- Design not to exceed Construction Budget
- Proposed Design Schedule
- Requirements of the Manual related to the University Procurement Rules, Chapters 7-10 of the Manual and Fire Safety Reviews
- Clarification / Resolution of Budget Development Comments
- Submittal Contents
- Review Requirements
- Intent of Review Comments
- Waivers and Code Modifications
- Sole Source / Proprietary Specifications
- Use of Standard HECO and CO Forms and Formats
- Value Engineering
- Prequalification of Contractors
- Other Regulatory Reviews

- Design Approach
- Project Scope to include:
 - Functional layout requirements
 - Type of occupancy and activities to be housed
 - Capacity requirements of spaces and/or building
 - Exterior finish or appearance requirements
 - Interior finish requirements
 - Types of construction or materials required
 - Style and character of building desired
 - Special considerations such as expansion
 - Floor and Roof Live Load, Wind Load, and Seismic design Criteria
 - Special HVAC or environmental requirements and existing systems and requirements.
 - Fuel Analyses & Selection
 - Special electrical power or lighting requirements and existing systems and requirements.
 - Schedule requirements for design and for occupancy
 - Geotechnical data requirements
 - Site particulars and requirements -A/E's questions and clarifications

The Architectural Guidelines will be completed for BOV approval. (See Appendix L)

SECTION 8.6 SCHEMATIC DESIGN/PROJECT CRITERIA

8.6.1 General Requirements: Unless waived by the HECO-2 Action Wording, a schematic design/project criteria submittal shall be made to the University Review Unit for review (usually within 120 days after the effective date of the Acts of Assembly, also referred to as the Appropriations Act, containing the project). 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. 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 DPB Form **S-1, or an** Assignable Room and Space Listing, which was the basis for development of the Schematic Design.

A schematic “On Board” review meeting with the University Review Unit 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 Board of Visitors is required. (See Appendix L) Reviews by the University Arboretum and Landscape Committee, the University Project Committee (Architect for the University) and the State Fire Marshal are also required. See the University Facilities Design Guidelines section

GR.3.3. All review issues must be resolved before the A/E is authorized to proceed with the preliminary design.

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:

- Floor plans consisting of single line drawings of each floor layout showing space names, nominal room sizes, and circulation paths
- Roof plan
- Longitudinal building section with floor to floor and floor to ceiling dimensions
- Transverse building section
- Exterior elevation views
- Structural plan of a typical supported floor framing scheme and a typical section showing the proposed components of the floor system
- Orientation and approximate location of existing and proposed roads, walks, and parking, and utilities on a the site plan
- Any other information that would be of value to the Agency and the Architect/Engineer reviewing the project.

8.6.4 Verification of Existing Conditions: The A/E shall visit the site and ascertain pertinent local conditions that must be addressed in the design.

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

SECTION 8.7 PRELIMINARY DESIGN (DESIGN DEVELOPMENT PHASE)

8.7.1 General Requirements: Based on the previous approvals and direction, the A/E shall prepare the Preliminary Design consisting of drawings, Narrative 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. The A/E shall have visited the site and ascertained pertinent local conditions required to be addressed in the submittal. 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 DPB Form S-1, or an Assignable Room and Space Listing, which was the basis for development of the Preliminary Design.

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 Review Process: The A/E shall prepare and submit to the University Review Unit, in quantities specified, black line or blue line prints of all drawings together with copies of cost estimates, Narrative, reports and other data as set forth below. After the University Review Unit reviews the submittal, one set of review comments and/or marked copies of the documents will be provided E-Mailed to the A/E by the University Project Manager 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 and the University Board of Visitors is required. (See Appendix L) Reviews by the University Project Committee (Architect for the University), the University Arboretum and Landscape Committee and the State Fire Marshal are also required. See the University Facilities Design Guidelines section GR.3.3 which includes the following Commonwealth of Virginia reviews:

- Fire Safety Review
- Erosion and Sediment Control Board
- Storm Water Management
- Division of Historic Landmarks
- Department of Health
- State Water Control Board
- Department of Air Pollution Control
- Department of Waste Management

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 upon.

8.7.4 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 8.7.2 and 8.4.
3. Soils report to include boring logs, geotechnical analysis and foundation design recommendations.

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.

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

Title Sheet(s)

- Project Identification: Agency number, Project Code, Appropriation Act number, and University PIMS (or Work Order) number.
- Location and vicinity maps.
- Tabulation of floor areas (new and renovated), total area, volume.
- Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
- Listing of applicable codes with dates.
- Building Purpose/Occupancy.
- Use Group(s) per VUSBC.
- VUSBC Construction Type
- Occupancy Load(s) per VUSBC.
- Index of drawings.

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

- Scale and north arrow.
- New and existing contours affected by the new work.
- Floor and contour elevations.
- Applicable boundaries with survey computations.
- Dimensioned relationship Location of major components of the new work to with respect to boundaries and existing structures.
- Location of test borings.
- General parking and handicap parking.
- Handicapped-accessible routes
- Pedestrian traffic routes.
- Demolitions: structures, walks, utilities, trees, etc.
- Proposed landscaping (planting materials)
- Existing and new utilities: storm sewers, sanitary sewers, water supply, gas, steam distribution pipes and tunnels, electric and telephone poles and lines, hydrant locations and data on fire flow test.
- Site improvements such as fencing, lighting, etc.
- Typical paving section for proposed types/thicknesses.
- Identify/show special earthwork recommended and construction considerations noted in soils report.

- Archaeology Features

Demolition drawings

For interior demolition

- provide information on work to be removed;
- note results of asbestos survey; and
- note results of lead based paint survey.

For total building demolition

- provide a floor plan showing building size;
- describe existing material /construction to be removed;
- show an elevation (drawn or photographic) of building;
- note results of asbestos survey; and
- note results of lead based paint survey.

Architectural drawings

Floor Plans (for each floor)

- Plans of each floor at 1/8" = 1'-0" preferred (1/16" = 1'-0" must be justified and have written approval of University Review Unit).
- Overall dimensions.
- Space names and/or numbers assigned by the University Office of Space and Real Estate Management, and number of occupants of all spaces.
- If the work is an addition, show the relationship of new to existing spaces.
- Distinguish new from existing construction.
- Show demolition on the architectural plans or separate plans.
- Indicate asbestos locations regardless of who removes it or how it is removed.
- Indicate all openings, entrances, delivery areas.
- Indicate handicap access and Areas of Rescue Assistance.
- Show scale and north arrow.

Roof Plan

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

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

- All openings: windows (including operable notation), doors, louvers, and vents.
- Percentage of glass vs. gross wall area.
- Floor elevations (above sea level).
- Identification of all major finishes.
- All stairs, ramps, and railings.
- Rooftop equipment and structures.
- Expansion and control joints.
- Grade at the face of the building wall.
- Subsurface construction (dotted in).

- Existing and new work clearly distinguished.

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

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

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

- One section for each type of wall construction.
- Identify all major materials and components.
- Identify insulation and note R value.

Finish Schedule

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

Furnishing/Equipment Plans

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

Structural Drawings

- Show Live Loads, Wind Loads, and Seismic Criteria used for structural design
- 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.
- Foundation Plan indicating type & tentative sizes
- Foundation details and improved improvements to bearing strata and other special requirements.

- Floor and roof Framing Plans of each level indicating type of system and tentative member sizes/depths and column spacing with defined grid lines.
- Typical Section(s) of framing identifying materials, tentative member sizes, thicknesses and, depths proposed.
- Typical Section of floor system.

- Indicate structural construction materials and properties.
- Details of connections to existing buildings, if applicable.
- Identify elements of proposed lateral force resisting system.

Fire Protection (FP) Information & Sprinkler Plans

Provide plan of each level showing the following:

- Fire protection information* including:
 - Height and area calculations in accord with VUSBC.
 - Total building perimeter (linear feet)
 - Location of all 30' wide open perimeter spaces served from a street by a minimum 18' wide posted fire lane (must be shown on a drawing)
 - 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.
 - Water flow test data required by NFPA 13.
 - Required or intended fire protection systems, fire detection and alarm systems, fire pump systems, smoke control systems per Chapter 7
 - Define each Use Group area and show its VUSBC Use Group classification (A-1, A-2, etc.).
 - Identify and show rating of all rated assemblies, smoke barriers.
 - Indicate use(s) of all building spaces (offices, auditoriums, etc.) or reference drawings where complete information may be found.
 - Show the room/space number and the maximum number of occupants per VUSBC for each space.
 - 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.
 - Identify the extent of all fire rated floor/ceiling and roof/ceiling assemblies.
 - Identify each type of automatic fire suppression system and where it is or is not used.
 - Identify occupancy hazard classifications and densities as explained in NFPA 13.

- Show proposed sprinkler piping layout including main sprinkler lines and a typical layout of branch lines (See 1994 NFPA 13, Figure A-6-1 for sample format.)
- Show and identify all new and existing standpipes.
- 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 14 Appendix 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.

- Note: Reduced pressure backflow prevention devices (RPBPD) shall be permitted as follows -On the discharge side of Fire Pumps in accord with NfiPA 20 -For systems without fire pumps, provide a check valve on the building (system) side of the RPBPD or provide a double check valve assembly.
- * asterisked information, except as noted, may be included in Basis of Design Narrative.

Plumbing Drawings

- Plans of each floor noting fixture locations and types. Indicate routing of main distribution lines with tentative sizes.
- Show general or schematic arrangement of all piping systems.
- Show location of water, sanitary sewer, storm sewer and sprinkler services to the building.
- Show tentative fixture schedule.
- Show location, sizes and types of Hot Water Heaters/ Heat Exchangers, Storage Tanks, and flues if required.
- Show gas piping layout and connected load, if applicable

Mechanical (HVAC) Drawings

- Plans of each floor showing single line duct layouts, tentative air (supply, return, exhaust) quantities, equipment locations, and layouts and general routing of heating/cooling piping.
- Show equipment schedules with tentative sizes, capacities, ID #, features, etc.
- Indicate locations and sizes of fans, pumps, compressors, conveyors, etc.
- Schematic layout and elevation of equipment room and/or central system showing configuration, tie-ins, etc. as necessary to describe system. -Central heating or cooling plants, distribution piping, equipment. -Preliminary control diagrams.

Electrical Drawings

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

- Lighting plans for each floor showing approximate fixture locations, type, and lighting level required (design level in foot-candles).
- Power distribution plans showing location of incoming service (transformers and primary switches), generators, main switchgear, motor control centers and panel boards.

- Show interface points service entrances, main control panels and backboards for communications, fire alarm, EMCS and other pertinent systems -Plans for each floor showing proposed locations of receptacles, telephone and data outlets, switches, fire alarm and other devices.

SECTION 8.8 WORKING DRAWINGS PHASE (CONSTRUCTION DOCUMENTS PHASE)

8.8.1 General Requirements: The A/E shall visit the site as necessary to ascertain pertinent local and site conditions. Based on the Preliminary plans (Design Development Documents) 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 Owner and Contractor, CO-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 in accordance with the format shown on the sample form entitled Project Space Profile. (See Appendix J)

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 Project Committee (Architect for the University), University Review Unit and responsible State Fire Marshal Office are required.

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. See Section 8.3.5 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 - Cost Estimate, 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 Review Unit with the Contract Document submission.

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)

- Project Identification: Agency number, Appropriation Act number, Project Code, University PIMS (or Work Order) number.
- Location and vicinity maps noted to show project location.
- Tabulation of floor areas (new and renovated), total area, volume.
- Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
- Listing of applicable codes with dates.
- Building Purpose/Occupancy.
- Use Group(s) per VUSBC.
- Type of construction and VUSBC Type #
- Occupancy Load(s) per VUSBC.
- Design Floor Live Loads.
- Index of drawings.

Site Plans (site/improvement plan & composite utility plan minimum requirements for new construction and additions)

- Based on approved comprehensive Master Plan.
- Scale and north arrow.
- Existing and new contours affected by the proposed work.
- Floor and pavement elevations.
- Applicable boundaries with survey computations.
- Dimensioned relationship of new work to boundaries and existing structures.
- Location of test borings.
- General parking and handicap parking.
- Handicap accessible routes
- Pedestrian traffic routes.
- Demolitions: structures, walks, utilities, trees, etc.
- Proposed landscaping (planting materials)
- 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.
- Profile of all utilities and any roads over 100 feet in length.
- Site improvements such as fencing, lighting, etc.
- Typical paving section of each type and thickness required.
- Identify/show special earthwork recommended and construction considerations noted in soils report.
- Archaeology Features

Demolition drawings

For total building demolition, provide:

- plan of building with length & width dimensions,
- elevations (drawn or photographic) and cross section of building to be demolished,
- details of termination of demolition, underpinning, etc.

For interior / selective demolition, provide:

- floor plans showing existing partition, etc., and showing or describing existing material /construction to be removed
- information or estimates for bidding for work to be removed.

Architectural drawings

Floor Plans (for each floor)

- Plans of each floor at a minimum 1/8" = 1'-0" preferred (but not less than 1/16" = 1'-0" with approval of University Review Unit).
- Show room/space numbers assigned by the University Office of Space and Real Estate Management.
- Overall dimensions.

- If the work is an addition, show the relationship of new to existing spaces.
- Distinguish new from existing construction.
- Show demolition on the architectural plans or separate plans.
- Indicate asbestos locations regardless of who removes it or how it is removed.
- Indicate all openings, entrances, delivery areas.
- Indicate handicap access.
- Show scale and north arrow.

Reflected Ceiling Plans

- Ceiling tile / grid layout
- Light fixture locations
- Sprinkler head locations
- HVAC diffuser and grille locations
- Coffers, drop soffits, changes in height or materials
- Space numbers
- Speakers and smoke detectors

Roof Plan

- Plan(s) of each roof at a minimum 1/8"=1'-0" preferred (but not less than 1/16" = 1'-0" with approval of University Review Unit).
- All proposed and existing drains, including auxiliary drains.
- Roof slope: 1/4" per 1'-0" to drains minimum (unless waived for re-roofing).
- All new and existing equipment.
- All significant roof penetrations and structures.
- Identification of materials on existing roofs.
- Typical roofing section identifying materials.
- Access to roof.
- Indicate direction of slope (high to low) with arrows

Exterior Elevations

- Scale (1/16" = 1'-0" minimum).
- All openings: windows, doors, louvers, vents.
- Percentage of glass vs. gross wall area.
- Floor elevations (above sea level). Coordinated with Site Plan elevations.
- Identification of all major finishes.
- All stairs, ramps, and railings.
- Rooftop equipment and structures.
- Expansion and control joints.
- Grade at the face of the building wall.
- Subsurface construction (dotted in).
- Existing and new work clearly distinguished.

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

- One longitudinal and one transverse section minimum.
- Show all floor levels / elevations on sections.
- Indicate ceilings in proper relation to floors.

- Method and extent of insulating exterior envelope.

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

- One section minimum for each type of wall construction.
- Identify all major materials and components.
- Identify insulation and note R'Ó value.
- One section with dimensions and details for each stair configuration.

Details

- Typical window, door and special opening details shall be drawn at a minimum 1-1/2" = 1'-0" scale.
- Interior and exterior details, including special doors, windows, woodwork and other decorative work.
- Toilet plans and elevations shall be drawn at a minimum 1/4" = 1'-0" scale.

Finish Schedule

- Indicate proposed finishes for all spaces. Note those existing finishes to remain.
- Give ceiling heights of interior spaces.
- Show (or specify) all finishes, textures, colors, etc., required to be provided by the Contractor.
- Use University assigned room numbers.

Door Schedule

- Doors numbered to University standards, type, size, material, hardware set number and fire rating if required.

Window Schedule

- Type, size, material and lintel requirements.
- Elevations of each window type.

Furnishing/Equipment Plans

- Show outline of all major equipment to approximate scale.
- Show outline of all built-in furnishings to scale.
- Provide elevations, sections and details as necessary to describe built-in equipment, casework and furnishings included in the work of this contractor.

Structural Drawings

- Unless indicated otherwise below, the structural drawings shall provide complete details of all structural components so that no additional structural design will be required for the preparation of shop drawings except for standard connection details and fabrication calculations.
- Show design live loads, wind loads, and seismic criteria used for design of structural systems per VUSBC Section 1603.
- 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.
- 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" to 1'.
 - The plans, details and specifications shall completely define the structural system and any special conditions for the project.
 - Foundation Plan indicating type & sizes.
 - Foundation details with improvement criteria for bearing strata and other special requirements.
 - Floor Framing Plans of each level indicating type of system, and member sizes/depths and column spacing and all penetrations.
 - Roof Framing Plan.
 - Typical Section(s) of floor and roof systems identifying materials, thicknesses, depths. Provide appropriate details to define structure.
 - Details of connections to existing buildings, if applicable.
 - 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.
 - Typical details for openings in floors and walls with limitations clearly noted.

Special Structural Requirements

See Chapter 9, Section 9.2 for special drawing and specification requirements for:

- Cast-In-Place Reinforced Concrete
- Cast-In-Place Post-Tensioned Concrete
- Precast Concrete Components
- Structural Steel
- Steel Joists
- Pre-Engineered Metal Structures
- Prefabricated Wood Components systems.

Fire Protection (FP) Information Plans

Provide plan of each level showing the following:

- Define each Use Group area and show its VUSBC Use Group classification (A-1, A-2, etc.).
- Identify and show rating of all rated assemblies, smoke barriers.
- Indicate use(s) of all building spaces (offices, auditoriums, etc.) or reference drawings where complete information may be found.
- Show the VUSBC number of occupants to be accommodated in each space. (This number should be the same as the posted maximum for the space.)
- 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.
- Identify the extent of all fire-rated floor/ceiling and roof/ceiling assemblies.

- With reference symbols, identify each new and existing, if known or available, fire resistance rated Structure Element and change in element design (including wall, floor, ceiling, and other vertical or horizontal elements).
- Identify each type of automatic fire suppression system and where it is or is not used.
- Identify occupancy hazard classifications and densities as explained in NFiPA 13.
- Show and identify all new and existing standpipes.
- Show locations of all portable fire extinguisher cabinets.
- Provide a small-scale drawing showing locations of water hydrants, test and flow 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.

8.8.8 Fire Protection Design Supporting Material: Provide the following information, calculations, and data on separate sheets or on the fire protection FP drawings to support the information shown on the FP plans:

- (1) Provide height and area calculations in accord with VUSBC.
- (2) Show the total building perimeter (linear feet).
- (3) State whether the building has a 30' wide open perimeter served from a street by a minimum 18' wide posted fire lane and on what drawing the perimeter and lane may be found.
- (4) Tabulate area of each building level, story, or floor and indicate the number of occupants accommodated by each. If the project is an addition, list new and existing areas and occupancies:
- (5) Tabulate the fire separation structure elements (and element changes) identified on FP plans, the fire resistance rating of each, the design reference numbers of approved testing laboratories, and the sheets where the designs are detailed:
Element.....Rating.....Design No.....Detail
- (6) Provide complete water flow test data required by NFiPA 13.
- (7) Required or intended fire protection systems, fire detection and alarm systems, fire pump systems, smoke control systems per Chapter 7

Sprinkler System Drawings

- Show proposed sprinkler and standpipe piping layout including main sprinkler lines and layout of branch lines. Call out sizes of all pipe 2” and larger. (See 1994 NFiPA 13, Figure A-6-1.1 for sample of Working Drawing equivalent.)
- Dimensionally locate pipe centerlines horizontally and vertically for risers, for mains and branch lines where location is critical to interface with other work.

- Provide Sections to scale of congested areas showing all pipes, ductwork, conduit, fixtures, structure, etc. in their respective sizes and locations
- Indicate relative location of sprinkler piping on other discipline's sections.
- Provide sprinkler riser diagram with appropriate fittings, accessories, sizes, alarms, valves, etc., noted.
- Show static & residual pressure and water flow used for design.
- Show sprinkler head type and temperature rating
- Indicate type and locations of required anchors or braces.
- Show and identify all new and existing standpipes.
- Provide a small-scale drawing showing locations of water hydrants, test and flow 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.

Plumbing Drawings

- 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. (See Sample Note in Appendix J.)
- Plans of each floor noting fixture (including laboratory and compressed air outlet) locations and types of each.
- Plumbing fixture schedules showing designations, connection sizes, and mounting heights of handicapped fixtures. (Note that flush valve handles shall be located on the wide side of the handicapped enclosure).
- Plans showing layouts and sizes of sanitary DWV piping, cold condensate drainage systems, floor drains, acid waste systems, neutralizing tanks, etc.
- Plans showing roof drains and areas served by each in square feet, piping and sizes. Show downspout boots and connections to foundation drains.
- 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.
- Plans showing layouts and sizes of compressed air piping, air compressors, air dryers, drains, etc.
- Plans showing deionized water systems.
- Riser diagrams for sanitary drain, waste and vent; domestic hot and cold water; deionized water; and compressed air where the system is extensive. Risers shall be designated and keyed to the plans. Show room numbers where the outlets/inlets occur, and show drain fixture units at the base of each riser. Show sizes of water hammer arrestors.
- Details of hookups at water heaters, air compressors, etc., and roof drain installation.
- Schedules of water heaters, air compressors, air dryers, and drains.

Mechanical (HVAC) Drawings

- For renovation projects, show demolition in sufficient detail that it may be bid from the drawings.

- Plans of each floor and roof showing double line-duct layouts, mechanical equipment location and layouts. Plans shall show ceiling-mounted lighting fixtures.
- Plans of each floor showing chilled water, heating hot water, steam and condensate piping and piping sizes. Show provisions for expansion. (This may be shown on ductwork plans where congestion is not a problem.)
- 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.
- Provide schedules for all mechanical equipment, steam traps, air devices, etc. showing sizes, capacities, HP, CFM, electrical characteristics, locations, features, etc.
- Provide drawings showing control schematics, automation points, etc.
- Provide schematic diagrams of chilled and heating water, steam, and condensate piping.
- Central heating and cooling plants, distribution piping, equipment, anchors, expansion joints, etc. shall be shown as necessary to clearly describe the work.
- Provide sections as required to clearly show the work in 3 dimensions.
- 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.
- 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.
- 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.)

- 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.
- Plans shall show all casework, furniture, mechanical equipment and other equipment that impacts the electrical design.
- 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

- Lighting plans for each floor showing fixture location, type, and lighting level (calculated, in foot-candles).
- 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

- Power distribution plans showing location of incoming service (transformers and primary switches), generators, main switchgear, motor control centers, and panel boards.
- Service entrances, main control panels, and backboards for communications, fire alarm, EMCS and other pertinent systems.
- Plans for each floor showing locations, and mounting heights, of receptacles, telephone and data outlets, switches, disconnect switches, motor starters and other devices.

Fire Alarm

- On electrical power floor plans, show location of control panel, battery and charger, transmitter, annunciator, fusible safety switch, remote trouble device, alarm devices, and each actuation device including fire extinguishing system switches.
- One electrical site plan, show location of any PIV valves or other devices to be connected to the fire alarm system.
- Show single line fire alarm riser diagram.

Site Plan

- 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.
- Details of ductbanks, equipment pads, manholes, lighting pole bases

Schedules, Risers, etc.

- 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.
- Sizes of all overcurrent protective devices, relays, CTs, PTs, starters and disconnects

Control Systems

- Provide a written sequence of operation for each mechanical and electrical control system stating explicitly how systems are to function.
- Give all pertinent data regarding safety, alarms, indicators, and control parameters.
- The sequence of operations may be shown on the control diagrams in lieu of in the specification.
- Provide control system diagrams.
- Indicate point(s) of connection of new to existing system.
- Indicate or describe location of operator interface (PC) unit.

8.8.9 Rock Excavation: See Section 7C.3 for requirements. Provide estimated quantities of rock excavation on the Bid Form.

8.8.10 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

8.9.1 Instruction to Bidders: See Sections 8.3.4 and 10.2.1.

8.9.2 Unit Price Bids: See Section 8.3.11.

8.9.3 Bid Form Preparation: See chapter 10.2.4.

8.9.4 Prequalification of Contractors or Subcontractors: Prequalification criteria, procedures, and appeal process requirements are shown in Chapter 11.

8.9.5 Advertising: The University shall notify the A/E in writing when final Contract Documents have been approved. See Chapter 10.2.6 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 CFO, be used for budget control subject to the following limitations: (Items 1, 2, 6, 8, 10, 11, 12 and 13 do not apply to Agency 209 projects)

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/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 SUBMISSIONS

Prior to the submission of construction documents, the Architect shall furnish a written statement that will certify that the responsible architects and engineers have reviewed the documents and certify them to have been completely coordinated to industry standards of care. Where correction and/or additions are required after review by the University and/or the University Building Official, the responsible State Fire Marshal Office, etc., changes will be marked in yellow and returned to the review agency and the University, upon completion of the corrections. 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 and shall be adjusted as appropriate for a particular project:

Number of copies usually required

	S	P	CD/RCD	YO	BID/ ADDENDA
Reviewing Agency					
University Review Unit (half the sets may be 1/2 size reduction sets) *plus 4 (not 2) for Health System Projects (1/2 size) - Change Orders for VUSBC regulated work			1 set per discipline plus 2* sets	1	2
Regional Fire Marshal (renovation)		1	1		2 #
Art and Architectural Review Board	1*	1*	-	-	-

Number of copies usually required

	S	P	CD/RCD	YO	BID/ ADDENDA
Reviewing Agency					
DCR (Division of Soil and Water Conservation (Erosion and Sediment Control *) (Stormwater Management *)		1 1	1 1	2 2	

Number of copies usually required

	S	P	CD/RCD	YO	BID/ ADDENDA
Other Review Agencies					
Department of Historic Resources	2*	-	2*	-	-
Health Department (Food Service)	-	1*	1	-	-
Department of Environmental Quality (Air Division)	1*	1*	1*	-	-
Department of Environmental Quality (Water Division)	-	1*	1*	-	-
Department of Environmental Quality (Waste Division)	-	**	**	-	-
County or City Manager	-	1##	-	-	-
Chesapeake Bay Local Assistance Department	-	-	2*	-	-

Legend: S = Schematics P = Preliminaries CD = Contract Documents
RCD = Revised or Required resubmittal of Contract Documents
Y/O = Yellow-out Documents
BID = Bid Documents, including Addenda

* Pertinent parts or sections of documents only

** Submit data and dump location request for all asbestos-containing material or other hazardous waste materials resulting from renovation or demolition.
Send one copy of all bid documents and addenda for both new construction and renovation projects to the responsible State Fire Marshal Office.
When determined by the University Review Unit as requested by the City/County Managers, provide one additional set of Preliminary Drawings

The A/E shall coordinate with and obtain approval of the utility designs from the University Utilities Department or, when applicable, local utilities agencies for connection and service, and shall obtain approval of any required turn lanes or transitions from the District Engineer of the Virginia Department of Transportation for entrances to the project site. If asbestos projects are authorized to proceed with working drawings, two copies are required, and an additional two if revision and resubmission is necessary.

SECTION 8.12 UNIVERSITY REVIEW UNIT REVIEWS AND APPROVALS

Prior to the submissions to the University Review Unit and other University and 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 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 University Building Official is satisfied that the documents are in conformance with all requirements, a Building Permit, HECO -17, will be issued by University Facilities Management. 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: Directive 562 provides guidance for review and issue of permits for work not specifically requiring a building permit but for which other code, directives and standards may apply.

8.12.3 Review Comments: The University Review Unit will transmit its review comments to the University Project Manager in one of the following ways:

812.3.1 By E-Mail. 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 each University Review Unit discipline and responsible State Fire Marshal Office comment, preferably by E-Mail below the review comment. All issues in dispute shall be resolved before proceeding to the next phase. University Review Unit will forward responsible State Fire Marshal Office fire safety comments, and comments on A/E responses, to the University Project Manager. A/E responses to responsible State Fire Marshal Office comments shall be transmitted to the University Review Unit (or when authorized by the Senior Review Architect) direct to responsible State Fire Marshal Office reviewer with copy to the University Review Unit.

812.3.2 By a meeting/conference at the University Review Unit 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) work days after the meeting.

For responsible State Fire Marshal Office fire safety reviews this process would be only at the invitation of that review agency with minutes accurately recorded by the University or the A/E.

812.3.3 By an “On Board Review” review meeting with the University Review Unit and the A/E. Documents will be reviewed and issues discussed and resolved. The A/E will record the minutes of this meeting and submit them to the University within seven (7) working days. This method will be used only in reviews of revised (not resubmitted) working drawings with highlighted corrections, and under conditions stipulated by the University Review Unit if approved by the Senior Review Architect. The “On Board Review” method will usually require that the revised working drawings be received at least three working days before the meeting.

812.4 Resubmittals: 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 resubmittals without compensation or reimbursement.

8.12.5 Revised Submittals: All changes, and revisions, and additions shall be highlighted in yellow on at least two revised submittal set of preliminaries or one unbound set of working drawings and specifications. Any new information shall be highlighted in another color.

8.12.6 Print and Release of Bid Documents:

812.6.1 Bid documents (plans and specifications) shall not be printed or released to bidders until the University Review Unit reviews revised documents and authorizes them to be printed and released.

812.6.2 When authorized to advertise for bid on Capital Projects by the approved HEC0-6 the University FP&C Office of Contract Administration shall establish a bid receipt date.

812.6.3 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.

812.6.4 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:

8.12.7.1 If Advertisements are authorized to be placed in the VBO and newspapers 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 following review times will be the goal for the University Review Unit, exclusive of holidays, unless the submissions are obviously incomplete, (in which case the documents will be returned to the A/E).

This will be applicable to schematic and preliminary submittals also. In the case of working drawings, the review comments shall be incorporated in the plans and specifications prior to submittal of revised working drawings or to issuing the documents for bid.

Average Review Periods for Complete Submittals

University Review Unit – Schematic Submission – five working days; Preliminary Submission – ten working days; Contract Documents – fifteen working days; Yellow-out Submission – three working days. responsible State Fire Marshal Office (subject to work load and availability), The Department of Historic Resources - three weeks The Division of Soil and Water Conservation - three weeks The Department of Health - three weeks

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.

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 University Review Unit 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 the University Review Unit review comments.

SECTION 8.13 QUALITY CONTROL / QUALITY ASSURANCE

8.13.1 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.

8.13.2 The A/E shall perform a Quality Assurance review of the working drawings Contract Documents prior to submitting the working drawings documents to the University Review Unit. See Chapter 9 for additional requirements and guidance for QC/QA reviews and coordination of plans and specifications.

8.13.3 The first sheet of the plans and specifications submitted to the University Review Unit 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. On large projects, a two day VE Study is encouraged at the Schematic Design phase.

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 (15 copies unless shown otherwise in the RFP) 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 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 Review Unit members are certified VE Team Members and perform many of the University’s VE Studies with an approved CVS. As an alternate the University may chose 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 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 of 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 (CVS) 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.

8.14.5 Information Supplied to the VE Team: Prior to commencing the VE study, the A/E will forward the following information to the VE Team:

- (a) Two sets of 35% drawings (full size)
- (b) Five sets of half size drawings
- (c) Outline Specifications & Systems Checklists (2 copies)
- (d) Detailed Cost Estimate (6 copies)
- (e) Basis of design (6 copies)
- (f) Design Calculations (Structural, Mechanical, Electrical)
- (g) Boring logs and soil reports
- (h) Scope of Project/Program requirements (6 copies)

8.14.6 Certified Value Specialist (CVS) Responsibilities: The CVS shall have the following responsibilities for the VE Study:

- a. Pre-Study
 - (1) Review complete design package & identify high cost areas.
 - (2) Prepare cost model (actual vs. historical)
 - (3) Prepare bar graphs of all sub systems.
 - (4) Prepare preliminary cost worth ratios.
- b. 40-Hour Study
 - (1) Team Leader and coordinator.
 - (2) Team recorder.
 - (3) Presentation of recommendations.
- c. Post Study
 - (1) Write and assemble report.

- (2) Proof all VE recommendations, especially the cost estimate and life cycle analysis.
- (3) Calculate redesign effort for each recommendation in man-hours.
- (4) Sign and submit final report within 7 days. Express mail 10 copies to the Owner and 5 copies to A&E of record.

8.14.7 VE Report Requirements: The results of the VE study performed on the project shall be documented as follows:

- (a) Contents page.
- (b) Brief description of total project and project requirements with a copy of the Owner's program requirements.
- (c) Brief summary of VE recommendations.
- (d) One site plan, floor plan and elevation on 8-1/2"x 11" or fold out.
- (e) Summary sheet (only) of 35% cost estimate.
- (f) VE cost model of project.
- (g) 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.
- (h) 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.

8.14.8 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 (CFO, Requestor, Architect for the University, Project Manager and other specialist personnel).

8.14.9 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	ARCH	STRUCT	MECH	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 Agency	4	4	-*	-*	-*	-*

• A/E Review, Supplement, and Comment on VE Report to Agency	8	4	4	4	4	4
• Follow-up on Questions/Decisions from oral Presentation	4	-	-	-	-	-
	24	16	12*	12*	12*	12*

* As required.

The design A/E responsibilities include the following:

- Present an overview of the project criteria and development to the value engineering team.
- Provide comments on the VE study report to the University within 14 days of receipt of the report.
- Participate in joint 35% review/VE resolution meeting at the University.
- 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.

8.14.10 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 Architect for the University, the Energy Budget required by the Manual, a user requirement for every office to have a window, or a user criteria 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.

8.14.11 A/E Action on VE Study: The following clarifies the specific submittals and approval procedures required for the VE Study responses and proposed action:

- Both the University and the Architect/Engineer (A/E) shall review and evaluate the Value Engineering recommendations.
- The A/E shall provide a written comment and/or evaluation of each VE recommendation to the University Project Manager, copy to the University Review Unit, along with the A/E's recommendation to accept, to reject, or to accept with modifications each VE recommendation.
- The A/E shall provide justification for rejection of, or modification to, any VE recommendation.
- The A/E shall prepare a Summary of Value Engineering Recommendations (see Format VE-1 in Appendix C) and indicate its recommended disposition of each item. The Summary sheet shall accompany the detailed responses / explanations sent to the University.
- The University shall review the A/E's evaluation and recommendations on the VE Study and the A/E's responses to the University Review Unit review comments. The University shall indicate its proposed action (acceptance, rejection, or acceptance as modified) on the Summary sheet.
- If any proposed action deviates from the requirements of the Virginia Uniform Statewide Building Code (VUSBC) 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.
- The University Review Unit 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 whether 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 HECO-5 will be approved and authorization given to prepare working drawings the Contract Documents.

SECTION 8.15 STRUCTURAL AND SPECIAL INSPECTIONS

8.15.1 The VUSBC in Chapter 1 prescribes the minimum inspections to be performed on a project. The VUSBC also adopts the International Building Code by reference. VUSBC Chapter 17, Structural Tests and Inspections 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 Owner's University's Project Inspection, the A/E and the Owner's University's Independent Testing Lab.

8.15.2 The University Building Official for all University-Owned buildings establishes the following procedure for the application of the Structural and Special Inspections for capital outlay projects.

815.2.1 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 including but not limited to inspections listed on the HECO-6b form. Identify those tests and inspections to be performed by the Owner's 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 Structural and Special Inspections in Division 1 of the Specifications, using the HECO-6b form. See Appendix M for the Concept of the Process.

8.15.2.2 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.

8.15.2.3 Each project shall have an on-site Project Inspector/Clerk of the Works who shall, as part of his responsibilities, check all materials delivered of to the site for conformance with the approved submittals. The Inspector shall also check the installation for proper materials, methods, clearances, etc., as described in the plans and specifications and in the approved submittals.

8.15.2.4 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.

8.15.2.5 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 the University has determined to exclude this service from the A/E contract, qualified Architects and Engineers of the University shall perform this function.

8.15.2.6 The A/E's structural engineer, the University's Project Inspector, and the University's Project Manager or responsible person shall complete the Final Report of Structural & Inspections, Form HECO-13.1b, and submit to the University Building Official as soon as completed but prior to the Substantial Completion inspection for the project.

8.15.3 Appendix M, Structural and Special Inspections, contains the list of Structural & Special Inspections required for University -owned Buildings. The A/E shall edit the applicable list as necessary to indicate those materials and inspections that are and are not required for the project.

8.15.4 See Chapter 10 and Appendix N for additional information on other Project Inspector functions.

SECTION 8.16 “COMMISSIONING” OF HVAC SYSTEMS

“Commissioning” for HVAC systems, as described in ASHRAE Guideline 1-1989 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 agency personnel if required.

See section 10.12 for "Commissioning" inspection requirements.

SECTION 8.17 FIRE PROTECTION SHOP DRAWINGS

Fire Protection and Sprinkler shop drawings and submittal data shall be reviewed and approved by the A/E of record. When the submittal with any added notations is satisfactory to the A/E, the A/E shall so stamp and send one copy of such documents to the responsible State Fire Marshal Office, as appropriate, for final review before approval to begin installation.

SECTION 8.18 PARTNERING

Projects above \$5,000,000 in construction costs shall have a formal partnering agreement unless waived by the Chief Facilities Officer. This will entail an initial session facilitated by an outside consultant as part of the preconstruction activities. Representatives of all partners shall attend and sign the Partnering Charter developed in the initial session. This Charter will contain a detailed mission statement including various commitments made to achieve project success. In addition the Charter will define a resolution process, a plan of action for specific project challenges and a plan for follow on partnering progress meetings to assess the performance against the Charter.

Participation by the partners is a basic service and this participation requirement shall be included within Division 1 of the specifications. The facilitator will be procured separately by the University of Virginia.

CHAPTER 9: DESIGN COORDINATION AND QUALITY ASSURANCE

SECTION 9.1 DESIGN COORDINATION

9.1.1 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. Submittals will be reviewed by the various disciplines in the University Review Unit for compliance with requirements and standard criteria. Errors and deficiencies shall be corrected by the A/E at no additional cost to the University.

9.1.2 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.

SECTION 9.2 QUALITY ASSURANCE CHECK LIST

The checklists in the HECOM Appendix Q provide guidance to assist the A/E in reviewing the documents and represent the information the University expects to be shown on the drawings to clearly identify the Work to be performed. 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.

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CHAPTER 10: CONSTRUCTION PROCUREMENT AND ADMINISTRATION

SECTION 10.1 GENERAL

Construction will 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 CFO that competitive sealed bidding is either not practicable or not fiscally advantageous to the public and (3) Medical Center Construction Projects. See Chapter 11 for Special 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, shall include the General Conditions of the Construction Contract HECO-7, and Supplemental General Conditions - SWAM. The Agency, at its discretion, may include a Supplemental General Condition to waive the requirements of Section 12 (b) of the General Conditions of the Contract, HECO-7, as it relates to the requirement for all Builders' Risk insurance for these categories of work if the Agency has, for each project, verified with the Department of Risk Management that its insurance will provide adequate coverage. Use the wording shown in the Sample in Appendix A.

Non-capital construction shall be procured in accordance with Appendix O.

Non-capital outlay minor construction, or repair or replacement in kind, or minor remodeling or renovation which does not meet the criteria above, which does not require plans, and which does not modify the Use Group Classification, existing Exits or other Fire Safety Elements, may be procured in the same manner as non-professional services in accordance with Chapter 7 of the Purchasing Manual for Institutions of Higher Education, Section 3C.

SECTION 10.2 CONSTRUCTION BIDS

10.2.1 Instructions to Bidders: See Chapter 8.3.4. Appendix A contains 2 sets of instructions to bidders, HECO 7a's; one for Non-General fund Higher Education projects and one for Non-General fund Medical Center Projects.

10.2.2 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.

10.2.3 Authorization to Advertise for Bids and Building Permit: Authorization to advertise for bids is given on completion of technical review(s) of the project documents by the

Review Unit and, approval of the Director Facilities Planning and Construction and issuance of the Building Permit. The original signature Building Permit will be held on file by the Real Estate Manager for final completion.

10.2.4 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.

10.2.5 Intentionally left blank

10.2.6 Advertising: The Office of Contract Administration 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.

The advertisement should be placed for a period of one or more days, as deemed appropriate, in one newspaper which has daily statewide circulation such as the Richmond Times-Dispatch, the Norfolk Virginian-Pilot, the Roanoke Times & World News or the Washington Post. The project should also be advertised in a newspaper which serves the area where the project is located if different from the above. 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 the Office of Contract Administration and be posted on the VBO/eVA web site when the expected procurement exceeds \$50,000.

10.2.7 Prebid Conference: If a Prebid 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 Office of Contract Administration shall conduct the Prebid conference. The agenda shall include the following:

1. Introductions of A/E and Agency representatives
2. Synopsis of the Work by citing or reading portions of
 - Notice of Invitation for Bids
 - Instructions to Bidders
 - Prebid Question Form

- Bid Form
 - Supplemental General Conditions
 - Special Conditions
 - General Requirements
 - Other conditions or requirements included in the Bid Documents that should be called to the attention of the bidders
3. 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.
 4. The A/E should issue an Addendum to include a copy of the attendees sign-in sheet and the questions posed with the response to each.

The Agency and the A/E must be careful not to provide any information, instruction, or clarification to Prebid attendees which is not made available to all potential bidders.

10.2.8 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 which can be covered in a one page Addendum may be issued up to 6 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 submitted to the Review Unit at the same time and by the same means as the Addenda are issued to the Bidders. A copy of all addenda shall also be sent to the responsible State Fire Marshal Office which will have jurisdiction over the project.

10.2.9 Receipt of Bids: A Virginia Construction Contracting Officer or a person acting under the supervision of the VCCO will receive the bids when submitted. That person 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 bidder. 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 and Wednesdays.

SECTION 10.3 BID OPENING

10.3.1 Bid Opening (other than Medical Center projects): Bids shall be publicly opened by a VCCO or his representatives(s) and shall be reviewed for completeness. A 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.

10.3.2 Bid Opening (For Medical Center Projects): Bids shall be privately opened by the VCCO or his representative(s) and shall be reviewed for completeness. A 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.

Once the designated bid receipt time has arrived, the Contract Officer will move the sealed bids to a private area. If the low bid is within budget, the bids will be announced immediately. If all bids are over budget the results of the bid opening will not be made public until the contract is awarded. At that time, the list of firms whose bids were received will be made available to the public.

SECTION 10.4 PROVISIONS FOR NEGOTIATION WITH LOW BIDDER

When the low bid exceeds available funds and upon approval of the CFO negotiations with the lowest responsive and responsible bidder may occur. For Medical Center Projects negotiations with up to three (3) bidders may occur. This would normally be the three lowest. In all cases, a record of the negotiations will become a part of the procurement *file* for the project.

SECTION 10.5 AUTHORITY TO AWARD A CAPITAL OUTLAY PROJECT CONTRACT

The VCCO approves all requests to award a contract (HECO- 8) to the low 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 at the Office of Contract Administration website prior to contract award.

SECTION 10.6 EXECUTION OF CONTRACT

The CFO has been delegated authority to execute contracts. The CFO will execute a written contract with the Contractor using the CO-9.

10.6.1 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 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 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. (University Procurement Rules)

Stay of award during protest. 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. (University Procurement Rules)

10.6.2 For Medical Center Projects no *Formal* Protests Such As Explained in 10.6.1 Shall Be Available.

10.6.3 Notices to Proceed will be issued by the VCCO after bonds and insurance certificates have been reviewed by Legal Counsel and the Building Permit has been issued.

SECTION 10.7 CONSTRUCTION CONTRACT ADMINISTRATION

10.7.1 General: The General Conditions of the Construction Contract, HECO-7, describe the contract administration procedures. (Appendix A)

10.7.2 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 preinstallation 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 section 5.3.5 and Chapter 10 of this Manual, section 1010.2 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.

10.7.3 Construction Administration Management: The University may assign a Construction Administration Manager to assist the 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 Administration 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 Administration 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 10.8 PRECONSTRUCTION MEETING

Prior to the start of construction a Preconstruction meeting shall be held. Attendees should include the Project Manager, Construction Administration Manager and Project Inspector, 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 and Superintendent (and Scheduler, if Contractor desires), and representatives of the Contractor's major Subcontractors. See Preconstruction Conference Format in Appendix H and the General Conditions of the Construction Contract (HECO-7) section 50.

SECTION 10.9 MONTHLY PAY MEETINGS

The intention is that the Contractor, the Construction Administration 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 (HECO-7) section 50. The monthly pay meeting is normally the best opportunity to exchange information and should include the following topics:

- Observations of status, quality and workmanship of work in progress
- Validation of the Schedule of Values and Certificate for payment
- Conformance with proposed construction schedule
- Outstanding Requests for Information Requests for Clarification and Requests for Proposal
- Submittals with action pending
- Status of pending Change Orders
- Status of Running Punch List items
- Work proposed for coming pay period
- Discussions of any problems or potential problems which need attention

SECTION 10.10 OTHER MEETINGS

Other meetings, such as progress meetings, coordination meetings, preinstallation meetings and/or partnering meetings may also be appropriate. See the General Conditions of the Construction Contract (HECO-7) section 50. Preinstallation meetings are required for all HVAC systems and components. Such meetings should include the A/E, the project engineer for the mechanical discipline, the Construction Administration 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 10.11 SCHEDULE OF VALUES AND CERTIFICATE FOR PAYMENT

The General Conditions of the Construction Contract, HECO-7, describe in Sections 20 and 36 the requirements for completing the Schedule of Values and Certificate for Payment, CO-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 CO-12 documentation requesting payment.

SECTION 10.12 INSPECTION OF WORK

10.12.1 General: The General Conditions of the Construction Contract, HECO-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 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 Project Inspector. The University will designate a specific individual to serve as Project Inspector. The Project Inspector will report to the Construction Administration Manager. The duties and functions of the Project Inspector include those listed in Section 16 of the General Conditions of the Construction Contract, HECO-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 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.

10.12.2 "Commissioning" Inspection of HVAC Systems: See section 8.16 for design phase commissioning requirements. Prior to any submittals and/or installation a preinstallation meeting will be held. See section 10.10 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 section BSRV.1.9.3 of the University of Virginia Facilities Design Guidelines. 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 re-quire 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.

10.12.3 Start up/Acceptance of MECHANICAL AND ELECTRICAL Systems: 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 backcharge 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.

10.12.4 Structural Inspections: See section 8.15 of this Manual and Appendix M for this requirement.

10.12.5 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, fireproofing and standard compaction control.

10.12.6 Fire Marshal Inspections: The Western Regional Office of the State Fire Marshal Office will normally be responsible for the Fire Marshal inspection.

SECTION 10.13 CONSTRUCTION CHANGE ORDERS

Generally Change Orders will be administered in accordance with section 38 of the General Conditions of the Construction Contract (HECO-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 University's Chief Facilities Officer. Also, any change costing \$50,000 or more shall require a Board on Changes Report and the prior approval of the change order by the Chief Facilities Officer as delineated in Facilities Directive No. 362. See Appendix K for standard change order procedures. No change order shall be issued, regardless of cost, that increases the approved scope of the project as shown on the approved HECO-2 or as set forth in the Capital Project Request or Preplanning Study without prior approval of the University of Virginia Executive Vice President and Chief Operating Officer. Additionally, the total cumulative amount for all change orders for a single contract shall not exceed the construction contingency available in the current budget. A request to infuse additional funds or to transfer funds to the Total Project Budget shall be submitted to the Director of Facilities Planning and Construction via the Capital Budget Manager (University V. P. for Management & Budget) on a revised HECO-2 with appropriate written justification, normally in the form of a Decision Brief for an increase in authority.

SECTION 10.14 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 shall review this set when he 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 10.15 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 Construction Administration Manager will insure the requirements, procedures, inspections and approvals below and in section 44 of the General Conditions of the Construction Contract (HECO-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 will then coordinate and arrange 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 Construction Administration Manager, the Project Inspector, University user representatives, representatives of the General Contractor, including those of the mechanical, electrical, and major equipment subcontractors, the A/E, the University, Review Unit, 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 Review Unit 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 HECO-13.3 and other documents as appropriate.

The University may submit this material to the University 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 reinspections 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

reinspections. Do not accept as Substantially Complete unless it (the part or whole) is ready for occupancy.

SECTION 10.16 BENEFICIAL OCCUPANCY

Once the University, the A/E, the Contractor 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 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 University Building Official.

The University 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 (HECO-13.3), (Directive 544 applies) 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 (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. HECO-13.3b Checklist for Beneficial Occupancy;
6. Fire Marshal's report and recommendation;
7. Document stating that the Asbestos Abatement, if any, is complete;
8. 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 University Building Official.

SECTION 10.17 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 Construction Administration Manager will insure the requirements of section 44 of the General Conditions of the Construction Contract (HECO-7) are complete. Upon completion of all Certificates of Completion, HECO-13.1 and 13.2, and with the Certificate of Use and Occupancy issued, HECO-13.3, the Project Manager shall sign and close the HECO-17 Building Permit on file with the Real Estate Manager.

SECTION 10.18 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 Project Manager shall sign the HECO- 17 and file a HECO-14.

SECTION 10.19 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 10.20 MAINTENANCE AND OPERATING MANUALS

Four 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 (HECO-7) section 49 apply. Note that four 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 10.21 OWNERSHIP OF DOCUMENTS

Ownership of all materials and documentation including the drawings and specifications and 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 of Virginia, 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 Rules 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:

- original sealed and signed drawing tracings
- original copy of the specifications
- copy of analyses made for the project
- indexed copy of the calculations made by each discipline for the project
- University copy of all shop drawings, submittals, cut sheets, operation and maintenance instructions, parts lists and other material related to the project.
- As built set of drawings and specifications

SECTION 10.22 CONTRACTUAL DISPUTES (University Procurement Rules)

The University's Procedure for Resolution of Contractual Claims, Directive 363, is to be followed for construction claims submitted in accordance with the General Conditions of the Construction Contract, section 47.

CHAPTER 11: SPECIAL PROCEDURES

SECTION 11.1 GENERAL

In accordance with the Restructuring Act and the Management Agreement for the University of Virginia, the following 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 Chief Facilities Officer. Approval by the Facilities Planning and Capital Development Administrator is also required for Medical Center Projects. These Design-Build, Construction Management, Competitive Negotiation, and Pre-Qualification Procedures apply to all capital projects for the University.

SECTION 11.2 DESIGN BUILD (D/B) PROCEDURES

- A. **PROCEDURE FOR APPROVAL TO USE D/B:** The University shall document, in writing (using the D & F format in Appendix R), the decision to use a D/B contract.

The document shall justify and substantiate that D/B is more advantageous than a competitive sealed bid construction contract with a general contractor and shall indicate how the University will benefit from using D/B. The document shall also include a written justification that sealed bidding is not practical and/or fiscally advantageous.

The Chief Facilities Officer (CFO) and the Architect of the University are the approving authority for requests to use D/B procedures.

- B. **DESIGN-BUILD (D/B) SELECTION PROCEDURES:** On projects approved for D/B procurement of the contract shall be a two-step competitive negotiation process. The following procedures shall be used in selecting a Design-Builder and awarding a contract.

1. The University shall appoint an Evaluation Committee which shall include a majority of licensed professional engineers or architects.
2. Selection of highly qualified Offerors (STEP I)
 - a. The University shall publish notice of its invitation for Design-Builders to submit Letters of Interest. The notice shall appear in at least two daily newspapers and on the On-Line Bids page of eVA website. The requirement to publish in the eVA website may be waived by the CFO in order to expedite the process.

- b. The Committee shall evaluate each responding firm's submittals and any other relevant information and shall recommend no more than seven offerors deemed most suitable for the project.
 - c. The Committee shall make its recommendation on the most suitable Design-Builders to the CFO, copy to the University Architect. The CFO shall approve the most suitable Design-Builders to receive a Request for Proposal.
3. Selection of a Design-Build Contractor (STEP II)
- a. The University shall prepare a Request for Proposal (RFP) containing the Agency's Facility Requirements, building and site criteria, site and survey data, the criteria to be used to evaluate submittals, and other relevant information, and issue it to the short-listed firms.
 - b. Those firms will be requested to submit technical and cost proposals. Technical Proposals will be submitted to the Evaluation Committee. Separately sealed Cost Proposals will be submitted to be held separately from the Technical Proposals. The short-listed firms may also be invited to provide oral presentations in order to provide additional information.
 - c. The Evaluation Committee will evaluate the Technical Proposals and presentation based on the criteria contained in the RFP. It may inform each D/B offeror of any adjustments necessary to make its Technical Proposal fully comply with the requirements of the RFP. In addition, the University may require that offerors make design adjustments necessary to incorporate project improvements and/or additional detail identified by the Committee during design development.
 - d. The firms may then be requested to submit revised technical and price proposals based on the technical discussions.
 - e. Price proposals will be opened and disclosed to the committee at the conclusion of the preliminary technical evaluations.
 - f. Based on the revisions made to the Technical Proposals, the Committee and an offeror may negotiate additive and deductive amendments to any offeror's Cost Proposals. Prices may be negotiated with no more than the three (3) low offerors.
 - g. The Committee shall make its recommendation on the selection of a Design-Builder to the CFO, copy to the University Architect, based on its evaluation and negotiations. The CFO shall select the Design-Builder.

- h. Upon receipt of the CFO's selection, the University will notify all offerors who submitted proposals which offeror was selected for the project.
- i. Proprietary information from competing firms will not be disclosed to the public or other firms provided the firm has so identified the information.

- 4. These procedures may be changed with the written consent of the Chief Facilities Officer (using the D & F format in Appendix R).

C. **REQUIRED DESIGN/BUILD (D/B) CONTRACT TERMS**

D/B contracts shall not proceed past the preliminary phase without a notice to proceed from the CFO and the approval of the Architect of the University. No construction work shall proceed without such notice.

SECTION 11.3 CONSTRUCTION MANAGEMENT (CM) PROCEDURES

The following procedures shall be used for the procurement of construction management contracts

- A. **PROCEDURE FOR APPROVAL TO USE CM CONTRACTS:** The University shall document, in writing (using the D & F format in Appendix R), the decision to use a CM contract.

The documentation shall justify and substantiate that the use of CM is more fiscally advantageous than a competitive sealed bid construction contract with a general contractor.

The Chief Facilities Officer is the approving authority for requests to use CM.

- B. **CONSTRUCTION MANAGEMENT (CM) PROCEDURES:** On projects approved for CM, the University shall proceed as follows to determine from those offerors who may submit proposals the most suitable offers

- 1. Issuance of a Request for Letters of Interest (LOI) which describes in general terms, the proposed construction project and requests names and qualifications of interested contractors. Public notice of the LOI shall be made in such manner to allow for maximum exposure of the requirements to potential offers that can be reasonably anticipated to submit proposals in response to the particular request. LOI's may also be solicited directly from potential contractors. The LOI notice shall appear in at least two daily newspapers and on the On-Line Bids page of eVA website. The requirement to publish in the eVA website may be waived by the CFO in order to expedite the process.

2. The Committee shall evaluate each responding firm's submittals and any other relevant information and shall recommend no more than seven offerors deemed most suitable for the project.
3. The Committee shall make its recommendation on the most suitable CMs to the CFO. The CFO shall approve the most suitable CMs to receive a Request for Proposal.
4. A Request for Proposal shall be prepared and issued only to the above listed (short listed) CM firms. The request will be for both technical and cost proposals.
5. The RFP contains the current stage of construction documents and will generally also include a description of the factors and values that will be used to evaluate the proposals. Firms will be encouraged to elaborate on their qualifications and performance data or staff expertise pertinent to the proposed project. The RFP will describe the factors that will be issued to evaluate the technical proposals and explain how the technical and cost proposals will be rated and weighted to select the successful offeror.
 - a. Offerors will be required to submit complete, detailed technical proposals describing how they intend to carry the project including:
 - Means and methods
 - Names and credentials of key personnel
 - Names and credentials of sub-contractors and key personnel
 - Proposed schedules and work plans
 - Detailed description of procedures for particularly sensitive parts of the project
 - Other information important to understanding the project and completing it successfully
 - b. Offerors will be required to submit a fixed price cost proposal for the entire project as described in the RFP and detailed in their technical proposals.
6. Technical Proposals will be distributed to the Evaluation Committee. Separately sealed Price Proposals will be submitted to be held separately from the Technical Proposals. The short-listed firms may also be invited to provide oral presentations in order to provide additional information. The price proposals will be opened after the initial technical evaluations.
7. The Committee will evaluate and rank the proposals and conduct interviews and negotiations with two or more offerors submitting the best proposals and approved by the CFO. Should the University determine in writing and at its sole discretion that only one offeror is fully qualified, or that one offeror is more highly qualified than the others under consideration, then, with the consent of the CFO, a contract may be negotiated with and awarded to that offeror.

8. The Committee shall make its final evaluation and forward its recommendation on the selection of a Construction Manager to the CFO. The CFO shall select the Construction Manager.
9. Upon receipt of the CFO's approval, the University will notify all offerors who submitted proposals which offeror was selected for the project.
10. The objective of this Competitive Negotiation procedure is to ensure clear and open communication of expectations of both the contractors and the University staff and then to make an award to the CM who provides the best combination of technical and price proposals.

This procedure may be modified with the written approval of the CFO (using the D & F format in Appendix R).

C. REQUIRED FIXED PRICE CONSTRUCTION MANAGEMENT CONTRACT TERMS:

All fixed priced construction phase at risk construction management contracts entered into by the University shall 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. (3) Final construction at risk pricing will use a CM open book process to capture all trade contracts bidding results. In extraordinary circumstances the CFO may grant a waiver of these contractual requirements in whole or in part.

- D. This procedure may be modified with the written consent of the CFO (using the D & F format in Appendix R).

SECTION 11.4 COMPETITIVE NEGOTIATION PROCEDURES

- A. **PROCEDURE FOR APPROVAL TO USE COMPETITIVE NEGOTIATION PROCEDURES:** The University shall document in writing (using the D & F format in Appendix R) the decision to use competitive negotiation procedures.

The documentation shall justify and substantiate that competitive negotiation is more advantageous than a competitive sealed bid construction contract with a general contractor and shall indicate how the University will benefit from using competitive negotiation.

The CFO must approve the D&F. Approval by the Facilities Planning and Capital Development Administrator is also required for Medical Center Projects.

- B. **COMPETITIVE NEGOTIATION PROCEDURES:** Competitive Negotiation shall include the the procedures of 11.3 D above. However in all cases the stage of design shall be 100% construction documents.

SECTION 11.5 PREQUALIFICATION PROCEDURES

- A. **PROCEDURE FOR APPROVAL TO USE PREQUALIFICATION PROCEDURES:** The University shall document in writing (using the D & F format in Appendix R) the decision to use prequalification procedures.

The documentation shall justify and substantiate that prequalification is more advantageous than a competitive sealed bid construction contract with a general contractor and shall indicate how the University will benefit from using prequalification.

The CFO must approve the D&F. Approval by the Facilities Planning and Capital Development Administrator is also required for Medical Center Projects.

- B. **PREQUALIFICATION PROCEDURES:** The following Prequalification procedures shall be followed. However in all cases the stage of design shall be 100% construction documents.

1. The University may prequalify contractors for a particular construction project and limit consideration of bids or proposals to prequalified contractors. The procedures contained in this Section shall be used for prequalification of contractors for a particular construction project. The University may prequalify both general contractors and selected subcontractors. Any prequalification of contractors shall be conducted in accordance with the procedures stipulated in this Section and the University Procurement Rules, and sufficiently in advance of the bid receipt date to allow potential contractors a fair opportunity to complete the process.
2. The objective of prequalification shall be to qualify as many contractors as possible to bid on the proposed work. 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.
3. The University shall advertise for the prequalification in at least two (2) newspapers, one of which has daily statewide circulation; on the On-Line Bids page of eVA web site; and shall post the advertisement in the public area where Invitations to Bid are generally posted. The date set for receipt of the Standard Form for Contractor's Statement of Qualifications shall be at least thirty (30) calendar days from the date of the initial newspaper advertisement.

4. The Standard Form for Contractor's Statement of Qualifications, G.S. Form E&B CO-16 (CO-16) shall be the application form submitted by contractors when applying to be prequalified for a particular construction project. The CO-16, when provided to interested contractors, shall be accompanied by the minimum qualification criteria for the proposed construction contract. The experience section may be expanded to include further project specific information.
5. The Chief Facilities Officer shall establish a committee of at least five (5) members to review the CO-16 forms submitted by interested contractors and determine which, if any, of the contractors shall be prequalified. Of the five (5) persons one shall be a certified Virginia Construction Contracting Officer, one shall be a registered architect or engineer and one shall be the project manager for the proposed project. The remaining persons should be familiar with the design and construction industry. The A/E for the project may, at the discretion of the Committee, serve as an advisor to the Committee.
6. University Procurement Rules permit the University to deny prequalification to any contractor only if the University finds at least one of the following:
 - a) 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;
 - b) The contractor does not have appropriate experience to perform the construction project in question;
 - c) 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 non-governmental construction;
 - d) 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;
 - e) 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 non-governmental construction or contracting;
 - f) 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

- g) The contractor failed to provide to the agency, in a timely manner, any information requested by the agency relevant to (a) through (f) above.
- h) The contractor does not have the requisite Virginia license issued by The Virginia Board of Contractors to perform work in Virginia pursuant to Virginia Procurement Rules.

7. The University shall notify, in writing, each contractor that submitted the CO-16 whether that contractor has been prequalified. If a contractor is denied prequalification, the written notice to that contractor shall state the reason(s) for denial of prequalification and the factual basis of such reasons(s). The written notice to each contractor shall be delivered by U. S. mail. A contractor denied prequalification shall have ten (10) calendar days from the postmark date of the written notice from the agency in which to appeal the denial of prequalification. The contractor shall submit the written appeal with any additional information which may support the appeal to the CFO, the University's designated appeal officer (Appeal Officer).

The decision of the CFO shall be the final University decision. There is no further administrative appeal procedure pursuant to University Procurement Rules; however, the contractor may initiate legal action pursuant to University Procurement Rules.

8. Verification of References supplied by the contractor in Sections VI: 1, 2, 3 & 5 of the CO-16 shall be accomplished.
9. Qualification criteria I, III, V and VI in the standard qualification criteria package in the CO-16 shall not be changed without the prior written approval of the CFO. Qualification criteria for Experience (II) shall be customized to fit the particular project for which prequalification is intended.
10. The Notice of Invitation for Bids for the project shall be published as required by Chapters 8 and 10 of the Manual, and on the On-Line Bids page of eVA web site. The advertisement shall appear no less than 30 days prior to the date of bid receipt, unless otherwise approved by the CFO. The advertisement shall state that bids will be accepted only from those contractors prequalified to bid on the project and a registered vendor with the eVA electronic procurement system.

SECTION 11.6 EMERGENCY PROCEDURES

See Directive 320 and consult with the Contract Administration Manager.

CHAPTER 12: THE CAPITAL PROJECT COMMITTEE

SECTION 12.1. COMMITTEE MAKE UP

12.1.1 General: A Capital Project Committee and its Steering Subcommittee will be appointed for each capital outlay project by the Executive Review Committee for Capital Project Development (ERC) with concurrence from the Architect for the University, the Facilities Planning and Construction (FP&C) Department, and the requisite senior administrator responsible for the use of the new facility.

12.1.2 The Steering Committee: The Steering Subcommittee will oversee the project's scope, budget, schedule, and design, and will serve as the primary contact with the consultant's design team. It serves as the project's primary decision making body, and may meet as often as weekly, particularly during the initial design phases. The Architect for the University, or his designate, convenes the committee through completion of preliminary design. After the preliminary design is approved by the Architect for the University, the committee is convened by the appropriate Division Manager from the FP&C Department.

Steering Subcommittee membership is limited to 5-7 individuals. Committee members may invite other individuals from their offices, on an as needed basis, to provide input at particular meetings. Membership will normally be comprised as follows:

- 1-3. Representatives from the Project Sponsor (*No more than three*)
4. A Representative from the Provost Office for all academic projects or the Vice President's Office of the Project Sponsor
5. The Architect for the University
6. A Division Manager from the FP&C Department
7. A Project Manager from the FP&C Department (*Note: The Project Manager serves as the Secretary of the Steering Subcommittee.*)

12.1.3 The Project Committee: The Project Committee will address program issues and will provide overall project review. It will seek program input from appropriate university departments, such as police, school program areas, etc. Typically, it will meet monthly. The Architect for the University, or his designate, convenes the committee through completion of preliminary design. After the preliminary design is approved, the committee is convened by the Division Manager from the FP&C Department.

Project Committee membership should be limited to 10-15 individuals and would normally be comprised as follows:

- 1-7. The Steering Subcommittee as defined previously (5-7 members)
8. A Faculty Representative
9. A Student Representative
10. A Representative from the University Budget Office
11. A Representative from Environmental Health and Safety
- 12-15. Representatives of specific departments whose responsibility are particularly germane to the project; e.g., policy, parking and transportation, etc.

SECTION 12.2 COMMITTEE RESPONSIBILITIES

Committee and Steering Committee responsibilities are defined in Facilities Management Directive Number 520 and attached “Handbook for Capital Budget Project Committees”. The Project Manager shall provide a current version of the directive and the handbook as an attachment to the committee membership assignment letter normally signed by the Chief Facilities Officer after approval of the ERC.

CHAPTER 13: MASTER PLANS AND SITE & UTILITY DRAWINGS

SECTION 13.1 MASTER PLANS

13.1.1 Each capital project must conform to a Site, Precinct or Master Plan developed by the Architect for the University and approved by the Board of Visitors.

13.1.2 A Utility Master Plan will be developed by the Facilities Management Department Director for Utilities to insure utility capacities exists to support the Master Plan. Utility facility locations will be as defined in the appropriate Precinct or Master Plan.

SECTION 13.2 SITE & UTILITY DRAWINGS

Current site and utility drawings are intended to depict the current condition of the University's physical plant. Updates typically occur annually and show buildings completed, land acquired, etc. The site and utility drawings shall be maintained by the Real Estate and Space Office in coordination with the Facilities Planning and Construction Department Resource Center and the Utilities Department of Facilities Management.

SECTION 13.3 OTHER MASTER PLANS AND REQUIREMENTS

Each Capital Project shall conform to the University's Regional Storm Water Plan and Historic Structures Plan.

CHAPTER 14: PLANNING AND PROJECT APPROVAL

SECTION 14.1 GENERAL

This chapter describes the capital outlay process from budget submittal to facility occupancy. It provides detailed guidance on documentation required for approvals at each milestone of the process. Unless specifically waived by the Chief Facilities Officer (CFO), execution of all capital outlay projects shall follow approval procedures in Section 14.4.

SECTION 14.2 PLANNING

The budget planning process is managed by the Director of Budget and the Architect for the University. The actual development of the capital budget submission packages will require the participation of FP&C. The resulting budget packages solicit the approvals of the Board of Visitors, General Assembly and the Governor as appropriate.

An Environmental Impact Report (EIR) shall be prepared for each qualifying project with an expected construction cost of \$300,000 or more. See Facilities Management Directive 522 for details as to the preparation of an EIR.

SECTION 14.3 PROJECT AUTHORIZATION

Architectural or engineering planning for or construction of, or acquisition of any capital project shall not commence or a revision be initiated without an approved HECO-2. Submit Form HECO-2 to the Director of Capital Budget, and the Facilities Planning and Capital Development Administrator for Health System projects, and the Director of FP&C prior to proceeding. For projects which consist of acquisition and construction, the acquisition must be submitted on a separate Form HECO-2. Normal cycle is for authority to be given to implement projects on or about July 1.

SECTION 14.4 PROJECT EXECUTION

14.4.1 Acquisitions, Demolitions, Leased and Temporary Facilities

See Appendix V, Real Property Transactions.

14.4.2 Construction Projects

The order of procedure for executing reviews and approvals on a Capital Project is shown on pages 14-5 through 14-8. An eight digit project code will be the basic project identifier. Projects under blanket or umbrella appropriations, a project 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 two digit sub-project code for each undertaking. The sub-code must be used on all capital outlay forms and correspondence.

The Project Manager must possess an approved “Request for Authority to Initiate Capital Project, Form HECO-2” on all capital projects. An EIR should be completed at this point.

14.4.2.1 The University normally hires an A/E firm to prepare drawings and specifications (See Chapter 4) upon receipt of the approved HECO-2. The University Architect will develop architectural guidelines and present them to the Board of Visitors for approval. An advertisement for A/E services is issued and a short list of firms is determined. A RFP is issued to the short listed firms and interviews are held. With the University Architect’s 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.

14.4.2.2 A pre-design conference is held from which the A/E develops and submits schematic designs for review by the Review Unit and others (Form HECO-4). At this point a procurement strategy planning session occurs to determine the preferred construction delivery method, bid, prequalification, design build or construction manager. The University Architect will present the project schematic design to the Art and Architectural Review Board (AARB) and 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.

14.4.2.3 The A/E develops preliminary designs for review and approval (Form HECO-5). The Review Unit, as outlined in Chapter 8 of this Manual, shall perform schematic, preliminary and contract document reviews and coordinate with the responsible State Fire Marshal Office for completion of fire safety reviews. The City of Charlottesville and Albemarle County will be notified by the Review Unit of the availability of the construction documents for review. If the project construction costs exceed \$5 million formal V/E reviews are required.

14.4.2.4 Completed working drawings and specifications shall be submitted by the University Review Unit to the Division of Soil and Water Conservation and other reviewing agencies as determined by the Review Unit. 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 University 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.

14.4.2.5 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 schematic phase. An approved HECO-8 is required before contract award and a HECO-17 is also required before the construction start. For information on Construction Change Orders see Chapter 10 (Form HECO-11a and HECO-11).

14.4.2.6 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. The application shall include a HECO-13.1 or HECO-13.1a (Certificate of Completion or Certificate of Partial/Substantial Completion by A/E); a HECO-13.2a (Certificate of Completion or Certificate of Partial/ Substantial Completion by Contractor); a copy of the Contractor and A/E's punch list; and a letter from the responsible State Fire Marshal Office stating it has no objections to the building being occupied or stating conditions for occupancy of the building. Final inspection of all projects will be conducted by the A/E, the University and the responsible State Fire Marshal Office.

Chapter 14 – Order of Procedures

	The following procedures and forms will be required for Capital Outlay projects. All HECO forms are approved locally and the PM is responsible for obtaining required signatures and proper distribution of copies as noted on the forms. Refer to Appendix B for forms.	Required Approvals	Copy Distribution
HECO-2 (blue)	<p>Authority to initiate non-general funded Capital Outlay project.</p> <p>This form shall be prepared by the Project Manager (PM) upon receiving Board of Visitors authority for the projects. 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 construction time • Allows schematic and preliminary design to proceed <p>Revisions to the authorized Project Budget total are accommodated on a revised HECO-2</p>	<p>PM Director Capital Budget Facilities Planning and Capital Development Administrator (HS Projects) Director FP&C</p>	<p>V.P. Mgmt & Budget CFO Architect for University DGS (BCOM) Requestor Const. Prog. Mgr. FP&C Budget Mgr. FP&C Contract Admin. All Approvals</p>
HECO-4 (green)	<p>Approval of Schematic Design</p> <p>Schematic Design must be approved by the Board of Visitors and the State Art & Architectural Review Board. Approvals will be obtained by the Architect for the University.</p> <ul style="list-style-type: none"> • Requires acceptance of the schematic design documents by the Review Unit. 	<p>PM Project Committee Architect of University BOV (B&G Committee) AARB Director FP&C Fire Marshal Arb & Landscape Comm. Review Unit</p>	<p>Director Capital Budget Facilities Planning and Capital Development Administrator (HS Projects) All Approvals</p>
HECO-5 (yellow)	<p>Approval of Preliminary Drawings and Specifications</p> <p>This form shall be prepared by the PM upon completion of preliminary design documents. Completion and approval of this document accomplishes the following: Note – Date of schematic approval by BOV and Architect for the University must be included.</p>	<p>PM Project Committee Review Unit Architect for University AARB (as req'd) Director FP&C</p>	<p>Director Capital Budget Facilities Planning and Capital Development Administrator (HS Projects) All Approvals</p>

Chapter 14 – Order of Procedures

	<ul style="list-style-type: none"> Requires acceptance of the preliminary design documents by the Review Unit Establishes the construction budget Updates the project budget Allows construction document preparation to begin <p>Preliminary design must be approved by the AARB, the Board of Visitors and the Architect for the University.</p>	Dept. of Health (as req'd) Dept of Historic (as req'd) DEQ (as req'd)	
HECO-6 (pink)	<p>Approval of Working Drawings and Specifications (Required for all projects regardless of dollar value)</p> <p>This form shall be prepared by the PM upon completion of the contract documents. Completion and approval of this document accomplishes the following: Note – Date of preliminary approval by BOV and Architect for the University must be included. See HECO-17 below for Building Permit requirements.</p> <ul style="list-style-type: none"> Signifies acceptance of the contract documents by the Review Unit Confirms the budget Confirms the construction time Authorizes the construction procurement process 	PM Review Unit Architect for University Arb & Landscape Comm. (as req'd) Facilities Planning and Capital Development Administrator (HS Projects) Director FP&C Dept. of Health (as req'd) Dept of Historic (as req'd) DEQ (as req'd)	Director Cap Prog All Approvals FP&C Budget Manager FP&C Contract Admin.
HECO-6a	<p>Statement of Structural and Special Inspections</p> <p>Structural and special inspections schedule in Appendix M.</p>	PM Director FP&C	Review Unit
HECO-8	<p>Authorization to Award Contract</p> <p>This form shall be prepared by the PM upon completion of the procurement process. Final approval allows award of the construction contract. Note a HECO-17 Building Permit is also required prior to contract award. Revisions to the authorized Project Budget total are accommodated on a revised HECO-2.</p>	PM Director Capital Budget Facilities Planning and Capital Development Administrator (HS Projects) VCCO	FP&C Budget Manager Review Unit (with a copy of the bid tabulation) All Approvals DGS (BCOM)

Chapter 14 – Order of Procedures

HECO-11	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.	A/E PM CFO (if over \$50,000 or greater than 25%) FP&C Contract Admin.	Review Unit All Approvals
HECO-11 a	Change Order Justification Provides justification and reasons for the change.	A/E PM	All Approvals
HECO-11a/e	Architect Engineer Change Order Authorizes a change in a contract for A/E Services	PM CFO FP&C Contract Admin. Director FP&C	All Approvals
HECO-13.1 HECO-13.1a HECO-13.1b HECO-13.2 HECO-13.2a	Certificate of Completion by A/E Certificate of Partial or Substantial Completion by A/E Final Report of Structural & Special Inspections (See VIII, Section 1.8; also App T) Certificate of Completion by Contractor Certificate of Partial or Substantial Completion by Contractor These forms shall be prepared by the project manager at the appropriate time. When completed and signed they shall be submitted in a package along with a form HECO-13.2 “Certificate of Use and Occupancy.”	See the form	See the form
HE(CO)-13.3	Certificates of Use and Occupancy This form authorizes use of the facilities. Refer to Director 564 for Medical Center Projects.	Review Unit Director FP&C Building Official	Space & Real Estate

Chapter 14 – Order of Procedures

<p>HECO-14</p>	<p>Project Completion Report</p> <p>This form is prepared by the project manager and the accounting office upon completion of the project.</p>	<p>PM Director FP&C FP&C Budget Manager</p>	<p>Director Capital Budget CFO DGS (BCOM) Facilities Planning and Capital Development Administrator (HS Projects)</p>
<p>HECO-17</p>	<p>Building Permit</p> <p>This form is prepared by the Review Unit upon review of the construction documents and normally accompanies the HECO-6 for Director FP&C review and Building Official approval. It is required prior to award of any construction contract.</p>	<p>PM Review Unit Director FP&C Building Official</p>	<p>Space & Real Estate All Approvals FP&C Contract Admin.</p>

CHAPTER 15: REPORTS

SECTION 15.1 MAJOR CAPITAL PROJECT REPORTING

In accordance with the Restructuring Act Section 23-83.109 c 3 any capital project funded totally with non-general funds but operating on real property that was originally acquired with general funds and costing more than \$2 Million will be reported to the Governor and the Chairs of the Senate Committee on Finance and the House Committee on Appropriations 60 days prior to the start of construction or issue of bonds.

SECTION 15.2 MEASUREMENTS REPORTS

Performance measures of the benefits derived from restructuring will be reported on annually for each fiscal year. This annual report will be shared with all level 3 institutions and will address the following.

15.2.1 General Accountability Measures

- No material audit findings
- Compliance with Board of Visitors ("BOV") approved restructuring policy
- Regular reports to the BOV by the designated building official related to his/her duties as the official responsible for project compliance with the building code. The building official has direct access to the BOV.
- Compliance with the Restructuring Act's reporting requirements for all BOV project authorizations
- All Certificates of Use issued subsequent to the State Fire Marshal's favorable occupancy report

15.2.2 Specific Performance Measures

Measure	Benchmark	Results
Number of days on average for institution to process change orders locally	Before decentralization, number of days on average for Bureau of Capital Outlay Management ("BCOM") to process change orders (UVA data to be used as proxy benchmark for all institutions)	

Measure	Benchmark	Results
Number of days on average for institution to complete code review, including fire and life safety	BCOM established standard for code review turnaround time (21 days)	
Number of days saved by BOV approval of NGF projects compared to state approval	Number of days that would have been required from BOV approval to Appropriation Act effective date	
Average number of days for institution to approve a lease	Average number of days for Real Estate Services to approve a lease (UVA and VT proxy data)	

This report is due 1 September.

SECTION 15.3 TRANSACTION COPIES

The following transactions require document copies be forwarded to DPB (BCOM) on an as occurs basis:

- HECO-2
- HECO-8
- HECO-14

APPENDICES

- A General Conditions of the Construction Contract (Form HECO-7), Supplemental General Conditions and Standard Instructions to Bidders (Form HECO-7A), General Conditions of the Design Build Construction Contract (Form HECO-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
- G Roof Inspection Forms and Procedures
- H Pre Construction Conference Agenda
- I Parameters for Calculation of Life Cycle Costs and Energy Analyses
- J Samples of Forms and Formats.
- 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 & Non Capital Outlay Project Procedures
- P Building Permit Policy
- Q University of Virginia Procedure for Resolution of Contractual Claims
- R Determinations and Findings
- S Not Used (Reserved)
- T Not Used (Reserved)
- U Not Used (Reserved)
- V Real Property Transactions (Capital Outlay, Aquisitions and Leases)
- W Supporting Documents

**APPENDIX A:
GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT, SUPPLEMENTAL
GENERAL CONDITIONS AND STANDARD INSTRUCTIONS TO BIDDERS**

Standard HECOM forms are available at <http://www.fm.virginia.edu/docs/fpc/heco/hecoforms> Standard DGS forms and formats are available for download from the DGS Form Center (<http://forms.dgs.virginia.gov>).

GENERAL CONDITIONS (HECO-7)

To view/download the latest version of HECO-7 contract document visit the HECOM website listed above.

To view/download the latest version of CO-7 contract document (referred to in HECO-7 above) visit the website listed above and enter “DGS-30-054” on the Forms Center.

SUPPLEMENTAL GENERAL CONDITIONS - FOR SMALL WOMAN OWNED AND MINORITY OWNED (SWAM) BUSINESS PROCUREMENT PLAN

To view/download the latest version of The Supplemental General Conditions-SWAM, visit the DGS website listed above and enter “DGS-30-377” in the search box on the Forms Center.

SUPPLEMENTAL GENERAL CONDITIONS for Renovation Projects and for Liquated Damages:

To view/download the latest version of these sample formats, visit the DGS website listed above and enter “DGS-30-376” in the search box on the Forms Center.

INSTRUCTIONS TO BIDDERS:

To view/download the latest version of the required contract document, visit the HECOM website listed above and enter HECO-7a or HECO-7am for Medical Center projects.

GENERAL CONDITIONS DESIGN BUILD (HECO-7DB)

To view/download the latest version of the HECO-7DB visit the HECOM website listed above.

To view/download the latest version of the CO-7DB contract document referred to in the HECO 7DB visit the DGS website listed above and enter “DGS-30-056”.

HECO-7DB
Revised (July 1, 2006)

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 (2004 Edition) are modified and supplemental as hereinafter described in this Addendum Number One.

1. 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 (CO-9DB), the Worker’s Compensation Certificate of Coverage (CO-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 University of Virginia in its Higher Education Capital Outlay Manual (HECOM) 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 it place add the following:

“(d) The University of Virginia Facilities Design Guidelines, 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 HECOM current edition is included by reference and shall be used by the Contractor’s A/E as the referenced standards for design.”

2. Section 7 Conditions at Site

In Paragraph (a) delete the word “Bidding” and replace with “Submitting a Proposal”.

3. Section 9 Subcontracts

4. Section 10 Separate Contracts

In Paragraph (b) delete the Phrase “Invitation for Bids” and replace with “Request for Proposal”. Delete the Phrase “Bid Form” and replace with “Cost Proposal Form”

5. In Paragraph (a) delete “Invitation to Bid” in two places with “Request for Proposal”
Section 12(a) delete the words “and the Director, Division of Engineering and Buildings”
6. 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 HECOM current edition is included by reference herein and shall be used by the Contractor’s A/E as the referenced standards for Design”
7. For all forms referenced in the G.S. Form E&B CO-7DB (12/2002 Edition) by “CO-,” replace “CO-“with “HECO-” except CO-9DB, CO-12.

APPENDIX B

STANDARD HIGHER EDUCATION CAPITAL OUTLAY FORMS

CPSM (CO) Forms are available direct from BCOM at the following Web Site:
http://forms.dgs.state.va.us/eo51/dgs_viewforms.asp?page=1&bu=BCOM

The below listed HECO Forms are available direct from the University of Virginia at the following Web Site:
<http://www.fm.virginia.edu/fpc/hecom.htm>

DETERMINATIONS AND FINDINGS (D&F) FORMS

D&F Form for Code/Design Issues
D&F Form for Procurement Issues
D&F Form for Real Estate Issues D&F Form for Storm Water Issues
D&F for Emergency Procurement (coming soon here & on the FP&C Desktop)

AUTHORIZATION FORMS

HECO-2 - (Blue) - Authority to Initiate Non-General Fund Capital Outlay Project
HECO-4 - Approval of Schematic Design
HECO-5 - (Yellow) - Approval of Preliminary Drawings and Specifications
HECO-6 -(Pink) - Approval of Working Drawings & Specifications
HECO-17 - Building Permit
HECO-8 - (White) - Authorization to Award Contract
HECO-14 - Project Completion Report

DESIGN CONTRACT MANAGEMENT FORMS

HECO-2.1a - A/E Selection Small Fee
HECO-2.1b - A/E Selection 3 Phone
HECO-3 - Contract Between Owner and A/E
HECO-3.1 - Term Contract Form for A/E
HECO-3.1a - Service Order Term Contract for A/E
HECO-3.2 - Contract Between Owner and A/E (Non-Capital)
HECO-3.3 - Term Contract for Cost Consultant
HECO-3.3a - Service Order for Cost Consultant
HECO-3.4a - Service Order for Construction Administration Manager
CO-8b - A/E Performance
HECO-11a/e - Architect/Engineer Contract Change Order
HECO-12ae - A/E Payment Invoice

CONSTRUCTION CONTRACT MANAGEMENT FORMS

HECO-6a - Statement of Structural and Special Inspections;
HECO-6b - 96 VUSBC Special Inspections;
HECO-7 - General Conditions Capital Outlay Projects;
HECO-7DB - General Conditions Design Build Capital Outlay Projects;
DGS-30-377 – Supplemental General Conditions/SWAM;
DGS-30-376 – Supplemental General Conditions – Renovations and Liquidated Damages;
HECO-7a - Instruction to Bidders;
HECO-7am - Instruction to Bidders Medical Center;

CO-9 - Commonwealth of Virginia Contract between Owner and Contractor;
CO-9DB – Commonwealth of Virginia Contract Between Owner and Design Builder;
CO-10 - Commonwealth of Virginia Performance Bond.
CO-10.1 - Commonwealth of Virginia Payment Bond
HECO-11 - Contract Change Order
HECO-11a - Change Order Justification
CO-12 - Commonwealth of Virginia Schedule of Values and Certificate for Payment
HECO-13.1 - Certificate of Completion by A/E
HECO-13.1a - Certificate of Partial Completion by A/E
HECO-13.1b - Final Report of Structural and Special Instructions
HECO-13.2 - Certificate of Completion by Contractor
HECO-13.2a - Certification of Partial Completion by Contractor
HECO-13.3 - Certificate of Use and Occupancy
HECO-14 – Project Completion Report
CO-14a – A/E Performance Rating (Bid/Construction Phase) (See CPSM)
CO-14b – Contractor Performance Rating (See CPSM)
HECO-17 – Building Permit for all Capital Projects

APPENDIX C

STANDARD HIGHER EDUCATION FORMATS

RFP for A/E Professional Services - Single Project

RFP for A/E Professional Services - Term Contract

RFP for VE Professional Services

MOU for A/E Professional Services - Single Project

MOU for A/E Professional Services - Term Contract

RFP for Competitive Negotiation (all types available)

RFP for Design/Build

Notice (IFB) of Invitation For Bids Format

Notice (IFB) of Invitation For Bids Format - Medical Center (closed opening)

Make Buy Invitation For Bids – (See Contract Administrator for procedure)

Standard Bid Form Format

IFB (Specifications) Cover Format

Invitation For Bids Contents Format

(See the FP&C Contract Administration Office Personnel for information and examples of the latest templates and examples.)

APPENDIX D

BASIS OF DESIGN NARRATIVE AND SYSTEMS CHECKLIST

1. 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.

2. 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:

- Type of occupancy/VUSBC Use Group
- Estimated occupancy capacity and method or factor used for estimate
- Functions to be housed in the building
- Proposed building location on the site
- Exterior Circulation (i.e. how this project may interface with other area facilities)
- Areas and/or capacity required for various activities proposed for building
- Type of Construction proposed: i.e. fire resistive, protected or unprotected noncombustible, etc. and VUSBC Type #
- Outline description of basic materials
- Future construction or expansion to be accommodated, if any
- Style and character of building desired
- Structural Design Live Loads, Wind and Seismic Design Criteria
- Types of structural framing evaluated and recommendation
- Description of the types of HVAC systems being evaluated, estimated heating and cooling loads, fuels evaluated and fuel selected to be used
- Description of all energy conservation and peak energy reduction methods being evaluated
- Description of types of electrical systems evaluated, voltages, possible transformer locations and need for generator
- Total square foot area per floor and per building
- Number of beds, seats or parking spaces, where applicable
- Total estimated construction cost based on the schematic documents
- Total proposed project budget
- Geotechnical report criteria
- Describe Site Work issues such as site survey, utilities, parking, roads, sidewalks and grading

3. 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.

Architectural:

- (a) Describe functions to be housed in the building and the applicable VUSBC Use Group Classification(s). Include copy of the minimum space/area requirements and adjacency criteria used to develop the design.
- (b) 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.
- (c) 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.
- (d) Computation of gross floor area in accordance with Section 7B guidance and of Building Efficiency factor/ratio. Gross floor areas should be indicated on the drawings.
- (e) 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.
- (f) 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.
- (g) 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.
- (h) 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. (Although required for space, utility and service requirement development, these drawings are not included in the final construction bid package.)
- (i) 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.)
- (j) 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?

(k) Design features to make facilities accessible to and usable by the physically handicapped and conform to the requirements of Section 7A.2 of **the Manual**. If not incorporated, appropriate reasons/justification shall be given.

(l) 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. 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.

(m) Describe special construction features incorporated into the facility such as barred windows, special wall/roof construction, etc.

(n) 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:

- (a) 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.
- (b) 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.
- (c) Special features to be included in the structure which are not evident from the drawings.
- (d) Description of the structural floor and roof systems proposed, with length, spacing and size of principal members (for beam and girder, etc.).
- (e) Description of the Lateral Force Resisting System proposed with appropriate materials and dimensions.
- (f) Statement of live loading to be used, to include floor loads, wind, snow, earthquake, etc., with data to justify.
- (g) Statement of any special considerations that affect the design, (e.g., special corrosion resistance requirements, detention facilities, cranes, etc.).
- (h) The usual accepted means of structural system selection is economy. Demonstrate this with cost comparisons of various appropriate framing systems such as:
 - (1) "Typical bay" member sizing and cost comparisons of alternate structural systems;
 - (2) Horizontal force resisting system for wind and earthquake;

- (3) Consideration of unusual geometry (long span, high bay, deep cuts, etc.);
- (4) Consideration of heavy equipment supports.

Plumbing:

- (a) Describe system to be utilized on each part of the project.
- (b) 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.
- (c) Estimated number of fixture units and water demand in gpm for all plumbing fixtures.
- (d) Estimated maximum and minimum water pressure at each building and indicate if booster pumping will be required.
- (e) 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.
- (f) Design temperature of domestic hot water distribution system and extent of recirculation system within building.
- (g) Indicate materials to be used for each piping system.
- (h) 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:

- (a) Design Conditions
 - (1) Describe and/or list the indoor and outdoor design conditions to be used in the design of systems for this project. Refer to criteria in Chapter 7.
 - (2) 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.
- (b) Heating
 - (1) 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.
 - (2) 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 re-turned to the sanitary sewer system (unless specifically instructed otherwise). Indicate the maximum hourly production of condensate.

- (3) 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.
- (4) Describe the HVAC Control System. A specific type of control system will be specified, i.e., pneumatic, electric or electronic.

(c) Ventilation

- (1) Indicate the quantity of outside air per person in all areas, the type of filtration, and whether OSHA requirements are applicable.
- (2) State if smoke removal/control systems are to be employed.
- (3) Describe the operation of the system in summer and winter modes.
- (4) Describe any methods to reduce or minimize outside airflow

(d) Air Conditioning

- (1) 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.
- (2) Define areas to be air conditioned.
- (3) Identify special humidification or de-humidification requirements, as well as special filtration requirements.
- (4) 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.

(e) Combination Systems

- (1) For systems in which the heating, ventilating and/or air conditioning are combined, repetition may be eliminated by consolidating the aforementioned requested information. Describe changeover procedures and requirements.

(f) Energy Conservation

- (1) 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.

- (2) Describe any methods to reduce energy usage and peakloads.
- (g) Briefly describe the controls for each system and indicate intended sequence of operation.
- (h) Briefly describe testing and balancing requirements to be required.
- (i) Since the University has an Energy Management System, the preliminary submittal shall be prepared to conform to the requirements and procedures in Chapter 7.

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 Agency 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:

- (a) Prepare an energy analysis as required by Chapter 7 and submit Energy Analysis Summary. Describe criteria and assumptions in narrative. Describe purpose and Justification of systems proposed.
- (b) Describe environmental constraints such as applicable regulations, liquid wastes, gaseous emissions, treatments required, etc.
- (c) Describe new boilers including rating, flow, temperature, pressure and type.
- (d) Describe control systems.
- (e) Describe any new auxiliaries to be added and what source of power will be used for their operation.

Refrigeration (Cold Storage):

- (a) Identify areas to be refrigerated, indicating their usage and temperatures to be maintained.
- (b) Describe type of refrigeration equipment and systems.

Thermal Storage:

- (a) Describe the type (static or dynamic) of storage being considered.
- (b) Provide preliminary cooling profile.
- (c) Provide preliminary equipment and tank sizes.
- (d) State how the A/E proposes to conform to University Procurement requirements when specifying thermal storage system and components.

Fire Protection Systems:

- (a) Describe type(s) of automatic sprinkler and gaseous extinguishing systems to be utilized and note locations to be protected.
- (b) Describe fire detection and alarm systems including location of detectors, manual stations, audible devices, control panels, etc.
- (c) 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.
- (d) Provide the following information about sprinkler systems:
 - (1) Hazard classification of occupancy and applicable Code reference.
 - (2) 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.
 - (3) Describe fire pump operating parameters.
 - (4) Approximate water demand for sprinkler system.
 - (5) Statement of adequacy/inadequacy of water supply and planned upgrades by local jurisdiction, if any.

Electrical:

- (a) Provide the following about interior distribution systems:
 - (1) Electrical characteristics (phase, voltage, and number of conductors in main distribution circuits).
 - (2) Breakdown in tabular form of the *estimated* connected load to show:

- a. Lighting load and convenience outlet load separately.
 - b. Power load for building equipment such as heating, air conditioning, etc.
 - c. 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.
- (3) 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.)**
 - (4) Type of conductors, such as rubber insulated, thermoplastic insulated, polyvinyl chloride jacket, etc., and where proposed to use.
 - (5) 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.
 - (6) A determination of short-circuit duty required for all service entrance protective devices and switchgear.
 - (7) 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 owner.

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.

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.

- (8) Indicate interior lighting on lighting plans.

(b) Outside distribution systems:

- (1) Contact the Facilities Utility Department for location and characteristics of nearest service capable of meeting project supply requirement.
- (2) 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.
- (3) Electrical characteristics of power supply to site including circuit interrupting requirements and voltage regulation.

- (4) 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.
- (5) Basis for selection of primary and/or secondary distribution voltage.
- (6) Type of conductors and where proposed to use.
- (7) 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.
- (8) 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.**
- (9) Type, adequacy and routing of supporting structure(s) for telecommunication cable.

Electronic Systems:

- (a) 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 items (m) and (n) below).
- (b) Indicate circuit requirements.
- (c) Indicate equipment selection in such categories as: University furnished equipment; standards manufacturers or commercially available items; and special equipment.
- (d) Describe site or location considerations.
- (e) Describe bonding and grounding requirements.
- (f) Describe communication and control cables and radio links.
- (g) Identify test equipment, repair shop, and spare parts storage requirements.
- (h) 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.
- (i) Identify wiring and cabling requirements plus terminations.
- (j) Identify power and lighting requirements, including emergency or standby requirements.
- (k) Describe air conditioning, including humidity and dust-control requirements.
- (l) Identify interference and clearance requirements.
- (m) State security requirements for Security/Entry Control System.
 - (1) 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 IDS:

Annunciation Panels and Cabinets
Visual and Audible Annunciators
Magnetic Switches
Proximity Sensors
Volumetric Sensors
Wire Grids
Vibration Detectors
Power Supplies Integral to Items on this List
Closed Circuit Television Cameras and Monitors, and
Video Recorders used for Intrusion Detection Purposes
Access Control Systems

- (2) IDS installation can be divided into three general functional categories:
- (a) Sensitive compartmented information facilities.
 - (b) Conventional arms, ammunition, and explosives storage sites (AA & E).
 - (c) All other (including but not limited to communication facilities, special training facilities, special operational facilities, intelligence facilities, etc.).

Describe access control equipment (versus IDS) when required and outline locations, function, and area of control.

Energy Monitoring and Control System (ECMS):

- (a) Indicate if any EMCS will be utilized.
- (b) Indicate if the EMCS will be stand alone or tied into central system.
- (c) Indicate if a sole source is required for tie in.
- (d) Describe the EMCS proposed to be used.

Site and Landscaping:

- (a) Describe site and facility location and give reasons for selection and orientation.
- (b) List and/or describe utilities available at the site.
- (c) Describe existing vegetation, bodies of water, topography, and soil conditions.
- (d) Describe existing site improvements to remain, to be altered, and to be demolished.
- (e) Describe existing pedestrian and vehicular access, roads, sidewalks, and parking to include accessibility for the disabled.
- (f) Describe proposed site improvements.
- (g) Describe proposed contours, bodies of water, and landscaping improvements.

Water Supply:

- (a) Describe the existing system including, but not limited to, the type, capacity, condition,

present water use, and unsatisfactory elements.

- (b) State type of construction proposed, materials for water mains, type of well, etc.
- (c) State design factors with present and projected design population loads for sewage treatment plants. Coordination with appropriate state/local regulatory agencies is required.
- (d) State materials to be used for sewer systems and sewage treatment plants.
- (e) Identify standards (federal, state, local) governing the design.
- (f) 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:

- (a) Describe the existing system indicating particularly the type, capacity, condition, present flow and unsatisfactory elements.
- (b) State degree of treatment necessary by effluent requirements and units needed to treat.(c) State design factors with present and projected design population loads for sewage treatment plants. Coordination with appropriate state/local regulatory agencies is required.
- (c) State materials to be used for sewer systems and sewage treatment plants.
- (d) Identify standards (federal, state, local) governing the design.
- (e) 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:

- (a) State general soil conditions, with a brief outline of soil exploration and testing performed. Indicate CBR value and pavement recommendations. (Show typical paving section on the drawings.)
- (b) 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.

BUILDING SYSTEMS AND EQUIPMENT CHECKLIST

Indicate systems and equipment to be included in project. Provide equipment data and area in spaces provided. When two or more subsystems are used, show portion of each by % of gross to nearest 10%.

STRUCTURAL

Foundation System Ground Floor Area (SF) _____

Type	Footing Bottom from Existing Grade	Compacted Fill
_____ Spread Footings	_____ 2'	_____ Borrowfill 1'
_____ Thickened Slab @ Edge	_____ 3'	_____ Borrowfill 2'
_____ Pile Foundation	_____ 4'	_____ Borrowfill 3'
_____ Caissons	_____ 5'	_____ Borrowfill 4'
_____ Continuous wall footing	_____ _____	_____ Borrowfill 5'
_____ Grade Beams		_____ Over 5'
_____ Special (See Sitework Section)		

Slab on Grade Slab on Grade Area (SF) _____

Type	Slab Thickness	Floor Live Load
_____ Floating	_____ 4"	_____ Under 100 PSF
_____ Grade Beam Supported	_____ 5"	_____ 101-200 PSF
_____ Pile Supported	_____ 6"	_____ 201-300 PSF
_____ Reinforced	_____ 8"	_____ 301-400 PSF
	_____ Over 8"	_____ Over 400 PSF

Structural Design Criteria

Seismic	Roof Live/Snow Load	Wind Loading
_____ Performance Category	_____ Roof LL 20 PSF	_____ Wind 80 mph
_____ Exposure Group	_____ Roof LL 30 PSF	_____ Wind 92 mph
_____ Site/Soil Coeff	_____ Roof LL 40 PSF	_____ Wind 103 mph
	_____ Roof LL 50 PSF	_____ Wind 115 mph

Structural Frame Type Gross Bldg. Area (SF) _____

- _____ Bearing Wall
- _____ Steel Frame
- _____ Concrete, Cast in Place
- _____ Wood
- _____ Concrete, Precast

Supported Floor

Supported Floor (SF) _____

Type System	Floor Design Live Load	Span
_____ Concrete, Cast in Place	_____ Under 40 PSF	_____ Under 26'
_____ Concrete on Steel Joists	_____ 40-60 PSF	_____ 26'-35'
_____ Concrete on Steel Frame	_____ 61-80 PSF	_____ 35'-45'
_____ Concrete, Precast	_____ 81-100 PSF	_____ 46'-55'
_____ Wood	_____ 101-150 PSF	_____ 56'-65'
	_____ 151-200 PSF	_____ Over 66'
	_____ Over 200 PSF	

Roof Structure

Area of Roof (SF) _____

Framing	Decking	Span
_____ Concrete, Cast In Place	_____ Steel	_____ Under 26'
_____ Precast Hollow Core	_____ Concrete Slab	_____ 26'-35'
_____ Concrete, Precast	_____ Wood	_____ 36'-45'
_____ Wood	_____ Gypsum	_____ 46'-55'
_____ Steel Joist	_____ Other (List)	_____ 56'-65'
_____ Steel Framing		_____ Over 65'

Pre-Engineered Building

Area (SF) _____

Type	Eave Height	Roof Slope
_____ Rigid Frame	_____ Eave height under 12'	_____ 1 in 12
_____ Post & Beam	_____ Eave height 12'-20'	_____ 2 in 12
_____ _____	_____ Eave height over 20'	_____ 3 in 12
		_____ >3 in 12

Exterior Wall	Roof Material
_____ Prefinished Metal	_____ Standing Prefinished Metal
_____ Masonry	_____ Standing Seam Metal
_____ Insulation 'U'	_____ Insulation 'U'

ARCHITECTURAL SYSTEMS

Roofing

Area of Roof (SF) _____

Type Mat'l	Insulation	Wind Uplift	Fire Resistance
_____ Built-up	_____ U = 0.03	_____ FM 1-30	_____ Class A
_____ Shingles	_____ U = 0.04	_____ FM 1-60	_____ Class B
_____ Sprayed	_____ U = 0.05	_____ FM 1-90	_____ Class C
_____ Metal Roofing	_____ U = 0.____		
_____ EPDM			
_____ CSPE			
_____ Other _____			

Stairs

Number of Risers (EA) _____

- _____ Exposed
- _____ Enclosed
- _____ Exterior
- _____ Interior
- _____ None
- _____ Area of Rescue Assistance

- _____ Concrete
- _____ Steel
- _____ Steel Pan
- _____ Checkered Plate
- _____ Grate
- _____ Closed Riser
- _____ Open Riser
- _____ Ships Ladder
- _____ Attic Access

Exterior Wall System

Exterior Wall Area (SF) _____ U Value _____

- Exterior Surface**
- _____ Brick
 - _____ CMU
 - _____ Synthetic (EIFS)
 - _____ Metal Panels
 - _____ Stucco
 - _____ Wood
 - _____ Concrete, Cast In Place
 - _____ Concrete, Precast
 - _____ Stone (Granite, Marble, etc)
 - _____ Vinyl Siding
 - _____ Other

- Backup**
- _____ CMU
 - _____ Wood Studs
 - _____ Steel Studs
 - _____ Concrete, C-I-P
 - _____ Concrete, Precast
 - _____ Furring
 - _____ Other

- Story Height**
- _____ Under 12'
 - _____ 12'- 20'
 - _____ over 20'

- Insulation**
- _____ Batt R= _____
 - _____ Rigid R= _____
 - _____ Other _____

Interior Wall System (excludes finishes)

Interior Wall Area (SF) _____

- Type**
- _____ Concrete Masonry Unit
 - _____ Steel Studs
 - _____ Wood Studs
 - _____ Concrete, Cast in Place

- Height**
- _____ 8'
 - _____ 9'
 - _____ 10'
 - _____ Over 10' (Height = _____ ft)

Interior Finishes

(show nominal % of each)

Gross Bldg. Area (SF) _____

- Walls**
- _____ Gypsum Board, Painted
 - _____ CMU
 - _____ Ceramic Tile
 - _____ Wood Panels
 - _____ Plaster
 - _____ Vinyl Wall Covering
 - _____ Other
 - _____ Other _____
 - _____ Other _____

- Floors**
- _____ VCT
 - _____ Sheet Vinyl
 - _____ Ceramic Tile
 - _____ Quarry Tile
 - _____ Exposed Concrete
 - _____ Terrazzo
 - _____ Carpet
 - _____ Hardwood
 - _____ Special Toppings

- Ceiling**
- _____ Acoustical
 - _____ Gypsum Bd
 - _____ Plaster
 - _____ Concrete
 - _____ Spray on
 - _____ Metal Panel
 - _____ Exposed Struct

Doors and Hardware

Surface Area one Side(SF)_____

Door Types

- _____ Hollow Metal Exterior, Size
- _____ Aluminum Store Front (glass), Size
- _____ Wood Exterior, Size
- _____ Folding, Size
- _____ Overhead, Size
- _____ Vault, Size
- _____ Metal Security Door
- _____ Wood Interior
- _____ Hollow Metal Interior

Frame Types

- _____ Hollow Metal
- _____ Steel Frame
- _____ Aluminum
- _____ Painted Wood
- _____ Stainless Steel
- _____ Other_____

Windows

Surface Area one Side (SF)_____

Type

- _____ Fixed
- _____ Double Hung
- _____ Projected
- _____ Casement
- _____ Sliding
- _____ Storm
- _____ Awning
- _____ Jalousie
- _____ Other_____

Glazing

- _____ Single
- _____ Double
- _____ Thermal
- _____ Safety
- _____ Wire glass
- _____ Bullet Proof
- _____ Reglazing
- _____ Other_____

Frame

- _____ Aluminum
- _____ Painted Wood
- _____ Vinyl Clad Wood
- _____ Aluminum Clad
- _____ Painted Steel
- _____ Other_____
- _____ Other_____

Specialities

Gross Bldg Area (SF)_____

- _____ Jail Doors/Locks
- _____ Clean Room
- _____ Case Work
- _____ Dark Rooms
- _____ Loading Dock Equip
- _____ Projection Screen
- _____ Marker & Tack Boards
- _____ Sign and Plaques
- _____ Flagpoles
- _____ Access Flooring
- _____ Telephone Enclosures
- _____ Ladders
- _____ Others
- _____

- _____ Toilet Accessories
- _____ Toilet Partitions
- _____ Wire Partitions
- _____ Metal Walkways
- _____ X-Ray Shielding
- _____ Wardrobes (Dormitory)
- _____ Chest of Drawers (Don-nitory)
- _____ Storage Shelving
- _____ Fireplaces
- _____ Movable Partitions
- _____ Postal Specialities
- _____ Exterior Sun
- _____ Control Devices
- _____

MECHANICAL SYSTEMS & EQUIPMENT

Plumbing

Number of Fixtures (EA) _____

Plumbing Fixtures

- _____ Flush Tank WC Floor mtd.
- _____ Flush Tank WC wall mtd.
- _____ Flush Valve WC floor mtd.
- _____ Flush Valve WC wall mtd.
- _____ Water Heater Electric
- _____ Water Heater Steam
- _____ Instantaneous W.H., Elec.
- _____ Instantaneous W.H., Steam
- _____ Water Heater Gas

- _____ Tub
- _____ Shower Fiberglass
- _____ Shower/Receptor
- _____ Shower Multi-head
- _____ Emergency Shower
- _____ Emerg. Eye-Wash
- _____ Emerg. Shower/
- _____ Eye-Wash

Piping

- _____ Copper Pipe
- _____ PVC Pipe
- _____ Acid Resistant Pipe
- _____ Cast Iron Piping
- _____ Valves, Fittings
- _____ Fixture Rough-ins
- _____ Pressure Reducer
- _____ Arrestors

Roof Drainage

- _____ Gutter & Downspouts
- _____ Scupper & Downspouts
- _____ Roof Drains & Interior Piping

Building HVAC Systems

Heating Load - _____ MBH

Building Heating Systems

- _____ Boiler
- _____ Heat Exchanger
- _____ Other _____

Distribution Medium

- _____ Steam
- _____ Hot Water
- _____ Hot Air

Fuel

- _____ Gas
- _____ Oil
- _____ Coal
- _____ Electric
- _____ Geothermal

Heating Equipment

- _____ Unit Heaters
- _____ Fin Tube Radiation
- _____ Individual Units
- _____ Cabinet Unit Heaters
- _____ Computer Room CW

Air Distribution

- _____ Ducted Supply
- _____ Ducted Return
- _____ Dual Duct
- _____ H&V Unit
- _____ Air Handling Unit

Mechanical Ventilation

- _____ Power Roof Exhaust Fans
- _____ In Line Exhaust Fans
- _____ In Line Supply Fans
- _____ Power Roof Supply Fans

Dehumidification

- _____ Desiccant
- _____ Refrigeration

Cooling Load - _____ Tons

Building Cooling Systems

- _____ Heat Pump, Water Cooled
- _____ Heat Pump, Air Cooled
- _____ Chiller
- _____ Direct Expansion
- _____ Reciprocating
- _____ Rotary Screw
- _____ Centrifugal
- _____ Steam Absorption
- _____ Cooling Tower
- _____ Thermal Storage
- _____ Roof Top Units
- _____ Single Zone
- _____ Multi Zone
- _____ Ventilation
- _____ Dual Temp. Water
- _____ Air Cooled Condensing Unit
- _____ Computer Room Glycol
- _____ Computer Room DX

- _____ H&V Units HW, Oil
- _____ Duct mtd. Coils
- _____ Heat Reclaim
- _____ Other _____

- _____ Fan Coll Units
- _____ VAV Fan Powered
- _____ VAV Terminal Only
- _____ VAV Reheat

Fan Capacity (CFM) _____

- _____ Fume Exhaust Hoods
- _____ Kitchen Exhaust Hoods
- _____ Kitchen Supply & Exhaust Hoods
- _____ Wall Exhaust & Fans

- _____ Regenerative
- _____ Non-Regenerative

CENTRAL PLANT SYSTEMS

Heating Capacity - _____ MBH

Cooling Capacity - _____ Tons

Central Heating Plant Equipment

- _____ Chiller
- _____ Boiler
- _____ Geothermal
- _____ Purchased (Outside source)

Central Cooling System

- _____ Direct Expansion
- _____ Reciprocating
- _____ Rotary Screw
- _____ Centrifugal
- _____ Steam Absorption
- _____ Cooling Tower
- _____ Air Cooled Condenser
- _____ Air Cooled Condensing Unit
- _____ Thermal Storage

Distribution Medium

- _____ Steam
- _____ Hot Water
- _____ High Temperature Hot Water

Fuel

- _____ Gas
- _____ Oil
- _____ Coal
- _____ Electric
- _____ Geothermal

Fire Protection

Gross Area Sprinkled (SF) _____

Sprinkler Type

- _____ Dry
- _____ Wet
- _____ Preaction
- _____ Deluge
- _____ Foam Water Deluge
- _____ Other _____

Classification

- _____ Light Hazard
- _____ Ordinary Hazard
- _____ Extra Hazard
- _____ Limited Area
- _____ Includes Booster Pump

Carbon Dioxide

- _____ Hose Reel
- _____ Flooding, Area
- _____ Flooding, Total

Storage Capacity (LBS) _____

Fire Alarm

- _____ Manual
- _____ Automatic Detectors
- _____ Mechanical & Electrical
- _____ Extend Existing (Mfr. _____)

Gross Building Area (SF) _____

ELECTRICAL SYSTEMS

Power

Connected Load (KW)_____

	Voltage Panelboards	Transformers
_____ 120/208	_____A _____V	voltage _____ V
_____ 277/480/120/208	_____A _____V	Rating _____ KVA
_____ 277/480	_____A _____V	
_____ 120/240	_____A _____V	
_____ Alteration to Existing	_____A _____V	
_____ Explosion Proof	_____A _____V	
	_____A _____V	

Lighting

Gross Building Area (SF)_____

- _____ Incandescent
- _____ Fluorescent
- _____ High Ind Discharge w/Battery Operated Emergency
- _____ High Ind Discharge (HID) High Bay
- _____ High Ind Discharge (HID) Low Bay
- _____ Explosion Proof @
- _____ Special System

Special Electrical Systems

Gross Building Area (SF)_____

- _____ Uninterruptable Power Supply (UPS)
- _____ Static/Battery
- _____ Motor Generator Set

Electrical Generators

Equipment Capacity (KW)_____

_____ Intermittent	_____ 120/240V, 1 PH, 60HZ	_____ 600 RPM
_____ Continuous	_____ 120/208V, 3PH, 60HZ	_____ 720 RPM
_____ Cogeneration	_____ 277/240V, 3PH, 60HZ	_____ 900 RPM
_____ Fire Pumps	_____ 347/600V, 3PH, 60HZ	_____ 1200 RPM
_____ Gas	_____ 4160V/2400V, 3PM, 60HZ	_____ 1800 RPM
_____ Diesel	_____ 11.5/6.5KV, 3PH, 60HZ	
_____ Turbine		
_____ Integral Radiators		
_____ Remote Radiators		

Special Electrical Protection

Gross Building Area (SF)_____

- _____ Lighting Protection
- _____ Lighting Grounding
- _____ Electronic Grounding
- _____ Distribution Grounding
- _____ Other_____

Energy Monitoring & Control System(ECMS)

_____ Local Control
_____ Remote Control

_____ Building Only
_____ Tie to Central System

Security Detection

_____ Intrusion Alarm for Access Control
_____ Access Control
_____ TV Camera & Monitor
_____ Conduit
_____ Conduit & Wire

Communications Systems

Telephone
_____ Agency Owned System
_____ Conduit Only
_____ Conduit & Wire

Public Announcement
_____ Agency Owned System
_____ Conduit Only
_____ Conduit & Wire

Television
_____ Agency Owned System
_____ Leased Cable System
_____ Conduit Only
_____ Conduit & Wire

Intercom
_____ Theater Sound
_____ Two-way communication listening
_____ Special System (Describe)
_____ Includes PA Systems
_____ Conduit
_____ Conduit & Wire
_____ Leased System
_____ Agency Owned System

Fire Alarm
_____ Local
_____ To Fire Station
_____ Conduit Only
_____ Conduit & Wire

Special Systems and Equipment

_____ Vacuum, Medical
_____ Oxygen
_____ Low Pressure below 150 psi
_____ High Pressure above 150 psi

Gross Building Area (SF) _____

_____ Vacuum, Industrial
_____ Nitrogen
_____ Compressed Air

Interior Steam System

_____ High Pressure
_____ Medium Pressure
_____ Low Pressure
_____ Chemical Treatments
_____ Feed Water Equipment
_____ With Condensate Return
_____ Without Condensate Return

_____ Gas Fired Boiler
_____ Oil Fired Boiler
_____ Electric Fired Boiler
_____ Prefabricated Stack
_____ Fire Tube
_____ Water Tube
_____ Controls
_____ Fuel Oil Storage

Other

_____ Dust Collection

- _____ Engine Exhaust, overhead
- _____ Engine Exhaust, underfloor
- _____ Engine Exhaust, through door

CONVEYING EQUIPMENT

Bridge Cranes

- | | | |
|----------------------|--------------------------|---------------------|
| _____ Span under 50' | _____ Capacity under 10T | _____ Run under 50' |
| _____ Span 51'-75' | _____ Capacity 10-20T | _____ Run 50-100' |
| _____ Span over 75' | _____ Capacity 20-40T | _____ Run over 100' |
| | _____ Capacity over 40T | |

Monorails

- | | | |
|--------------------|-------------------------|----------------------|
| _____ Manual | _____ Capacity under 5T | _____ Run under 50' |
| _____ Electric | _____ Capacity 5- 10T | _____ Run 50 to 100' |
| _____ Air Operated | _____ Capacity over 10T | _____ Run over 100' |

Fixed Hoist

- _____ Manual
- _____ Electric
- _____ Air Operated

Vehicle Lifts

- _____ Capacity under 5T
- _____ Capacity 5-10T
- _____ Capacity over 10T

Elevators

Number of Stops (EA) _____

- | | |
|-------------------|-----------------------|
| _____ Electric | _____ Passenger |
| _____ Hydraulic | _____ Freight |
| _____ Escalators | _____ Chair Lift(H/C) |
| _____ Conveyors | _____ Wheelchair Lift |
| _____ Dumbwaiters | |

BUILT-IN EQUIPMENT

Gross Building Area (SF) _____

- _____ Hospital Equipment
- _____ Dental Equipment
- _____ Food Service Equipment
- _____ Chapel Equipment
- _____ Movie neater Equipment
- _____ Rifle Range Equipment
- _____ Laboratory Equipment
- _____ Waste Disposal Equipment

- Other Built-In Equipment (list):
- _____
 - _____
 - _____
 - _____
 - _____

- _____ Paint Spray Booth
- _____ Special Warehouse Equipment
- _____ Snow Melting Equipment
- _____ Exercise/Fitness Equipment
- _____ Athletic / Sports Equipment

- _____ Maint Shop Equipment
- _____ Vault
- _____ Parking Lot Control
- _____ Turnstiles / Personnel Access

DEMOLITION INTERIOR

Gross Building Area (SF) _____

Interior Demolition

- _____ Complete Interior of Bldg.
- _____ Complete Interior Partition
- _____ Complete Interior Finishes
- _____ Complete Interior Mechanical
- _____ Complete Interior Electrical
- _____ Other _____

Asbestos Removal

Total Cost (Lump Sum) _____

- _____ Asbestos Removal Roofing Felts, Insulation
- _____ Asbestos Removal - Piping, Equip
- _____ Asbestos Removal - Ceilings
- _____ Asbestos Removal - Fireproofing
- _____ Asbestos Removal - Floors

Lead Based Paint Removal

Total Cost (Lump Sum) _____

- _____ Bulk Removal (Material with lead-based paint still on it)
- _____ Surface Removal / Abatement

SITework SITE UTILITIES AND IMPROVEMENT DESCRIPTIONS

Exterior Electrical

Length of Run (LF) _____

- _____ Electrical Distribution, Primary _____ KV
- _____ Agency Owned
- _____ Utility Co _____
- _____ Electrical Distribution, Secondary _____ V _____ PH
- _____ Substation/Transformer _____ KVA rating

Exterior Communication

Length of Run (LF) _____

- _____ Fire Alarm Distribution
- _____ Security Alarm Distribution
- _____ Communication, Telephone Distribution
- _____ Exterior EMCS Distribution
- _____ Other _____

Area Lighting

Number of Fixtures (EA) _____

- Poles with Lights: _____
- Foot Candles Req'd _____
- Pole Type _____ Type Fixture _____ Mounting Height _____
- Building Mounted: _____
- Foot Candles Required _____
- Type Fixture _____ Mounting Height _____

Lighting Protection

- _____ Building
- _____ Electrical Systems

EXTERIOR MECHANICAL DISTRIBUTION

Length of Run (LF) _____

- _____ Heat Distribution, Overhead
- _____ Heat Distribution, Underground Encased
- _____ Heat Distribution, Underground Trenches
- _____ Chilled Water Distribution
- _____ Condensate Collection
- _____ Gas Distribution
- _____ Compressed Air Distribution

EXTERIOR WATER DISTRIBUTION

Length of Run (LF) _____

- _____ Water Distribution Piping
- _____ Fire Protection Water Distribution
- _____ Fire Hydrants
- _____ Water Pumping Station
- _____ Fire Booster Pump

EXTERIOR SANITARY SEWER COLLECTION

Length of Run (LF) _____

- _____ Sanitary Sewer Piping
- _____ Manholes
- _____ Sewage Pump Station
- _____ Sewage Lift Station
- _____ Domestic Sewage Treatment

EXTERIOR STORMWATER SYSTEM

Length of Run (LF) _____

- _____ Storm Drainage Piping
- _____ Box and Arch Culvert
- _____ Drainage Facing Materials
- _____ Retention Pond, Wet
- _____ Detention Pond, Dry
- _____ Underground Structure Detention
- _____ Median Detention

EARTHWORK

Volume, Curb Fill (Cu. Yd) _____

- _____ Site Clearing
- _____ Site Grading & Excavation
- _____ Site Irrigation
- _____ Site Dewatering (major)
- _____ Replacement of Unsuitable Materials & Compaction
- _____ Erosion Control
- _____ Environmental Protection

LANDSCAPING

Area Planted (SY) _____

- | | |
|--------------------------------|-------------------------------------|
| _____ In Construction Contract | _____ By Owner or Separate Contract |
| _____ Fine Grading | |
| _____ Fertilizing | |
| _____ Topsoil | |
| _____ Seeding | |
| _____ Sodding | |
| _____ Trees, Shrubs, Other | |
| _____ Plantings | |

SITE IMPROVEMENTS

Area Developed (SY) _____

- | | |
|------------------------|------------------------------------|
| _____ Retaining Walls | _____ Pedestrian Bridge - Open |
| _____ Signs | _____ Pedestrian Bridge - Enclosed |
| _____ Site Furnishings | _____ Pedestrian Tunnel |
| _____ Flagpole & Misc. | _____ Steps/Ramps |
| _____ Concrete Walks | _____ Bituminous Walks |
| _____ Gravel Paths | _____ Special Walks |

_____ Wells (Water)

_____ Other_____

ROADS - PAVED

_____ Concrete Roads
_____ Overlay Roads
_____ Slurry Seal Road

Paved Area (SY)_____

_____ Flexible (Bituminous) Roads
_____ Surface Treatment Roads
_____ Other_____

PARKING

_____ Concrete Parking
_____ Overlay - Parking
_____ Slurry Seal Parking

Paved Area (SY)_____

_____ Bituminous Parking
_____ Surface Treatment - Parking
_____ Graveled Parking Lot

FENCING

_____ Selected Areas
_____ Pedestrian Gates
_____ Alarms

Length of Fencing (LF)_____

_____ Entire Perimeter
_____ Vehicular Gates
_____ Other_____

POLLUTION ABATEMENT STRUCTURES

Water Treatment
Industrial Waste Treatment
Electro-Static Precipitator
Fields
Single Stage_____ Two Stage_____

Domestic Sewage Treatment
Oil Water Separators
Other:_____

RECREATION EQUIPMENT/FIELDS

_____ Playground Equipment
_____ Tennis / Basketball Courts
_____ Football/Soccer/Lacrosse Fields
_____ Other_____

Lump Sum (EA)_____

_____ Grandstands, Bleachers
_____ Softball/Baseball Fields
_____ Concession / Restroom Bldg
_____ Other_____

SUPPORTING STRUCTURES

(Separate from building above)

_____ Central Heating Plant
_____ Central Cooling Plant
_____ Mechanical Equipment Building
_____ Vehicle Wash Platform
_____ Other_____

Lump Sum (EA)_____

_____ Electrical Equipment Building
_____ Guard House / Security Gate
_____ Other_____

SPECIAL BUILDING FOUNDATIONS

Length (LF)

Piling

<u>Type</u>	<u>Length of Piling</u>	<u>Capacity (design)</u>
_____ Timber	_____ Under 25'	_____ 15 tons
_____ Concrete, Precast	_____ 26'-35'	_____ 20 tons
_____ Concrete, Pressure Inject	_____ 36'-45'	_____ 25 tons
_____ Steel H Piles	_____ 46'-55'	_____ 30 tons
_____ Steel Sheet Piling	_____ 56'-65'	_____ 35 tons
_____ Other _____	_____ 66'-95'	_____ 40 tons
	_____ Over 95'	_____ _____ tons

Caissons (Drilled and Cast-in-place)

_____ 24" Diameter	_____ Plain Bottom
_____ 36" Dia	_____ Belled Bottom
_____ 48" Dia	
_____ 60" Dia	_____ ft Nominal Depth

Underpinning of Existing Structures Lump Sum Amount (LS) _____

SITE DEMOLITION

Lump Sum (LS) _____

- _____ Remove Utilities
- _____ Remove Paving and Slabs
- _____ Remove Structures
- _____ Remove/Dispose of Asbestos (Exterior)
- _____ Remove/Dispose of P.C.B.
- _____ Remove/Dispose of Contaminated Earth

APPENDIX E: COST ESTIMATES

1. 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 (copy included in this Appendix). 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 separate contingencies for design phase and construction phase shall be included as 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 CO- 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.

2. 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.

3. 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 Agency shall provide a reconciliation of the estimates.

4. 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.

<u>System</u>	<u>System Unit</u>	<u>Unit/Measure</u>
<u>Foundation</u>	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

<u>Slab-on-Grade</u>	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.

<u>Structural Frame</u>	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.

<u>Supported Floor</u>	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."

<u>Roof Structure</u>	Roof Area	Sq. Ft.
------------------------------	-----------	---------

Includes construction of structurally integrated or independently supported roofs, i.e., precast concrete roof slabs, concrete topping, steel decking, joists, beams. Roofing system excluded.

<u>Roofing</u>	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.

and Air Conditioning

Capacity

MBTU or Tons

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

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.

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.

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.

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.

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

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.

SITWORK, UTILITIES & IMPROVEMENT DESCRIPTIONS

Exterior Electrical

Distribution

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 Agency-owned systems. Add in this total the costs of exterior Fire Alarm, EMCS, security and similar distribution lines.

Area Lighting

Number of Fixtures

Each

Includes poles, fixtures, excavation and backfill, concrete work, wire, duct and conduit.

Exterior Mechanical

Distribution

Length of Run

Lin. Ft.

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.

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.

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.

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, subgrade 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.

Includes paving, tack and seal coats, curbs, curbs and gutters, subgrade 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.

Earthwork

Volume (Cut + Fill)

Cu. Yd.

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.

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.

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

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.

Includes footings, posts, fencing materials, alarms, gates and turnstiles for perimeter fencing. Includes station perimeter and individual facility.

Special Building

Foundations

Length

E- 3E- 2Lin. Ft.

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

Includes removal, hauling and disposal of utilities, buildings, roads, paving, slabs, foundations, structures and related existing site features.

APPENDIX F

CHECK LIST FOR RECEIVING AND OPENING BIDS

The University shall assure that the person receiving bids, called the Bid Officer, is 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 and all bids must be receive by 2:00 p.m.”**

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 not 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 Agency 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 now shown.
- (3) Prior to revealing any of the information in the bid, the Bid Opening Designee must verify that
 - the Bid Bond or Certified Check in the amount of 5% is attached where required and
 - that the Form of Proposal is signed by the bidder and
 - 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 _____ are acknowledged.
 - e. Bid Bond or Certified Check is _____ is not _____ included.
 - f. Bid Form is signed.

THEN

g. Read Bid Information

- Any proper Bid Modification received,
- Part A. Building Base Bid Amount,
- Part B – Sitework Base Bid Amount,
- Any other Parts of the Base Bid,

- The TOTAL BASE BID AMOUNT, and
 - Then any Additive Bid Item Amounts in order.
 - (days for completion if Bidder was allowed to state such on the Bid Form)
- h. Any **qualification** to the requested information on the Bid Form shall be noted as the bid is read.

AFTER BID OPENING IS COMPLETE

- a. 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!**
- b. After two hours, return all Bid Bonds, checks, etc., to all but 3-lowest bidders. Work papers can be returned to all.
- c. Keep bids and bid bonds or checks from 3-lowest bidders until Contract is signed.
- d. 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).
- e. Prepare an official tabulation of bids indicating:
- Name and Project Code of project as on the specifications
 - Time and date of bid receipt and opening
 - Exact Name, address, telephone & FAX numbers of Bidders
 - Bidder's Virginia Registration Number (non-requirement statement).
 - All amounts bid for Base Bid(s), Parts, the Total Base Bid Amount, any Bid Modification and Additive Bid Items.
 - Completion time stated, if Bidder was given the option.
 - Acknowledgement of receipt of all addenda and number of addenda issued.
 - Whether or not sealed work papers were submitted.
 - Name of University's Bid Opening Designee.

APPENDIX G: ROOF INSPECTION FORMS AND PROCEDURES

1. The Roof Inspector

The minimum qualifications below serve as criteria for the University if selecting an outside, full-time roofing inspector:

- A. 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.
- B. 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.
- C. He should be thoroughly familiar with the latest edition of the NRCA Roofing and Waterproofing Manual.
- D. The Inspector should have a minimum of five years of full-time, practical roofing experience or approved equivalent experience.
- E. 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 owners and Architects / Engineers for the roof projects.
- F. He should be trained and competent in the services he is providing.
- G. Roof Inspector's Scope of Work:
 - (1) The Inspector shall monitor the work continuously during installation of the roof.
 - (2) He shall monitor the work for compliance with the contract documents and the State's Roofing Policy of Chapter 7 of this Manual.
 - (3) 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.
 - (4) The Inspector may recommend suspension of work or rejection of non-complying work to the A/E and University.

- (5) He shall not:
 - (a) 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.
 - (b) Authorize deviations from the contract documents.
 - (c) Enter the area of responsibility of the Contractor's superintendent.
 - (d) Issue orders on any aspect of construction means, methods, techniques, sequences, procedures, or safety in connection with the work.

- (6) 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.

2. The Roof Consultant

The Consultant should have the following qualifications:

- A. Roof consulting and testing services should be the Consultant's full-time occupation.
- B. He should have a minimum of five years of field experience in providing the service.
- C. 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.
- D. He should be required to submit three complete surveys of roofs that were repaired, recovered, or replaced; names, addresses and telephone numbers of roof owners; and Architects or Engineers responsible for preparing the drawings and specifications.
- E. 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.
- F. He should be trained, experienced and competent in performing required services.
- G. 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.
- H. He should submit resumes of his firm and all employees participating in the service.

- I. 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.
- J. 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.

3. 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 an Agency may repair or replace the roof. The following outlines requirements for NDE surveys:

- A. Equipment, subject to the University's approval, shall be equal to the following:
 - (1) Infrared: AGA 720 system or Inframetrics 520 system
 - (2) Nuclear: Seaman Troxler 3216 Roof Reader, Nuclear Model R-50 or later model
 - (3) Electrical Capacitance: As approved by the University
- B. Surveys
 - (1) 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 and coordinated.

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 C1153, "Standard Practice for the Location of Wet Insulation in Roofing Systems Using infrared Imaging", except of otherwise noted in this Appendix.

- (2) 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 inter-sections and record them on a roof plan. Provide daylight photographs of anomalies.

C. 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:

- (1) 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.
- (2) On all other roofs a minimum of one dry and one wet core shall be taken from each roof surveyed.
- (3) 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.

D. 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.

- (1) 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.
- (2) Identify all materials – surfacing, membrane (and number of plies), insulation, vapor barriers, adhesives, etc. – in the cores.

E. 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.

F. 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:

- (1) Identify and describe all anomalies.
- (2) Identify and describe any visual survey defects that may be harmful to the roof.
- (3) Give the causes for each anomaly and defect.
- (4) Recommend alternate courses of corrective action for defects and anomalies harmful to the roof.
- (5) Provide the cost for correcting the defects and anomalies.

4. Drawings

The consultant hired to survey roofs shall provide plans complying with the following:

A. General Requirements are:

- (1) Print size, preferably, should be 24" X 36"; but in no case larger than 36" X 46".
- (2) Minimum drawing scale is 1/8" = 1'0" for roofs or portions of roofs surveyed.
- (3) Provide one reproducible print (Mylar, etc.) and two non-reproducible prints, as a minimum, for each sheet of drawings.
- (4) A legend defining all symbols and explaining abbreviations.

B. Drawings shall show the following as a minimum:

- (1) All roofs surveyed
- (2) State identification, title, and date
- (3) An orientation north arrow and drawing scale
- (4) The area of each roof and approximate overall dimensions.
- (5) 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.

- (6) All roof slopes and valleys noted with drainage arrows. If there is no slope, state that the roof is dead level.
- (7) Where flashing is carried to a vertical surface, identify the surface (roof vent, masonry parapet, etc.) and give its height from roof level.
- (8) For a visual survey, show and explain all roofing defects and anomalies. Show interior damage (to the roof system) by dotted line.
- (9) 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).
- (10) 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 (<http://forms.dgs.state.va.us>).

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

PRECONSTRUCTION CONFERENCE AGENDA

PRECONSTRUCTION CONFERENCE AGENDA

PROJECT:

Work Order No. _____

I. Introduction of Team Players

- A. University Project Manager
- B. University Construction Administration Manager
- C. A/E project manager
- D. Contractor project manager and Superintendent

II. Inspection

- A. University Inspector _____
- B. Architectural Representative _____
- C. Fire/Life Safety _____
- D. Quality Control Inspection by Contractor
- E. Other consultants

III. Correspondence and Communication

- A. Copies of all correspondence will be directed to:
- B. Correspondence Includes:
 - 1. General Correspondence (To Project Manager Only)
 - 2. Submittals
 - 3. Request for Information (RFIs)
 - 4. Change Orders

IV. Status of Contract

- A. Contract
- B. Separate University Contracts
- C. Notice to Proceed
- D. Completion Date - Damages
- E. Working Hours

V. Submittals

- A. Project Manager and Superintendent's List
- B. Schedule of Values
- C. Construction Schedule (monthly) Bar Chart, other
- D. Cash Projection Schedule
- E. List of Subcontractors. (Minority List)
- F. Shop Drawings (2 approved copies to UVA)
 - 1. Schedule of Shop Drawinga and Submittals
- G. Emergency Contact List
 - 1. Post on Job
- H. Change Orders (Per General Conditions)
- I. As-Builts

VI. Special Items

- A. Detectors (Smoke/Fire)
- B. Dust Control
- C. Noise Control
 - 1. Abusive Language
- D. Equipment/Materials Removal
- E. Asbestos
 - 1. Dump reports
 - 2. Encapsulation 0 weekends
- F. Firestopping
- G. Notify UVA Police
- H. Shutdowns
 - 5 Day notice.
- I. Project Meetings
- J. Quality and Inspection
 - 1. Site visits by A/E, consultants, inspectors and others
 - 2. Running punch list
 - 3. Quality control, testing, inspections and notices required
 - 4. Systems commissioning requirements

- K. Parking and Staging Area, Site limits, Access

- L. Safety-Security
 - 1. Identification
 - Badge and I.D.#
 - 2. Hazardous Material Safety Data Sheets

- M. Special Conditions

- N. Minority Participation

- O. Project Sign

VII. Payment Request

- A. Deadline importance

- B. By schedule of values

- C. Dual submittal to project manager and A/E

- D. Monthly Pay Meeting

VIII. Contractor Evaluation

- A. By Construction Project Manager and Inspector

- B. By Architect and/or Engineer

- C. By Project Manager

IX. Contractors Comments/Questions

X. UVA Comments/Questions

XI. Architect's Comments/Questions

Attachment: Attendance Roster

APPENDIX I PARAMETERS FOR CALCULATING LIFE CYCLE COSTS AND ENERGY ANALYSES

Parameter for Calculation of Life Cycle Costs and Energy Analyses

I. 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.)

II. Additional Instructions for Calculating Life Cycle Costs for Energy Analyses

a. Use the following periods for energy-related life cycle cost studies:

- | | |
|-----------------------------------|----------|
| 1) Building Envelope Studies: | 30 years |
| 2) Central Heating System Plants: | 30 years |
| 3) Building HVAC Systems: | 20 years |
| 4) 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.

III. 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.

Building Life Cycle Cost Summary Worksheet

Standard Department of General Services (DGS) forms and formats are available for download from the DGS Forms Center (<http://forms.dgs.virginia.gov>).

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

SAMPLES OF FORMS AND FORMATS

See the Manager, Office of Contract Administration, Facilities Planning and Construction Department, for the following:

Supplementary Agreement for Off-Site Storage of Fabricated Structural Steel

Supplementary Agreement for Off-Site Storage of Precast Concrete Panels

Sample Prebid Question Format

Sample VBO Posting Data for Construction Project

Sample Hardware Specification & Schedule

Sample Submittal Register

Sample Panelboard Schedule Format

Sample Schedule of Values & Certificate for Payment (CO- 12)

Sample RFP for Project Inspection/Management Services (Nonprofessional Services)

Sample RFP for Construction Testing Services (Nonprofessional Services)

Sample General Conditions for Nonprofessional Services

Sample Special Conditions for Nonprofessional Services

Sample Demolition Note

Sample Disadvantaged Business Utilization Evaluation Criteria

APPENDIX K

CONSTRUCTION CHANGE ORDER PROCEDURE GUIDELINES

OVERVIEW

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. A. 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) to the Contractor describing the requested change and asking that the Contractor submit a price proposal for accomplishing said change in the Work.
- B. 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 to the Contractor describing the requested change and asking that the Contractor submit a price proposal for accomplishing said change in the Work.
- C. Where the Contractor desires to make a substitution and/or 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.
- D. 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.
- E. 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.

2. 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:

GC- 1, General Contractor s Estimate for Change Order

SC- 1, Subcontractor s Estimate for Change Order

SS- 1, Sub-Subcontractor s Estimate for Change Order

The general contractor and each affected subcontractor and sub-subcontractor must sign these forms. These forms are available at:

http://forms.dgs.state.va.us/eo51/dgs_viewforms.asp?page=5&srch=&order=FormNum&sort=ASC&div=&bu=BCOM

3. 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.
4. If the Change Order proposal is acceptable, the University shall have a Change Order prepared.
5. The A/E shall prepare the Change Order form (Form HECO-11) and 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.
6. 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.
7. **No work on any change order shall be accomplished without the approval of the Change Order.** Change Order approval authorities are described in Directive 362 "Change Orders for Construction and Professional Services Contract".
8. The University will distribute approved Change Orders to the A/E and Contractor.
9. Further guidance is contained in Directive 362 "Change Orders for Construction and Professional Services Contract". This Directive also addresses procedures for Board on Changes procedures and Emergency "Time and Materials" change order procedures.

APPENDIX L
ART & ARCHITECTURAL REVIEW BOARD
&
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 agency for which they are intended. While no rigid prescriptive standards exist, the AARB generally requires each submission to demonstrate:

- A resolution of basic functional and organizational requirements.
- A command of the fundamental principles of good design, including refinement of color, form, scale, material and craft.
- A positive contribution to the order and aesthetic of the physical setting.
- Due consideration of its environmental, historical and cultural factors.
- 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 are held in the Library of Virginia, conference room A on the first floor. The address is 800 E. Broad Street, Richmond, VA 23219.

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 Agency wishes to make its presentation. Agency request 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 also is 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 Agency 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 is made during the Design Development phase and should include samples of materials and colors. Presentations during the Construction Documents 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, Agency 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 Agency 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 Agency's initial submittal.

The following items should be addressed (and well illustrated) by the Agency and its Architect/Engineer at each presentation to the AARB:

- **Program:** A brief description of the building program, including the purpose for the project and primary internal relationships.
- **Relationship to the Surrounding Community, Adjacent Sites, and Agency Master Plan:** Include discussion of land use policy, pedestrian and vehicular circulation systems, landforms, and architectural character.
- **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.
- **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:

Agency Name (include address, telephone and fax, contact person):

Project Title (include project code and location):

Current Project Status and Schedule (preplanning study, schematics, etc.; next milestone date):

Project Description (area, number of stories, building and roof forms, predominant exterior materials):

Brief Program Description:

Relationship to Approved Master Site Plan (include date of master site plan):

Contextual Issues and Design Intent:

Previous History with AARB (dates and actions):

Names and Titles of Those Appearing for the Agency and Architect/Engineer.

Estimate of Time Required for this Presentation: Action This Date (for use by AARB):

Note: Attachments to this data sheet submittal are required.

The Architect for the University

All submittals and presentations will be coordinated by the Architect for the University.

BOARD OF VISITORS (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 of Virginia, 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 of Virginia and requires presentations at various stages of project execution. The University Architect coordinates these BOV reviews.

BOV approval of A/E Selections and Architectural Guidelines: is required and will be coordinated by the Architect for the University. The Architectural Guidelines should address each of the following seven general headings, as appropriate

1. Initial reference shall be made to the Vision Statement:
“Inherent in these Guidelines is the intent and scope of the Vision Statement for the Buildings and Grounds of the University of Virginia, adopted by the BOV on May 21, 1991. The Vision Statement shall be the primary reference for the overall design and planning of the Project.”
2. Contribution to the Master Plan
3. Nature of site and site plan strategy (this is also the place to address any landscape issues which may be specific to this Project)
4. Context, mass, and scale; relationship to the surrounding community, if appropriate
5. Architectural character, form and materials
6. Pedestrian and vehicular issues, including parking
7. Other issues unique to this Project (if any)

BOV approval of Schematic Designs and Preliminary Designs: is required and will be coordinated by the Architect for the University. These presentations will be similar to the AARB presentations noted above and will include

- an aerial photo (whenever possible),
- a site plan demonstrating relationships with other buildings and major topographical and landscape features,
- simple plans with the basic functional organization clearly portrayed,
- rendered elevations with shadows and in color,
- cross sections (often necessary to explain how additions are connected to their parent buildings),
- and either a rendered perspective or a model or one or more photographs of a model

APPENDIX M

STRUCTURAL & SPECIAL INSPECTIONS

The 1993 VUSBC Article 1, Section I 10, "Inspections," prescribes minimum Inspections to be performed on a project and cites the 1993 BOCA National Building Code, Article 17, Section 1705, requirements for Special Inspections. (The 1996 BOCA Code revision/rewrite includes similar requirements as Chapter 17, Structural Tests and Inspections.) 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:

- 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;
- 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;
- the A/E and the Agency 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 University for review and approval.
- 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;
- 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;
- 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;
- the University's Project Inspector/Clerk of the Works will observe day-to-day operations and report deviations/discrepancies in the materials and/or work versus contract documents and approved submittals;
- the University's 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;
- 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.
- 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.
- Copies of the HECO-6a, HECO-6b and HECO-13. 1b are also included for reference.

APPENDIX N: DUTIES OF THE PROJECT INSPECTOR

The Project Inspector must have the following minimum qualifications to perform the duties listed below:

- have education, trade related training, and experience in a design or construction related field;
- have the ability to read and understand the requirements of building Plans & Specifications;
- have some knowledge of construction means, methods and procedures;
- 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, NFIPA, NEC, BOCA, ASHRAE, etc.)
- have an understanding of the General Conditions of the Construction Contract;
- have the ability to read and understand a construction bar chart schedule; and
- 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 Project Inspector. This listing supplements and expands upon the duties, functions and responsibilities generally described in Chapter 10 of the **Manual** and in Section 16 of the **General Conditions of the Construction Contract**. The Project Inspector is an employee of the University and is responsible to the University for performing the duties, observations, and services described. The Project Inspector reports to the Construction Administration Manager, if assigned, otherwise to the University Project Manager. The Project Inspector will be assigned in writing. These duties may also be assigned to the Construction Administration manager. 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 Project Inspector shall perform the following services unless modified by the contract for services:

- Monitor and inspect all construction materials, equipment, and supplies for compliance with the contract documents, shop drawings, and submittals.
- Inspect installation and workmanship for compliance with the approved plans, specifications, shop drawings and referenced standards. (e.g. ACI, SMACNA, NFIPA, NEC, BOCA, ASHRAE, etc.) Verify compliance prior to cover or close-in of work.
- 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.

- 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 Project Inspector shall not interpret or change approved plans and specifications.
- 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. (See Formats in Appendix N of the **Manual.**)
- 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.
- 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.
- 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,
- 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.
- 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.
- Observe and report on all tests performed by the Contractor and note results in daily reports.
- Report presence of and activities performed by University's Testing & Inspection agents.
- Verify invoices for on-site tests/site visits of independent testing entities, which are to be paid by the University.
- 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. (See Formats in Appendix N of the **Manual.**)

- 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.
- 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.
- 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.
- 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.
- 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.
- 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
- 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.

- 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.
- 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.
- 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.
- 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 Project Inspector 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.
- 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.
- 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.
- The Inspector 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.
- The University may assign the Project Inspector other duties related to the project.

The Project Inspector has no authority to and shall not:

1. Authorize deviations from the Contract Documents;
2. Enter into areas of responsibility of the Contractor's superintendent;
3. Issue directions regarding construction means, methods, techniques, sequences or procedures, or safety precautions and programs in connection with the Work;
4. Authorize or suggest that the University occupy the project in whole or in part;
5. Issue a certificate for payment.

Supervisor: The Inspector shall report to the University's Project Manager or Construction Administration Manager, if assigned.

CHECKLIST OF PROJECT INSPECTOR

1. 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.

2. MEETINGS (ATTEND, REVIEW MINUTES AND MAINTAIN COPIES)

Preconstruction meeting.

HVAC Preinstallation meeting.

Monthly pay request.

Interim A/E inspection.

Pre-roofing conference.

Substantial Completion Inspection.

Final Inspection.

Coordination meetings.

Records University's minutes of meetings when A/E is absent.

3. SUBMITTALS (RECEIVE, USE, KEEP TRACK OF)

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.

Project inspector reports.

Minutes of meetings.

Operation and maintenance manuals, and instructions.

Any other documents and revisions resulting from issues concerning work.

4. INSPECTIONS/QUALITY CONTROL

Inspects all work and materials for conformance to Contract Documents, shop drawings, change orders.

Coordinates special inspections.

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 off site storage for Contractor materials is approved.

Verifies Contractor records proper disposal of hazardous material.

5. SCHEDULING/PAYMENTS

Assists A/E to verify accuracy of CO- 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.

6. 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

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NON CAPITAL OUTLAY PROJECT PROCEDURES

PROJECT TYPES

Those projects with total project costs less than \$1,000,000 are considered non-capital outlay projects. When the funding source is operating budgets, grants, gifts, a revenue source, or University of Virginia (UVA) 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. However, all capital projects are managed in accordance with the HECOM. A summary of the various project types typical at UVA follows:

CAPITAL PROJECTS (>\$1,000,000)

General Fund

Funding and authority from the General Assembly. Requires project specific capital budget submittal for funding and authority. Manage in accordance with the HECOM.

Non General Fund

Authority from the Board of Visitors. Requires project specific capital budget submittal for authority. Uses UVA non-general funds. Manage in accordance with the HECOM.

Non General Fund Blanket (<\$2,000,000)

Authority from the General Assembly. Requires capital budget submittal for the blanket authority. Uses UVA non-general funds. (Usually amounts to ~\$4 mil to ~\$10 mil per biennial) Manage in accordance with the HECOM.

NON CAPITAL PROJECTS (<\$1,000,000)

Non General Fund

Funding and authority from UVA. Manage as non capital HECOM 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 HECOM project.

NON CAPITAL HECOM PROJECT PROCEDURES

In general, the HECOM procedures for non-general fund non-capital outlay projects are the same as those for non-general fund capital outlay projects. Contracting procedures, code requirements, building permits, and safety requirements are identical for all non general fund projects. However, non capital HECOM projects do not require the same level of reviews and approvals as a standard capital outlay HECOM project.

The following capital project HECOM reviews and approvals are not required:

HECO 2 "Project Authorization" - use the Work Order with appropriate fund code citation

HECO 4 "Approval of Schematic Design"

HECO 5 "Approval of Preliminary Drawings & Specifications"

Note that the BOV and AARB reviews are generally not required on non-capital projects unless required by the Architect for the University.

HECO 8 Approval to Award

The following HECOM forms and approvals are required:

HECO 2.1 series - A/E selection forms

HECO 3 series - A/E contracts

HECO 6 - Approval of Working Drawings (Note University Architect,
and Landscape Committee approvals may apply)

HECO 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 BUILDING PERMIT POLICY

The Building Permit Policy for University Buildings and Structures is contained in Facilities Directive 562 and is available on-line at <http://fac.mgmt.virginia.edu/directives/>.

Forms for Building Permits are in Appendix B.

APPENDIX Q

UNIVERSITY OF VIRGINIA PROCEDURE FOR RESOLUTION OF CONTRACTUAL CLAIMS

The University of Virginia Procedure for Resolution of Contractual Claims is contained in Facilities Directive 363 and is available on-line at <http://fac.mgmt.virginia.edu/directives/Dir363.doc>.

APPENDIX R DETERMINATIONS AND FINDINGS

D&F Forms are available from the FP&C Web Site at: <http://www.fm.virginia.edu/fpc/Forms/DandF-Forms.htm>. |

APPENDIX S
NOT USED (RESERVED)

APPENDIX T
NOT USED (RESERVED)

APPENDIX U
NOT USED (RESERVED)

APPENDIX V
REAL PROPERTY TRANSACTION
Capital Outlay, Acquisitions and Leases

See Assistant Director, Space and Real Estate Management

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APPENDIX W

SUPPORTING DOCUMENTS

A. Enabling Legislations

1. Medical Center Codified Autonomy 1996 Virginia Acts of the Assembly (see also Virginia Code §23-77.4)
2. Restructured Higher Education Financial and Administrative Operations Act (The Act) 2005 Virginia Acts of the Assembly (see also Virginia Code §23-38.88 to §23-38.121)
3. Management Agreement By and Between the Commonwealth of Virginia and the University of Virginia (The Management Agreement) 2006 Virginia Acts of the Assembly.

B. Board of Visitors Policies

1. Policy Statement Governing Exercise of Post Appropriation Autonomy for Certain Non-General Fund Capital Projects - 1996.
2. Policy Statement Governing Exercise of Procurement Autonomy by the University on behalf of the Medical Center – 1996.
3. The Management Agreement to The Act Policy Statement Governing Capital Projects.
4. The Management Agreement to The Act Policy Statement Governing Leases of Real Property.
5. The Management Agreement to The Act Policy Statement Governing the Procurement of Goods, Services, Insurance, and Construction and the Disposition of Surplus Materials.

C. Delegation Letters

1. Building Official Delegation
2. Procurement and Capital Project Execution Delegation.

See the CFO Administrative Assistant for copies of the above.